# UNDERSTANDING HEARING LOSS

## It can adversely affect the young and the old

Hearing impairment is the most common chronic handicap in developed countries like Singapore. In the US, only 9.7% of persons aged 65 years or more have normal hearing. Hearing loss affects not only the elderly; it is also the most common industrial disease afflicting the economically active age group.

Our ear consists of three parts:

- Outer ear, consisting of the pinna and ear canal, which serves to direct sound waves to the middle ear.
- Middle ear, which directs sound waves to the inner ear by the vibration of the eardrum and three tiny bones called the ossicles. The eardrum separates the outer ear from the middle ear and it vibrates in response to incoming sound waves. It is air- and water-tight to protect the delicate structure of the middle and inner ear. The middle ear space is connected to the back of the nose by the auditory or Eustachian tube which opens intermittently when swallowing or yawning, allowing air pressure to equalise across the ear drum. This ability to equalise is negatively affected by allergies and infections of the nose and sinuses. The negative ear pressure can cause an effusion, causing a decrease of the middle ear sound conduction.
- Inner ear is where fluid-filled cochlea converts the sound waves into nerve impulses, which are then transmitted by the auditory nerve into the brain. Inside the inner ear are special fluid-filled semi-circular canals that enable us to keep our balance.

### TYPES OF HEARING LOSS

Hearing loss may be divided into conductive, sensorineural, mixed (conducive and sensorineural) or false (pseudohypoacusis).

Conductive hearing loss happens when sound transmission from the pinna to the inner ear is impaired. It involves the external canal, eardrum and/or middle ear. The common causes are impacted wax, ear inflammation from infections, or negative pressure due to sinonasal diseases like a cold, flu or allergy.

Sensorineural hearing loss exists when there is injury to the inner ear or related auditory nerves. Common conditions include noise-induced deafness, a blow to the head and deafness from ageing.

False hearing loss results from psychological, emotional or outright fraudulent cases.

The normal range of sound frequencies humans can detect is 20Hz to 20,000Hz; the upper limit drops to 10,000Hz by about 60 years of age. Constant exposure to noise above 90dB (decibels) will cause deafness to all frequencies above 4,000Hz.

### DEAFNESS IN CHILDREN

Deafness in children is commonly due to middle ear problems from sinonasal diseases. A negative pressure in the ear caused by a blocked auditory tube due to thick mucus or from glands at the back of the nose (adenoids), would give rise to an effusion in the middle ear, causing a conductive hearing loss.

About one in 1,000 babies are born with congenital hearing loss. Unfortunately, hearing loss at birth is usually not diagnosed until the child is about 2.5 years old. Babies who fail to startle or awaken to loud noises, do not babble at about three months, or not utter words when 12 to 18 months old, may be hard of hearing. Older children with hearing loss will prefer louder sounds, or often ask for words to be repeated for clarity.

The parents' early assessment of the child's hearing is particularly important. If the parent is suspicious of hearing loss, bring the child to a doctor immediately, so that a complete audiometric and otological evaluation can be done. In children who have uncorrected hearing handicaps, the ability to discriminate background noise from speech remains impaired and this can severely hinder a child's ability to develop normal speech and language skills. Learning disabilities and emotional difficulties may then ensue.

### How to Prevent Hearing Loss

- Rubber or plastic earplugs cut out noise effectively. They are inserted into the ear canal. Have them custom fitted for optimal comfort and protection.
- Cotton plugs should not be used as they do not block any high frequency sounds.
- Earmuffs offer the most effective protection against noise, since they cover the sound conducting bones around the ears as well as the ears themselves.
- Occupational noise is the most common source of sound pollution. If you must shout to be heard, then the noise level is hazardous to your ears.
- Keep radio or TV volume to a level where you can still hear the person beside you talking. Similarly, if others close by can hear what you are listening on your iPod or MP3 player, it is too loud for your ears.

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