

# Presbycusis

## What is presbycusis?

Presbycusis is the loss of hearing that gradually occurs in most individuals as they grow older. Hearing loss is a common disorder associated with aging. About 30-35 percent of adults between the ages of 65 and 75 years have a hearing loss. It is estimated that 40-50 percent of people 75 and older have a hearing loss. The loss associated with presbycusis is usually greater for high-pitched sounds. For example, it may be difficult for someone to hear the nearby chirping of a bird or the ringing of a telephone. However, the same person may be able to clearly hear the low-pitched sound of a truck rumbling down the street.

There are many causes of presbycusis. Most commonly, it arises from changes in the inner ear of a person as he or she ages, but presbycusis can also result from complex changes along the nerve pathways leading to the brain. Presbycusis most often occurs in both ears, affecting them equally. Because the process of loss is gradual, people who have presbycusis may not realize that their hearing is diminishing.

## What are the symptoms of presbycusis?

With presbycusis, sounds often seem less clear and lower in volume. This contributes to difficult hearing and understanding speech. Individuals with presbycusis may experience several of the following:

- ~ The speech of others seems mumbled or slurred.
- ~ High-pitched sounds such as “s” and “th” are difficult to hear and tell apart.
- ~ Conversations are difficult to understand, especially when there is background noise.
- ~ A man’s voice is easier to hear than the higher pitches a woman’s voice.
- ~ Certain sounds seem annoying or overly loud.
- ~ Tinnitus (a ringing, roaring, or hissing sound in one or both ears) may also occur.



## What are the causes of presbycusis?

Sensorineural hearing loss is caused by disorders of the inner ear or auditory nerve. Presbycusis is usually a sensorineural hearing disorder. It is most commonly caused by gradual changes in the inner ear. The cumulative effects of repeated exposure to daily traffic sounds or construction work, noisy offices, equipment that produces noise, and loud music can cause sensorineural hearing loss. Sensorineural hearing loss is most often due to a loss of hair cells (nerve endings in the inner ear).

# Fact Sheet

This can occur as a result of hereditary factors as well as aging, various health conditions, and side effects of some medicines (aspirin and certain antibiotics).

Presbycusis may be caused by changes in the blood supply to the ear because of heart disease, high blood pressure, vascular (pertaining to blood vessels) conditions caused by diabetes, or other circulatory problems. The loss may be mild, moderate, or severe.

## What can be done?

There are many strategies to help people with presbycusis. Hearing aids may be recommended for some individuals. Assistive listening devices can provide further improvement in hearing ability in certain situations. One example of such a device is the built-in telephone amplifier. Another example is FM systems that make sounds clearer, with or without a hearing aid, by delivering sound waves like a radio. Training in speechreading (using visual cues to determine what is being spoken) can help those with presbycusis to understand better what is being said in conversations or presentations.

## 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 eardrum (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.

*Adapted with permission from the National Institute on Deafness and Other Communication Disorders.*