

Hearing Loss ... or Why is Everyone Mumbling ?

Lorna Dowson M.Sc. Audiologist
St. Mary's Hospital, Montreal



International Symbol of
Hearing Impairment

Introduction

Hearing is one of the 5 senses

It is a complex process of picking up sound and attaching meaning to it. The ability to hear is critical to understanding the world around us.

The human ear is a **fully developed part of our bodies at birth**. It responds to sounds that are very faint as well as sounds that are very loud. Even before birth, infants respond to sound.

ASHA

Some Statistics

Hearing loss is the third most prevalent chronic disability of older adults:

- 20% of adults over 65.
- 40% of adults over 75.
- 80% of nursing home residents.

All of the above have significant hearing problems.

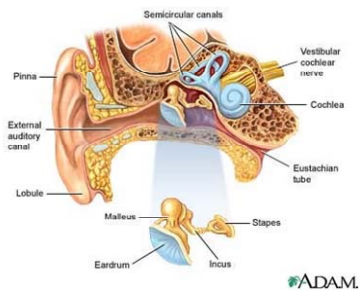
Seniors represent the fastest growing segment of the population in Canada. Seniors are expected to make up ¼ of the Canadian population by 2041 (Statistics Canada)
CASLPA – Canada

- 30% of people over 65 have some type of hearing loss.
- 14% of those between 45 & 64 have hearing loss.
- 8 million people between the ages 18 and 44 have hearing loss.
- 6 babies in a thousand have some degree of hearing loss at birth.

ASHA – US

How Do We Hear?

The ear can be divided into 3 parts leading up to the brain:
 The **OUTER EAR** consisting of the pinna, the ear canal and the eardrum. Sound is funneled down the ear canal, striking the eardrum, and causing it to vibrate.



The **MIDDLE EAR** is an air space behind the eardrum which contains the **"HAMMER"** (Malleus), the **"ANVIL"** (Incus) and the **"STIRRUP"** (Stapes), three small bones called the **OSSICLES**. The chain of these tiny bones is connected to the eardrum at one end and to an **opening to the inner ear (Oval Window)** at the other end.

The brain interprets the electrical signal which travels up the auditory nervous system as **"SOUND"**.

The Auditory System



Causes of Hearing Loss

- Hearing related disorders in seniors can be caused by:
- Aging disorders
 - Noise exposure
 - Heredity
 - Middle ear dysfunctions
 - Medications that affect hearing
 - Neurological diseases (eg. Stroke)
 - Head injury
 - Tumors

I tell my patients that hearing loss is the sum total of all your life's experience; it's the genes you were born with, the illnesses you have had, some of the medications you have taken, the noise to which you have been exposed, any trauma to your head, etc. ... The longer you live, the more "experiences" you have had !

Types of Hearing Loss

A hearing loss can be

- Conductive
- Sensorineural – some doctors call this neurosensory
- Mixed

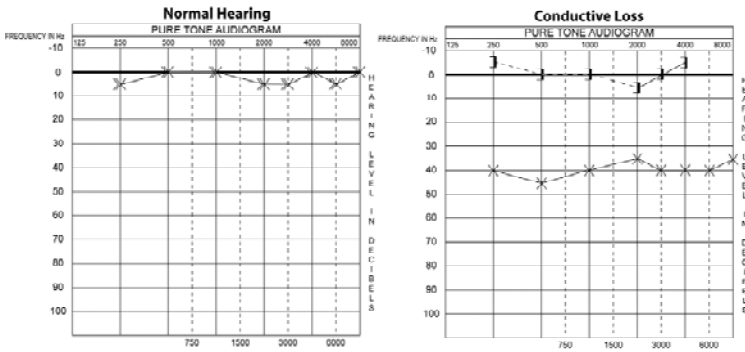
The most common type of hearing loss is Sensorineural involving the cochlea and the hearing nerve.

An audiogram is a chart which represents your ability to hear tones and the volume at which you just hear each tone

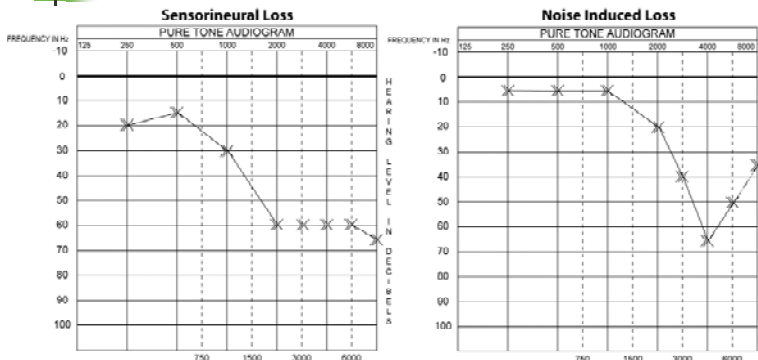
Adult normal	-10 to 25 dB	Moderately Severe	56 to 70 dB
Mild Loss	26 to 40 dB	Severe	71 to 90 dB
Moderate	41 to 55 dB	Profound	91 dB +

It is possible to hear some sounds normally and other sounds with great difficulty.

Types of Hearing Loss



Types of Hearing Loss

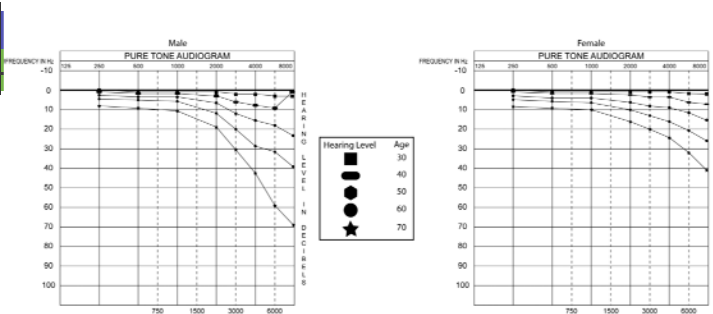


Configuration of Hearing Loss

The configuration or shape of a hearing loss refers to the degree and pattern of the hearing loss across the frequencies on an audiogram.

- **Bilateral vs. Unilateral**
It is bilateral if both ears are affected. Unilateral if only one ear is impaired.
- **Symmetrical vs. Asymmetrical**
If the extent and shape of the hearing loss are the same in both ears then the loss is symmetrical. Asymmetrical means the degree and or configuration differ in each ear.
- **Progressive vs. Sudden**
If the hearing loss became worse over time (gradually) the loss is progressive. Sudden means that the hearing loss happened very quickly.
A SUDDEN HEARING LOSS REQUIRES IMMEDIATE MEDICAL ATTENTION to determine its cause and treatment.
- **Fluctuating vs. Stable**
Fluctuating means hearing loss that changes over time ... sometimes getting better sometimes getting worse. Some people mistake a situational loss as a fluctuating loss.
"I hear you when you face me but not from down the hall"

Air Conduction Thresholds as a Function of Age
for persons with no known history of ear disease

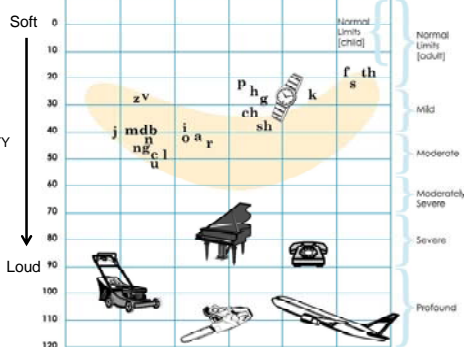


Note : These graphs represent "Normal" hearing thresholds as we age with no history of ear problems. The ability to hear high frequency sounds decreases as we grow older affecting our ability to hear sounds such as F, S, T and TH. A person with high frequency loss will notice increased difficulty understanding in background noise.

according to ISO 1999 Standard(1998)

Source: From Rosier G. Progression of Hearing Loss Caused by Occupational Noise. Scand. Audiol. 23:13-32, 1994

PITCH is the quality of sound or FREQUENCY
Low Pitch → High Pitch



LOUDNESS is the quantity of sound or **INTENSITY**

A healthy human ear can hear sounds ranging in frequency from 20 – 20,000 Hertz (Cycles per second).

Hearing tests measure Hearing from 250 – 8,000 Hz.

- Low** frequency sounds include the **sounds of a bass drum, a tuba or speech sounds such as B D or the vowel OO.**
- High** frequency sounds include the **chirping of birds, the sound of a triangle being played or the speech sounds such as F or S.**
- Soft** or low intensity sounds include the **soft rustling of leaves, whispering or a clock ticking.**
- High** intensity sounds or **loud** sounds include the sound of a **lawnmower, a hairdryer, or a plane taking off.**



Getting the Help You Need

Your hearing should be screened once a decade and once every 3 years after 65. Children should be screened at birth and again as they start school or at any time their hearing is questioned.

If you think you have a hearing loss:

- See your doctor for a referral - Ask him to check your wax build up or other debris in your ear canal. Tell him what concerns you have about your hearing.
- Enlist the help of the CLSC if you do not have a family physician
- See an audiologist for your hearing assessment – if a hearing aid will help, the audiologist can advise you how to obtain one and if you are eligible under the Medicare program (RAMQ)
- If you are eligible, you will need to see an Ear Nose and Throat Specialist who will assess you and provide the required attestation of permanent hearing loss.
- See an audioprothésiste (hearing aid dispenser) for your hearing aid fitting
- If possible return to the audiologist for assessment with your hearing aid during the first few weeks after you have received it.
- If you feel you need more help adjusting to hearing aid use, request an appointment with an audiologist in your Regional Rehabilitation Center



Getting the Help You Need

Eligibility for a hearing aid covered by RAMQ is *not* based on age but rather on the degree of hearing loss in your *better ear*

- You will qualify for at least one digital hearing aid under the RAMQ program if your hearing loss at 500, 1000 and 2000 Hz averages to 35 dB or more in your *better ear*
- If your hearing loss in both ears is moderate or greater you may be eligible for coverage of assistive devices such as an amplified telephone and infra-red system for television
- If your hearing loss is moderately severe or greater, you may be eligible for environmental signals for the doorbell, telephone and fire alarm. You may also qualify for an adaptive alarm clock
- People who are visually handicapped qualify for 2 hearing aids
- Students qualify for 2 hearing aids if they are enrolled in a program recognized by the Minister of Education. (Mature students too!)
- Since 2006, people who are working qualify for 2 hearing aids (regardless of age)



Prevention of Hearing Loss

- Avoid loud noise exposure or use proper ear protection when it is unavoidable
- Discuss how medications you take might affect your hearing with your Pharmacist and Physician
- Wear a helmet when you ride a bike, ski or roller blade
- Wear a seat belt
- Improve your general state of health



Consequences of Untreated Hearing Loss

Research studies have linked hearing loss to:

- **Irritability**, negativism and **anger**
- **Fatigue**, tension, stress and **depression**
- Social rejection and **loneliness**
- **Reduced alertness** and increased risk to personal safety
- Impaired memory and ability to learn new tasks
- Reduced job performance and earning power
- **Diminished** psychological and **overall health**

Hearing loss is not just an ailment of old age. It can strike at any time and at any age.

S. Kochkin PhD. The consequences of untreated hearing loss
cited SeniorsResourceGuide.com



Consequences of Untreated Hearing Loss

The National Council on Aging (NCOA) documented the effects of hearing loss on the lives of individuals aged 50 and older. They surveyed 2300 people with hearing loss and 2000 family members to determine their perceptions of the effects of hearing loss and hearing aid use.

Hearing aid users report:

- **Better relationships with their families**
- **Greater independence**
- **Improved social life**

Family members consistently reported greater improvement in these areas than did the hearing aid users themselves.



Consequences of Untreated Hearing Loss

Non-hearing aid users report significantly more negative effects of their hearing loss. Compared to hearing aid users, non-users were more likely to report:

- **Less social activity**
- **More** episodes of **sadness and depression**
- **More** episodes of feeling **tense, irritable or anxious**

These differences were independent of such factors as age, gender and degree of hearing loss.

Barriers to Hearing Aid Use

- **2 out of 3 non-users** said **"my hearing is not bad enough"**
- **1 out of 2 non-users** cited the **cost of hearing aids**
- **1 out of 5 non-users** explained that **"it would make me feel old"** or **"I'm too embarrassed to wear one"**

National Council on Aging 1999 www.ncoa.org

Hearing Rehabilitation



- You must clearly **understand the specific nature of your hearing loss**. Sometimes it takes several discussions with an Audiologist for things to “click” CHIP may be a useful resource for you if there is a lack of accessibility to services in your region. www.hearhear.org
- **Your family and friends must also understand** the nature of your loss. Others do not know how you hear ... Although they do know if you don't hear well ! They know that they use lots of energy trying to communicate with you. They know that the volume of the TV or radio is giving them a headache.
- **Hearing aids can be extremely helpful** for most people with significant hearing loss. But, they are **not a cure nor a miracle**. They can however provide amazing benefit. It may take some people time and patience to get used to hearing the sounds of the world again. The brain takes time to learn to hear differently.
- **Lip-reading can be very helpful**. It involves more than reading lips but rather **putting together what you hear with what you see with what makes sense !**

Hearing Rehabilitation



- **Assistive listening devices can be very helpful** in allowing a hard of hearing person to carry out activities of daily living. They include:
 - Amplified telephone
 - Infra-red system for television or stereo (wireless earphones)
 - Signaling devices to alert you to the doorbell, phone ring, fire alarm and if needed baby crying.
 - Adapted alarm clock
 - Personal amplifier

As a temporary measure, I have always liked the Radio Shack Stereo Amplified Listener. It works best if the person speaking to you holds the amplifier just below his or her chin. This provides a better signal to noise ratio and allows you to lip read. You would have to order this online. You will also need a comfortable pair of small stereo earphones with it – both should cost less than \$50.



Radio Shack United States
<http://www.radioshack.com/product/index.jsp?productId=2104056>

Hearing Rehabilitation



Practice good communication strategies

- **Avoid talking from a distance** or from another room.
- Ask others to **speak directly to you**, not with their heads turned away.
- **Ask others to get your attention before speaking to you** by calling your name or touching your arm.
- Ask others to speak clearly, at a normal pace and a reasonable volume. **Yelling doesn't help**. It just distorts the sound. Over-pronouncing does too!
- **Put down the newspaper** and pay attention to what the other person is saying. People with hearing loss do not have the luxury of hearing without listening.
- Reduce competing noise when possible. **Do not try to have a conversation when water is running** or near a noisy appliance. **Turn down the radio or TV**.
- Avoid important conversations in the car especially if you are driving.
- Choose your seat wisely in a restaurant, not near the service area. **Seat yourself facing the person you want to talk to**.