New Insights on Noise Damage

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Traditionally hearing conservationists have been concerned about the effects of noise on sensory cells within the inner ear. These sensory cells are called hair cells in reference to tiny cilia structures that resemble hairs when seen under a microscope. New research, however, indicates that excessive noise may damage neural structures of the inner ear as well.

Recent scientific studies with animals reveal that noise and the aging process progressively interrupt connections between the sensory hair cells and neurons within the inner ear, eventually leading to death of the neurons themselves. With age, the connections tend to be lost gradually over a lifetime. With loud noise, the nerve damage can be immediate, observed even in cases of temporary hearing loss when there is no obvious damage to the sensory hair cells. Researchers speculate that loss of neurons in the inner ear may contribute to common auditory perception problems, such as difficulty understanding speech in noisy background situations. Studies continue, with the ultimate goal of developing better measures for early detection and prevention of hearing loss.

References and further reading:

Kujawa S (2014). Putting the 'Neural' Back in Sensorineural Hearing Loss, Hearing Journal: 67(11) 8.

National Institute on Deafness and Other Communication Disorders Topic Pages:

Age-related hearing loss
Noise-induced hearing loss