

Primary Ear and Hearing Care Training Resource

STUDENT'S WORKBOOK

Intermediate Level



**World Health
Organization**

Chronic Disease Prevention and Management

WHO Library Cataloguing-in-Publication Data

World Health Organization.
Primary ear and hearing care training resource.

4 v.

Contents: Basic level
Trainer's manual : intermediate level
Student's workbook : intermediate level
Advanced level.

1. Ear – physiopathology · 2. Hearing disorders – therapy · 3. Hearing loss – therap · 4. Primary prevention – education
· 5. Community health aides – education · 6. Teaching materials · I. Title.

ISBN 92 4 159361 X (set) (NLM classification: WV 270)
92 4 159268 0 (Basic level)
92 4 159269 9 (Trainer's manual)
92 4 159270 2 (Student's workbook)
92 4 159271 0 (Advanced level)

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Printed in Switzerland

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FOREWORD


The World Health Organization estimated that in 2005 there were 278 million people in the world with disabling hearing impairment (moderate or worse hearing loss in the better ear). Two-thirds of these are in developing countries. Many more have mild hearing loss and many kinds of ear diseases. These problems can cause life-long and sometimes life-threatening difficulties to people with them; they may have a profound effect on the ability of individuals to communicate with others, on their education, on their ability to obtain and keep employment, in social relationships and through stigmatization. These problems also produce surprisingly large economic burdens on society as a whole.

In developing countries there are few programmes to prevent and treat ear diseases and help people with hearing impairment, and, in many of these countries, few or no trained health workers to implement them.

Some of the most effective and cost-effective interventions against ear and hearing disorders can be implemented at the primary level by trained primary ear and hearing care (PEHC) workers or primary health care (PHC) workers or their equivalent. If these interventions are used on a large scale they will have a major impact on the burden of ear disease and hearing loss. However most developing countries do not have PEHC workers and the topic is hardly addressed in the training of PHC workers. Workers in Community-based rehabilitation (CBR) programmes rarely deal with this field.

The WHO Primary Ear and Hearing Care Training Resource is intended to address this urgent need. It consists of manuals and other materials for interactive and culturally appropriate training of village health workers, PEHC, PHC and CBR workers, and also more experienced personnel working at primary level. It comprises basic, intermediate and advanced level components.

The resource focuses on community involvement and raising awareness, and covers basic measures for prevention and management. A section on hearing aids is included for communities where there are no other trained personnel to help people use them effectively. The resource has been developed by a wide process of consultation in many developing countries, and has been field tested in Africa and Asia. It will be made freely available to projects and programmes that wish to conduct training in this field.



WHO stated, in 1978, that "Primary Health Care is essential health care made universally accessible to individuals and families in the community by means acceptable to them, through their full participation and at a cost that the community and country can afford. It forms an integral part of the country's health system of which it is the nucleus and of the overall social and economic development of the community."*

It is hoped that the resource will contribute to primary health care and will stimulate and enable greater priority to be given by developing countries to addressing ear and hearing disorders, and hence start to make a substantial reduction in their burden in the developing world.

* *Primary health care. Report of the International Conference on Primary Health Care: Alma-Ata, USSR, 6–12 September 1978.* Geneva, World Health Organization, 1978 (Health for All Series, No. 1), p.34.

PREFACE

FOR THE INTERMEDIATE LEVEL

This level of the training resource is an educational tool for the training of primary ear and hearing care workers and also primary health care workers in developing countries. The primary ear and hearing care worker can use it in their work with people suffering from common ear diseases and/or having a hearing impairment. He/she will also be able to work with members of the patient's families and the broader community.

Prevention, diagnosis and treatment of common ear diseases and hearing impairment are discussed. The training resource emphasises basic information that will enable primary ear and hearing care workers to help parents, care givers, teachers and employers and community members to relate to a person who is hard of hearing.

Diagrams and photographs are used to clarify the structure, abnormalities and common disorders of the ear and hearing and to explain the equipment needed for treatment and management of hearing loss.

The trainer's manual contains the necessary knowledge and skills needed by the primary ear and hearing care worker. It also recommends interactive training and shows the trainer when to use the teaching aids provided.

The student's workbook contains the necessary knowledge and skills the student needs to understand and apply as a primary ear and hearing care worker. Each student is required to complete the interactive exercises throughout his or her training. By doing so each will show their understanding of primary ear and hearing care.

The intermediate level of the training resource consists of:

- A trainer's manual
- A student's workbook
- Teaching aids

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ACKNOWLEDGEMENTS

The principal work was done by Ms. S. Harvest with special thanks to Clare Litzke for writing Module 7 – Introduction to hearing aids and Ilka Linz, Berlin – layout artist. All photographs/graphics were contibuted by Suchitra Prasansuk, Chris Prescott, Piet van Hasselt, Ron Brouillette, Michael Hawke, Clare Litzke, Andrew Smith and Sally Harvest. CHP/ACE team helped with the new covers and style. Christoffel-Blindenmission (CBM) provided technical inputs and fully funded the development and production of the resource.

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PURPOSE OF TRAINING RESOURCE

The purpose of this training resource is to assist with the training of primary ear and hearing care workers in developing countries.

Recent WHO (World Health Organisation) estimates for Global Burden of Disease (2005) show that 278 million people worldwide are estimated to have disabling hearing impairment. Two-thirds of these people live in developing countries. Approximately 50% of these cases are preventable. The role of the primary ear care worker is vitally important for the prevention, diagnoses and treatment of ear and hearing disorders.

An important role for the trained primary ear and hearing care worker will be to help the patient, family and community to understand common ear disease and hearing loss. The PEHC worker will be taught when to refer for further treatment and support. This training resource emphasises the need for prevention, diagnosis and treatment of common ear disease and hearing loss. It also shows that with understanding and the necessary support, people with hearing loss can play productive roles in the household, school or in the work place.

The training resource consists of three parts:

- A trainer's manual
- A student's workbook
- Teaching aids

The trainer's manual will guide the trainers through the course that is linked to the student's workbook and give support to the trainer in the following ways:

- Advises the trainer which teaching aids are needed for each module
- Contains the relevant knowledge and skills content
- Prompts the trainer to ask relevant questions and lead discussions
- Ensures that students participate in their learning
- Explains the process of how we hear sounds
- Explains prevention, diagnosis and treatment of common ear and hearing disorders
- Explains reasons for hearing impairment
- Explains the management and possible solutions available for the hard of hearing

The student's workbook is an interactive manual that comprises eight modules and supports the student's studies in the following ways:

- Describes the knowledge and skills required
- Requires the student to complete activities related to common ear disease and hearing impairment
- Encourages students to discuss issues relating to common ear disease and hearing impairment
- Explains the process of how we hear sounds
- Explains prevention, diagnosis and treatment of common ear and hearing disorders
- Explains reasons for hearing impairment
- Explains the management and possible solutions available for the hard of hearing

The teaching aids are relevant to each module and are clear and simple to understand. The students are encouraged to use the teaching aids to enhance their understanding of common ear diseases and hearing impairment. The posters have separate labels to identify specific sections or functions. The training resource contains a list of recommended equipment.

CRITICAL OUTCOMES

- Become a competent Primary Ear and Hearing Care worker and work effectively as a member of a team for the effective treatment of the patient
- Identify and find the best possible solutions/answers for raising awareness about ear disease and/or hearing problems, and dealing with their prevention and management
- Organise and manage oneself and one's activities responsibly and effectively
- Collect, analyse, organise and critically evaluate information regarding ear disease and/or hearing problems
- Communicate effectively using visual and/or language skills in the modes of oral and/or written persuasion to assist the patients
- Use appropriate technology effectively and critically, showing responsibility towards the health of the patient
- Be culturally sensitive across a range of social contexts

EAR CARE EQUIPMENT

- Cotton applicators, 14cm, serrated
- Head light (spare bulbs)
- Head mirror
- Ear syringe (metal) 50ml
- Kidney bowls
- Otoscope (spare bulbs)
- Disposable specula – 2.5mm and 4mm
- Syringes – plastic, various sizes
- Equipment for doing simple maintenance on hearing aids and ear moulds

module 1

Structure and function of the ear



By the end of this module the Health Care Worker should be able to:

- Explain why hearing is important
- Recognise and name the parts of the ear
- Explain the function of the ear
- Explain the path sound travels through the ear
- Explain how people hear

PRE TEST

| Questions | True | False | Don't know |
|--|------|-------|------------|
| The pinna is made up of cartilage covered by skin and can bend | | | |
| The tragus makes wax to fill up the ear canal | | | |
| The normal ear canal is a straight tube with a wet lining like the lining inside your mouth | | | |
| The eardrum is at the end of the ear canal | | | |
| The ossicles conduct sound vibrations from the eardrum to the cochlea (hearing organ) | | | |
| The Eustachian tube connects the middle ear space to the back of the nose | | | |
| The middle ear space is full of mucus to help us hear properly | | | |
| The cochlea (hearing organ) contains hair cells to convert sound vibrations into nerve signals | | | |
| The balance organ is called the vestibular system | | | |
| Infection in the ear can cause a lame face (facial palsy) | | | |
| Score | | | |

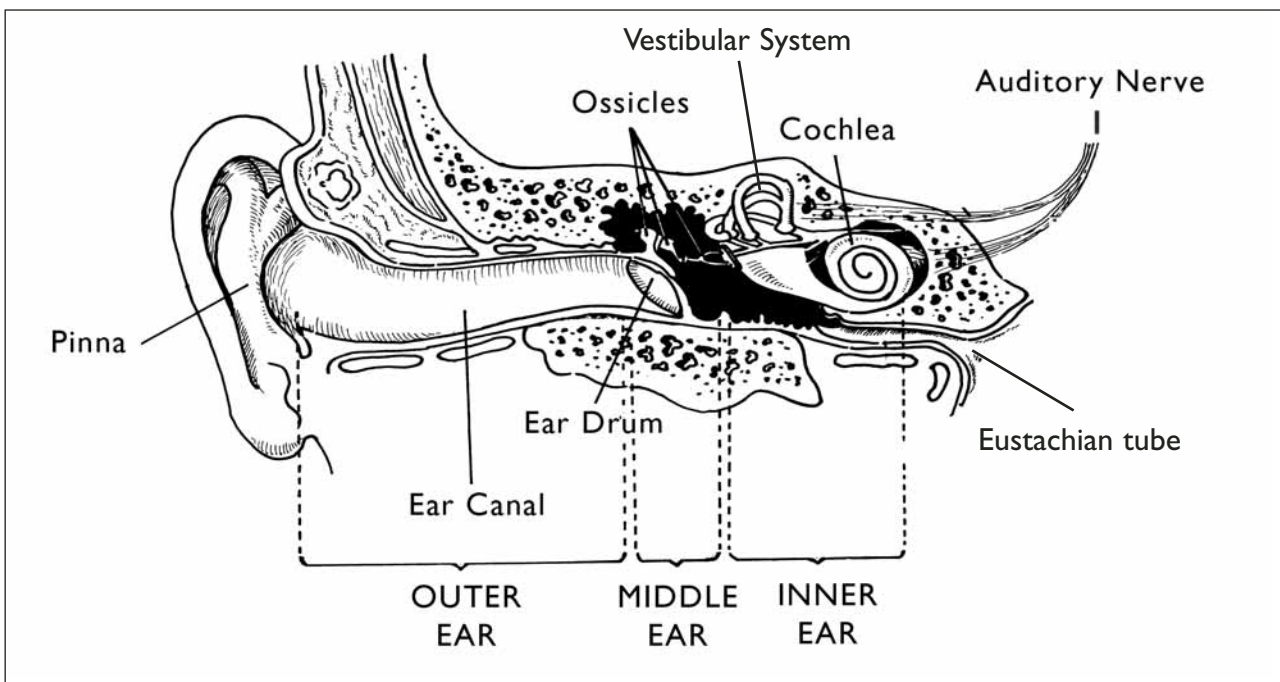
Symbols

- ☺ Discussion in groups or with the trainer
- ✎ Write in your answers or ideas
- * Take part in an activity

Terminology

| Outer ear | Middle ear | Inner ear | Others |
|------------------|---------------------------------------|--|------------------------------|
| Pinna | Ear drum (Tympanic Membrane) | Cochlea (hearing organ) | Facial nerve |
| Tragus | Middle ear space | Vestibular system (balance organ) | Disabling hearing impairment |
| Earlobe | Ossicles – malleus Incus Stapes | Hair cells | Hearing impairment |
| Ear canal | Eustachian tube | Auditory nerve (Hearing and balance nerves) | |
| Sound vibrations | Mastoid bone | Nerve signals | |
| Wax | Mastoid air cells | | |
| Self cleaning | mucus | | |

Structure: What are the parts of the ear?



Function: Discuss what the ear does


Use the following words: talking, communicating, hearing, listening, sounds, voices, speaking, learning, school, work

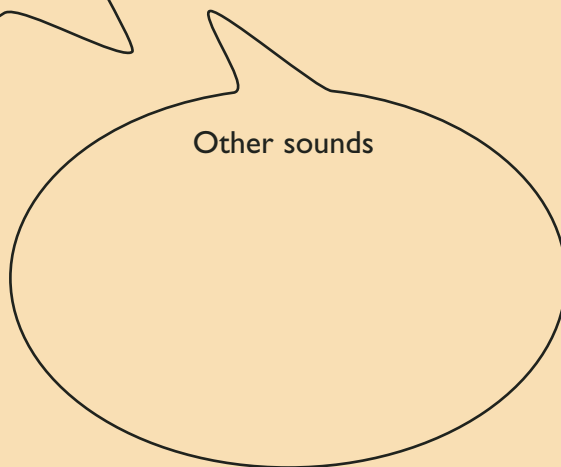
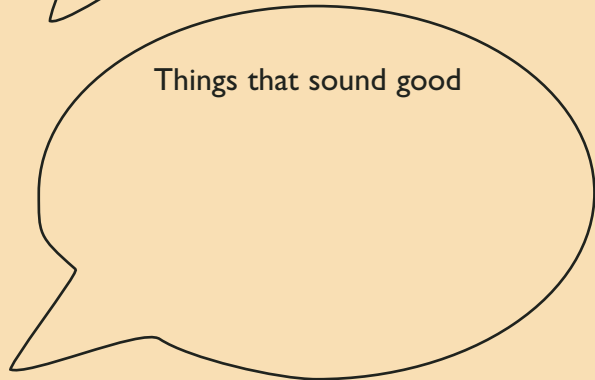
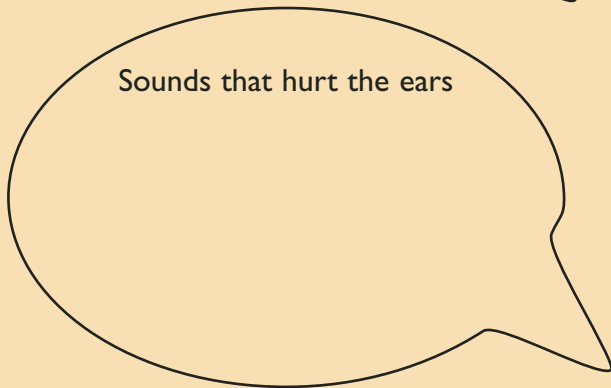
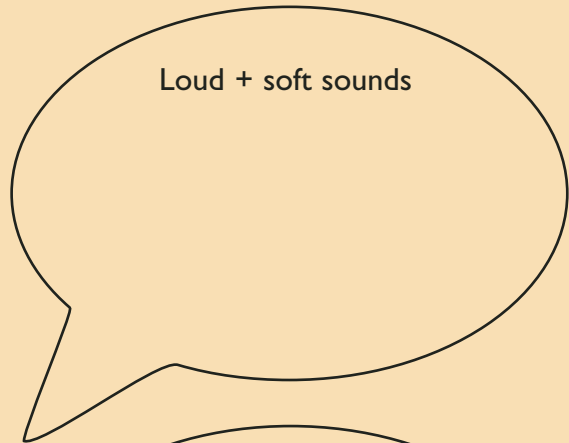
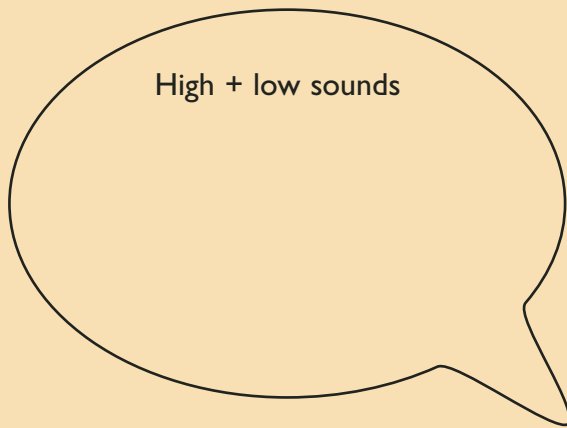
I. COMMUNICATION

I.1 Different types and levels of sound

Activity 1

Think of the different types of sounds people can hear and the different levels (loud and soft) of sounds people can hear.

 Write them in the speech bubbles



1.2 Why is hearing important?

Speech and hearing play a vital part in every person's life from the time they are born. Unless both speech and hearing develops the person will not be able to communicate easily with family, friends, at school, people in the workplace etc.


Communication enables us to learn as well as be involved in everyday life. Our speech and language skills develop as we grow. The earlier ear and hearing problems are picked up, the earlier they can be treated and managed.

The World Health Organisation estimates that about 278 million people worldwide have disabling hearing impairment. About two thirds of these people live in developing countries. About 139 million cases of disabling hearing impairment could be prevented.

Activity 2

How do you think you would feel if you could not hear well?

| | |
|------------|---------|
| left out | ignored |
| frustrated | happy |
| confident | angry |
| withdrawn | sad |

 Write down any other feelings:

1.3 Hearing impairment

Hearing impairment is the inability to hear as well as someone with normal hearing. Hearing impaired people can be Hard of Hearing (HOH) or deaf.

There are several different levels of hearing impairment:

- Having difficulty hearing conversational speech (slight impairment)
- Having difficulty hearing loud speech (moderate impairment)
- Can only hear some words if they are shouted into the ear and having to rely on lip reading or hearing aids to help understand speech (severe impairment)
- Cannot even hear shouted words and having to rely on lip reading or sign language for communication (profound impairment)

Children have disabling hearing impairment when they have difficulty hearing conversational speech or identifying most sounds. Children need good hearing to develop proper speech and to hear as they learn.

Use the words "hearing impairment" when a person cannot hear well.

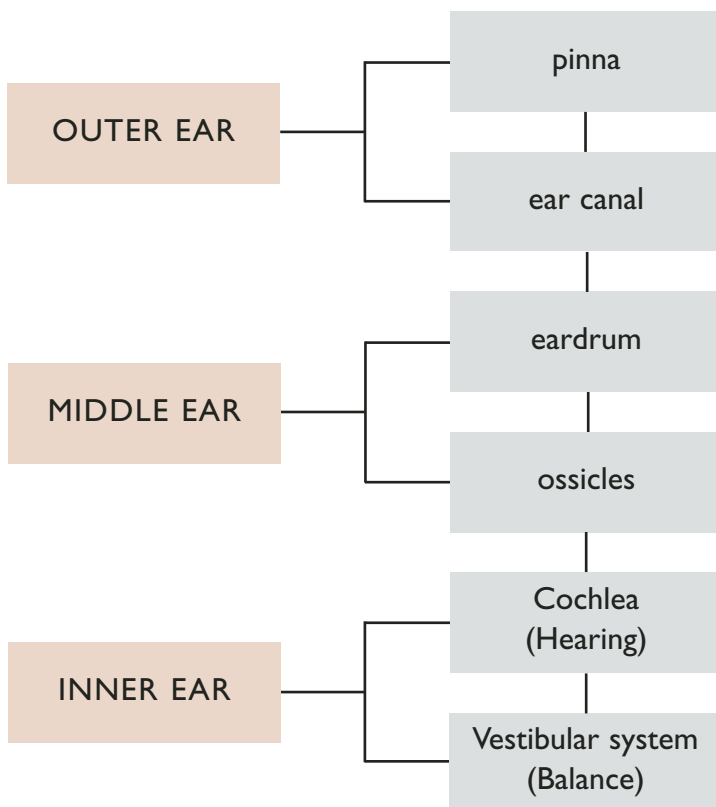
Only use "deafness" or say that a person is "deaf" when they cannot hear at all.

About half of all hearing impairment and deafness could be prevented if common causes were dealt with in Primary Health Care.

- It is important to be able to hear well. In order to hear we need healthy ears that function properly
- Ear and Hearing Care workers play an important role in preventing and treating the common things that cause hearing impairment and deafness.
- Ear and Hearing Care workers need to understand the normal structure and function of the ear to help identify the common abnormalities and diseases of the ear.

2. STRUCTURE AND FUNCTION OF THE EAR


The ear consists of three parts:

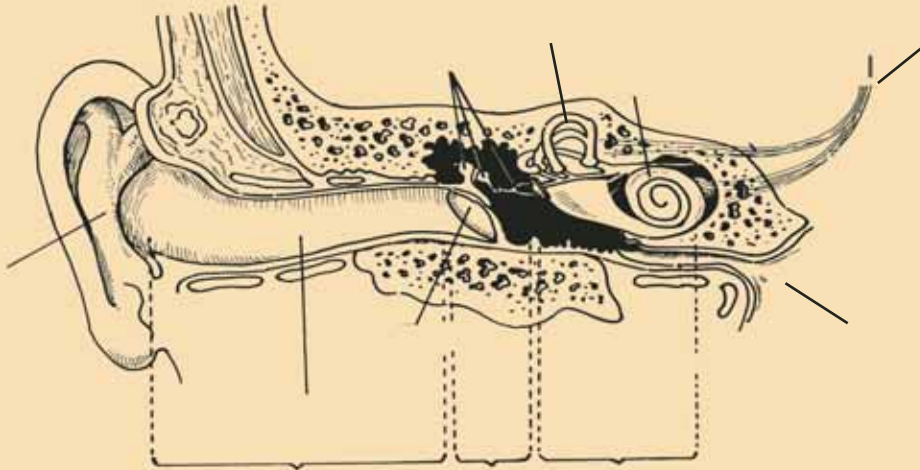


THE EAR HAS TWO FUNCTIONS – HEARING AND BALANCE

The three sections of the ear

Activity 3

 Complete the diagram by writing in the correct names of each part



Labels:

Outer ear, Middle ear, Inner ear, Pinna, Ear canal, Eardrum, Middle ear space, Ossicles, Cochlea (Hearing organ), Vestibular system (Balance organ), Hearing nerve, Balance nerve, Eustachian tube

3. THE OUTER EAR

The outer ear has two parts – the pinna and the ear canal


3.1 What is the structure of the pinna?

The pinna is made out of cartilage covered by normal skin. Cartilage can be bent. The ear lobe is soft and this is where holes are usually made so that earrings or traditional jewellery can be worn. The pinna leads into the ear canal. In front of the opening of the ear canal is a bump called the tragus.

3.2 What is the function of the pinna?

The pinna picks up sound vibrations and directs them into the ear canal. Hard of hearing people sometimes put their hand behind the pinna to help pick up more sound. If a person has deformed ears they might have difficulty hearing. Some deformed ears have no opening into the ear canal so that sounds cannot get through which will make the hearing problem much worse.

Activity 4

 Mark each question as you examine each ear:

| | LEFT EAR | | RIGHT EAR | |
|---|----------|----|-----------|----|
| | Yes | No | Yes | No |
| Can you see the pinna? | | | | |
| Can you see the tragus? | | | | |
| Can you see the entrance to the ear canal? | | | | |
| Is it open? | | | | |
| Can you see any hairs in the entrance to the ear canal? | | | | |
| Do both ears look normal? | | | | |

3.3 What is the structure of the ear canal?

The ear canal is an open tube with a skin lining. At the entrance there are hairs to try and stop things getting into the ear canal. Just beyond the hairs are glands that produce wax that spreads to cover the skin in the ear canal and helps to keep it healthy. The ear canal normally cleans itself and clears the wax out by itself.

There is a small bend in the ear canal and in the deep part the skin is thin and sensitive to pain and can easily be injured. At the end of the ear canal is the eardrum.

Do not put things in the ear canal – you may harm it

3.4 What is the function of the ear canal?

The sound vibrations picked up by the pinna travel down the ear canal to the eardrum and make the eardrum vibrate.

If the ear canal is blocked the sound vibrations cannot reach the eardrum. When this happens the person is not able to hear sounds clearly.

The commonest cause of a blocked ear canal is wax.

Some people produce more wax than normal and some ears do not clear the wax out properly.

Activity 5

 Discuss with a partner:

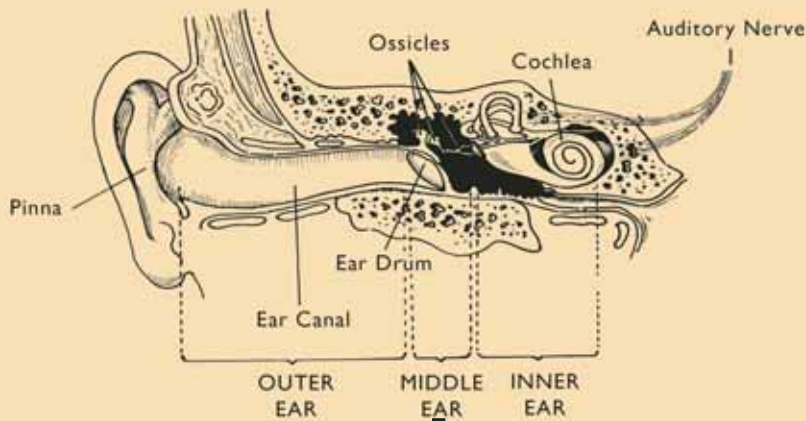
What do you think a patient would complain about if wax was blocking the ear canal?

If you feel something in the ear canal – get it checked at your clinic

A healthy ear canal is important for hearing.

4. THE MIDDLE EAR

Activity 6



✎ Complete the diagram by writing in the correct names of each part
List of labels: air cavity, stapes, malleus, incus

4.1 What is the structure of the middle ear?

The ear canal leads to the eardrum. The eardrum is a thin membrane that separates the outer ear from the middle ear. The middle ear is a space that is filled with air. The air gets into the middle ear through the Eustachian tube. The Eustachian tube goes from the back of the nose to the middle ear.

There are three tiny bones in the middle ear called the ossicles

Ossicles = malleus + incus + stapes

Or they can be named after their shapes

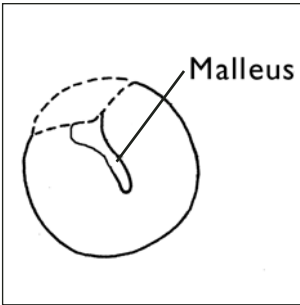
Ossicles = hammer + anvil + stirrup

Activity 7

* Pinch your nose closed and try to blow gently through your nose. You should feel your ears 'pop' open as air passes through the Eustachian tube into your middle ear.

Do not do this if you have a cold as the infected mucous in your nose could be pushed through the middle ear.

The malleus forms part of the eardrum – see diagram and picture.



The malleus is connected to the incus. The incus is connected to the stapes. The stapes fits into a tiny oval window that opens into the inner ear.

The middle ear has a lining that usually secretes a tiny amount of mucus. This mucus is drained away through the Eustachian tube. If the lining produces too much mucus this blocks up the Eustachian tube and air cannot get into the middle ear and the mucus cannot drain away properly. The middle ear space will fill up with mucus and then the eardrum and the ossicles will not be able to vibrate properly to transmit sound. The patient may not hear well and have some pain




Bacteria can get through the Eustachian tube into the middle ear and cause infection.

4.2 What is the function of the middle ear?

The eardrum picks up the sound vibrations that travel down the ear canal. The eardrum vibrates and makes the ossicles vibrate. The ossicles vibrate and conduct these vibrations across the middle ear space. The stapes vibrate and make the fluid in the inner ear vibrate.

The sound vibrations can only be conducted across the middle ear if the space is filled with air.

Activity 8

 What do you think would happen if the ossicles could not vibrate?

4.3 The mastoid air cell system

The mastoid bone is situated behind the middle ear and is filled with air.

The mastoid is a bony system of cells that contain air and is linked to the middle ear. Both these areas are filled with air and the mastoid air cell system works as an air tank that helps balance the air pressure changes in the middle ear.

5. THE INNER EAR

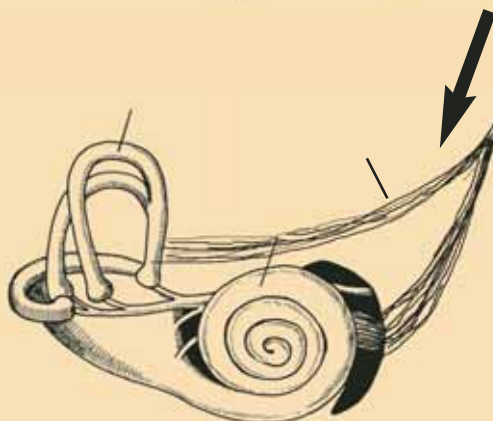
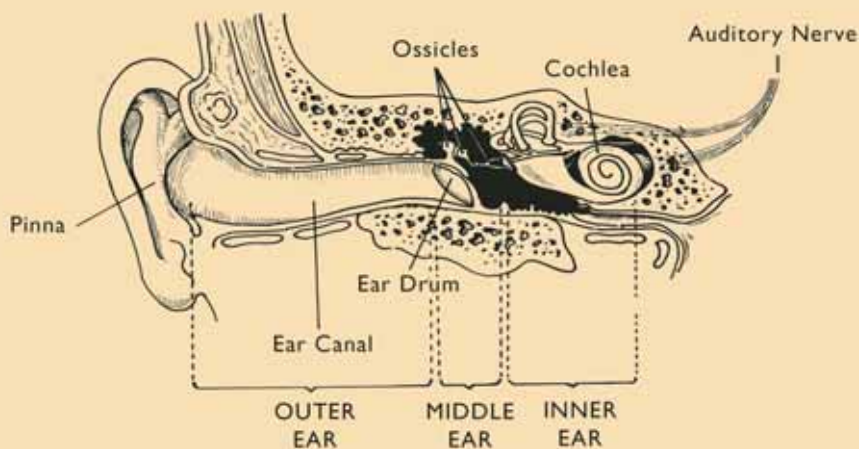
The inner ear has two parts.

- The cochlea deals with sound vibrations and is responsible for hearing
- The vestibular system is responsible for balance

5.1 Hearing: What happens in the cochlea?

The cochlea is filled with fluid and contains a delicate membrane lined with tiny hair cells. The hair cells are all connected to the hearing nerve. Vibrations of the ossicles make the fluid vibrate. The vibrations are picked up by the hair cells. The hair cells change the sound vibrations into tiny nerve signals. These nerve signals then travel along the auditory nerve to the brain. In the brain there is a special area where these nerve signals are interpreted as the sounds we hear. Damage to the cochlea or hearing nerve causes hearing impairment or deafness.

Activity 9



Complete the diagram by writing in the correct names of each part:
 Labels: vestibular system, cochlea, auditory nerve (hearing and balance nerve)


What path does sound travel from outside the ear until we can hear it?



- Sound vibrations are picked up by the pinna
- The pinna directs these sound vibrations into the ear canal
- The sound vibrations reach the membrane of the eardrum and make it vibrate
- The vibration of the eardrum causes the ossicles to vibrate
- The ossicles vibrate and cause the fluid in the inner ear to vibrate
- These vibrations are picked up by the hair cells in the cochlea
- These hair cells change the vibrations into nerve signals
- These nerve signals travel along the hearing nerve to the brain
- In the brain the nerve signals are interpreted into the sounds we hear

How sound travels through the ear

Activity 10

 Complete the diagram by drawing a line to show how sound travels through each part of the ear



5.2 Balance: The vestibular system

The vestibular system is also filled with fluid. Movements of our head cause the fluid to move. There are different hair cells in the vestibular system that are all connected to the balance nerve. These hair cells pick up any movement in the fluid and convert it into nerve signals. These nerve signals pass along the balance nerve into the brain. The brain has a special area where the nerve signals are interpreted as the movements we feel.

Normal function on both sides is needed for us to keep our balance and so that we can keep our eyes focused on what we are looking at as we move our head around.

If there is infection in one ear that spreads into the inner ear, the function of the vestibular system on that side will be upset and the patient will feel dizzy. If there is inflammation of the balance nerve on one side the same thing will happen. When a patient is dizzy and feels as if everything is moving round and round we say that they have vertigo.

6. FACIAL NERVE

You need to make sure that you know something about nerves and muscles. Some nerves make muscles work. In the face there is only one nerve on each side that makes all the muscles on that side of the face work. It is called the facial nerve. Infection in the middle ear can cause facial palsy (also called lameface).

The facial nerve goes through the ear inside a bony tunnel on the wall between the middle ear and the inner ear.



If ANY part of the ear becomes damaged because of infection or injury the person may become temporarily or permanently hearing impaired

POST TEST

| Questions | True | False | Don't know |
|--|------|-------|------------|
| The pinna is made up of cartilage covered by skin and can bend | | | |
| The tragus makes wax to fill up the ear canal | | | |
| The normal ear canal is a straight tube with a wet lining like the lining inside your mouth | | | |
| The eardrum is at the end of the ear canal | | | |
| The ossicles conduct sound vibrations from the eardrum to the cochlea (hearing organ) | | | |
| The Eustachian tube connects the middle ear space to the back of the nose | | | |
| The middle ear space is full of mucus to help us hear properly | | | |
| The cochlea (hearing organ) contains hair cells to convert sound vibrations into nerve signals | | | |
| The balance organ is called the vestibular system | | | |
| Infection in the ear can cause a lame face (facial palsy) | | | |
| Score | | | |

module 2

Hearing impairment and deafness: causes and prevention



By the end of this module the Health Care Worker should be able to:

- Identify and explain common causes of hearing impairment
- Describe the risk factors for hearing impairment
- Explain hearing impairment preventive measures
- Explain the different types of hearing impairment
- Explain the different levels of hearing impairment

PRE TEST

| Questions | True | False | Don't know |
|---|------|-------|------------|
| Hearing impairment always means that a person is deaf | | | |
| Deafness cannot be inherited | | | |
| A child who is born deaf may not learn to speak properly | | | |
| All deaf people can hear normally if they wear a hearing aid | | | |
| There are different levels of hearing impairment | | | |
| Moderate hearing impairment means that a person cannot hear speech even if it is shouted close to their ear | | | |
| Neglected ear infections can cause hearing impairment | | | |
| Damage by loud noise to the hair cells in the cochlea (hearing organ) always recovers | | | |
| Some drugs when used over a period of time can cause hearing impairment | | | |
| Vaccination against measles, mumps and rubella can prevent hearing impairment | | | |
| Score | | | |

Terminology

| | | |
|--------------------------------|--|--|
| Hearing impairment | Genetic (hereditary) causes | Head injury |
| Disabling hearing impairment | Causes during pregnancy – viral infection, rubella (German measles), syphilis, drugs that damage hearing | Old age |
| Normal hearing – no impairment | | Hearing aids |
| Slight hearing impairment | | Genetic counselling |
| Moderate hearing impairment | Causes at birth – prematurity, difficult birth, jaundice | Immunisation/vaccination |
| Severe hearing impairment | | Preventative measures |
| Profound hearing impairment | Childhood diseases – measles, mumps, meningitis | Consanguineous marriage |
| Deafness – deaf | Ear infections | Speech: whispered speech – conversational speech – loud speech |
| Lip reading | Ototoxic drugs | |
| Sign language | Loud noise | |

Symbols

- ☺ Discussion with partner or in groups
- ✍ Complete by writing in answers or ideas
- * Take part in an activity

I. HEARING IMPAIRMENT

I.1 What do we mean by hearing impairment?

This is when a person is not able to hear as well as someone with normal hearing. There are several different levels of hearing impairment:

- A person has difficulty hearing conversational speech
- A person has difficulty hearing loud sounds
- A person can only hear some words if they are shouted into the ear
- A person cannot even hear shouted words

A person who cannot even hear shouted words has deafness or is said to be deaf

I.2 What do we mean by disabling hearing impairment?

This is when people can only hear loud speech or shouted words, or when they cannot even hear shouted words. Children have disabling hearing impairment when they have difficulty hearing conversational speech. Disabling hearing impairment in children is set lower than in adults because children need good hearing to develop proper speech and to hear as they learn.

I.3 What are the different types of hearing impairment?

1. Conductive hearing impairment

This term is used when the problem causing the hearing impairment is in the ear canal or in the middle ear.

It is then difficult for sound to be "conducted" through to the inner ear.

The problem can often be corrected by treatment or if it cannot the patient can be helped by wearing a hearing aid.

2. Sensorineural hearing impairment

This term is used when the problem causing the hearing impairment is in the cochlea or in the hearing nerve or sometimes both.

The "sensori-" part comes from the cochlea which is a "sense organ" and the "neural" part comes from the hearing nerve.

Hearing aids can sometimes be used to help hearing.

2. CAUSES OF HEARING IMPAIRMENT

2.1 Causes before and during birth:

Genetic (hereditary) causes

- Hearing impairment could run in the family

Problems during pregnancy


- Diseases during pregnancy – Rubella (German measles), other viral infections
- Sexually transmitted diseases – syphilis
- Drugs that can damage hearing when taken during pregnancy

Difficulties during or just after birth

- Premature birth
- Difficult birth when the baby suffers from lack of oxygen
- Jaundice after birth

Activity 1

What are some of the things you think can cause hearing impairment?

 Mark what you think would cause hearing impairment and write down any other ideas.

- | | |
|-----------------------------|--------------------------|
| Washing ears | <input type="checkbox"/> |
| Working with machinery | <input type="checkbox"/> |
| Deafness in the family | <input type="checkbox"/> |
| Baby not breathing at birth | <input type="checkbox"/> |
| Very loud noises | <input type="checkbox"/> |
| Blowing your nose | <input type="checkbox"/> |

Other ideas:

Note

Problems during pregnancy can cause hearing impairment.

How to help prevent hearing impairment:

- A comprehensive Rubella vaccination programme should be applied in the community.
- Screening of pregnant women for syphilis should be done and treatment given if necessary.
- Some drugs taken during pregnancy can cause hearing impairment – always check what drugs are prescribed. The word that is used for drugs that can damage hearing is "ototoxic" drugs. These drugs can only damage the cochlea.
- Good antenatal care with care during birth gives a better chance of a healthy baby.
- Jaundiced babies should be referred for treatment.

2.2 Other causes of hearing impairment:

Childhood diseases

- Measles, Mumps, Meningitis

Ear infections

- Infection can cause problems in the ear canal, the middle ear or the inner ear

Drugs that can damage hearing (ototoxic drugs)

- Antibiotics such as Streptomycin and Gentamicin
- Antimalarials such as Quinine and Chloroquine

Noise

- Working with noisy machinery, loud music, explosions

Accidents

- Head injury or injury to the ear can cause hearing impairment

Old age

- As people get older they usually develop some hearing impairment

Wax

- Wax blocking the ear canal can cause hearing impairment at any age

Glue ear

- Glue ear is a common cause of hearing impairment in children

Consanguineous marriage

- Marriage between people who are closely related, usually between first or second cousins or sometimes a closer relationship

3. HOW WELL CAN WE HEAR?

3.1 No hearing impairment:

People with normal hearing can hear whispered speech.

3.2 Slight hearing impairment:

People with slight hearing impairment can hear normal (conversational) speech only if the speaker is close (1 metre).

Hearing aids may be needed for this level of impairment to amplify sound.

3.3 Moderate hearing impairment:

People with moderate impairment can hear loud speech only if the speaker is close (1 metre).

They may lip read to help understand speech.

They have difficulty listening to the radio or television unless the volume is turned up.

Children have difficulty hearing the teacher at school.

Hearing aids are recommended for this level of impairment to amplify sound.

3.4 Severe hearing impairment:

People with severe hearing impairment can hear speech only when the words are shouted into the ear.

Hearing aids are needed for this level of impairment.

Lip reading and sign language are needed to understand speech when hearing aids are not available.



3.5 Profound hearing impairment (Deafness):

People with profound impairment (deafness) cannot even hear shouted speech.

Hearing aids may help some deaf people understand words.

People born deaf may never learn to speak unless given special assistance.

Lip reading, natural gestures and sign language are essential for communication.

* What level of hearing do you think this boy has?

4. WHAT IS IT LIKE TO HAVE HEARING IMPAIRMENT?

Activity 2

* Choose a partner

Press a finger on the tragus of both of your ears to close off the ear canals and stand about an arm length facing away from your partner.

He/she must ask you a question in a soft conversational voice.

Can you hear the question clearly?

yes

no

Turn around and watch his/her lips as another question is asked.

Does it help to watch his/her lips?

yes

no

Turn around and watch his/her lips and natural gestures


Does it help to watch his/her face and gestures?

yes


no

Now let your partner close off both of his/her ears and you ask the questions.

Activity 3

 Write down what you think are some of the difficulties that a person with hearing impairment will have in their daily life.

Some words to use: conversation, speech, learn, communication, sounds, join in, left out

 Discuss this with your group and trainer

5. HOW DOES HEARING IMPAIRMENT AFFECT SPEECH?

We develop speech by listening to other people talking and then try to imitate what they are saying.

Children learn to talk by saying the words they hear around them. If they have hearing impairment they will not hear the words properly and they will pronounce the words incorrectly.

Children born with deafness or who become deaf before they learn to speak cannot hear words and cannot develop speech without special training. They need to use sign language to communicate.

Adults who become hearing impaired start to pronounce words incorrectly because they cannot hear their own voice properly.

6. HOW CAN WE PREVENT HEARING IMPAIRMENT AND DEAFNESS?

6.1 Genetic counselling

Hearing impairment can be inherited. Ask patients or parents if they know of any hearing impairment in the family.

Inherited hearing impairment can be of any level from slight to profound. It can be present from birth or can develop later in life.

There could be high risk when one or both parents are deaf. These parents should be referred to your doctor for investigation and counselling.

In genetic counselling the families of parents of a deaf child are studied to advise them if there is a risk of inherited deafness being passed on if they have more children.


6.2 Prevention of ear infections


Ear infections are common in young children especially when there is overcrowding in the home, when people smoke at home, when there is poor hygiene, when these children are in close contact with people with runny noses, coughs and colds and when children attend day care centres. You can advise parents about these things.

Breast-feeding helps a baby resist infections. You can encourage mother to continue breastfeeding.

Neglected ear infections can cause hearing impairment. You must educate your community to seek help for ear infections. Early intervention in ear infection helps prevent hearing impairment.

Activity 4

 List some of the things that you think might prevent hearing impairment and deafness

 Discuss your ideas with your group and trainer

How to help prevent hearing impairment:

- Refer babies with neonatal jaundice for treatment.
- Apply the Expanded Programme of Immunisation (EPI) in your community.
- Treat ear infections early to prevent damage to the middle ear.
- Ensure that drugs that can damage hearing are only given on prescription by a doctor.
- Educate your community about the harmful effects of loud noise.
- Encourage cyclists and motorcyclists to always wear protective helmets

6.3 Ear Hygiene

Important points to remember:

- Do not try to clean the ear canal – it will clean itself
- Do not put things in the ear canal – you may harm it
- If you feel something in the ear canal – get it checked at your clinic
- A healthy ear canal is important for hearing

6.4 Vaccinations

Vaccination against Haemophilus and Pneumococcus bacterial infections helps prevent ear infections in children. If these vaccinations are available, advise parents to have their children vaccinated.

Diseases such as measles, mumps and rubella can cause hearing impairment.

Meningitis can cause hearing impairment.

Tuberculosis meningitis can cause hearing impairment.

Ensure all children in your community are vaccinated against these diseases according to the recommendations of your Health Authority vaccination programme.

6.5 Ototoxic drugs

PLEASE NOTE:

Ototoxic drugs are drugs that can damage hearing.

Drugs that can damage hearing should be prescribed by doctors only!


Common ototoxic drugs are antibiotics such as gentamicin and streptomycin and the antimalarials such as quinine and chloroquine.

There are other drugs that can damage hearing.

6.6 Protection of ears from noise

If the ear is exposed to loud noise the hairs of the hair cells in the cochlea break and do not repair themselves so that the hearing impairment is permanent. Hearing protectors should always be worn when working in a noisy environment.

Activity 5

 List some very loud noises and where they can be found:

| Noise | Where it can be found |
|----------|-------------------------------|
| gunshots | when there is war or fighting |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |
| _____ | _____ |

Excessive noise is one of the major causes of hearing impairment in industry

- Advise all workers exposed to loud noise to wear hearing protectors.
- Screen workers in a noisy environment for hearing impairment.
- Encourage the enforcement of noise legislation.

PREVENTION IS BETTER THAN CURE!

POST TEST

| Questions | True | False | Don't know |
|--|------|-------|------------|
| Hearing impairment always means that a person is deaf. | | | |
| Deafness cannot be inherited. | | | |
| A child who is born deaf may not learn to speak properly. | | | |
| All deaf people can hear normally if they wear a hearing aid. | | | |
| There are different levels of hearing impairment. | | | |
| Moderate hearing impairment means that a person cannot hear speech even if it is shouted close to their ear. | | | |
| Neglected ear infections can cause hearing impairment. | | | |
| Damage by loud noise to the hair cells in the cochlea (hearing organ) always recovers. | | | |
| Some drugs when used over a period of time can cause hearing impairment | | | |
| Vaccination against measles, mumps and rubella can prevent hearing impairment. | | | |
| Score | | | |

module 3

The outer ear: examine, treat, refer



Pinna deformity due to injury

By the end of this module the Health Care Worker should be able to:

- Demonstrate examination of the pinna
- Describe or demonstrate use of an otoscope
- Describe or demonstrate examination of the ear canal
- Describe problems of the outer ear
- Describe the treatment or referral of problems of the outer ear

PRE TEST

| Questions | True | False | Don't know |
|---|------|-------|------------|
| Some people have a tiny "hole" in front of their pinna which can become infected | | | |
| An otoscope is an instrument used to examine the pinna | | | |
| You need to pull the pinna forwards to see into the ear canal | | | |
| Children with sores on their body can spread the infection to the skin of their pinna | | | |
| Swimming in dirty water can cause otitis externa | | | |
| Wax does not come out of the ear canal by itself and always has to be removed | | | |
| Foreign bodies in the ear canal need to be removed | | | |
| Hard wax dissolves in water | | | |
| Otitis externa is treated with antibiotics | | | |
| You should always test the hearing when a patient has a deformed ear | | | |
| Score | | | |

Symbols


- ☺ Discuss with partner or in groups
- ✍ Complete by writing in answers or ideas
- ✳ Take part in an activity


Terminology

| | | | |
|------------------------------|----------------------------------|------------------|-----------------------|
| The Pinna | Normal pinna | Normal ear canal | Fungal infection |
| Skin infection | Ear Canal | Otoscope | Eardrops |
| Infection of the pinna | Wax | Speculum | Incision and drainage |
| Pre-auricular sinus | Foreign body | Batteries | Syringing |
| Deformity of pinna | Otitis externa | Bulb | Refer |
| Unknown abnormality of pinna | Unknown abnormality of ear canal | Antiseptic cream | Ear hygiene |
| | | Antibiotics | Diabetic |

I. EXAMINATION OF THE EAR

Activity 1

 Why do you need to examine the ear?

 Discuss your ideas with your group and with your trainer

I.1 Examination of the pinna


Activity 2

What can you see when you examine the pinna?

Choose a partner and look at both ears of your partner and examine the pinna

Mark off each your findings on the examination chart.

| Examination of the pinna | Left ear | | Right ear | |
|--|----------|----|-----------|----|
| | yes | no | yes | no |
| Is there any infection of the skin around the ear or in the pinna? | | | | |
| Is the pinna swollen and inflamed? | | | | |
| Is there any injury to the pinna? | | | | |
| Is there a tiny "hole" in front of the pinna? | | | | |
| Is this infected? | | | | |
| Is the pinna deformed? | | | | |
| Is there an abcess on the pinna? | | | | |
| Is there anything else abnormal that you do not know what it is? | | | | |
| Is the pinna normal? | | | | |
| Is the pinna absent? | | | | |

 Discuss with your trainer what you have seen and any difficulties that you have had.

2. PROBLEMS OF THE PINNA

2.1 Skin infections

Skin infections are common when children and adults do not practice good personal hygiene. If they scratch their ear with a dirty finger nail or after they have been touching other sores on their body they can start up infection in the skin around the ear or in the pinna. Playing or washing with stagnating water can cause infection of the pinna.



2.2 Infection of the pinna

When the pinna itself – not just the skin but also the cartilage underneath the skin – is infected the whole pinna becomes inflamed and swollen. This is a serious infection especially in a person with diabetes. The pinna can be deformed by such infection.

2.3 Injury to the pinna

Injury can damage the pinna and cause deformity. Injury to the entrance to the ear canal can cause it to close up completely.

2.4 Pre-auricular sinus – a tiny “hole” in front of the pinna

These are common in some areas. They can become infected and cause an abscess.

2.5 Deformities

Deformities are not common but there may be hearing impairment especially if there is no opening into the ear canal. Patients with a deformity should have their hearing assessed. Deformities can be present at birth – congenital deformities – such as in the absence of the pinna. Deformities can happen later from injury or infection – acquired deformities.

2.6 Other problems whose cause is not known to the examiner

Any problem that is not known to the examiner should be referred.

When examining the pinna, if there is any problem write and/or draw your findings in the patient's record card.

3. EXAMINATION OF THE EAR CANAL

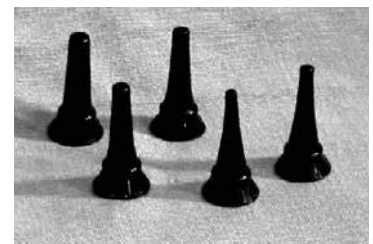
To examine the ear canal you need to use an instrument called an otoscope. An otoscope is a special torch with speculums of different sizes to look into the ear canal.



An otoscope

Checklist for the use of the otoscope

- Make sure each speculum is clean
- Switch on the otoscope – does the bulb shine brightly?
- Choose the biggest speculum that fits comfortably in the patient's ear canal.
- Can you see through the otoscope and the speculum?



Different sizes of speculum

Batteries for the otoscope

- Batteries go flat very quickly
- Make sure you switch the otoscope off when you have finished examining the patient
- Batteries can leak and cause damage if they are left in the otoscope – take them out at the end of the clinic

Safety!

The tip of the speculum should only go into the ear canal far enough to see past the hairs. If it is pushed in any further they will touch the very sensitive skin deeper in the ear canal and hurt the patient. It may also scratch the skin of the ear canal and cause bleeding. After examining the patient you should check that there is no damage to the ear canal skin.

- Examine the ear canal. Is it normal? Can you see the eardrum?
- Make a drawing on the patient's card of what you see



How to use an otoscope

- Hold the otoscope like a pencil in your hand – then rest your hand against the patient’s head to avoid hurting the patient if they make a sudden movement.

With the other hand gently pull the pinna away from the head to straighten the ear canal:



Adults – pull pinna back and up.


Children – pull pinna back and down


- First shine the light into the opening to inspect the entrance to the ear canal.
- Then look through the otoscope and gently put the speculum into the ear canal – DO NOT go into the deep part of the ear canal as it is very sensitive to touch and you may scratch the skin lining.
- Examine the ear canal. Is it normal? Can you see the eardrum? (Examining the ear drum will be dealt with in a later module)
- Make a drawing on the patient’s card of what you see

Children and babies should be held firmly by an adult to prevent them from moving – see diagram.

ALWAYS ... change or wash the speculum after examining the ear. This prevents the spread of infection from one ear to the other. Try to examine the good ear first.

Activity 3 – when otoscopes are not available

 What do you think you should look for when you examine the ear canal?

 Discuss your ideas with your group and with your trainer.

Activity 4 – when otoscopes are available

Choose a partner. Use an otoscope to examine both ear canals of your partner.

| Examination of the pinna | Left ear | | Right ear | |
|--|----------|----|-----------|----|
| | yes | no | yes | no |
| Is there any wax in the ear canal? | | | | |
| Is the wax blocking up the ear canal? | | | | |
| Is there a foreign body in the ear canal? | | | | |
| Is there any discharge in the ear canal? | | | | |
| Is the skin lining of the ear canal inflamed and/or swollen? | | | | |
| Is there anything else abnormal that you do not know what it is? | | | | |
| Is the ear canal normal? | | | | |

😊 Discuss what you have seen and any difficulties that you have had with your trainer

What could you see when you examine the outer ear?

- Normal pinna Look at the front and back of the pinna - no abnormality seen
- Normal ear canal Use an otoscope – no abnormalities seen. The eardrum can be seen
- Problem of the pinna The skin could be infected
 - The pinna could be infected
 - There could be a tiny "hole" in front of the pinna which could be infected
 - The pinna could be injured
 - The pinna could be deformed
 - There could be some other problem
 - There could be absence of pinna
- Problem in the ear canal The ear canal could be blocked by wax
 - There could be a foreign body in the ear canal
 - The ear canal could be full of discharge
 - The skin lining of the ear canal could be infected
 - There could be a fungal infection
 - There could be some other problem

Normal ear canal
with healthy eardrum



Foreign body

Children often put things into their ears. Insects can crawl into the ear canal. This is a picture of a bead in an ear canal.



Wax

Some people either produce too much wax or do not clear it out of their ear canal. Wax can block the ear canal and be uncomfortable or cause hearing impairment.



Otitis externa

Infection of the skin lining of the ear canal is called otitis externa. It can be just a small abscess in the hairy area at the entrance to the ear canal or it may be infection of the skin deeper in the canal. The infection can be either fungal or bacterial. In some areas otitis externa is a common cause for discharge from the ear. In some areas fungal infections are common due to using/bathing in dirty water.

This picture shows infection of the skin lining of the ear canal.



If there is any problem in the ear canal write and/or draw your findings on the patient's record card.

Activity 5

* Choose a partner. One is the 'Health Care worker' and one is the 'Patient'. The patient chooses one of the problems from the list below and uses their imagination to make it sound like a typical patient from their clinic. The health care worker asks more questions about the problem and then uses their knowledge to describe what they might see if they were to examine the patient.

Some suggested patient problems:

- Patient has a sore on the leg. Now has sores in the ears.
- Patient fell off bicycle and injured ear.
- Patient is a child who has an abscess in front of the ear.
- Patient is a new baby. Baby has one deformed ear.
- Mother thinks child has put something into the ear.
- Patient has been swimming in dirty water. Ear now discharging.
- Patient has a sore ear after trying to clean it.

☺ Discuss this and then present your problem to the group.

✍ Complete the patient's health card. Fill in the patient details. Write in details of the problem. Circle each finding of the examination.

PATIENT HEALTH CARD

| | |
|---|---|
| Date | Name |
| Sex | Address |
| Age | |
| What is the patient's problem? | |
| LEFT EAR | RIGHT EAR |
| Pinna | Pinna |
| Normal / Abnormal | Normal / Abnormal |
| Skin infection | Skin infection |
| Infection of the pinna | Infection of the pinna |
| Pre-auricular sinus | Infected / Not infected |
| Injury to pinna | Minor / Serious |
| Deformity of the pinna | From birth / Happened later (Injury / Infection) |
| Some other problem | Some other problem |
| Ear Canal | Ear Canal |
| Normal / Abnormal | Normal / Abnormal |
| Wax - Blocking the canal / Not blocking the canal | Wax - Blocking the canal / Not blocking the canal |
| Foreign body | Foreign body |
| Otitis externa | Otitis externa |
| Fungal infection | Fungal infection |
| Some other problem | Some other problem |

4. PROBLEM, TREATMENT AND REFERRAL

Problem

Treatment and referral

The Pinna

Superficial skin infections - sores
Earpiercing

Treat by cleaning the sores and applying an antiseptic cream. Some patients may need an antibiotic.

Treat with cleaning and appropriate medicines.

Ask patient to return for a check up.

PLEASE NOTE:

Chronic cases should be referred.

Deep infection with swelling of the pinna

PLEASE NOTE:

This is a serious infection.

These patients should be referred urgently.

If there will be a delay then start an antibiotic.

Some of these patients may be diabetic so the urine should be checked.

Injury to the pinna

If minor then treat injury with appropriate cleaning and dressings.

Ask patient to return for a dailycheck up.

PLEASE NOTE:

Refer serious injuries, such as like swelling and bruising, cuts right through the cartilage, cuts into the ear canal, and severe burns, to your hospital for treatment.

Pre-auricular sinus (tiny "hole" in front of the pinna)

If not infected then no treatment is needed.

If infected then:

- Start an antibiotic and refer

- Incise and drain if there is an abscess

Ask patient to return for a dailycheck up.

PLEASE NOTE:

Refer to your doctor when the infection has healed or if the infection will not heal.

Deformities of the pinna

- Check for and refer

- Check for hearing impairment and refer

Problem

Treatment and referral

The Ear Canal

Foreign body

Most foreign bodies will come out with syringing.
 Try to syringe it out.
 Vegetable seeds that do not come out must be referred urgently as the seeds swell.
 Insects that do not come out with syringing should be drowned by filling the ear canal with olive oil drops or clean cooking oil.
 PLEASE NOTE:
 Refer if the foreign body cannot be safely removed.
 Refer if the foreign body cannot be removed.
 Hooks and other instruments should **never** be used.

Wax

Wax does not need to be removed if not blocking the ear canal – only if blocking the ear canal, then try to syringe it out.
 Soften the wax by putting water into the ear for 10 minutes as often as possible for two days and then try syringing.
Water softens wax.
 PLEASE NOTE:
 Refer if the wax cannot be safely removed.
 Refer if the wax cannot be removed.

Otitis externa

Clean ear canal by dry mopping and/or syringing before treatment.
Treat with appropriate eardrops.
 Patients should be checked every 2 days and if the ear canal is full of pus it must be cleaned again.
 PLEASE NOTE:
 Refer if otitis externa does not heal with adequate treatment.
 If there is inflammation around the ear then refer the patient.
 Sometimes eardrops do not work well and these patients should be referred if the infection has not healed after one week of treatment.

Some other problem
 but you do not know
 what it is

Refer these patients.

Who could the patient be referred to?

Patients who cannot be treated or patients who have a problem but you do not know what it is should be referred to someone with more experience – a more highly trained nurse, a clinical assistant, a nurse or clinical practitioner or a doctor. If someone with more experience is not available or if the case is urgent then refer the patient to your local hospital.

Activity 6

Work with your partner from Activity 5 and complete the Patient Health Card for your patient from Activity 5

PATIENT HEALTH CARD

What is the name of the problem?

What is the name of the problem?

😊 Discuss with your trainer what you are going to call the problem and how you should treat it.

Always check both ears!

EAR HYGIENE

DO only use medication in your ears that has been prescribed for you

DO use clean towels to dry your ears

DO NOT put anything into your ear

DO NOT try to clean your ears with hairpins, tooth picks or anything else!

DO NOT let dirty water go into your ears

DO NOT leave cotton wool in your ears

ADVERTISE THIS MESSAGE TO YOUR COMMUNITY!

POST TEST

| Questions | True | False | Don't know |
|---|------|-------|------------|
| Some people have a tiny" hole" in front of their pinna which can become infected | | | |
| An otoscope is an instrument used to examine the pinna | | | |
| You need to pull the pinna forwards to see into the ear canal | | | |
| Children with sores on their body can spread the infection to the skin of their pinna | | | |
| Swimming in dirty water can cause otitis externa | | | |
| Wax does not come out of the ear canal by itself and always has to be removed | | | |
| Foreign bodies in the ear canal need to be removed | | | |
| Hard wax dissolves in water | | | |
| Otitis externa is treated with antibiotics | | | |
| You should always test the hearing when a patient has a deformed ear | | | |
| Score | | | |

module 4

The ear canal: examine, diagnose and clean



Pus discharge from the ear canal

By the end of this module the Health Care Worker should be able to:

- Make and use a dry mop safely to clean the ear canal
- Make and use a wick to clean the ear canal
- Demonstrate the use of a syringe to remove wax and/or foreign bodies
- Describe putting in eardrops

PRE TEST

| Questions | True | False | Don't know |
|--|------|-------|------------|
| People should clean their ears regularly by making and using a dry mop made from a thin stick and cotton wool | | | |
| It does not matter if the end of the stick goes right through the cotton wool as this helps to clean out any wax | | | |
| Wicking and dry mopping can be used to clean the ear canal | | | |
| Children should be held facing you with their heads free to move so you can clean their ears | | | |
| You can gently syringe an ear if it is discharging pus | | | |
| When you syringe an ear the water must be cold | | | |
| If a vegetable seed is put into the ear it can sometimes swell up inside the ear canal | | | |
| Don't put anything into the ear if you see a perforation in the eardrum after syringing an ear | | | |
| Patients must "pump" the tragus after putting eardrops into their ear | | | |
| Patients should put cotton wool in their ears after putting in eardrops | | | |
| Score | | | |

Symbols

- ☺ Discussion with students or in groups
- ✎ Students complete by writing in answers or ideas
- * Students take part in an activity

Terminology

| | |
|-------------|------------------------|
| Dry mopping | Head mirror / headlamp |
| Wicking | Eardrops |
| Syringing | Ear hygiene |
| Otoscope | |

I. DRY MOPPING AND WICKING

Activity 1 – Why do you need to clean the ear canal

☺ Discuss with your group and with your trainer

How can you clean the ear canal?

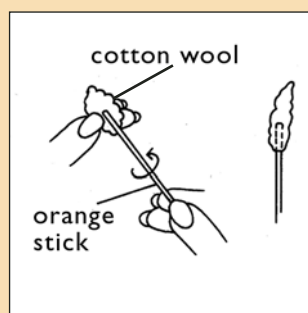
- Dry mopping is used to clean ears that are discharging.
- Wicking is a way to clean ears that are discharging when the materials needed for dry mopping are not available.
- Syringing can be used to remove wax, a foreign body or any discharge.

Activity 2

Divide into two groups. Group A makes dry mops. Group B makes wicks. When confident, change groups.

* Choose a partner

Materials: 1 thin wooden stick applicator and cotton wool



- Wash your hands with soap and water – air dry.
- Pull off a small piece of cotton wool.
- Gently pull it out into an oval shape.
- Put the tip of the stick into the centre of the cotton wool.
- Twist the stick round and round with one hand whilst holding half of the cotton wool tightly against the stick with the thumb and index of your other hand.

A

- Half of the cotton wool should extend from the end of the stick and form a fluffy, soft tip.
- The rolled up piece of cotton wool should be long enough so that when the soft tip is deep in the ear canal and next to the eardrum there is still some cotton wool sticking out of the ear canal. This is so that you can hold onto the cotton wool and ensure that the cotton wool comes out of the ear canal.
- After completing dry mopping, wash your hands again.

Note: Teach patients:

- Only clean their ears with a dry mop when the ear is discharging.
- When the ear is dry it must not be cleaned with a dry mop.
- A dry mop is not the same as a "cotton bud".
- "Cotton buds" must never be used to clean ear canals as they are too big and the cotton wool is wound onto the stick too tightly

* Choose a partner

Materials: – A small piece of absorbent cotton cloth or
– A piece of soft strong tissue paper – NOT flimsy toilet paper that can fall apart in the ear.

- Wash your hands with soap and water – air dry
- Make a wick by rolling the cloth or the tissue paper into a pointed shape.
- Gently pull the pinna away from the head. This helps straighten the ear canal.
- Place the wick into the ear canal.
It will absorb any discharge or blood in the ear canal.
- Leave it in place until it is wet.
- Remove the wet wick and inspect it. Is there pus on the wick?
- Replace with a clean wick.
- Repeat until the wick stays dry.
- After completing wicking, wash your hands again.



😊 Discuss the following points about your dry mop/wick with your group and trainer

- Will the cotton wool come off the stick easily?
- What would happen if it did?
- What would you do if the cotton wool or a piece of the paper/cloth got stuck in the ear canal?
- What would happen if the tip of the stick pushed through the cotton wool?
- Why should you use clean cotton wool or a clean piece of paper/cloth in each ear?
- Why should you wash your hands with soap and water and air dry both before and after?

Remember – make the dry mop the correct size for the patient's ear canal

Ask your partner if you may CAREFULLY try to clean his/her ear using the dry mop or wick you have made. Ask the trainer for help if you are not sure how to do it!

Dry Mopping

An adult can sit sideways in front of you pointing the ear to the source of light.



How to hold a child to prevent them moving while you mop their ear

Follow the steps listed below.

- Hold the mop between the thumb and first finger of your better hand
DO NOT HOLD IT TIGHTLY.
 - With your other hand gently pull the pinna away from the head
Adults – pull the pinna back and up
Children – pull the pinna back and down
This helps straighten the ear canal
 - Gently push the soft tip into the ear canal and turn the mop slowly round and round while you do this
 - The soft tip will absorb any discharge or blood in the ear canal
 - Take the mop out of the ear canal and inspect the tip
 - Is there pus on the mop? Sometimes the pus will be bloodstained
 - Use a clean mop each time
 - **DO NOT** carry on cleaning if the patient is in any pain
- **TAKE THE MOP OUT** of the ear canal if the patient moves or jerks
 - When clean, examine the ear canal with an otoscope
 - Check both ears!



**Keeping the patients records up to date is very important:
Write down what you see in the patient's ear canal on their patient record card.**

Patients can be taught how to clean their own or their children's ears by making dry mops or wicks.

2. SYRINGING

DO NOT SYRINGE IF THE EAR IS DRY AND IF YOU KNOW THERE IS A PERFORATION IN THE EARDRUM

Refer these patients

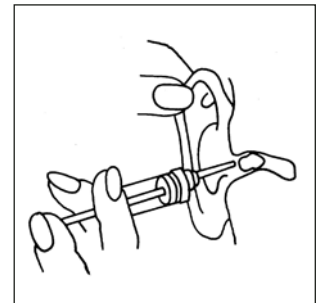
The patient must sit with the ear facing the light and you must be able to see the entrance to the ear canal clearly.

Fill the syringe with boiled, cool water and squirt it hard a few times back into the water container to check that it works well and the tip does not come off.

Remember: the water used to syringe the ear MUST be exactly the same as body temperature – 37°C

Warm but comfortable on the hand

- Gently pull the pinna away from the head.
- Place the tip of the syringe just inside the canal and squirt the water into the ear canal.
- Water should be directed around the foreign body. The water will then be behind the foreign body and should push it out.
- Catch the water that comes out in a bowl. Check to see what has come out of the ear canal.
- Examine the ear canal with an otoscope after every five syringes.
- Once the foreign body has come out of the ear canal you should be able to see the eardrum.
- Check both ears!



Children put all kinds of things in their ears.

NOTE:


Do NOT direct the water straight onto the foreign body! If you do the water will push the foreign body further into the ear canal.


If you see any trauma to the ear canal after you have removed the foreign body fill the ear canal with eardrops, give the patient eardrops to take home and use four times each day. Check the ear again after two days.

REMEMBER: Blocked ears can cause temporary hearing impairment! After removal of the foreign body check that the hearing is normal.


- Most foreign bodies will come out with syringing
- Hooks and other instruments should never be used as they can cause damage to the ear canal and eardrum
- Vegetable seeds that do not come out with syringing must be referred urgently as the seeds swell
- Insects/ticks that do not come out with syringing should be drowned by filling the ear canal with olive oil drops or clean cooking oil and then try again
- Examine the ear canal with an otoscope after removal of the foreign body
- Check both ears!

Activity 3

 List some of the things that children put in their ears

 Discuss your ideas with your group and with your trainer


Activity 4

 Choose a partner – one is the patient; one is the health care worker.

The patient tells the health care worker that he/she thinks there is a foreign body in one ear. The health care worker must explain to the patient what he/she will do to get it out. The patient then holds the syringing model while the health care worker syringes out the foreign body.

DO NOT PUT THE FOREIGN BODY IN YOUR EAR. PUT IT IN THE SYRINGING MODEL

Change and repeat so both partners practice explaining and syringing.

 Discuss any problems you are having with the trainer.

What will you do if you see a perforation in the eardrum after syringing a dry ear?

 Discuss with the trainer.

3. HEAD MIRRORS AND HEADLAMPS



Headmirror



Headlamp and otoscope

Head mirrors or headlamps are sometimes used by doctors or other experienced health workers when they are trying to do something in a patient's ear. A headlamp or head mirror provides the light needed to examine the ear without an otoscope, and leave both hands free.

Using a head mirror or a headlamp will make it easier to dry mop or syringe an ear.

If there is one in your clinic ask your doctor to show you how to use it.

4. HOW TO PUT IN EARDROPS

When putting eardrops into the ear it is important to make sure that the eardrops reach the bottom of the ear canal. When using eardrops to treat middle ear infection it is important that the eardrops go through the perforation in the eardrum and into the middle ear. Sometimes the eardrops go all the way down the Eustachian tube and the patient can taste them.

Their local Health Authority will recommend the eardrops that they can use.

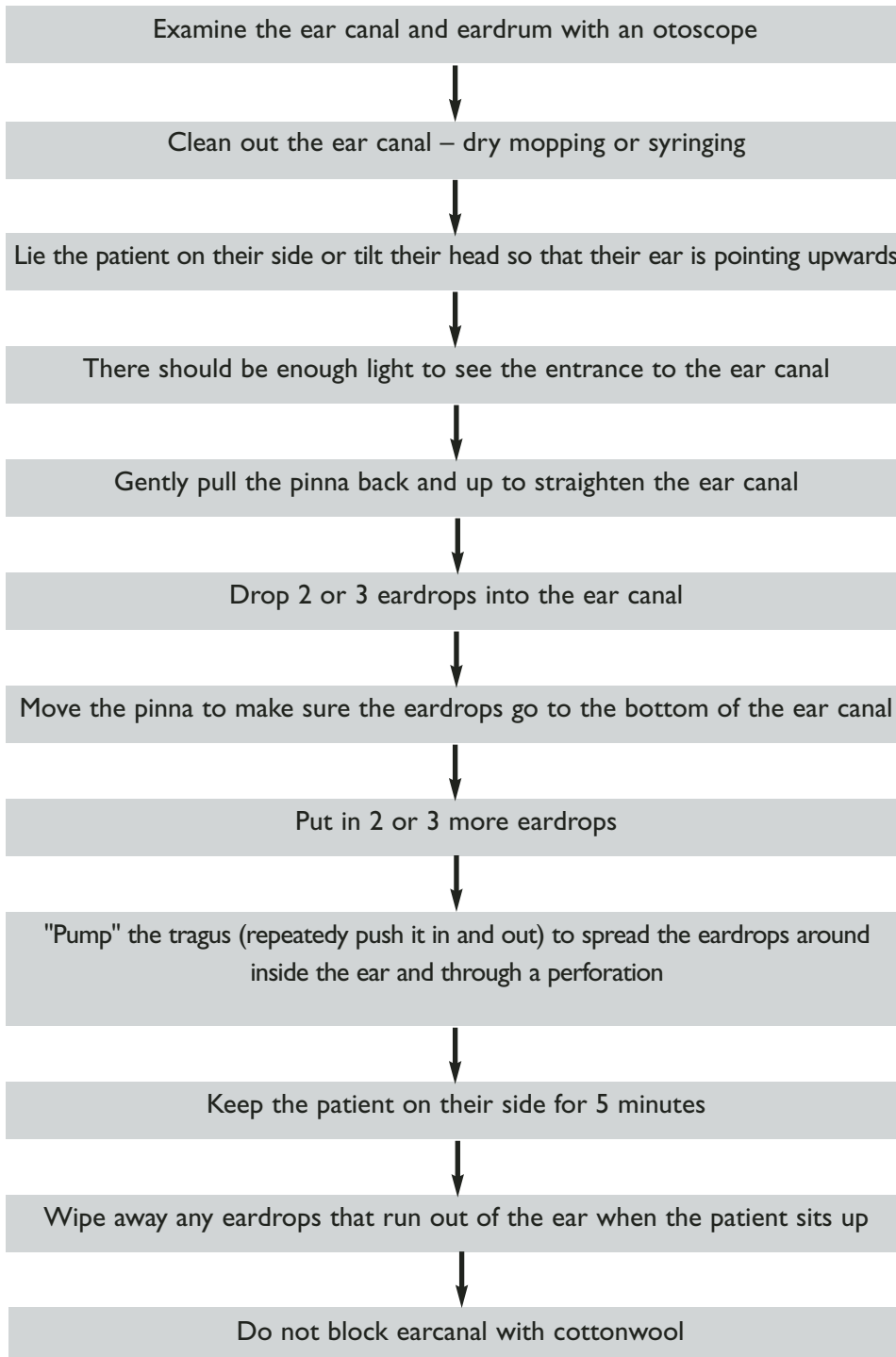
There are different kinds of eardrops that are used for ear infections.

- Antiseptic eardrops are cheap and can be used for many infections.
- 2% acetic acid with 30% glycerine and 45% spirit in distilled water.


| | | |
|--------------------------|-----------------------------|--------|
| The recipe for 10 ml is: | acetic acid (98%) | 0.2 ml |
| | glycerine | 3 ml |
| | spirit (96%) | 5 ml |
| | distilled or purified water | 1.8 ml |


- Antibiotic eardrops are more expensive eardrops and so are often only supplied by hospital clinics. They usually work better than the others.
- Fungal infections sometimes need to be treated with antifungal cream. This can be put into the ear canal with a small syringe.

Follow these steps when putting in eardrops:



Activity 5

 If you had to put eardrops into a small child's ear how would you make sure that the child does not move? Why do you think the child might not keep still?

 Discuss your answers with your trainer

5. TEACHING THE PATIENT TO CARE FOR HIS/HER EARS

Patients should be taught how to:

- put in eardrops at home
- clean their ears by dry mopping or wicking
- put the eardrops in regularly

Patients should return to the clinic regularly until the infection has cleared up.

Ear Hygiene

DO only use medication in your ears that has been prescribed for you

DO use clean towels to dry your ears

DO NOT put anything into your ear

DO NOT try to clean your ears with hair pins, tooth picks or anything else!

DO NOT let dirty water go into your ears

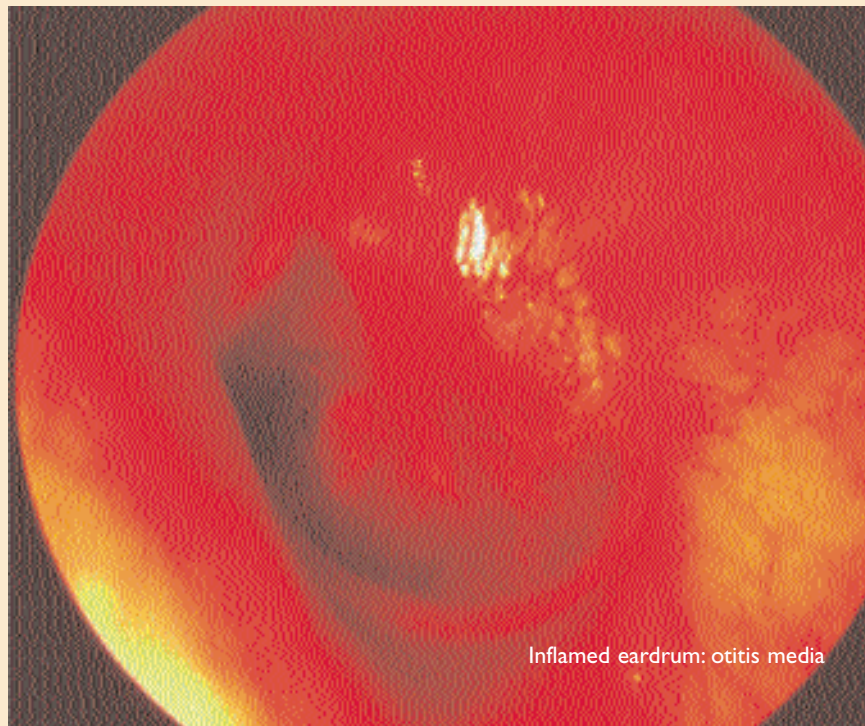
DO NOT leave cotton wool in your ears

POST TEST

| Questions | True | False | Don't know |
|--|------|-------|------------|
| People should clean their ears regularly by making and using a dry mop made from a thin stick and cotton wool | | | |
| It does not matter if the end of the stick goes right through the cotton wool as this helps to clean out any wax | | | |
| Wicking and dry mopping can be used to clean the ear canal | | | |
| Children should be held facing you with their heads free to move so you can clean their ears | | | |
| You can gently syringe an ear if it is discharging pus | | | |
| When you syringe an ear the water must be cold | | | |
| If a vegetable seed is put into the ear it can sometimes swell up inside the ear canal | | | |
| Don't put anything into the ear if you see a perforation in the eardrum after syringing an ear | | | |
| Patients must "pump" the tragus after putting eardrops into their ear | | | |
| Patients should put cotton wool in their ears after putting in eardrops | | | |
| Score | | | |

module 5

The middle ear: examine, diagnose and treat



Inflamed eardrum: otitis media

By the end of this module the Health Care Worker should be able to:

- Demonstrate / describe examination of the eardrum using an otoscope
- Describe the common middle ear problems
- Describe the eardrum appearances of the common middle ear problems
- Describe the complications of middle ear disease
- Describe treatment / referral of the common middle ear problems

PRE TEST

| Questions | True | False | Don't know |
|---|------|-------|------------|
| In Acute Otitis Media the eardrum never perforates (bursts) | | | |
| In Chronic Suppurative Otitis Media there is a perforation in the eardrum and a discharge for more than 2 weeks | | | |
| Sticky mucus causes Glue Ear | | | |
| Normal eardrums all look the same | | | |
| In Acute Otitis Media the eardrum looks inflamed | | | |
| The treatment of Acute Otitis Media is eardrops | | | |
| Infection can turn Inactive Chronic Suppurative Otitis Media into Active Chronic Otitis Media | | | |
| Mastoiditis can cause meningitis and a brain abscess | | | |
| The treatment of Dry Perforation is dry mopping and eardrops | | | |
| Dirty water can only cause infection in the ear canal. It cannot cause infection in the middle ear. | | | |
| Score | | | |

Symbols

- 😊 Discuss with partner or in groups
- ✍ Complete by writing in answers or ideas
- ✳ Take part in an activity

Terminology

| | | | |
|-----------------------------|---|---------------------------------------|----------------------------------|
| Eardrum | Bulging eardrum | Mastoiditis | Glue Ear |
| Otoscope | Perforation | Meningitis / Brain abscess | Otitis Media with Effusion (OME) |
| Acute and Chronic infection | Discharge | Facial palsy | Middle Ear Effusion |
| Otitis Media (OM) | Chronic Suppurative Otitis Media (CSOM) | Balance problems – vertigo, dizziness | Preventable Hearing Impairment |
| Acute Otitis Media | Dry perforation | Hearing impairment / deafness | |
| Inflamed eardrum | Complications | | |

I. THE EARDRUM




Normal healthy eardrum





Examining the ear with an otoscope

The eardrum is a thin membrane that separates the ear canal from the middle ear. A normal healthy eardrum has a smooth, shiny surface and has no holes (perforations) in it. By examining the eardrum it is possible to recognise the common middle ear problems from the appearance of the eardrum.

Activity 1

 What does the eardrum do?

 What can damage the eardrum?

 Discuss your answers with your group and with your trainer

I.1 Examining the eardrum

Activity 2 – Examining the eardrum (When otoscopes are available)

Use an otoscope to examine the ears of the other students in your group. Hold the otoscope like a pencil in your hand. Some otoscopes are difficult to hold like this and have to be held in a fist.

Important points to remember:

- Pull the pinna back and up to straighten the ear canal.
- Use a speculum that is large enough to see through and is comfortable for the size of the ear canal.
- Move the tip of the speculum around gently until you can see the whole of the eardrum.
- Answer these questions while you are looking at the eardrum.

| | Yes | No | Not sure |
|---|-----|----|----------|
| Can you see the ear drum? | | | |
| Does the eardrum look normal and healthy? | | | |

If **No** or **Not sure** discuss with your trainer

ALWAYS ... change or wash the speculum after examining the ear. This prevents the spread of infection from one ear to the other.

ALWAYS ... examine the good ear first.

Activity 3 – Examining the eardrum (When otoscopes are not available)

☺ Discuss the following with your trainer.

- What would you do if you could not see the eardrum?
- What would you do if you were not sure if you could see the eardrum?
- What would you do if the eardrum was not normal and healthy?
- What would you do if you were not sure if the eardrum is normal and healthy?

2. WHAT ARE THE COMMON MIDDLE EAR PROBLEMS?

2.1 Acute Otitis Media.

Infection in the middle ear for less than 2 weeks is called **Acute Otitis Media**.

Who can get acute otitis media?

It is very common in babies and young children, less common in older children and much less common in adults.

It is common in HIV positive babies and in malnourished children.

It is common when babies are not breastfed, when there is overcrowding, when there is smoking in the home, when children are in contact with other children who have runny noses and coughs.

What happens?

It often starts with a cold or a sore throat. It can be caused by measles.

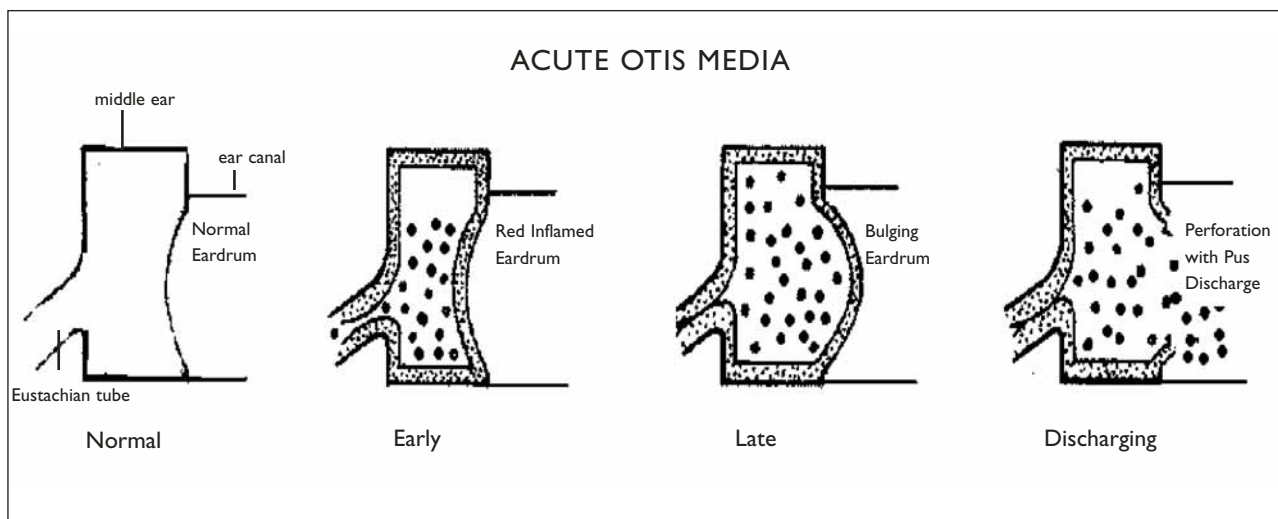
Infection spreads up the Eustachian tube from the nose or the throat.

The lining of the middle ear becomes infected and this causes fever and pain and the eardrum is inflamed (red).

Pus forms and fills the middle ear space.

Pressure builds up and the eardrum bulges.

If the infection is not treated the eardrum may burst (a perforation) and pus will start to discharge from the ear.



Red, Inflamed Eardrum

What will be seen?

Questions to ask the patient

- Has there been a recent cold and/or sore throat?
- Has the patient had a fever/temperature?
- Is the ear painful?

Examination

Use an otoscope to look at the eardrum

- The eardrum will be inflamed and there could be a bulging eardrum or a perforated eardrum with pus discharge.
- Check both ears
- Check behind both ears for swelling (mastoiditis)



Bulging eardrum

Treatment

- Antibiotic must be prescribed for 5 days
- Painkiller needs to be prescribed if the ear is painful or if the patient has a fever
- Review after 2 days
- Review again after 1 week
- Test the hearing when infection has cleared



Perforated Eardrum with pus

Refer if:

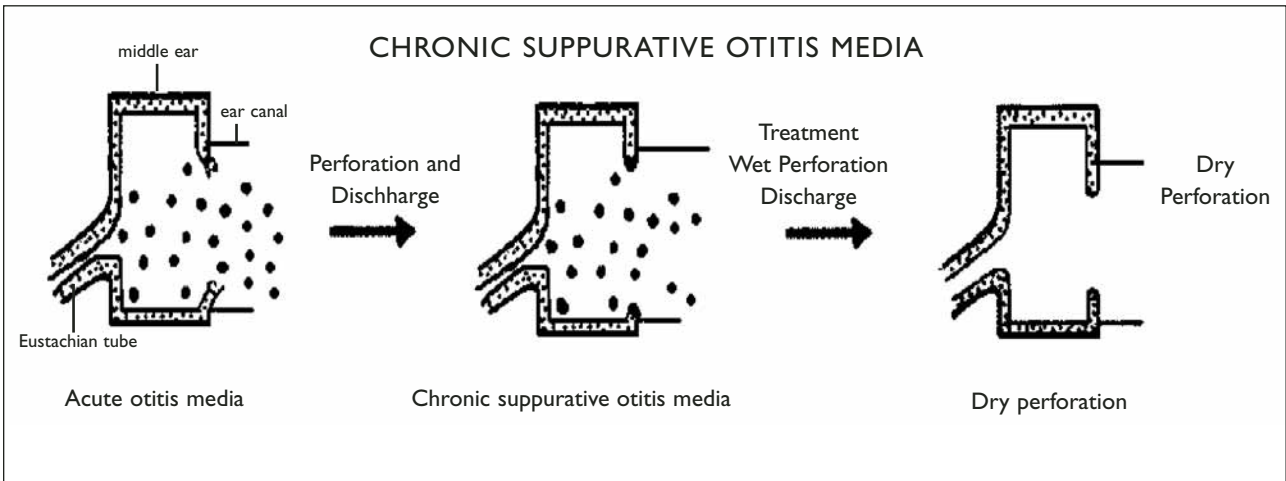
- Headache
- Drowsiness
- Swelling behind the ear
- Eardrum is still inflamed after 5 days of antibiotic
- Hearing impairment after infection has cleared
- Vomiting
- Neck stiffness
- Still painful after 2 days of antibiotic

If there is **no history of pain** and of **fever** and the ear is discharging then it is probably dry perforation (inactive otitis media) that has become active and is now called Chronic Suppurative Otitis Media

REMEMBER: **Acute – problem for less than 2 weeks**
 Chronic – problem for 2 weeks or more

2.2 Chronic Suppurative Otitis Media CSOM (also called active chronic otitis media)

Chronic Suppurative Otitis Media is an infection in the middle ear
 The ear will have been discharging for 2 weeks or more.



What happens?

Chronic Suppurative Otitis Media first starts as otitis media that is not properly treated and so the eardrum perforates (bursts) and the ear discharges pus. The discharging ear is neglected and discharges pus for 2 weeks or more through the perforation. After the first infection the next infections start from dry perforation (inactive chronic otitis media) – see below.



Perforation in the eardrum with pus discharge

What will be seen?

Questions to ask the patient

- Has the ear been discharging for 2 weeks or more?
- Is there any pain or fever?
- Is there any hearing impairment?

REMEMBER: There should be no pain

Examination

Use an otoscope to look in the ear canal

- Clean the discharge out of the ear canal by dry mopping or syringing

Use an otoscope to look at the eardrum

- The eardrum will have a perforation
- Check both ears
- Check behind both ears for swelling (mastoiditis)

Treatment

Give a single course of oral antibiotic treatment as for acute otitis media if not already given. Note: oral antibiotic treatment may not be effective against chronic ear infections. Do not give repeated courses of oral antibiotics for a draining ear.

- Teach patient how to dry mop ears. Patient should dry mop 3 times a day.
- Follow up in 5 days. If the ear discharge still persists, continue dry mopping and start with antiseptic eardrops.
- Refer, if possible, to a specialist for ear suction and antibiotic eardrops.
- See patient as often as possible to repeat dry mopping or syringing and putting in eardrops – daily or weekly – and repeat examination of the ear and behind the ear each time.
- Test the hearing in both ears when the infection has cleared.

Refer if:

- Pain in ears
- Swelling behind the ears
- Balance problems
- Facial palsy
- No improvement after 1 month of treatment
- Hearing impairment when infection has cleared

**REMEMBER AND EDUCATE THE COMMUNITY:
Discharge from the ear means Infection**

When the infection is treated the pus discharge stops but the perforation does not always heal.



A dry perforation in the eardrum

2.3 Dry Perforation (also called Inactive Chronic Otitis Media)

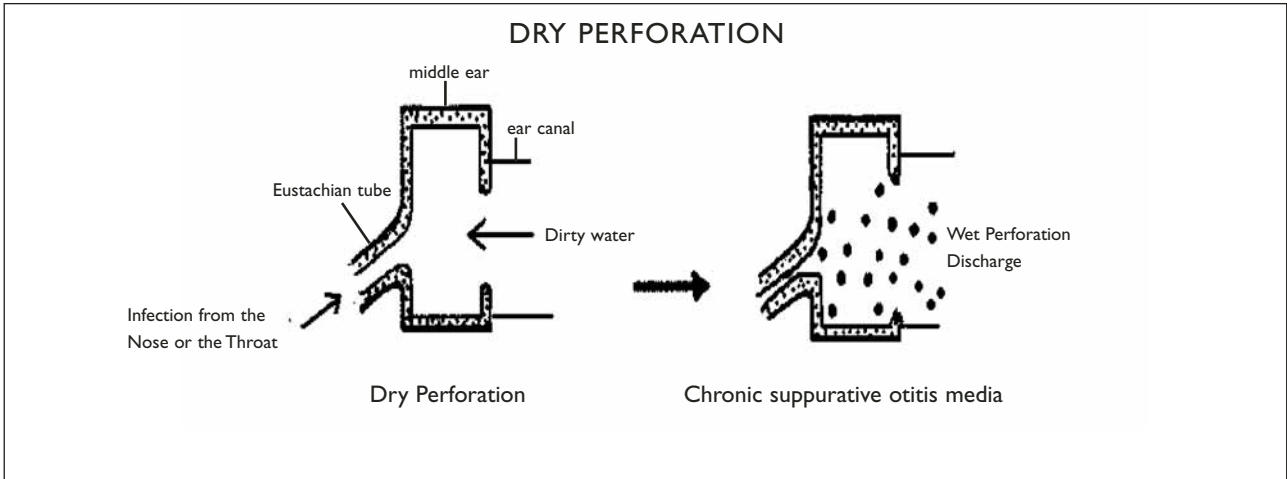
Dry perforation means that there is no infection but there is still a perforation (hole in eardrum) that is dry and does not heal.

What will be seen?

NOTE:

Infection can turn dry perforation back into Chronic Suppurative Otitis Media.

Infection gets up the Eustachian tube from a cold or sore throat or it gets in through the perforation from dirty water.



Questions to ask the patient

- When dry:
- Has the ear discharged in the past?
 - Has there been or is there any problem with hearing?
- When infected:
- Has there been a recent cold and/or sore throat?
 - Has water got into the ear?

REMEMBER: There should be no pain

Examination

- When infected:
- See Chronic Suppurative Otitis Media
- When dry:
- Use an otoscope to look at the eardrum
 - Test the hearing in both ears

Treatment

- When infected:
- See Chronic Suppurative Otitis Media
- When dry:
- No treatment needed
 - Keep water out of the ear

Refer

- When infected
- See Chronic Suppurative Otitis Media
- When dry:
- If there is hearing impairment
 - If the ear often becomes infected

3. COMPLICATIONS OF EAR INFECTIONS

- Acute Otitis Media and Chronic Suppurative Otitis Media can spread into the mastoid air cells in the mastoid bone behind the ear to cause **mastoiditis**.
- A swelling forms behind the ear and the patient becomes ill.
- Mastoiditis is a serious disease.
- Acute and Chronic Suppurative Otitis Media can cause **meningitis**.
- Infection in the mastoid can spread to the brain to cause **meningitis and/or brain abscess**.
- Acute Otitis Media and Chronic Suppurative Otitis Media can affect the facial nerve and cause **facial palsy**. When the nerve is affected all the muscles go lame – this is known as facial palsy.
- Acute Otitis Media and Chronic Suppurative Otitis Media can spread into the inner ear to cause **balance problems**. The words vertigo and dizziness are sometimes used.
- Acute Otitis Media and Chronic Suppurative Otitis Media can spread into the inner ear to cause **deafness**.

4. MASTOIDITIS

What does it look like?

Questions to ask the patient

- Does the patient have an ear infection or has the patient had an ear infection recently – pain, fever, discharge?
- Is the patient unwell?
- Is it sore or swollen behind the ear?

Examination

Use an otoscope to look in the ear canal and at the eardrum

- There may be discharge
- The ear canal may be very swollen
- The eardrum may be inflamed, bulging, perforated

Check behind the ear – There will be inflammation and/or swelling over the mastoid bone pushing the pinna forwards

- Is this swelling an abscess?

Check both ears



Early stage – inflammation behind the ear

Treatment

Refer urgently to your hospital. If there will be a delay:

- Start an intravenous antibiotic if possible. (Use an antibiotic that is recommended for this condition by your health programme)
- Incise and drain any abscess

Refer if:

- Inflammation and/or swelling over the mastoid bone
- Patient unwell with a high temperature
- Headache
- Vomiting
- Drowsiness
- Neck stiffness



Late stage – an abscess/
swelling behind the ear

5. GLUE EAR (ALSO CALLED OTITIS MEDIA WITH EFFUSION – OME)

Who gets glue ear?

Glue ear is common in young children. It is less common in older children. It sometimes occurs in adults.

What happens?

The lining in the middle ear is similar to the lining in the nose and produces sticky mucus (glue) which drains away down the Eustachian tube. In the beginning stage the fluid is very thin.

If too much mucus is produced it blocks the Eustachian tube and air cannot get into the middle ear.

The middle ear space fills up with sticky mucus and the eardrum and the ossicles cannot vibrate properly causing hearing impairment.

In children the hearing impairment causes speech problems – delayed speech development, words are not spoken properly / clearly.

What will be seen?



Early Stage – Eardrum "Dull"



Late Stage –
Eardrum "Sucked In"

Questions to ask the patient

In children:

- Is the hearing normal?
- Is the speech clear?
- Is the ear sometimes painful?

In adults:

- Does the ear feel blocked?

Examination

Use an otoscope to look at the eardrum

- The eardrum will not look normal – it could be dull, it could be "sucked in"
- Check both ears

Test the hearing – There will be slight/moderate hearing impairment

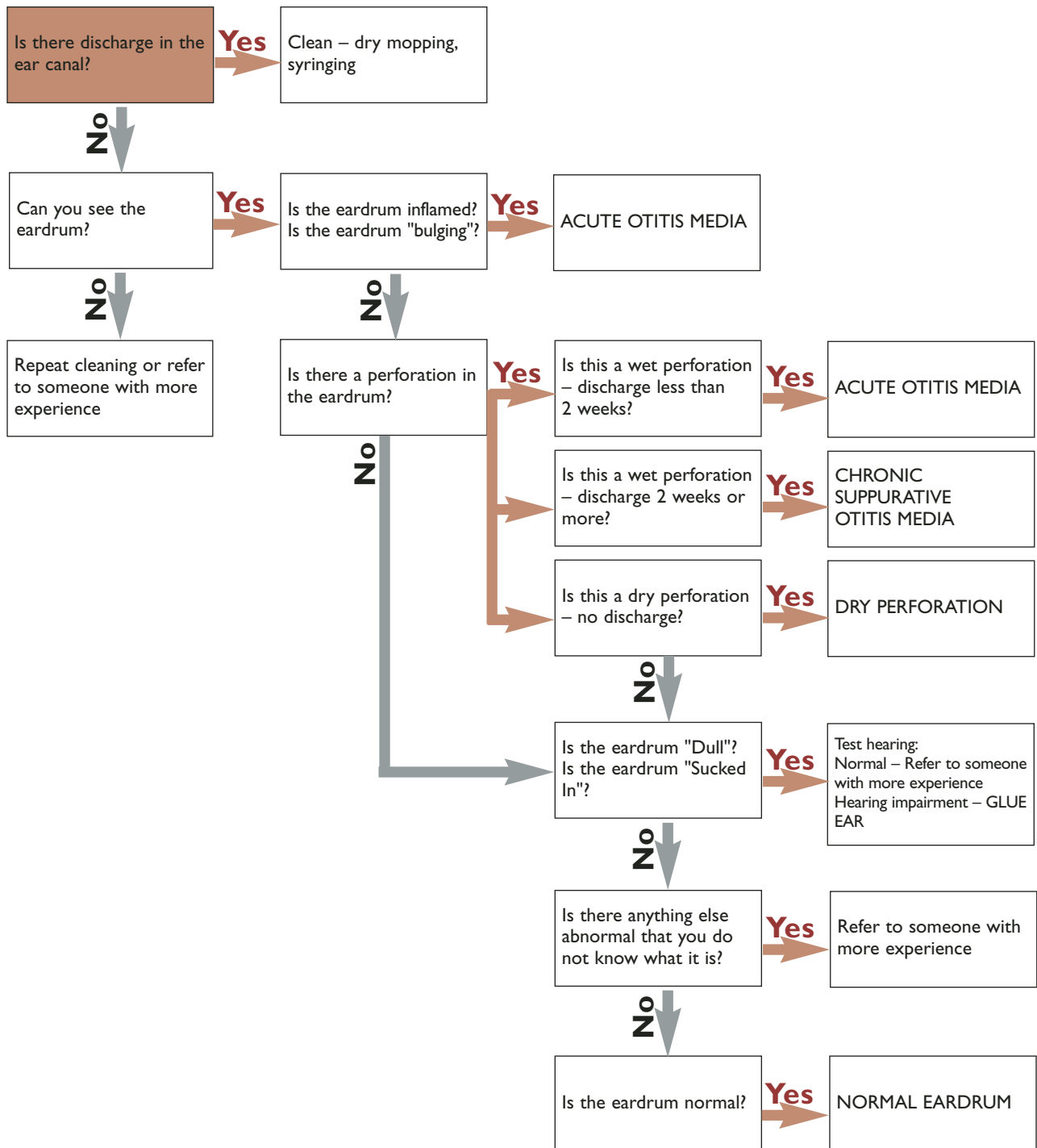
Treatment

- Treat any Respiratory Tract Infection – upper and/or lower
- Treat any ear infection.
- See patient again after 1 month and repeat examination and hearing test

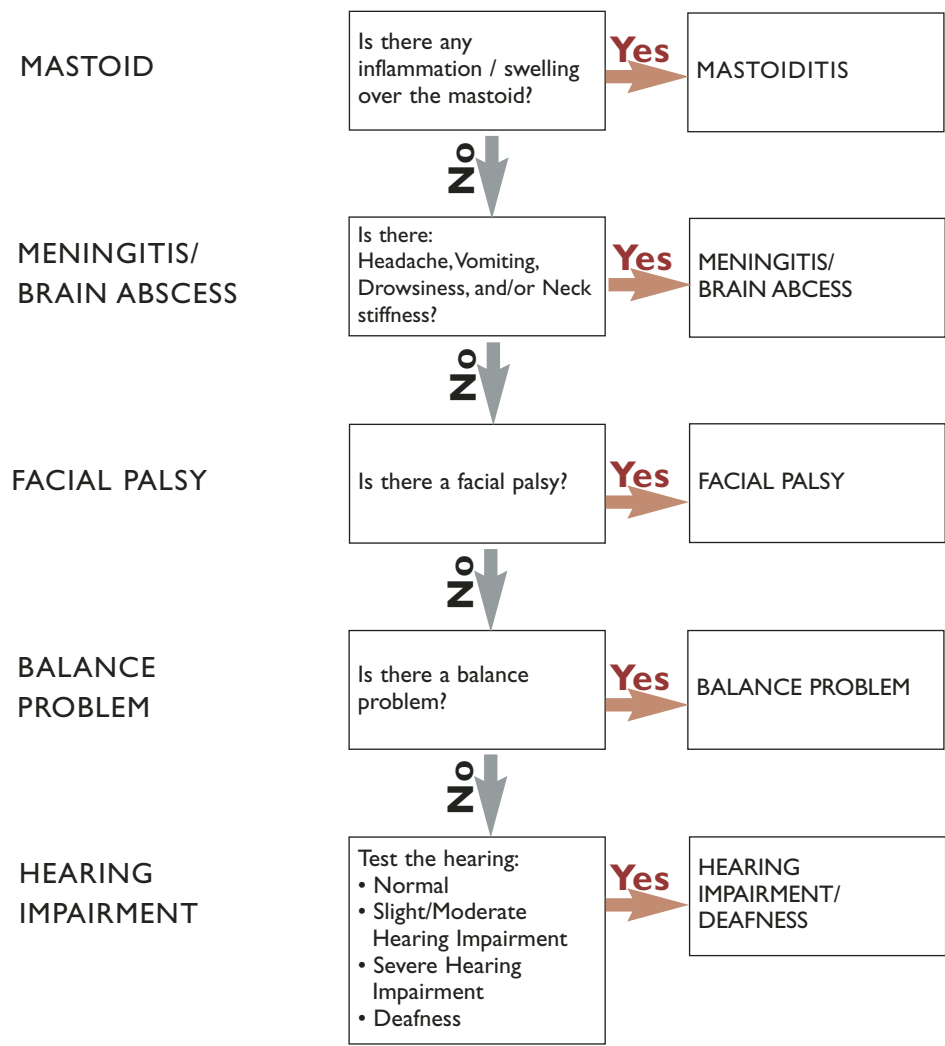
Refer if:

- There is still hearing impairment at the repeat visit

6. HOW TO EXAMINE THE EARDRUM




To complete the examination of the ear:



Activity 4

✱ Students choose a partner. One is the 'Health Care worker' and one is the 'Patient'.

The patient chooses one of the problems from the list below and uses their knowledge to make it sound like a typical patient at their clinic. The health care worker asks more questions about the problem and then tries to describe what they might see if they were to examine the patient. You can discuss this together and then present your problem to the group..

 Complete the patient's health card. Fill in the patient details. Write in details of the problem. Circle each finding of the examination. Name the problem. Write in details of the treatment for the problem.

Some suggested patient problems:

- Patient has a child who was crying all night with a sore ear.
- Patient has had a discharge from the ear for a long time. No pain.
- Patient had a discharge from the ear last year. Now cannot hear well.
- Patient has a child who had a sore ear last week and now has a discharge from the same ear.
- Patient has had a sore ear for several days. Now feels ill and the pain is now behind the ear.
- Patient found semi-conscious. Discharge from the ear.
- Patient has a child who is not speaking clearly.
- Patient has been swimming in the river/dam and now has a discharge from the ear. No pain.

| PATIENT HEALTH CARD | |
|---|--|
| Date | Name |
| Sex | Address |
| Age | |
| What is the patient's problem? | |
| LEFT EAR <hr/> Eardrum Normal / Abnormal Inflamed / Bulging Perforation: Wet / Dry "Dull" / "Sucked In" Something else but you do not know what it is <hr/> Mastoid Normal / Inflammation or swelling over the mastoid | RIGHT EAR <hr/> Eardrum Normal / Abnormal Inflamed / Bulging Perforation: Wet / Dry "Dull" / "Sucked In" Something else but you do not know what it is <hr/> Mastoid Normal / Inflammation or swelling over the mastoid |
| Meningitis/Brain Abscess • Normal • Headache • Vomiting • Drowsiness • Neck stiffness | |
| Facial Nerve Normal / Facial palsy | Facial Nerve Normal / Facial palsy |
| Balance problem Normal / Balance problem | |
| Hearing Impairment Baby questions – Normal / Hearing impairment | |
| Voice test: • Normal hearing • Slight impairment • Moderate impairment • Severe impairment • Deafness | Voice test: • Normal hearing • Slight impairment • Moderate impairment • Severe impairment • Deafness |
| What is the name of the problem? | |
| How are you going to treat the problem? | |

😊 Discuss your ideas with your trainer

7. INFECTIONS OF THE MIDDLE EAR

- Acute and chronic otitis media are common, particularly in children.
- They cause a lot of ill health and can have serious and even fatal complications.
- They are an important preventable cause of hearing impairment.
- It is vitally important that parents and the community are made aware of the importance of early intervention and should be encouraged to bring patients for treatment as soon as there is any sign of ear infection.
- Early intervention with proper treatment can lead to full recovery and avoid further infection and possible hearing impairment.
- Ear hygiene needs to be taught at clinics, hospitals, schools and included in any other community health programmes.

Stress the importance of early intervention.

Ear Hygiene

DO only use medication in your ears that has been prescribed for you

DO use clean towels to dry your ears

DO NOT put anything into your ear

DO NOT try to clean your ears with hairpins, tooth picks or anything else!

DO NOT let dirty water go into your ears

DO NOT leave cotton wool in your ears

POST TEST

| Questions | True | False | Don't know |
|---|------|-------|------------|
| In Acute Otitis Media the eardrum never perforates (bursts) | | | |
| In Chronic Suppurative Otitis Media there is a perforation in the eardrum and a discharge for 2 weeks or more | | | |
| Sticky mucus causes Glue Ear | | | |
| Normal eardrums all look the same | | | |
| In Acute Otitis Media the eardrum looks inflamed | | | |
| The treatment of Acute Otitis Media is eardrops | | | |
| Infection can turn Inactive Chronic Suppurative Otitis Media into Active Chronic Otitis Media | | | |
| Mastoiditis can cause meningitis and a brain abscess | | | |
| The treatment of Dry Perforation is dry mopping and eardrops | | | |
| Dirty water can only cause infection in the ear canal. It cannot cause infection in the middle ear. | | | |
| Score | | | |

module 6

Assessing hearing and counselling






By the end of this module the Health Care Worker should be able to:

- Describe screening hearing assessment in babies
- Describe screening hearing assessment in children aged 3 – 6 years
- Undertake screening hearing assessment in adults and older children
- Explain the results of screening hearing assessment
- Describe counselling of patients with hearing impairment and their families
- Describe community awareness activities

PRE TEST

| Questions | True | False | Don't know |
|--|------|-------|------------|
| Testing hearing is the same as screening hearing | | | |
| Parents do not usually know if their children have hearing impairment | | | |
| Questions can be used to assess hearing in babies | | | |
| Young children usually repeat words when asked to do this | | | |
| You can use your voice to assess hearing in older children | | | |
| People with normal hearing can hear you when you whisper | | | |
| Lip reading helps people with hearing impairment to understand words | | | |
| Deaf children cannot go to school | | | |
| Communities usually know that deafness is a disability | | | |
| Health workers should teach teachers to assess hearing in schoolchildren | | | |
| Score | | | |

Symbols

-  Discuss with partner or in groups
-  Complete by writing in answers or ideas
-  Take part in an activity

Terminology

| | |
|----------------------|--|
| Testing hearing | Hearing and speech development in babies |
| Screening hearing | Assessing hearing in babies |
| Audiometer | Noisemakers |
| Decibels | Special education – "Deaf School" |
| Voice Test | Lip reading |
| Whispered voice | Sign language |
| Conversational voice | Advice and support |
| Loud voice | Raising awareness |
| Shouted voice | |

1. WHAT IS HEARING IMPAIRMENT?

When a person is not able to hear as well as someone with normal hearing then they have hearing impairment. There are several different levels of hearing impairment:

- Not able to hear whispered voice - slight
- Not able to hear conversational voice - moderate
- Not able to hear loud voice - severe
- Not able to hear shouted voice - profound

2. WHAT IS DEAFNESS?

We call profound hearing impairment deafness or we say that a person is deaf.

Most people born without hearing (deaf) never hear speech or learn to speak. People sometimes call this problem "deaf-mute" or "deaf and dumb" but to many people these words mean the same as "deaf and stupid". Because of this, these words can hurt people who are deaf and should be discouraged.

Deaf people can use sign language to communicate.

If a deaf person heard speech and learned to speak before going deaf they can sometimes lip read.

3. WHY IS IDENTIFYING HEARING IMPAIRMENT IMPORTANT IN CHILDREN?


- Good hearing is important for speech and language development.
- Good speech and hearing are important for communication.
- Good communication is important for learning in the home and at school.
- Learning is important if a child is to develop to their full potential.
- Identification of hearing impairment helps us to improve the quality of residual hearing.


Because of this it is important that babies and children have their hearing assessed regularly. A good place to do this is at "immunisation" clinics and "well baby" clinics. Teachers should be encouraged to assess the hearing of all children when they start school. Teachers can be taught the same simple hearing test that will be taught in this module.

3.1 Signs to look for if you think a child has a hearing problem

- he/she cannot follow simple instructions
- he/she gives the wrong answers to questions
- he/she does not respond when you call
- he/she cannot dance/sing in time to music
- he/she cannot identify different sounds

Activity 1

 Write down some of the things you may notice or that you should look for if you think a child cannot hear properly

 Discuss your ideas with your group and with your trainer

4. HOW CAN HEARING BE ASSESSED

The World Health Organisation chart below shows levels of hearing impairment measured in two ways:

- With an audiometer which is a machine for testing hearing
- With a "voice test" which is a less accurate way of assessing hearing

The voice test is a Screening test that means it is a way of finding out whether people have normal hearing or not. To do this whispered voice is used.

When people do not have normal hearing the voice test can also be used to find out what level of hearing impairment they have by using other levels of voice – conversational voice, loud voice or shouted voice.

| Grade of impairment | Level tested with an Audiometer | Level tested with the Voice Test | Recommendations |
|--------------------------------|---------------------------------|--|---|
| Normal hearing | 25 dB or better | Able to hear whispers. | — |
| Slight impairment | 26 - 40 dB | Able to hear and repeat words spoken in normal voice at 1 metre. | Counselling. Hearing aids may be needed. |
| Moderate impairment | 41 - 60 dB | Able to hear and repeat words using loud voice at 1 metre. | Hearing aids usually recommended. |
| Severe impairment | 61 - 80 dB | Able to hear some words when shouted into the ear. | Hearing aids needed. If no hearing aids available, lip-reading and signing should be taught. |
| Profound impairment (Deafness) | 81 dB or greater | Unable to hear and understand even a shouted voice. | Hearing aids may help understanding words. Additional rehabilitation needed. Lip-reading and sometimes signing essential. |

4.1 The Audiometer

Some of you may work in clinics or hospitals where hearing tests are done with a machine called an audiometer. This machine measures the sound levels that people can hear in units called decibels (dB). People with normal hearing may be able to hear a sound at a level of 1 decibel. A person with hearing impairment may only be able to hear a sound at a level of 50 decibels which is in the range for moderate hearing impairment. Another way of saying this is that person has a hearing impairment of 50 decibels.



4.2 The "Voice Test"

Most Primary Care clinics do not have equipment for testing hearing. At these clinics hearing can be screened using the voice. The voice is used at the different levels in the chart to say words that the patient repeats back if they have heard them clearly.

4.3 Assessing hearing in babies

The best person to know whether a baby can hear or not, is the mother or care giver. We can find out whether the baby can hear properly or not by asking questions about the baby's hearing and about the baby's speech development.

Babies do different things at different ages so first you need to know what a baby with normal hearing should do at different ages.

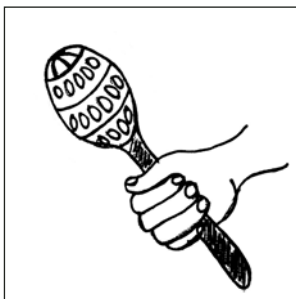
Age of baby

How they should respond

| | |
|------------------------------------|---|
| A few weeks old (up to 6 month) | Should show some sign of hearing sounds – open eyes, blink, look alert (like they are listening to the sound) |
| About 6 months | Should respond by trying to see where the sound is coming from by turning their eyes or head in the direction of the sound |
| About 9 months | Should be listening to loud and very soft sounds and making all sorts of sounds themselves |
| About 1 year | Should respond to their own name and to other words they know and starting to say "baby" words |
| About 18 months | Should be able to point to familiar things when asked to do so and be using simple words |
| 2 years old | Should be able to hear soft sounds and know what direction they are coming from and be able to put words together into simple sentences |

These are the questions to use in assessing hearing in babies

| Age of baby | Questions | Yes | No |
|-----------------|---|-----|----|
| A few weeks old | Does your baby open his/her eyes or blink when there is a noise? | | |
| | Does your baby appear to be listening to you when you talk or sing? | | |
| About 6 months | Does your baby try to see where the noise is coming from by turning his/her eyes or head towards the sound? | | |
| | Does your baby enjoy you talking to him/her? | | |
| About 9 months | Does your baby appear to respond to even very soft sounds? | | |
| | Does your baby enjoy babbling and making other sounds? | | |
| About 1 year | Does your baby respond when you say his/her name and the name of things he/she play with? | | |
| | Is your baby starting to say baby words? | | |
| About 18 months | Does your baby pick up or point to things around the house when you ask them to do this? | | |
| | Is your baby starting to use simple words? | | |
| 2 years old | Do you think your baby can hear normally even when you speak to him/her in a very soft voice? | | |
| | Is your baby putting words together and trying to talk to you? | | |



If the answer to any of the questions is 'No' then you should begin to think that the baby may have hearing impairment.

Some of these babies may have delayed development and this could be the reason they are not responding properly to sounds. A full developmental assessment needs to be done if this seems to be the reason.

Try to refer babies who you think may have hearing impairment to a clinic or hospital where the hearing can be tested with special testing equipment.

What can be done if the baby cannot be referred for special testing? If this is not possible you can try testing babies from about nine months of age with a simple "noisemaker". Stand behind the baby so he/she cannot see the movement of the noisemaker. The noisemaker should make a sound about as loud as a whispered voice. A few grains of salt, sand or sugar moved around (NOT shaken) on a plastic container is a good high frequency sound. If you do not have a noisemaker, try rubbing your fingers behind the babies ear. The baby should respond by turning in the direction of the sound.

Never ignore possible hearing impairment in a baby or a child

4.4 How will you test the hearing?

- Find a quiet room and someone to help you.
- It needs two people to test the hearing – one to stand 1 metre behind and to one side of the baby and make a noise with the noise maker and the other sit in front of the baby and watch to see whether the baby turns to look to see where the sound is coming from.
- Ask the mother to hold her baby sitting up on her lap and facing in front while the test is being done.
- The person in front gets the baby's attention by showing a toy or something else.
- The person in front covers the toy and at the same moment the person testing makes a noise with the noisemaker.
- Does the baby look to see where the sound is coming from?
- If the baby responds then the person standing behind moves to the other side and the test is repeated.

If the baby responds then the hearing is normal. The test should be repeated after three months to see if the hearing is normal.

If the baby does not respond and there is an ear problem the problem should be treated and the test repeated when it has healed.

If the baby does not respond and there is no ear problem then the parents should be given advice about the things they should do at home to help the baby - see below in the section "Advice to parents with a hearing impaired baby or child". The test should be repeated every three months until both the Health Care Worker and the parents are sure that there is hearing impairment. The child should then be referred to a local hearing testing centre, to find out if the child needs a hearing aid, and to a teacher at a local school, local deaf groups or a "Deaf School" to be assessed to find out whether Special Education is needed.

4.5 Testing children 3 to 7 years old

The voice test can be used to assess hearing at this age but children at this age are often too shy to repeat words. Instead ask them to do things such as:

- 'Touch your nose'
- 'Point to your mouth'
- 'Put your hand on your tummy'

Activity 2

Make up a group of four and think up, discuss and write down what kinds of noisemakers you could make and use. Present your ideas to the whole group, discuss them and decide which would be the best to use and why.

😊 Discuss your ideas with your group and with your trainer

Or you could put things on a table in front of them and ask them to point to each one as you say its name. Choose things that they know such as:

Cup/mug Book/paper

Pencil/toy Apple/sweet

If you are testing children in your clinic frequently, you could make a chart with pictures of these items to use for testing

Give the instruction or say the word from in front until they know what to do.

Then stand behind the child and start with a whispered voice. Repeat two or three times until you are sure that the child is hearing clearly what you are saying.

- Correct response – **normal hearing.**
- No response – repeat in conversational voice.
- Correct response – **slight hearing impairment.**
- No response – repeat in loud voice.
- Correct response – **moderate hearing impairment.**
- No response – repeat by shouting into the ear
- Correct response – **severe hearing impairment.**
- No response – **deafness.**

Try to refer children who you think may have hearing impairment to a clinic or hospital where the hearing can be tested with special testing equipment.

4.6 What can be done if the child cannot be referred for special testing?

If the parents think the child has a hearing problem but the voice test showed the hearing is normal:

- The test should be repeated every three months until both the Health Care Worker and the parents are sure that the hearing is normal.

If the child has a hearing problem and there is an ear problem as well:

- The ear problem should be treated and the test repeated when it has healed.

If the child has a hearing problem and there is no ear problem:

- The parents should be given advice about the things they should do at home to help the child – see below in the section "Advice to parents with a hearing impaired baby or child". The test should be repeated every three months until both the Health Care Worker and the parents are sure that there is hearing impairment. The child should then be referred to a local hearing testing centre, to find out if the child needs a hearing aid, and a teacher at a local school, local deaf groups or a special school for deaf children to be assessed to find out whether Special Education is needed.

REMEMBER:

Babies who cannot hear properly will grow up with problems in communication and will not be able to learn properly
The hearing problem may affect their speech and language development

It is important that children with hearing impairment get proper support and training. If the child has hearing impairment or deafness the ideal treatment is a hearing aid with special training and education directed towards communication and development of skills. This is what a “Deaf School” does for these children.

If the child is deaf and a "Deaf School" is not available, encourage the parents to start non-verbal communication. They will have to make up signs for food, members of the family and important objects and activities. They should try to make contact with other members of the community who use sign language.

If the child has some hearing then using signs as well as words helps the child to learn lip-reading. Often these children can hear low frequency sounds but not high frequency sounds and this means that many words will not be heard properly and using signs and lip reading helps them to understand what has been said.

5. TESTING ADULTS AND OLDER CHILDREN.

Adults and older children can be assessed using the voice test. Each ear needs to be tested separately.

Stand behind and to one side of the patient and reach around and "close off" the other ear by pressing on the tragus until the ear canal is blocked.

Start by explaining that when you do the test you are going to close off one ear and stand on the other side and say some words that should be repeated back to you. Then stand in front of the patient and say some words loud enough for the patient to hear and get him or her to repeat the words until you are sure the patient knows what to do. Then stand to one side of the patient and close off one ear of the patient. Then, keeping the ear closed, stand on the patient's other side, and say some words that should be repeated back to you.

NOTE that patients with very poor hearing should be tested with both ears open.

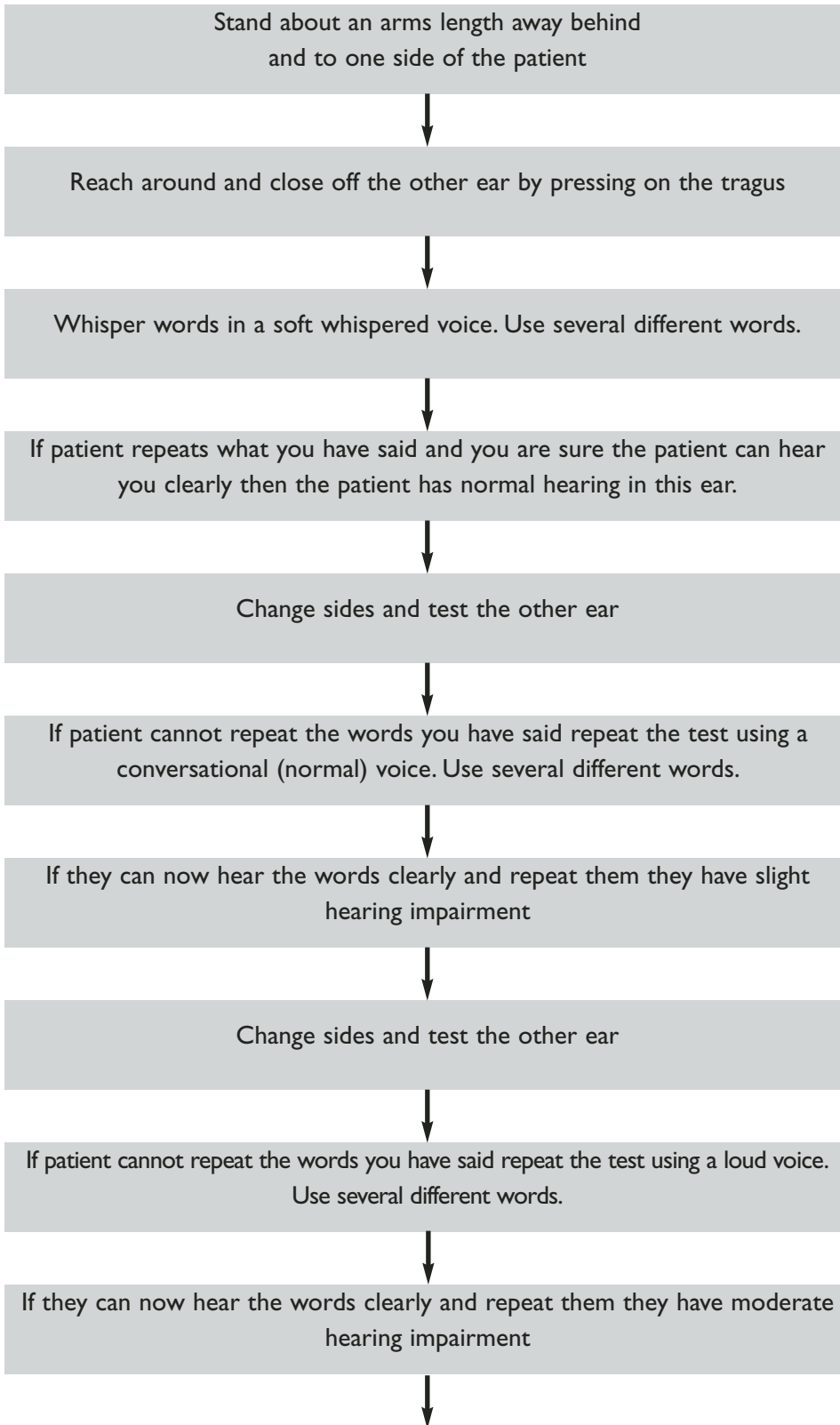
Practice is needed to get the voice levels right for the test.

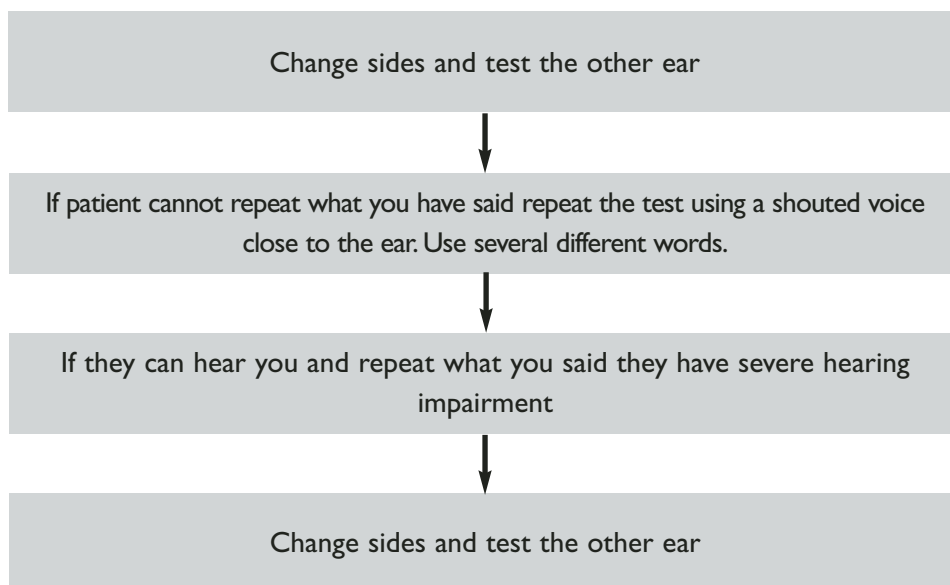
- For whispered voice breathe out and then whisper the words.
- Conversational voice is the quiet conversational voice you would use if speaking to someone sitting next to you.
- Loud voice is the level you would use to speak to someone across the other side of the room when there is other conversation in the room.
- Shouted voice is the level you would use to speak to someone on the other side of the road when there is traffic noise.

Suggested list of words that could be used for testing:

| | | | |
|-------------|---------|---------|-----------|
| Post office | Number | Farm | Mat |
| Sky | Fish | Taxi | Aeroplane |
| Fire | Bicycle | Factory | Ladder |

5.1 How to assess hearing using the voice test





If the patient cannot hear even your shouted voice they have profound hearing impairment or deafness

Activity 3

* Choose a partner

Follow the steps of the flowchart – How to assess hearing using the voice test – and test your partner's hearing. Test at all four levels even if your partner has normal hearing.

Mark response when you test your partner – remember to close off the other ear when you test each ear

| | Left ear | | Right ear | |
|---|----------|----|-----------|----|
| | Yes | No | Yes | No |
| Can your partner hear your soft whispered voice? | | | | |
| Can your partner hear your conversational (normal) voice? | | | | |
| Can your partner hear your loud voice? | | | | |
| Can your partner hear your shouted voice? | | | | |

Now let your partner test your hearing

5.2 What to do when the hearing has been assessed.

For older children:

If the parents think the child has a hearing problem but the voice test showed the hearing is normal:

- The test should be repeated every three months until both the Health Care Worker and the parents are sure that the hearing is normal.

If the child has a hearing problem and there is an ear problem as well:

- The ear problem should be treated and the test repeated when it has healed.

If the child has a hearing problem and there is no ear problem:

- The parents should be given advice about the things they should do at home to help the child – see below in the section "Advice to parents with a hearing impaired baby or child". The test should be repeated every three months until both the Health Care Worker and the parents are sure that there is hearing impairment. The child should then be referred to a local hearing testing centre, to find out if the child needs a hearing aid, and to a teacher at a local school, local deaf groups or a special school for deaf children to be assessed to find out whether Special Education is needed.

For adults:

If the hearing is normal no treatment is needed.

If there is a hearing problem and there is an ear problem as well:

- The ear problem should be treated and the test repeated when it has healed.

If there is a hearing problem and there is no ear problem:

- Refer patients who you think may have hearing impairment to a clinic, centre or hospital where the hearing can be tested with special testing equipment.

6. WHO NEEDS ADVICE AND SUPPORT WHEN THERE IS SOMEONE IN THE FAMILY WITH HEARING IMPAIRMENT?

6.1 The patient

It is sometimes difficult for a person – even a child – to understand why they are hearing impaired. They are sometimes seen as 'different' or 'stupid' and so they can become withdrawn. If their family does not understand and support them it is very difficult for them to learn to communicate, develop language and learn about the world around them.

If the patient is a child they should be referred for special education. Their parents and family should be encouraged to communicate with them using pictures and signs as well as by pointing to things. If they have to go to a normal school the teachers should be told that they have a hearing problem and be asked to give them special attention.

If the patient is an adult they should find out if there are any other hearing impaired or deaf people in the community and form a support group.

An older person with hearing impairment due to old age may only need the family to speak a bit more slowly and clearly and face them while they are speaking.

The patient should have their ears checked and tested regularly to make sure they are clean, healthy and that the hearing has not deteriorated.

People with hearing impairment should be encouraged to use hearing aids where possible and affordable.

6.2 Parents and family members

Parents and family members play an important role in the life of a person with hearing impairment or deafness. The hearing impaired person needs to learn to communicate first in the home. Family members can develop a simple sign language to support their speech when talking to a hearing impaired or deaf person.

They should include the hearing impaired or deaf person in all activities in and around the home.

Parents and family members should educate themselves and learn how to communicate with the hearing impaired or deaf person. With support, people with hearing impairment can be educated and enter into the job market. Parents should ensure that their children receive the best possible education and training so that they may become self-sufficient.

Parents could join, or form, support groups in their own community and so offer support to each other.

Activity 4

* Choose a partner

Each of you in turn thinks up a sign for a word or an activity around the home. Make this sign to your partner who has to try and guess what the sign means.

7. ADVICE TO PARENTS WITH A HEARING IMPAIRED BABY OR CHILD

- Let the child see your face when you speak to them
- Make sure there is good light for the child to see your face
- Get the child's attention before you speak to them
- Decrease other distractions – especially loud noises
- Encourage hard of hearing children to listen and discriminate different sounds especially if they are using a hearing aid.
- Stand close to the child when you speak

- Speak clearly and more slowly
- Don't shout and exaggerate movements
- Repeat words and instructions many times
- Use gestures, drawings, paintings – point at things
- Encourage lip-reading
- Don't eat or chew while talking to the child
- Do not over protect the child
- If the child has a hearing aid he/she must use it
- Be patient – it takes time to learn to communicate

8. METHODS TO USE TO HELP HEARING-IMPAIRED PEOPLE LIP-READ

- Face the person when speaking
- Get their attention before you speak to them
- Do not cover your mouth with your hand or newspaper
- Make sure there is good light for them to see your face. Do not turn off the lights – they will not be able to see your lips!
- Decrease other distractions – especially loud noises. Turn off the radio or TV
- Speak clearly and more slowly
- Repeat words and instructions many times

Activity 5

* Choose a partner

Each of you in turn thinks of a word and "mouths" this word to your partner without saying the word. Your partner has to try and guess what the word is.

9. RAISING AWARENESS IN THE COMMUNITY AND IN SCHOOLS

One of the main problems in some societies is that hard of hearing and deaf people are not seen and they are shut away in the home because they are believed to be 'stupid' and so cannot do anything. When this happens community awareness of the problem of hearing impairment is low.

Another problem is that families sometimes do not realise that a family member who they think is "stupid" is in fact hard of hearing and so do not take them to have their ears examined and tested.

Public awareness campaigns could create a better understanding of hearing impairment and the disability that it causes:

- Local clinics should display posters about hearing impairment and ear care to raise awareness amongst patients.
- Communities should be encouraged to have "Healthy ear" days to raise awareness in the community.
- Communities should be encouraged to have fund raising activities to help equip their local clinics for testing hearing and supplying hearing aids.
- Health workers should visit schools and talk to teachers and learners about hearing impairment and its problems and encourage activities such as designing posters to raise awareness and playing "What can you hear?" games to identify children with hearing impairment.
- Children should be introduced to their first language only
- Encourage deaf adults to teach sign language classes and talk about deafness.

10. WHAT COULD HEALTH CARE WORKERS DO?

- Teach teachers about hearing impairment and encourage them to include this in their teaching programme
- Train teachers to recognise signs for hearing impairment, teach them how to do the simple voice test and refer children with hearing impairment for treatment
- Promote awareness campaigns in the community and encourage people with hearing impairment to have their ears checked and their hearing tested
- Raise awareness in the community by speaking to social, religious and other groups in the community about hearing impairment. Promote the use of sign language with sign language interpreters in their meetings to assist people with deafness.
- Promote the need to include hearing impaired people in the world of work, in education and in society
- Encourage the formation of support groups for the hearing impaired and their families
- Recruit educated deaf adults to assist with deaf awareness campaigns and help deaf children in school and the community.

POST TEST

| Questions | True | False | Don't know |
|--|------|-------|------------|
| Testing hearing is the same as screening hearing | | | |
| Parents do not usually know if their children have hearing impairment | | | |
| Questions can be used to assess hearing in babies | | | |
| Young children usually repeat words when asked to do this | | | |
| You can use your voice to assess hearing in older children | | | |
| People with normal hearing can hear you when you whisper | | | |
| Lip reading helps people with hearing impairment to understand words | | | |
| Deaf children cannot go to school | | | |
| Communities usually know that deafness is a disability | | | |
| Health workers should teach teachers to assess hearing in schoolchildren | | | |
| Score | | | |

module 7

Hearing aids



By the end of this module the Health Care Workers should be able to:

- explain the basic concepts of hearing aids
- understand the function of BW and BTE hearing aids
- insert and check batteries for BW and BTE hearing aids
- understand the importance of earmoulds and how they fit into the ear
- carry out basic care and maintenance on BW and BTE hearing aids
- identify simple faults for BW and BTE hearing aids and propose a solution

PRE TEST

| Questions | True | False | Don't know |
|--|------|-------|------------|
| People should clean their ear moulds regularly | | | |
| It does not matter if water gets into the hearing aid | | | |
| If the battery drawer is not closed properly there is weak or no sound heard | | | |
| Children should be encouraged to wear their hearing aids | | | |
| Sound comes and goes if the cord is not plugged in correctly | | | |
| Condensation cannot block the ear mould | | | |
| Sound is distorted if the volume is too high | | | |
| Do not replace the battery if it is running down | | | |
| Patients must be taught how to care for their hearing aid | | | |
| Speech and language development in hard of hearing children cannot be improved by wearing hearing aids | | | |
| Score | | | |

Symbols

- ☺ Discuss with partner or in groups
- ✎ Complete by writing in answers or ideas
- * Take part in an activity

Terminology

| | |
|------------------------------|------------------|
| hearing aid | aid |
| onset of hearing impairment | background noise |
| earmould | volume control |
| body worn (BW) hearing aid | condensation |
| behind the ear (BTE) hearing | |

1. WHAT ARE HEARING AIDS?

Spectacles can often help people with poor vision see better.

Walking sticks or wheelchairs can often help people who cannot walk move around more easily.

What can help people with a hearing impairment? – Hearing aids.

Everyone knows what spectacles or walking sticks look like. They are used by many people all over the world. Hearing aids are not as well known.

What is a hearing aid? – An electrical device worn on the ear.

What do hearing aids do? – They allow hearing impaired people to hear sounds better. Hearing aids make sounds louder.

2. WHO CAN USE HEARING AIDS?



Behind the ear hearing aid (BTH)



Body worn hearing aid (BW)

Almost everyone, young and old, who has a hearing impairment can be helped to hear better by wearing hearing aids. The successful use of hearing aids depends on many things :-

- at what age the hearing impairment occurred
- whether the hearing impaired person has already developed spoken language
- how soon hearing aids are fitted after the hearing impairment is identified
- the degree of hearing impairment – slight, moderate, severe, profound
- the type of hearing impairment – conductive, sensorineural
- how motivated the hearing aid wearers are to wear and use hearing aids
- how well hearing aids are fitted and maintained
- the help and support available to learn to use hearing aids – especially for young children
- where hearing aids are used - quiet or noisy surroundings

In general, people with a hearing impairment in only one ear do not need to use a hearing aid.

3. WHY ARE HEARING AIDS NEEDED?

Hearing impaired people need hearing aids to help them communicate. Hearing aids help to hear speech and other sounds. The ability to hear all these sounds not only improves the quality of life of hearing impaired people but can also improve their ability to learn at home, at school or in the workplace. Hearing aids can help hearing impaired people become active members of their families and community instead of being isolated and alone.

4. WHEN SHOULD HEARING AIDS BE FITTED?

Hearing aids should be fitted as soon as a hearing impairment has been identified. Deaf or hard of hearing babies and young children need to hear well in order to develop speech and language and so should be fitted with hearing aids and taught how to use them. Important language learning years can be lost when a hearing impaired child is not fitted with hearing aids.

5. WHERE CAN HEARING AIDS BE OBTAINED FROM?

Hearing aids need to be fitted after an accurate hearing test. Hearing aids (including the earmoulds) then need to be properly fitted into the ear. Hearing aid users and their families must be given instructions and help on how to use hearing aids and look after them. Hearing aids should only be obtained from a qualified person with appropriate training and experience to carry out all these tasks.

Activity 1

Do hearing impaired people in your local area/community have hearing aids and if so, where do they get them from?

😊 Discuss the answer with the trainer and the group

Remember – hearing aids are not a miracle cure for hearing impairment, they are an "aid" that helps hearing impaired people to hear sounds better.

6. TYPES OF HEARING AIDS AND HOW THEY WORK

Sounds enter the hearing aid through the microphone. Inside the hearing aid the sound is made louder and the louder sound is then heard by the user.

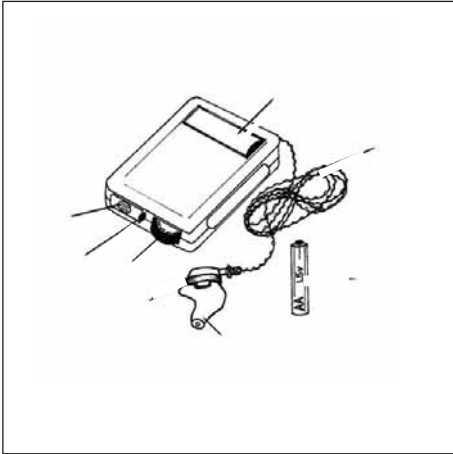


Diagram of BW hearing aid

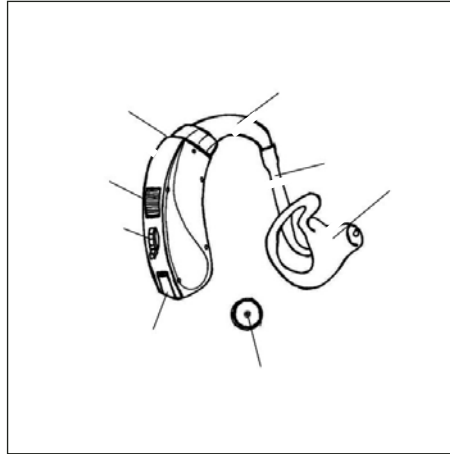


Diagram of BTE hearing aid

Parts of hearing aids

Microphone – the sound is picked up through the microphone

On-off switch on a hearing aid is usually labelled 'O T M'

O = Off position

T = Telecoil used with specially adapted equipment to cut out background noise

M = On position (M stands for microphone)

Sometimes the on-off switch is part of the battery drawer. In this case the hearing aid is switched off by slightly opening the battery drawer.

Volume control alters the loudness of the sound going into the ear from the receiver. It can be adjusted by the hearing aid wearer.

Receiver produces the amplified sound that goes into the ear.


Battery drawer is where the battery is kept and is usually positioned at the bottom of the hearing aid


Battery is the power supply for the hearing aid.

Ear hook (BTE hearing aids only) – this rigid plastic hook fits over the top of the ear to hold the hearing aid in position. It is also connected to the plastic tubing of the earmould.

Cord (BW hearing aids only) – the receiver is attached to the main part of the hearing aid by a cord. This cord can be single (for one receiver), or double (for two receivers).

Activity 2

 Label the diagrams of a BW and BTE hearing aid above

 Identify and explain the function of one part of a hearing aid to the group

How does a hearing aid help us hear better?

Sounds enter the hearing aid through the microphone. Inside the hearing aid the sound is made louder and the louder sound is then heard by the user.

Types of hearing aids

Body-worn (BW) hearing aids

BW hearing aids are a small box worn on the front of the body with a cord leading to the receiver that is clipped into an ear mould in the ear. They are usually used for severe and profound hearing impairment.

Behind-the-ear (BTE) hearing aids

BTE hearing aids are worn behind the ear and are connected by a short length of plastic tubing to an ear mould in the ear. They can be used for all levels of hearing impairment.

Batteries

The correct batteries must be used or the hearing aid will not work properly.

- BW hearing aids – any standard AA size 1.5 V battery can be used, but long life alkaline batteries are advised (these are more expensive but will last much longer).
- BTE hearing aids – special hearing aid batteries must be used. The battery life depends on how often the hearing aid is used, at what volume and the power of the hearing aid itself.
- Batteries may last from just a few days to almost a month.

Remember - watch/camera batteries should not be used as they will damage a BTE hearing aid

- BW hearing aids – place the battery in the battery drawer matching the positive signs together
- BTE hearing aids – remove the paper/sticker from the battery and place the battery in the battery drawer matching the positive signs together.
- Gently close the battery drawer - do not force it shut.

Note: the paper/sticker cannot be replaced and the battery put back in the packet to be used later

How to check the battery is working:

- Remove the hearing aid from the ear and take off the earmould.
- Switch the hearing aid on and turn the volume control to the highest setting
- Place the hearing aid in the palm of your hand. For a BW hearing aid place the receiver next to the microphone.
- If there is a continuous whistling sound the battery is working
- If there is no whistling sound the battery is used. Replace the battery
- If there is still no whistling sound with a new battery then there is a problem with the hearing aid

**Activity 4**

- * Correctly fit a battery into a hearing aid.
- * Use the procedure above find whether the sample batteries are working or used.

Ear moulds

The ear mould is an essential part of all hearing aids.

What are earmoulds and why are they needed?

Earmoulds connect the hearing aid itself to the ear. They are made individually for each person so that they fit exactly into the ear. If an earmould is the wrong size or has been put in the ear incorrectly sound leaks from around the earmould and causes a whistling sound. Also an earmould that does not fit properly will be uncomfortable and may even be painful. Earmoulds need to be replaced every one to two years. Children, whose ears grow very quickly, will need new earmoulds every few months.



Activity 5

* Identify whether the sample earmoulds are for the left or right ear and for a BW or BTE hearing aid

Fitting the earmould onto the hearing aid

For a BW hearing aid the earmould simply clips on to the receiver and can then be fitted into the ear.

For a BTE hearing aid the earmould is connected to the hearing aid so the crescent shapes are matching

The plastic tubing also needs to be cut to the right length. If it is too long the hearing aid will not stay behind the ear properly. If it is too short then the ear hook of the hearing aid will be pulled down on the top of the ear and be uncomfortable.



Earmould too small

Remember – the tubing must not get twisted as this will block the pathway of the sound



Earmould with tubing cut too short

Fitting the earmould into the ear

Trainer to demonstrate (using his own ear and earmould or one of the students) how to correctly fit an earmould into the ear

Fitting an earmould into the ear correctly is not easy and can take some practise :

1. Hold the earmould at the hollow of the outer ear between the thumb and first finger.
2. Fit the canal part into the hollow of the outer ear first.
3. Fit it into the top of the ear and finally press in the hollow of the outer ear.

Activity 6

- * Practise fitting your partner's earmould into his/her ear
- * Try fitting your own earmould into your ear- ask your partner to check that it is correctly fitted.
- * Discuss these activities with your partner and trainer - what you found difficult and how it could be made easier.

7. HEARING AID CARE AND MAINTENANCE

Hearing aids are expensive and delicate so all wearers must be shown how to look after the hearing aid. Lost or broken hearing aids are no help to anyone.

Looking after hearing aids**DO:**

- Remove hearing aids before putting on perfume or hair spray
- Only use the on-off switch and the volume control – all other controls should only be changed by the person who fitted the hearing aids

DO NOT:

- drop them – hearing aids are delicate.
- get hearing aids wet – remove them for washing and swimming.
- leave hearing aids in direct sunlight or on top of a heater.
- wear hearing aids if you have any ear discharge from an infection
- use a pin, paper-clip or any sharp object to remove dirt from hearing aids or earmoulds
- try to repair hearing aids yourself - if they break return them to the place where they were fitted

Activity 7

- * Suggest ways in which hearing aids may get broken or go wrong
- * Discuss how these things could be prevented

Some expected answers:

- dropping hearing aids on the floor
- getting hearing aids wet
- handle hearing aids with care
- remove hearing aids for washing or swimming

If hearing aids do get wet, do not put them in the oven or the sun to dry out. Remove the batteries, leave the battery drawers open and put them somewhere safe for a day or two and they may dry out.

Store hearing aids in their box, in a cool, dry place out of the reach of other children and animals. Don't just put them in a pocket!

Keep cords of BW hearing aids free of knots and do not wind them tightly around the hearing aids

Looking after batteries

Batteries should be stored in a cool, dry place, away from small children and animals who may swallow them. If a battery is accidentally swallowed seek medical help immediately. In very hot, humid climates batteries can be stored in a refrigerator. Used batteries must be disposed of carefully and not thrown in the fire or left where small children or animals can reach them.

When the hearing aid is not being used it should be switched off to save the batteries. In hot, humid climates or if the hearing aid is not going to be worn for a long time the battery should be removed from the hearing aid altogether.

Batteries for BW hearing aids can be bought at local shops. Batteries for BTE hearing aids can usually be bought at hearing centres or clinics. Always check that batteries are well within their expiry date.

Looking after ear moulds

It is very important to keep earmoulds clean so they need to be washed every two or three days :-

- Detach the earmoulds from the hearing aids
- Wash the earmoulds in warm soapy water. Do not use strong detergent or spirit.
- Any wax stuck in the hole through the earmoulds can be removed using a toothpick.
- Rinse the earmoulds in clean water and blow through the tubing to remove any drops of water.
- Dry the earmoulds with a soft cloth or tissue and replace them the correct way around on the hearing aids.

Condensation (small drops of water) sometimes forms in the plastic tubing and can block the earmould. If this happens, remove the earmould and tubing from the hearing aid and blow through the tubing.

NOTE – DO NOT BLOW INTO THE HEARING AID ITSELF

Activity 8

- * Design and draw a poster (A4) to illustrate one way of looking after a hearing aid
- * Discuss how carers, professionals and hearing aid wearers themselves can best be taught to look after hearing aids used in the community /local area (e.g. workshops, leaflets etc.)

Some expected answers

- Giving out leaflets to wearers
- putting up a poster
- holding workshops for parents of children who wear hearing aids
- holding seminars for teachers who have pupils that wear hearing aids

8. HEARING AID FAULT-FINDING

| Problem | Problem identified | Solution |
|-------------------------------------|--|-----------------------------------|
| Weak or no sound | Hearing aid switched off | Switch hearing aid on |
| | Volume too low | Increase volume |
| | Battery running down or used | Replace battery |
| | Battery not inserted correctly | Insert battery correctly |
| | Battery drawer not closed properly | Close battery drawer |
| | Ear mould tubing blocked with wax or moisture | Clean ear mould and tubing |
| | Ear mould tubing twisted | Replace ear mould tubing |
| | Cord broken | Replace cord |
| Sound comes and goes | Other | Send hearing aid for repair |
| | Dirty battery contacts | Send hearing aid for repair |
| | On-off switch or volume control faulty | Send hearing aid for repair |
| | Cord not plugged in correctly | Push in cord plugs |
| Distorted sound | Cord faulty | Replace cord |
| | Volume too high | Decrease volume |
| | Battery running down | Replace battery |
| | Clothing noise | Wear hearing aid outside clothing |
| | Cord faulty | Replace cord |
| Acoustic feedback (whistling sound) | Other | Send hearing aid for repair |
| | Ear canal blocked with wax | Remove wax from ear canal |
| | Volume too high | Decrease volume |
| | Earmould loose or too small | Replace earmould |
| | Earmould not fitted correctly into the ear | Re-fit earmould |
| Hearing aid uncomfortable to wear | Earmould or earmould tubing cracked | Replace earmould or tubing |
| | Earmould not fitted correctly | Re-fit Earmould |
| | Earmould too big or poorly made | Modify or replace earmould |
| | Earmould tubing too long or too short | Adjust / replace earmould tubing |
| | Hearing aid not adjusted correctly or not suitable | Adjust or replace hearing aid |
| | Ear infection | Treat ear infection |

If no problem can be identified or solution found the hearing aid must be sent to a trained hearing aid repair technician or returned to the manufacturer for repair.

POST TEST

| Questions | True | False | Don't know |
|--|------|-------|------------|
| People should clean their ear moulds regularly | | | |
| It does not matter if water gets into the hearing aid | | | |
| If the battery drawer is not closed properly there is weak or no sound heard | | | |
| Children should be encouraged to wear their hearing aids | | | |
| Sound comes and goes if the cord is not plugged in correctly | | | |
| Condensation cannot block the ear mould | | | |
| Sound is distorted if the volume is too high | | | |
| Do not replace the battery if it is running down | | | |
| Patients must be taught how to care for their hearing aid | | | |
| Speech and language development in hard of hearing children cannot be improved by wearing hearing aids | | | |
| Score | | | |



Please note:

In certain centres it may be necessary to obtain approval to implement training using this resource. Permission should be obtained from the relevant authorities.

Comments and observations by users are welcome and should be sent to:

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