Module 3:

Hearing assistance needs assessment and care planning

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Contents

Aim

To enable learners to identify clients with a hearing impairment, to record and interpret the results of a clinical hearing assessment and to plan appropriate hearing assistance.

By the end of this module learners should be able to

- Understand and explain conductive and sensorineural hearing losses
- Make a basic interpretation of a client's audiogram to determine the degree, type and symmetry of their hearing loss
- Interpret from an audiogram the impact of a client's hearing loss on their ability to hear high or low frequency sounds and their understanding of speech
- Observe behavioural signs that may indicate hearing loss
- Collect essential care plan information for assisting a hearing impaired client who cannot independently manage their hearing aids or implantable devices
- Check if a client has excessive cerumen (ear wax) accumulation in the ear canal by otoscopic inspection
- Access basic information for operating cochlear sound processors.

Scope

This module is relevant to clients in long stay residential care but also to those in home or respite care or in hospital. In the latter situations a client may benefit from immediate hearing assistance and also referral for post-discharge action.

It is assumed that nurses will study the physiology and pathophysiology of the auditory system and resultant medical care needs elsewhere in their training.

This module concentrates on practical aspects of hearing assistance. Nevertheless, knowledge of the type and degree of a client's hearing impairment will help in developing hearing assistance aspects of their care plan.

Related modules

- Module 1: Core skills for hearing assistance
- Module 2: Communicating with hearing impaired clients
- Module 4: Hearing assistance implementation and evaluation

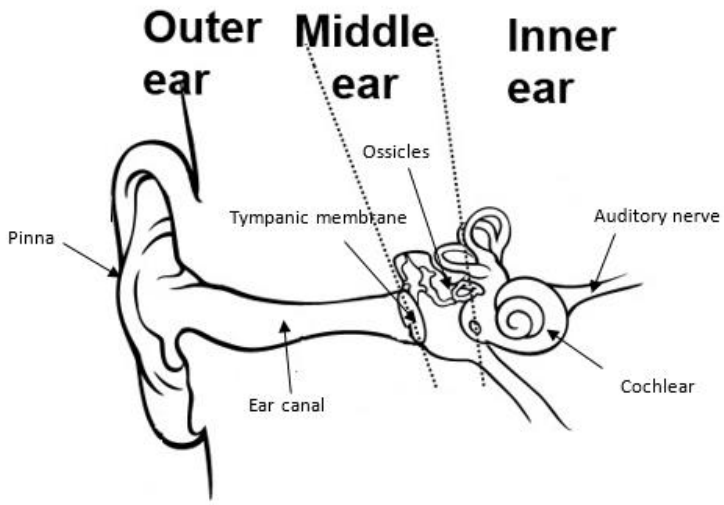
1. Types and degrees of hearing loss

The hearing pathway

A hearing loss can result from a problem at any point in the hearing pathway – in the outer, middle or inner ear or in the auditory nerve to the brain. See Figure 1.

Figure 1: Hearing pathway

Outer ear	Middle ear	Inner ear
Pinna > ear canal > tympanic membrane > ossicles > cochlear > auditory nerve		



Types of hearing loss

Depending on which part of the auditory system is affected, a hearing loss is categorised as *conductive* or *sensorineural* or a mixed loss.

- *Conductive loss*

A conductive loss is caused by blockage or damage in the outer and/or the middle ear leading to loss of loudness. Accordingly, a conductive loss may often be helped by the amplification provided by a hearing aid.

- *Sensorineural Loss*

A sensorineural loss results from damage to, or malfunction of, the cochlear or the nerve pathways that lead to the brain - causes include, ageing (‘presbycusis’), exposure to excessive noise, certain diseases, viruses, drugs and genetic causes. A sensorineural loss usually leads to loss of both loudness and clarity of hearing (‘speech discrimination’) and can also usually be assisted with a hearing aid.

Degrees of hearing loss

Different degrees of hearing loss may be described in general terms:

Mild loss
Soft noises may not be heard. Understanding speech becomes difficult in groups, noise or at a distance.

Moderate loss
Speech at an average conversational level sounds very soft and there will be more difficulty understanding speech at distances greater than a metre or in background noise or in open areas such as community rooms and outdoors unless there is close proximity to the speaker and their face can be seen. Visual clues and hearing aids should help. Particularly among older people high-pitch speech sounds may not be heard making understanding difficult.

Moderately severe loss
Normal speaking voices are unlikely to be understood without visual clues, including lip reading. Some speech sounds may be heard if spoken loudly at close distance. Even with hearing aids some speech sounds may not be understood without visual clues.

Severe loss
A normal speaking voice will not be heard even at close range. Hearing aids will be needed, even so some speech sounds will not be heard clearly. Group conversations will be very difficult. There will be dependence on visual clues including lip reading.

Profound loss
Only some very loud noises will be heard. Normal speech will not be heard but hearing aids may provide useful auditory clues to aid lip reading and provide a sense of connection with the environment.

2. Measurement of hearing loss and its implications[1]

For clinical purposes and for better understanding of the impact of a client's hearing loss precise measurements are needed.

A common test of hearing ability is called *pure tone audiometry* where a person listens to a range of beeps (called pure tones) and indicates when each can be heard. The softest sounds that can be heard are marked on a graph called an *audiogram.*

When the sounds are presented through head-phones or insert earphones this measurement is called 'air conduction' because the sounds go via the air, down the ear canal, through the mechanism of the middle ear, and then to the cochlear in the inner ear. It is also possible to measure the sensitivity of the cochlear by testing how well sound is heard through the bones of the skull – this is called 'bone conduction'. These two tests can indicate where a hearing problem is located. We will concentrate on air conduction testing.

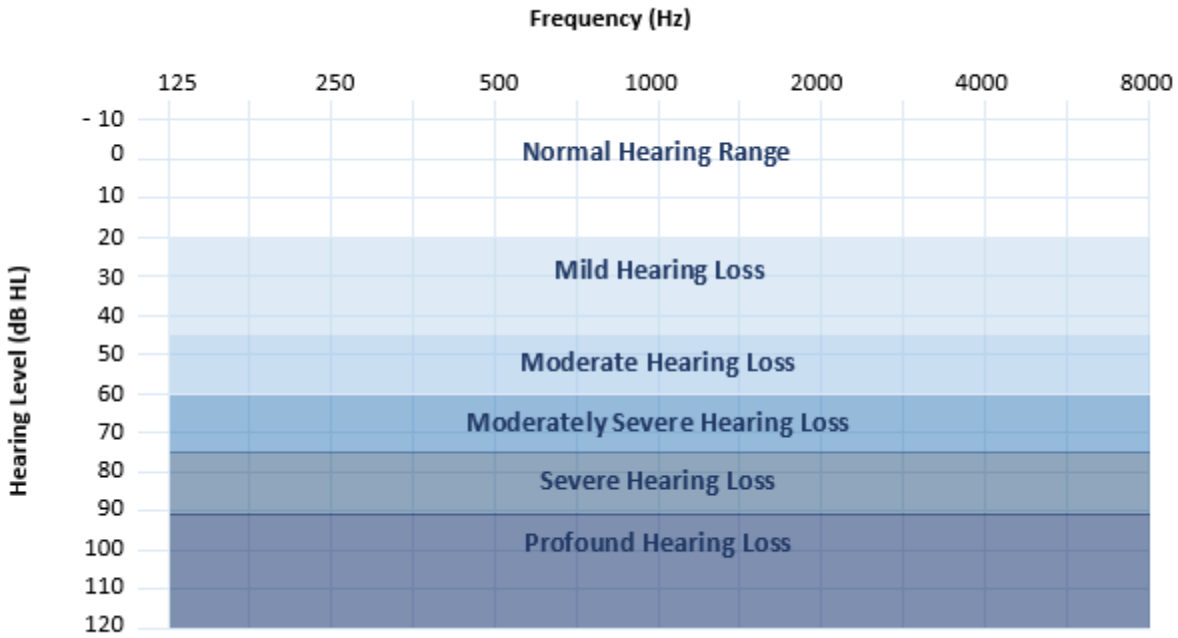
[1] Based on Australian Hearing Information Sheets NRF2143 and 2144

Reading and interpreting audiograms – degree, type and symmetry of loss

The numbers along the top of the graph refer to the *frequency* or pitch of sounds expressed in 'Hertz'. The higher the number, the higher the pitch of the sound. Most speech sounds fall in the frequency range 250 to 8000 Hertz. The loudness or *intensity* of sound is measured in 'decibels' – these are shown along the side of the graph.

Different degrees of hearing impairment described above can be defined by ranges of sound frequency and intensity. See Figure 2.

Figure 2: Audiogram chart showing degrees of hearing loss



Audiograms also provide an indication of

- Type of loss (i.e. conductive, sensorineural or mixed) See Figures 3 & 4
- Symmetry of loss. This is the degree of similarity between hearing in the right and left ear.

Air conduction thresholds for the right ear (i.e. the softest sounds the right ear can hear at each frequency measured) are marked as an 'O', and the left ear as an 'X' on the audiogram. Bone conduction thresholds are marked with square brackets.

Figure 3: Example of an audiogram showing mild conductive hearing loss in both ears[2]

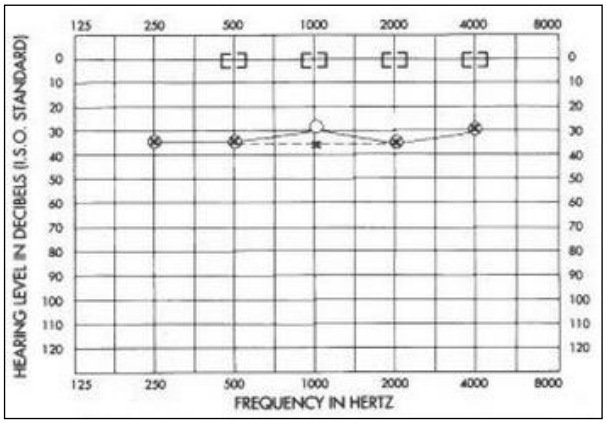
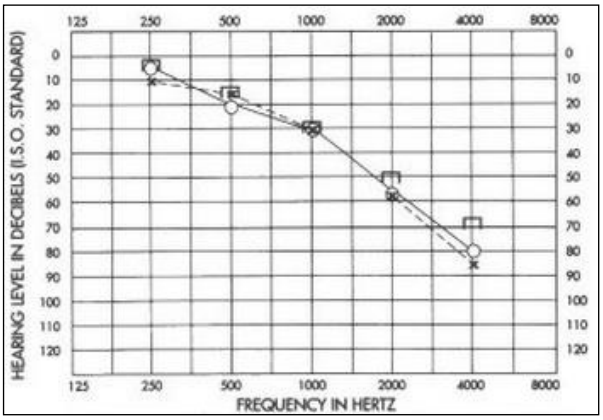


Figure 4: Example of an audiogram showing a mild to severe high frequency sensorineural hearing loss in both ears [2]



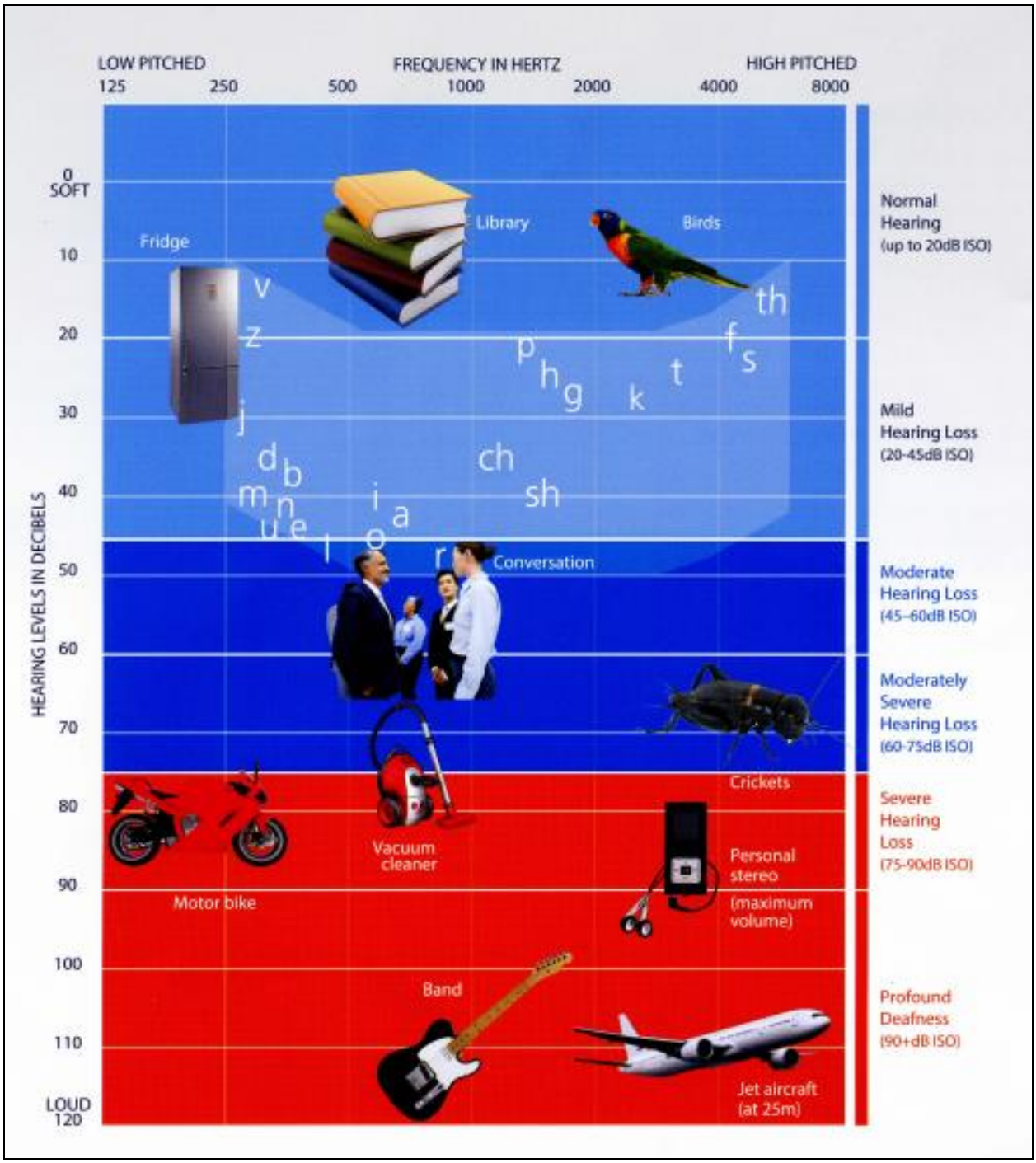
Reading and interpreting audiograms - speech discrimination

In previous modules the impact of hearing loss on *understanding* speech has been mentioned – particularly the impact of high frequency loss. Different sounds in speech have different pitch and loudness. For example, the "o" sound in the word "cow" is low in pitch and fairly loud while the "s" sound in the word "hats" is high pitch and fairly soft. A person with a high frequency hearing loss may only hear part of the word because they are hearing the louder, low frequency sounds, and not the softer high frequency sounds in the word. Thus, while they may hear the word, they may not understand it.

The banana shaped shaded area in the upper part of the *Frequency and Intensity of Speech and Other Common Sounds* chart (Figure 5) below includes the approximate location of speech sounds in terms of their frequency (in Hertz) and their intensity (in decibels).

[2] Australian Hearing Information Sheets NRF 2144

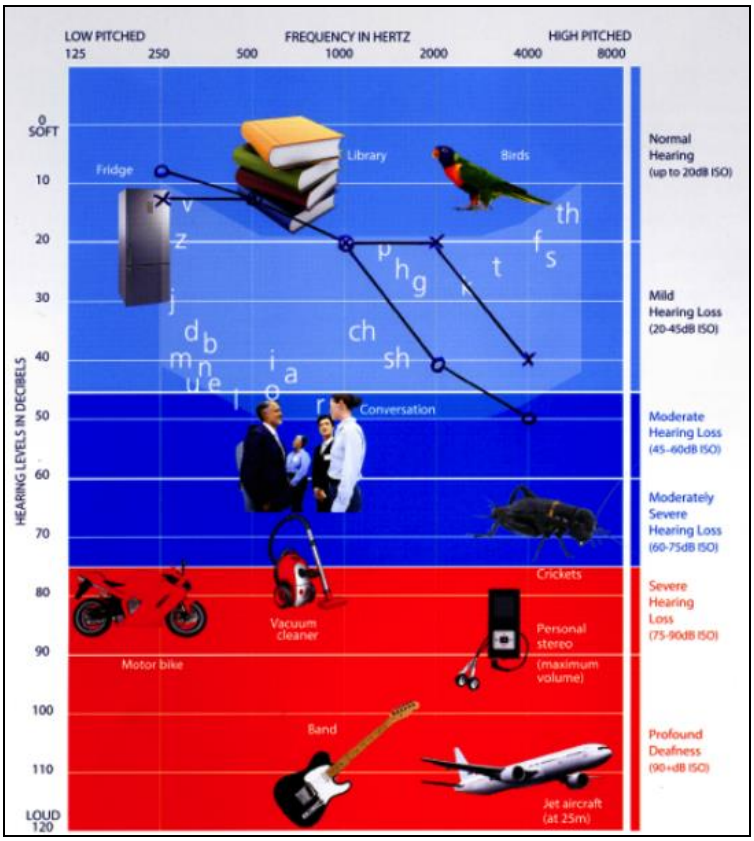
Figure 5: ***Frequency and Intensity of Speech and Other Common Sounds*** **chart** [3]



[3] Australian Hearing Information Sheets NRF 4248

If a client's audiogram is available the air conduction graphs for both ears can be plotted on a photocopy of the chart. This will provide an *approximation* of the speech sounds not heard by a hearing impaired client without amplified sound. Such plots can be useful in explaining to a client (and possibly their family) the impact of their hearing loss and why hearing aids or an alternative listening device might be of assistance. To demonstrate this, the audiogram of a client's high frequency hearing loss has been plotted on the chart in Figure 6 below. This is followed by an explanation of the impact of this client's hearing loss. See Appendix 1 for a copy of the chart for photocopying purposes (suitable for black and white copying).

Figure 6: Audiogram plotted on *Frequency and Intensity of Speech and Other Common Sounds* chart



Type and Degree of Loss	**Mild to moderate high frequency loss**
Symmetry of Loss	Greater loss in right ear
Impact on ability to understand speech	Both ears hear the vowels and the lower-frequency consonants, but miss softer high pitch sounds such as "s", "th" "f" and "t," among others. This will reduce the person's speech discrimination making listening to conversation difficult, especially in noisy situations. The client would have to rely on a combination of clues from several sounds, words, patterns of speech, and possibly also on visual clues to understand what is said. An appropriately programmed hearing aid should be of assistance.

The capability to hear speech is a function of two abilities:

- the ability to *detect* the sounds of speech, and
- the ability to *understand* speech sounds.

The audiogram shows how much sound someone can detect, but not how clearly speech can be heard. To measure a person's 'speech discrimination' – how well they can understand speech – different tests are needed. For example, a list of selected words may be presented which the hearing impaired person is asked to repeat.

A person who has a problem understanding the words, even when they are loud enough, may find the benefit provided by a hearing aid will be reduced. People who have a sensorineural hearing loss sometimes fall into this category.

Cochlear implants may assist people with severe to profound sensorineural hearing impairment who no longer obtain adequate amplification from hearing aids.

For further information on understanding of the use of audiograms visit:

The Audiogram: Explanation and Significance by Mark Ross published by Hearing Loss in May/June 2004
www.hearingloss.org/sites/default/files/docs/Ross_Audiogram_MJ04.pdf

Exercise 1: Reading and interpreting an audiogram

Learners to plot the audiogram provided on to a photocopy of the Frequency and Intensity of Speech and Other Common Sounds chart in Appendix 1 and describe in the answer box what the impacts of the hearing loss would be on understanding speech.

Purpose: Learners to demonstrate their ability to read and interpret an audiogram.

Support materials:
Frequency and Intensity of Speech and Other Common Sounds Chart (Appendix 1)
Exercise handout and sample answer (Appendix 2).

3. Identification of a client's hearing impairment

As part of the *initial assessment* of clients entering hospital, a care facility or other care arrangement it is important to determine whether they are hearing impaired.

In care settings uncorrected hearing loss can result in seriously reduced quality of life and may contribute to an increase in depression and dementia.

Hearing impaired people may suffer uncertainty and distress if they are deprived of their hearing aids while in hospital. This could occur due to an emergency admission or concern that their valuable aids may be lost or damaged if taken to hospital. Similarly, they may forget to bring spare hearing aid batteries with them or staff may not know how to assist them with an unfamiliar implanted hearing device.

Hearing impairment may adversely affect a client's ability to respond to medical questions and to understand medical advice and instructions. Rather than expose themselves to potential embarrassment a person who cannot hear well may simply smile and say 'yes' when they have not understood what was said to them.

Identification in a care plan that a client is hearing impaired
This is very important and can be reinforced by marking the care plan/file with the international hearing assistance symbol.

Signs observed in clients that may indicate a hearing loss include:

- Frequent requests for repetition
- Does not respond when name is called or back is turned
- Loud volume on TV or radio
- Difficulty understanding conversation in groups or noise
- Responds only to loud speech or sounds
- Misses what is said, especially if speaker isn't facing them
- Responses are inconsistent with conversation
- Watches speaker's face and gestures intently
- Difficulty hearing door bell, phone 'rings' and/or difficulty hearing speaker on the phone
- Withdrawing from social activities.

When assessing older clients, it is essential not to mistake some of these behaviours as signs of dementia

If at the time of an admission assessment there has been insufficient opportunity to observe such behaviours a client (or if necessary, a family member) can be asked: [4]

- Can you hear but sometimes not understand conversation?
- Do you find it much harder to hear in noise or groups of people?
- Do you have difficulty understanding what people say unless they are facing you?
- Do you think people mumble or slur their words?
- Do you have to ask for repeats a lot?
- Do you need the TV or radio up louder than others?
- Do you find you have misunderstood the topic and are embarrassed when you say the wrong thing?
- Do you avoid group meetings, social occasions, and even family gatherings because you have difficulty hearing?
- Do you hear the phone or doorbell ring?

[4] Australian Hearing Information Sheet NFR143

If a client appears to have a hearing loss which warrants professional assessment most hearing services providers will administer a screening hearing test free of charge. If this indicates a need for further assessment and possible corrective action see the *Good Practice Guide section 3.4* regarding possible eligibility for assistance under the Government Hearing Services Program. Those not eligible for the HSP can get assistance from an audiologist in private practice.

In home care, and, if appropriate, in reasonably short-stay residential situations such as respite or in hospital, it may be appropriate to encourage a hearing impaired client to seek professional assessment of their hearing with the possibility of obtaining hearing aids or an alternative listening device. If the client is eligible to access the Hearing Services Program the matter could be referred to the client's GP suggesting that the GP consider providing the client with an HSP Medical Certificate which could be presented to a hearing services provider. This may form part of discharge procedures where these are in place. However, before taking such action an otoscopic inspection of the ears should be undertaken to ensure that the apparent loss is not due to wax or other blockage in the ear canal.

A client with an evident hearing impairment may be encouraged to seek professional assessment with the possibility that hearing aids or an alternative listening device may be recommended. It is appropriate to point out to the client that with hearing it's a case of 'use it or lose it' and that it is likely to become increasingly difficult to adapt to using hearing aids later in life.

In addition to the risk that uncorrected hearing loss may lead to social isolation and depression, Dementia Australia states that:

- 'Age-related hearing loss is a factor that increases the risk of dementia ... however, hearing loss is only a risk factor, and having any form of hearing loss does not mean that a person will [necessarily] develop dementia.
- 'Research suggests that people with mild symptoms of hearing loss may be twice as likely to develop dementia as those with healthy hearing. People with severe hearing loss may be five times more likely to develop dementia.'

Taking corrective action (e.g. wearing hearing aids) over a substantial period helps to lessen the risk of developing dementia. This agues for not delaying corrective action for hearing loss. However, a client should not be pressured to do so even if there is an apparent need for such action. An unwilling hearing aid user is unlikely to persevere with hearing aid use during the sometimes-difficult period while adapting to them. Motivation is the key factor in successful device usage.

Clients who use, or have previously used, hearings aids

It may be appropriate to ask whether a client uses, or has previously used, hearing aids or other assistive listening devices.

- *Hearing Aid Benefit Questionnaire*
  If a client uses hearing aids the attached *Hearing Aid Benefit Questionnaire* may help in identifying hearing assistance needed by the client. (Appendix 3). The questionnaire may be administered verbally.

  Question 3 in the *Hearing Aid Benefit Questionnaire* contains indicators of necessary hearing assistance by staff irrespective of the client's length of stay in hospital or residential care. Questions 3 & 4 may suggest areas where mentoring by staff (or a trained volunteer if available) might help a long-stay client to improve hearing outcomes.

- *Client Hearing Impairment Information and Assistance Needs* form
  The *Client Hearing Impairment Information and Assistance Needs* form (Appendix 4) can be used in client records to identify clients with apparent hearing loss whether or not they use hearing aids or an alternative listening device. It also captures essential information for assisting hearing impaired clients who cannot independently manage their hearing aids. This form should be included in the client's care plan.

  If a client (or family member) says that hearing aids were used previously - but were found to be unsatisfactory - establish if possible, what difficulties were experienced. Consider whether it might be possible to now get a better outcome. See *Module 4: Hearing Assistance Implementation and Evaluation section 1.*

4. Clients who use cochlear implants or other implanted devices

Where a client presents with an implanted device which care staff will need to assist the client with, staff should ensure that they know how to perform the necessary functions, which may include:

- fitting the external component/s
- switching the device on and off, selecting the appropriate program and at least adjusting the volume
- changing the battery/ies and recharging if applicable
- storing the device properly when not in use.

Where staff do not already have this knowledge, they should ensure that they can perform the necessary functions prior to treatment which may render the client temporarily incapable of operating their device.

Cautions!

- When the external component of a cochlear implant is turned off or removed from the head the user will normally not be able to hear anything through the implanted ear.
- Implantable devices are delicate and expensive and should be handled with the same care as hearing aids.
- Other cautions may be listed in the user guides and in *Good Practice Guide,* Attachment 11.

If the client or an accompanying person is unable to instruct relevant care staff, such staff should consult online support advice. See provider support addresses at the end of *Good Practice Guide,* Attachment 11. This should be done before the need to operate the device will arise so as to avoid distress to the client.

Exercise 2: Referring to hearing implant manuals for guidance on performing the necessary functions

Learners should check that they could perform the following functions for a Cochlear Ltd Nucleus 6 sound processor:

- fitting the external component/s
- switching the device on and off, selecting the appropriate program and adjusting the volume
- changing the battery(ies) and recharging them if applicable
- storing the device properly when not in use.

Purpose: Learners to demonstrate their ability to locate and navigate a hearing implant manual.

Support materials:
Exercise handout (Appendix 5)

5. Otoscopic inspections

Where a client appears to have a hearing loss, before initiating a professional assessment the possibility of excessive cerumen (ear wax) accumulation or other obstruction in the ear canal should be checked using an otoscope. The presence of some cerumen in the ear canal is normal. However, excessive wax accumulation may interfere with a clinician's ability to accurately assess the client's hearing or with making an impression of the ear canal to enable hearing aid moulds to be supplied or fitted. Accumulation of cerumen may also lead to hearing aid moulds becoming blocked with wax.

Where excessive cerumen is found to be present ear drops are normally administered for a few days to soften the wax. The wax may then dissipate without further intervention, otherwise syringing of the ear may be necessary. Irrigation of the ear canal is normally undertaken by a GP or authorised RN, however an Enrolled Nurse should be competent to make an otoscopic inspection to determine whether excessive cerumen has accumulated. Particularly in aged care settings**,** the ability to make such an inspection is very helpful as it enables requests for syringing to be made confidently and quickly rather than having to wait for a GP to visit. (Other wax removal methods are sometimes used by ENT specialists and audiologists.)

Use of an otoscope will probably be included with other nurse clinical training.

The following web link may however be useful.

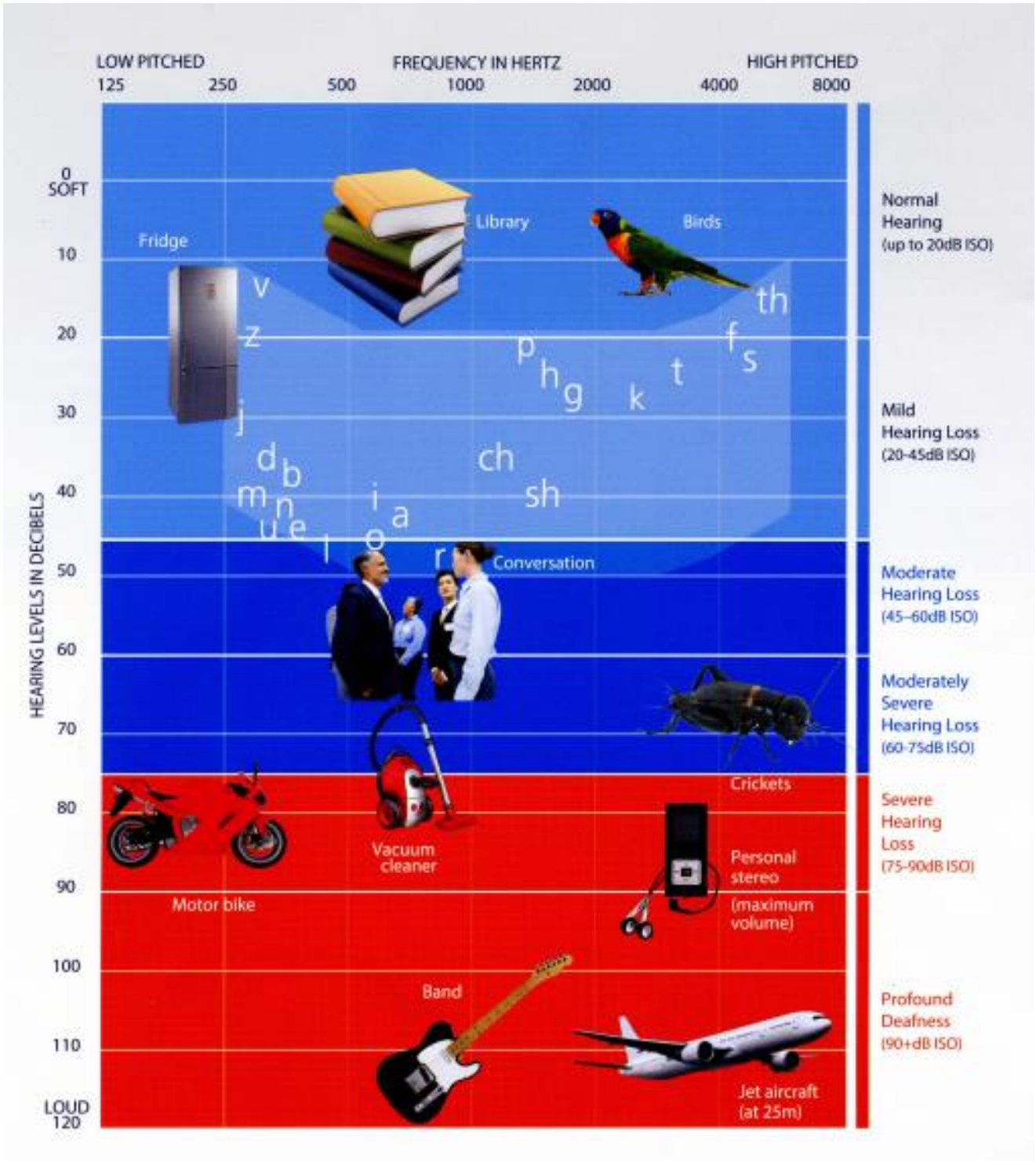
For further information on undertaking otoscopy:

ENT - Ear Examination – Otoscopy YouTube Instructional Video produced by students at Oxford University Medical School in conjunction with the ENT faculty - demonstrates how to perform an examination of the ear using an otoscope. It also shows the anatomy of the tympanic membrane. (3 mins 10 sec).
www.youtube.com/watch?v=FE0sot4OoAE

Appendix 1: Frequency and Intensity of Speech and Other Common Sounds chart

(Cover sheet)

Frequency and Intensity of Speech and Other Common Sounds chart [5]



[5] Australian Hearing NRF 4248

Appendix 2: Handout and sample answer for Exercise 1: Reading and interpreting an audiogram

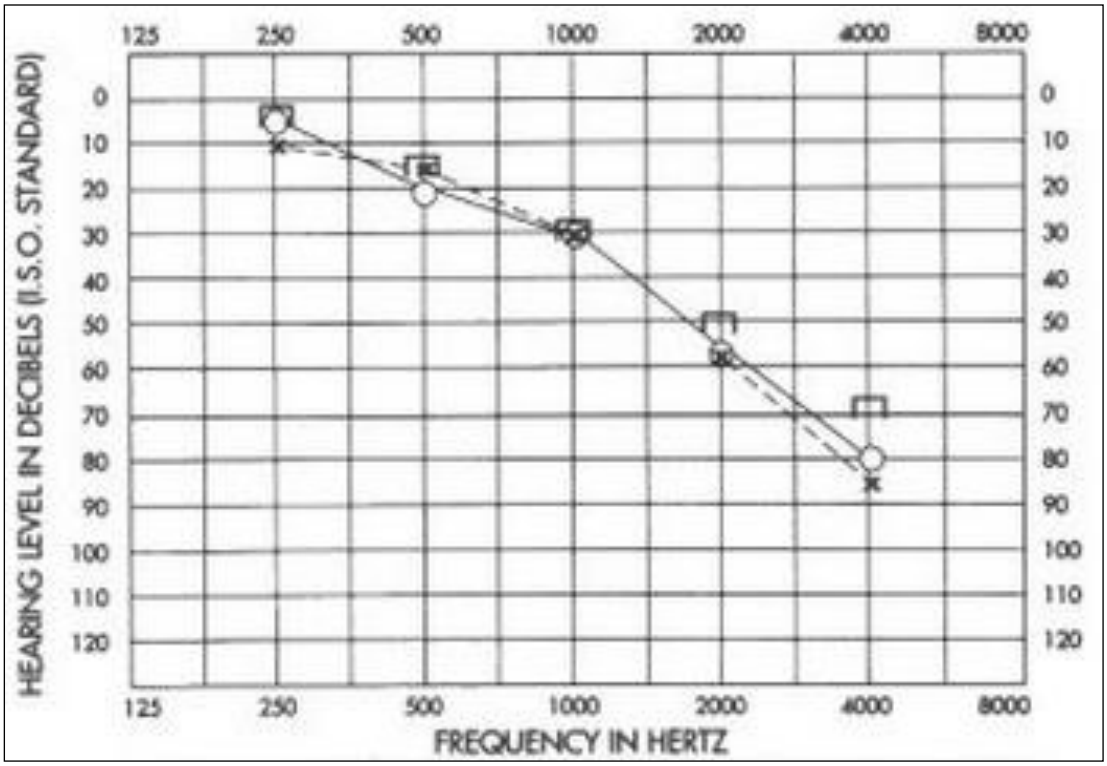
Exercise 1: Reading and interpreting an audiogram

Exercise 1: Sample answers for reading and interpreting an audiogram

(Cover page)

Exercise 1: Reading and interpreting an audiogram

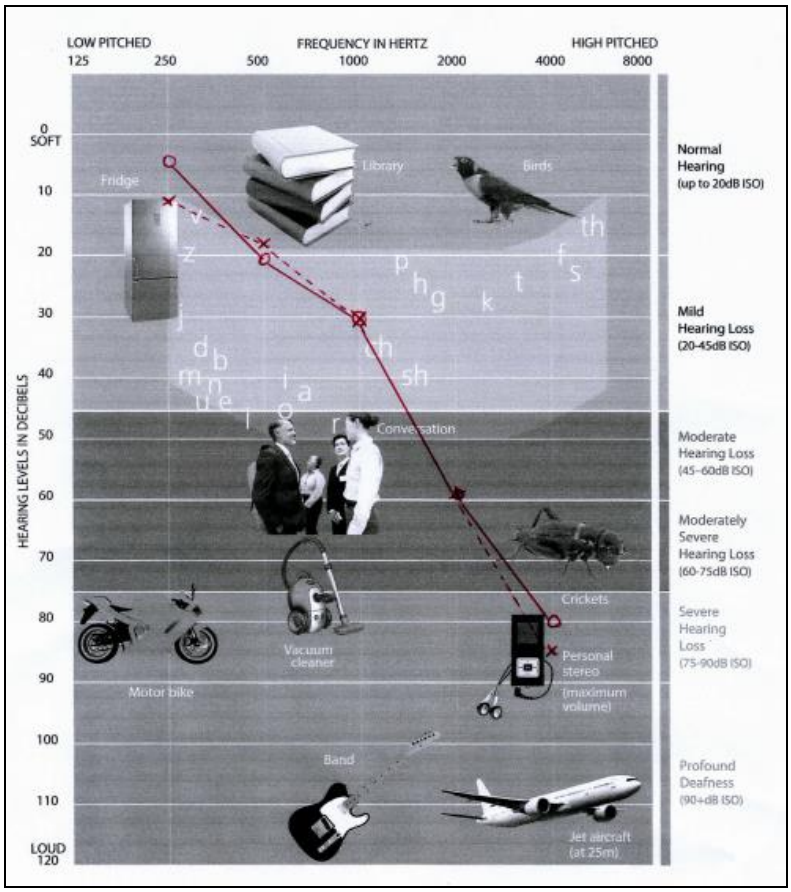
1. Plot the following audiogram below on to a photocopy of the *Frequency and Intensity of Speech and Other Common Sounds* chart.



2. Describe what you believe the impacts of the hearing loss would be.

Type and Degree of Loss	
Symmetry of Loss	
Impact on ability to understand speech	

Exercise 1: Sample answer for reading and interpreting an audiogram



Type and Degree of Loss	**Mild to severe high frequency loss**
Symmetry of Loss	Almost equal loss in both ears
Impact on ability to understand speech	The person will have difficulty hearing soft high pitch consonants such as “th”, “f”, “s”, “t” and “k” among others. This will reduce the person’s speech discrimination making listening to conversation difficult, especially in noisy situations. An appropriately programmed hearing aid should be of assistance.

Appendix 3: Hearing Aid Benefit Questionnaire

(Cover sheet)

Hearing Aid Benefit Questionnaire

Consumer _____

Location _____

Please tick the best answer for each question

QUESTION 1 Do you usually wear….

One hearing aid ☐ Two hearing aids ☐

QUESTION 2 On average how often do you wear your hearing aid(s)?

4 to 8 hours per day *(more than half of each day)* ☐

1 to 4 hours per day *(less than half of each day)* ☐

Occasionally *(less than 1 hour per day but more often than 1 hour per week)* ☐

Seldom *(less than 1 hour per week)* ☐

Never wear the hearing aid(s) ☐

Please tell us why you never wear your hearing aid(s)

_____

_____

_____

How would you describe your satisfaction with your hearing aid(s)?

Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

QUESTION 3 Do the following actions cause you difficulties?	YES	NO
A Do you have difficulties positioning or removing the hearing aid(s)?	☐	☐
B Do you have any difficulties changing the batteries?	☐	☐
C Do you have any difficulties adjusting the controls of the hearing aid(s)?	☐	☐
D Do one or both aids whistle when in your ear and set at a comfortable hearing level?	☐	☐
E Does the fit of one or both hearing aids or earmoulds cause you discomfort?	☐	☐
F Do the hearing aids make sudden loud noises unbearably loud (not just annoying)?	☐	☐
G Does your own voice sound loud, hollow or as if it is echoing?	☐	☐
H Do other people help you adjust or handle your hearing aid(s)?	☐	☐

QUESTION 4 How much does your hearing aid help you with the following activities?

In addition, please rate activities in order of importance to you.

	A Lot	A Little	Not at all	Help not needed	Level of Importance
Family					
Small group conversation					
Gatherings (e.g. meetings/church)					
Social Activities (e.g. shopping/bowls)					
Television an /or radio					
Telephone					

QUESTION 6 & 7 *are for aged care recipients or hospital patients receiving assistance from staff.*

QUESTION 6 How satisfied are you with the assistance you receive in managing your hearing aid(s)?

Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

If you are dissatisfied with the service you receive please tell why...

_____

_____

_____

QUESTION 7 If you are a client of

☐

(name of aged care facility's principal hearing services provider), how satisfied are you with their service?

Very Satisfied ☐ Satisfied ☐ Dissatisfied ☐ Very Dissatisfied ☐

If you are dissatisfied with the service you receive please tell why...

_____

_____

_____

_____

_____

_____

_____

Based on National Acoustics Laboratories HAUQ 8a

Appendix 4: Client Hearing Impairment Information and Assistance Needs form

(Cover sheet)

Consumer Hearing Impairment Information and Assistance Needs

Consumer _____

Location _____

Tick as appropriate and date any changed information in the future

Consumer is hearing impaired but does not use hearing aid(s) or alternative devices ☐

Consumer has not brought their hearing aid(s) or alternative device to hospital / respite care ☐

Best side for communicating Both ears ☐ Right ear only ☐ Left ear only ☐

OR

Consumer uses

Behind the ear hearing aid(s) ☐ In the canal hearing aid(s) ☐

In the ear hearing aid(s) ☐ Other device ☐ _____

Worn in

Both ears ☐ Right ear only ☐ Left ear only ☐

Battery Size

312 ☐ 675 ☐

13 ☐ Other ☐

Degree & type of hearing loss if known _____

_____

Hearing Service Provider _____

Phone Number _____

Client Card ID # _____ *If applicable, otherwise provider may request pension # or DOB*

None ☐ **Inserting Aids** ☐

Removing Aids ☐ **Changing Batteries at least weekly** ☐

Combined with cleaning aids(s), including cleaning any wax or moisture blockages

Volume Control *Level at which set or instructions for changing* ☐

Comments on volume _____

CONSUMER REQUIRES THE FOLLOWING ASSISTANCE FROM STAFF

Changing programs

Telecoil / T-Switch ☐ Other _____

Does consumer suffer from **significant tinnitus**?

Yes ☐ No ☐

If yes, what mitigating practices and / or devices are used?

_____

Comments

Appendix 5: Handout for Exercise 2: Referring to hearing implant manuals for guidance on performing the necessary functions

Describe how you would perform the following functions for a Cochlear Ltd Nucleus 6 sound processor. www.cochlear.com/au/home/support

Function	Description
Fitting the external component/s	
Switching the device on and off, selecting the appropriate program and adjusting the volume	
Changing the battery(ies) and recharging them if applicable	
Storing the device properly when not in use	