CONDITION

Sensorineural deafness

Sensorineural deafness is hearing loss caused by damage to the inner ear or the nerve that carries sound to the brain.

WHAT IT IS
Hearing loss from inner-ear or auditory-nerve damage

BODY SYSTEM
Hearing and nervous system

MAIN SYMPTOMS
Reduced hearing, unclear speech, tinnitus, trouble hearing in noise

WHAT CAUSES IT
Aging, noise, inherited changes, illness, or medicines

HOW IT IS DIAGNOSED
Audiometry using air- and bone-conduction testing

MAIN TREATMENT
Hearing technology, communication support, and cause-specific care

CAN IT BE CURED?
Sometimes - some sudden or treatable causes recover

IS IT AN EMERGENCY?
Sometimes - sudden hearing loss needs same-day assessment

LONG-TERM OUTLOOK
Often permanent but manageable with hearing support

Overview

Sensorineural deafness, also called sensorineural hearing loss, happens when sound cannot be processed normally by the inner ear or the hearing nerve. It can affect one or both ears and range from mild hearing loss to profound deafness.

Deep inside the ear is a spiral-shaped organ called the cochlea. It contains tiny sensory hair cells that turn sound vibrations into electrical signals. The auditory nerve carries these signals to the brain. Damage anywhere along this pathway can reduce hearing.

This differs from conductive hearing loss, where sound is blocked before reaching the inner ear. Earwax, fluid behind the eardrum and some eardrum problems can cause conductive loss. Some people have both types, known as mixed hearing loss.

Sensorineural hearing loss often makes speech sound unclear rather than simply quiet. Hearing may be especially difficult in restaurants, group conversations or other places with background noise.

Most inner-ear damage cannot be reversed. However, hearing aids, cochlear implants, assistive technology and communication changes can make a substantial difference. A few causes may improve when treated promptly. Sudden hearing loss is particularly important because it needs urgent medical assessment.

Symptoms

The experience is different for each person. Hearing may change slowly over years or disappear suddenly. One ear may be worse than the other.

Possible symptoms include:

High-pitched sounds are often affected first. This can make consonants such as "s," "f" and "th" difficult to distinguish, even when vowels remain audible.

Children may show delayed speech, limited responses to sound or difficulty following spoken instructions. School-age children may seem inattentive when they cannot hear clearly. These signs have several possible causes and need a proper hearing assessment.

- Difficulty understanding speech, especially with background noise
- Needing people to repeat themselves or speak more clearly
- Turning up the television, phone or headphones
- Missing doorbells, alarms or quiet voices
- Feeling that people are mumbling
- Difficulty telling where sounds come from
- Tinnitus, such as ringing, buzzing or humming without an outside source
- Dizziness or a spinning sensation called vertigo

Causes and risk factors

Age-related changes are a common cause. Hair cells and nerve pathways can gradually lose function over time. This is called presbycusis and usually affects both ears.

Repeated or very loud noise can damage inner-ear hair cells. Possible sources include

machinery, firearms, explosions, power tools and amplified music. Risk is influenced by loudness, distance from the sound and length of exposure.

Some sensorineural hearing loss is inherited. Genetic changes may cause hearing loss from birth, during childhood or later in life. A person can have an inherited form even without an obvious family history.

Other possible causes include:

Medicines linked with hearing damage include some cancer treatments, certain antibiotics and some other specialist treatments. The risk differs between medicines and may be affected by dose, treatment length and kidney function. Do not stop a prescribed medicine because of hearing concerns without medical advice.

In sudden sensorineural hearing loss, no definite cause is found in many cases. This does not mean the symptoms are imagined or unimportant.

- Infections affecting the inner ear or nervous system
- Ménière's disease, which can cause hearing loss, tinnitus and vertigo
- Autoimmune conditions in which the immune system attacks inner-ear tissue
- Head injury or major changes in pressure
- Tumors affecting the auditory nerve, usually noncancerous
- Reduced blood supply or other damage to inner-ear structures
- Certain medicines that can harm hearing, known as ototoxic medicines

Diagnosis

A hearing assessment usually begins with questions about when the change started, whether one or both ears are affected, noise exposure, medicines, tinnitus, dizziness and family history. The ears are examined for wax, infection and eardrum problems.

An audiologist performs hearing tests in a quiet booth. During pure-tone audiometry, you respond to tones played through headphones and through a vibrating device placed behind the ear. Comparing these results helps separate sensorineural hearing loss from a blockage or middle-ear problem.

Speech testing measures how softly you can hear words and how clearly you understand them. Tympanometry checks how the eardrum and middle ear move. It does not diagnose inner-ear damage by itself, but it can identify another cause of reduced hearing.

Babies and people who cannot complete standard testing can have tests that measure

inner-ear or brain responses to sound. These include otoacoustic emissions and auditory brainstem response testing.

Further tests are chosen according to the pattern of hearing loss. Blood tests may be used when infection or an immune condition is suspected. Magnetic resonance imaging, or MRI, may be recommended for unexplained hearing loss affecting one ear, marked differences between the ears or other nerve-related symptoms.

Treatment and management

Treatment depends on how severe the hearing loss is, how quickly it developed and whether there is an underlying cause.

Sudden sensorineural hearing loss may be treated with corticosteroids like prednisone or hydrocortisone , which reduce inflammation. Treatment can be given by mouth or, in specialist care, through the eardrum into the middle ear. Prompt assessment matters because treatment may be more helpful when started early. Recovery is not guaranteed.

When a specific cause is found, care may include treating an infection, reviewing a medicine or managing an immune or inner-ear condition. Medication changes should be made with the clinician responsible for the treatment.

Hearing aids amplify and process sound. Modern devices can be adjusted for the frequencies affected and may improve speech understanding. They do not restore normal hearing, and the brain may need time to adapt to them.

A cochlear implant may be considered when severe or profound hearing loss is not helped enough by hearing aids. It uses an implanted device to send electrical signals to the auditory nerve. Assessment includes hearing tests, medical review and discussion of likely benefits, limitations and rehabilitation. It does not reproduce natural hearing.

Other useful support can include:

Partners, relatives and colleagues can help by facing you, gaining your attention before speaking, reducing background noise and speaking clearly without shouting.

- Remote microphones and other assistive listening devices
- Television captions, text relay and visual or vibrating alerts
- Auditory rehabilitation and listening practice
- Lip-reading or speech-reading support
- Spoken-language, signed-language or combined communication approaches

Complications

Untreated or poorly supported hearing loss can make conversations tiring. It may contribute to loneliness, reduced confidence and difficulty at work or school. Some people withdraw from social situations because following speech takes so much effort.

Hearing loss can affect awareness of traffic, alarms and other warning sounds. Dizziness from an associated inner-ear condition may increase the risk of falls.

Research has found an association between hearing loss and cognitive decline in older adults. An association does not prove that hearing loss directly causes dementia. Staying socially connected and using appropriate hearing support may reduce some of the practical effects of reduced hearing.

In young children, significant hearing loss can affect speech, language, learning and social development. Early access to suitable communication and educational support is important.

Tinnitus or vertigo may continue even when hearing devices improve access to sound. These symptoms can require separate assessment and management.

Prevention

Sensorineural hearing loss cannot always be prevented. Inherited forms, many age-related changes and some illnesses occur despite reasonable precautions.

Noise-related damage can often be reduced. Move away from very loud sound, take quiet breaks and keep personal listening devices at a comfortable level. Use correctly fitted hearing protection around machinery, firearms or loud entertainment. Protection must suit the setting because some jobs require you to remain aware of alarms and speech.

Follow workplace hearing-safety procedures and attend offered hearing checks. Regular testing may identify a change before it becomes obvious in daily life.

Tell healthcare professionals about existing hearing problems when discussing medicines that may affect the ear. If hearing changes, tinnitus or balance symptoms begin during treatment, report them promptly. Do not stop treatment on your own.

Vaccination and appropriate treatment of certain infections can reduce some infection-related hearing loss, but they cannot prevent every case.

Living with it and what to expect

Some forms remain stable for years. Others gradually worsen, particularly age-related or inherited hearing loss. Sudden loss may improve fully, partly or not at all. Tests and the cause can provide useful guidance, but they cannot predict the exact course for one person.

Follow-up hearing tests show whether hearing is stable and whether devices need adjustment. Routine review is also useful if hearing aids become less effective, uncomfortable or difficult to use. Wax, device problems and changes in hearing can all affect performance.

Listening effort can cause fatigue, especially during meetings, classes or group conversations. Planning quiet breaks, using captions and choosing well-lit seating can help. Asking for written information or a remote microphone is a practical adjustment, not a sign that treatment has failed.

Many people continue working, studying, driving and taking part in relationships and hobbies. The most helpful approach may combine hearing technology with changes to the environment and a communication style that suits you.

Some people identify as deaf or Deaf and use sign language or participate in Deaf culture. Others describe themselves as having hearing loss. There is no single communication choice or identity that is right for everyone.

When to get medical help

Seek same-day urgent medical assessment if hearing suddenly decreases in one or both ears, including if you wake up with hearing loss. Sudden sensorineural hearing loss can be mistaken for earwax or congestion, but the inner ear needs to be considered quickly.

Sudden loss with new tinnitus, ear pressure or vertigo also needs urgent assessment. If same-day primary or specialist care is unavailable, an urgent care or emergency service may be appropriate.

Call emergency services if hearing loss occurs with signs of a stroke or serious neurological problem, such as:

Arrange a routine hearing assessment if hearing has gradually declined, conversations are becoming difficult, tinnitus persists or one ear seems consistently worse. Children with possible hearing or speech-development concerns should also be assessed rather than waiting for them to "grow out of it."

- Facial drooping, arm or leg weakness, or numbness
- New trouble speaking, understanding speech or walking
- Collapse, confusion or a sudden severe headache

- Major head injury, especially with blood or clear fluid from the ear

Common questions

Is sensorineural deafness permanent?

It often is because damaged inner-ear hair cells generally do not regrow in humans. Some sudden, inflammatory, infectious or medicine-related cases may improve, especially when the cause can be treated promptly. Hearing technology can help even when the underlying damage is permanent.

Can earwax cause sensorineural hearing loss?

Earwax usually causes conductive hearing loss by blocking sound before it reaches the inner ear. It does not normally damage the auditory nerve. However, it is not possible to tell the type of hearing loss from symptoms alone, and sudden loss should not be assumed to be wax.

Will hearing aids restore normal hearing?

No. Hearing aids make sounds more accessible and can improve speech understanding, but they cannot recreate normal inner-ear function. Benefit depends on the hearing pattern, device fitting, listening environment and time spent adapting to amplified sound.

Why is my hearing worse in only one ear?

Possible causes include previous infection, injury, uneven noise exposure, Ménière's disease and, less commonly, a growth affecting the hearing nerve. A clear difference between the ears deserves assessment because additional testing may be needed.

Can sensorineural hearing loss get worse?

It can remain stable or progress. Age-related, noise-related and some inherited forms may worsen over time. Regular hearing tests can track changes and help keep hearing devices appropriately adjusted.

Can surgery cure sensorineural deafness?

Ordinary ear surgery cannot repair damaged cochlear hair cells or the auditory nerve. A cochlear implant may provide access to sound for some people with severe or profound loss, but it is a hearing device rather than a cure and requires specialist assessment and rehabilitation.

Sources

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