Age Related Hearing Loss

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SOUND OF SILENCE

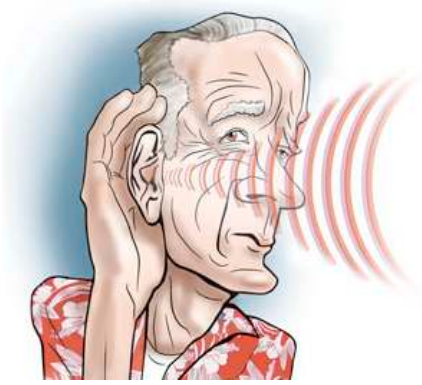
Have you ever noticed an older person close to you saying 'what' more often, turning up the television beyond others' comfort level, complaining that others do not speak clearly and misunderstanding what is being said? He might be suffering from hearing loss associated with ageing, medically known as **Presbyacusis**.

Presbyacusis occurs in both ears and affects over half of all people above 60 years of age, making it the second most common cause of disability in older people.

Hearing loss may cause the elderly to withdraw socially as they tend to miss out on talks with friends and family, resulting in loneliness and depression. Close ones often think that the person is uncaring and difficult when the problem is about hearing.

A hearing loss is a serious concern, whether small (missing certain sounds) or large (being profoundly deaf). Although an invisible handicap, its effects on health, happiness and personal well being are very real.

Although the main cause of presbyacusis



is ageing, there are other factors to be considered. Some people may have a genetic predisposition towards presbyacusis while diet and lifestyle play a significant role. Exposure to noise in earlier life or a history of middle ear infection will hasten the onset of noticeable hearing loss. Other aggravating factors include medication frequently prescribed in later life (such as diuretics) and osteoporosis.

A common phenomenon associated with presbyacusis is **recruitment**. This occurs because while the threshold of hearing increases as hearing declines , the pain threshold (or level of tolerance to loudness) remains the same resulting in a much narrower dynamic range of hearing. A person with recruitment may have increased difficulty understanding speech if there is more than one speaker or if the environment is noisy. Moderately loud noise may also be physically uncomfortable and even painful.

Research has shown that when the brain is left unstimulated, its ability to understand speech can degrade. This is called **Auditory Deprivation** and occurs when someone does not wear hearing aids. Just like the old saying goes, “If you don't use it, you lose it.”

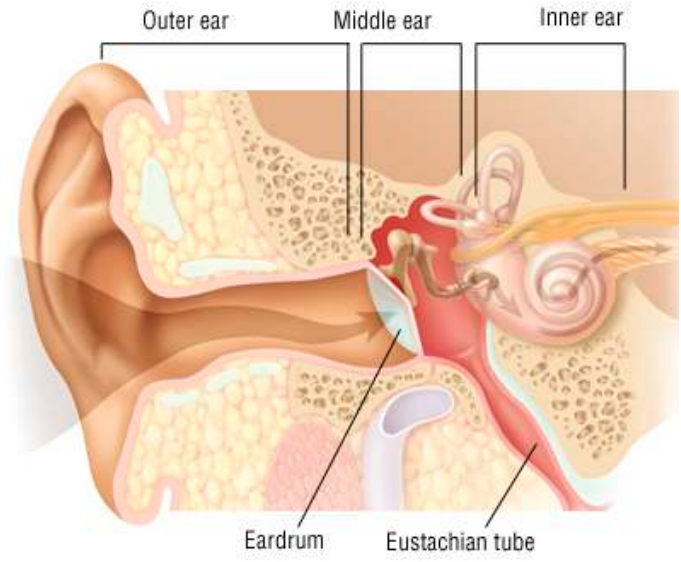
Editorial

Everyone who lives long enough will gradually develop some degree of age related hearing loss. Medically, age related hearing loss is called presbyacusis. Presbyacusis is caused due to the combined effects of intrinsic ageing of the peripheral or central auditory systems and the accumulated effects of wear & tear.

Most people with presbyacusis can hear speech but have difficulty in understanding it. Vital components of speech sounds, usually the higher pitched consonents, which give intelligibility to speech, are missing or distorted. For this reason, many people experience difficulty in understanding women and children while they easily hear and comprehend lower pitched male voices. Fortunately, modern aids like hearing aids and cochlear implants can correct this high-frequency loss.

Hearing loss is the most common chronic human disability causing serious communication problems in 30 % of people over 60, and more than 50 % of those over 80. Recent advances in the areas of cochlear implants and genetics of hearing loss are helping in a greater understanding of the biological foundations of both, normal and impaired hearing.

Dr. Neeraj Kasliwal



HOW DOES HEARING WORK ?

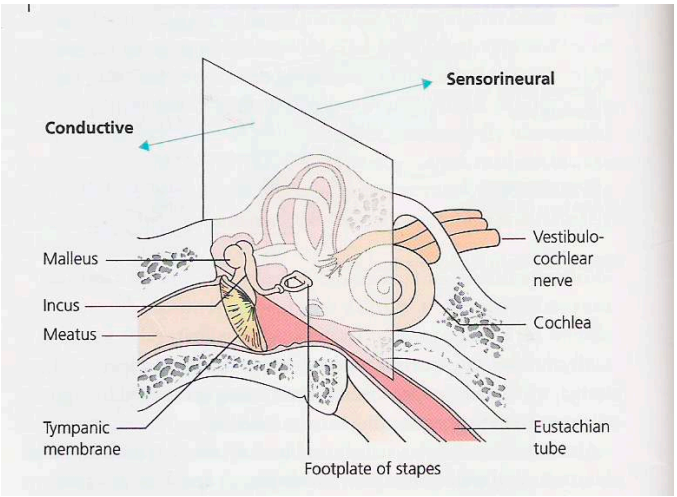
- The outer ear collects sound waves and works like a funnel to send them through a narrow tube (ear canal) that leads inside the ear. At the end of the ear canal is the ear drum (tympanic membrane).
- The tympanic membrane is a thin membrane that vibrates when sound waves strike it. It divides the area called the outer ear from the middle ear. It is attached to a set of three tiny bones in the middle ear.
- These bones are called the hammer (malleus), anvil (incus), and the stirrup (stapes). The bones pass the vibrations of sound waves to a small organ in the hearing part of the inner ear called the cochlea which is a coiled structure like a snail shell.
- The inner ear is filled with a thin fluid that transmits pressure changes throughout the cochlea. Inside the cochlea are tiny hair cells that pick up sound vibrations from the fluid and cause nerve impulses in the auditory nerve.
- The auditory nerve carries the message to the brain, where it is interpreted as sound.

TYPES OF DEAFNESS

- Conductive
- Sensorineural

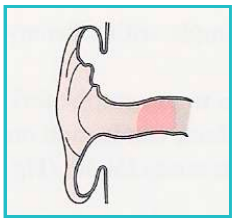
Conductive hearing loss can result from problems in the ear canal or middle ear.

Sensory neural hearing loss is due to problems in the inner ear or nerves going from the ear to the brain. It is most often the result of damage to the tiny hair cells in the cochlea. Age related hearing loss, known as Presbyacusis is a sensorineural hearing impairment.

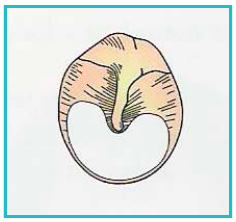


Distinction Between Conductive and Sensorineural hearing loss

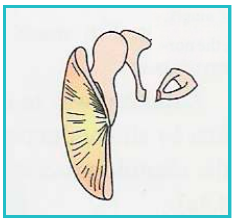
REASONS FOR CONDUCTIVE HEARING LOSS



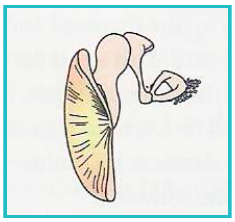
Blocked meatus



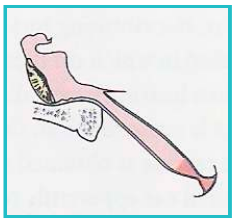
Peroration of tympanic membrane



Ossicular discontinuity



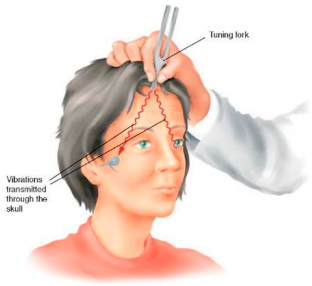
Ossicular fixation



Eustachian tube obstruction

DIAGNOSIS OF HEARING LOSS

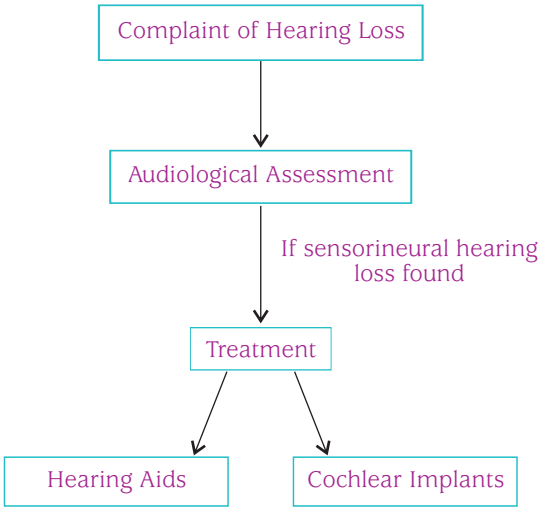
Audiometry (test of hearing) uses a device that makes tones of different loudness. Other tests involve using a tuning fork, checking the ability to hear difference between words that sound similar, and measuring how loudly words have to be spoken.



Tuning fork tests

Pure tone audiometry

APPROACH TO A PERSON OF PRESBYACUSIS



BASIC DESIGNS OF HEARING AIDS

In-the-ear hearing instruments (ITE)
These are custom made devices that house all of the hearing instrument's components in a unit that fits within the ear. You may be offered one of the following:

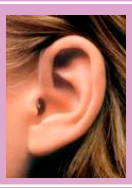
CIC
Completely-in-the-canal: Fits deeply inside your ear canal

ITC
In-the-canal: small enough to fit almost entirely in your canal

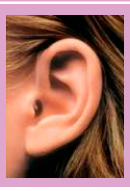
ITE
In-the-ear: Made to fit within the external ear

Behind-the-ear hearing instruments (BTE)
Components in these instruments are contained in a housing that rests behind the ear, connected by a thin tube to a custom ear mould or tip. You may be offered one of the following:

BTE
Behind-the-ear: Fits snugly behind the ear and is attached to a custon earpiece



Open Fit: Ultra-thin tubing is virtually invisible



RIC
Reciever-in-the-canal:
The smallest BTE instrument

COCHLEAR IMPLANT

Cochlear implant is a surgically implantable electronic device that bypasses the damaged parts of the inner ear and sends electrical stimulation directly to the auditory nerve, where it is then interpreted as sound by the brain.

Candidacy Criteria

- Bilateral Severe to Profound SNHL with very poor speech understanding
- Little improvement in speech understanding using optimally fitted hearing aids
- No medical contraindications to surgery
- Appropriate expectations and motivation

After Surgery

- The implant is "switched on", 3 weeks to a month after the surgery.
- Training with speech therapists helps patients learn how to use the cochlear implant.

PREVENTING HEARING LOSS

- Don't listen to music or television at a very loud volume at home.
- Use ear-protection at loud music events or in noisy work environments.
- Both the level of noise and the length of time you're exposed to it, determine whether the if a noise will cause damage to your hearing.
- A good rule of thumb is: if you have to raise your voice to be heard by someone standing three feet away, the noise around you could be damaging.
- Everyday sounds, such as music, power tools, or a lawn mower, have been shown to cause hearing damage.

DO'S AND DON'TS IN MANAGING HEARING LOSS

- **Do** avoid long-term use or overdose of drugs that cause hearing loss. Talk with your doctor about possible problem drugs.
- **Do** get treatment for ear infections, allergies, and respiratory problems that could affect the ear.
- **Do** avoid long-term exposure to loud noise. If you cannot, wear ear protection (ear plugs or earmuffs).
- **Do** visit your doctor for removal of earwax.
- **Do** call your doctor if you have pain in or drainage from your ear or you develop dizziness, headaches, or fever.
- **Don't** insert things like cotton-tipped swabs, in your ears.
- **Don't** ignore worsening loss of hearing.

TIPS FOR THE PERSON WITH HEARING LOSS

- Pay attention!
- Concentrate on the speaker!
- Remember…You are not alone!
- There is help!
- Be persistent and assertive in receiving help!
- A hearing handicap can be overcome!

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