

Deafness Encyclopedia Article

Deafness

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Deafness

Deafness is a loss of hearing. This loss can be temporary or permanent and can be due to a variety of reasons.

Damage to hearing is often mechanical. In particular, the eardrum is vulnerable to damage, because of its location at the border between the outer and **middle ear**. Failure to equalize the pressure build up between the external air and the inner part of the ear can cause the eardrum to rupture. As well, the eardrum can be mechanically ruptured, as by a loud noise or, most commonly, by an over-vigorous attempt to clean out the ear with a swab. Such conductive hearing loss can be repaired surgically. Head injuries can damage either the nerves that convey the auditory signals to the **brain** or the auditory cortex, which is the region of the brain that receives and processes the auditory signals.

Infection in the middle ear, such as the viral infections of measles, mumps and meningitis, can produce a build up of fluid in the middle ear. The resulting loss of hearing, which is called sensori-neural hearing loss, can be temporary or permanent. Ototoxic drugs, that is, drugs capable of damaging hearing, can cause deafness. This is an undesirable side effect of the drug. Some of the drugs are life saving, so a loss of hearing is viewed as a price to pay for a life saved. But other ototoxic drugs are widely used for a variety of ailments. A well-known example is aspirin. If taken in large quantities, aspirin can affect hearing.

Sudden Sensorineural Hearing Loss (SSHL) can occur instantaneously. In almost all cases only one ear is affected. Most people will recover the lost hearing. But in 15% of people, recovery does not occur.

Deafness also has a genetic origin. In one type of deafness, non-syndromic autosomal recessive deafness, over 20 locations on human's **chromosomes** are known to be involved. One location is particularly important. The gene at this location, GJB2, encodes a protein that functions to help recycle potassium across cell membranes. The malfunction of the protein may disrupt membrane function. For reasons yet to be determined, this can inhibit hearing. Other genetic mutations cause improper formation of structures called **cilia** in the cochlea of the inner ear. The cilia normally move in response to sound vibrations, which helps convert the sound waves to electrical signals. Impaired cilia could stop the sound information from reaching the brain.