



BCMS REPORT

BALTIMORE CITY MEDICAL SOCIETY FOUNDATION

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How Can Loud Noise Damage Hearing?

Decibel Levels for Everyday Sounds

(Decibel - a unit for measuring the loudness of sound)

Painful:

150 dB = fireworks at 3 feet
140 dB = firearms, jet engine
130 dB = jackhammer
120 dB = jet plane takeoff, siren

Extremely Loud:

110 dB = maximum output of some MP3 players, model airplane, chain saw
106 dB = gas lawn mower, snow blower
100 dB = hand drill, pneumatic drill
90 dB = subway, passing motorcycle

Very Loud:

80-90 dB = blow-dryer, kitchen blender, food processor
70 dB = busy traffic, vacuum cleaner, alarm clock

Moderate:

60 dB = typical conversation, dishwasher, clothes dryer
50 dB = moderate rainfall
40 dB = quiet room

Faint:

30 dB = whisper, quiet library

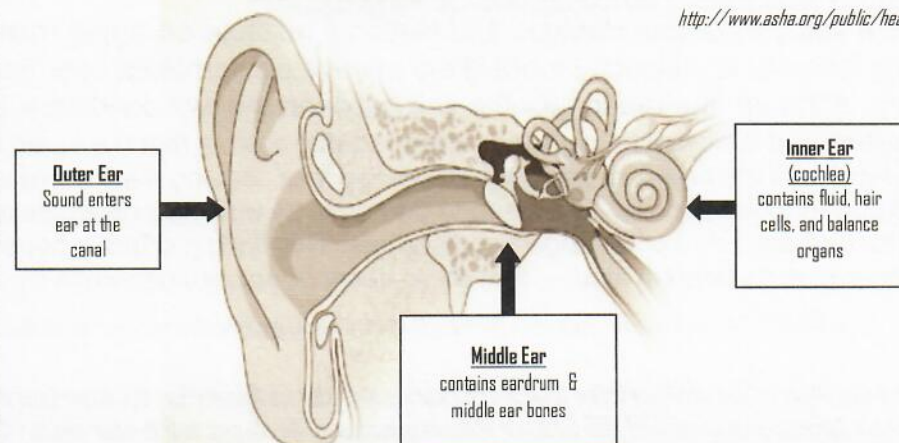
The most common effect of loud noise on hearing is a permanent hearing loss. The best way to prevent a noise-related hearing loss is to use hearing protection properly and limit exposure to dangerous levels of sound.



Understanding how we hear will help you understand how loud noise can hurt your hearing. This happens in the following way:

- Sound enters the ear through the ear canal and vibrates the eardrum. When sound is loud, it moves with excessive force, at which point it can rupture the eardrum or dislodge the tiny bones of the middle ear, which sit directly behind the eardrum.
- As the sound passes through the middle ear, it travels to the inner ear, known as the cochlea, which is filled with fluid and tiny hair cells that move, sending electro-chemical signals to the brain. Loud sound will damage or destroy the delicate hair cells within the cochlea.
- Only healthy hair cells can send signals (electrical impulses) to the brain where sound is detected and interpreted. Hair cells damaged by loud sound cannot send signals to the brain for interpretation.
- Intense brief noises, like a firecracker or an explosion, can rupture the eardrum and damage hair cells, as can continuous and/or repeated exposure to high levels of noise.

<http://www.asha.org/public/hearing/Noise>



*(Retrieved from:
www.noisypplanet.nidcd.nih.gov/parents/ethome.htm and
www.lhh.org/noise/facts/environment.html on
September 24, 2009)*

THE MORE YOU KNOW...

How can I tell if I am listening to dangerous noise levels?

You may be listening to dangerous noise levels if:

- You must raise your voice to be heard.
- You can't hear someone 3 feet away from you.
- Speech around you sounds muffled or dull after you leave the noisy area.
- You have pain or ringing in your ears (this is called "tinnitus") after exposure to noise.



Ototoxic Hearing Loss

More than 200 medications (prescription and over-the-counter) are known to be ototoxic, which means they are damaging to the ear, resulting in hearing loss, tinnitus (ringing in the ear) or balance disorders. While hearing and balance problems caused by these medications can sometimes reverse when the drug therapy is discontinued, there is a risk of permanent damage to patients. In some instances, exposure to loud noise while taking certain medications will increase their damaging effects.

The first sign of ototoxicity is usually tinnitus (ringing in the ears). Over time, hearing loss may develop. This hearing loss may go undetected until the ability to understand speech is affected. Balance problems can also occur.



Which medications are ototoxic?

- Medications known to cause permanent damage include certain aminoglycoside antibiotics, such as gentamicin, and cancer chemotherapy drugs, such as cisplatin and carboplatin.
- Medications known to cause temporary damage include salicylate pain relievers (aspirin), quinine (to treat malaria), and loop diuretics (to treat certain heart and kidney conditions).

Before beginning treatment with ototoxic medications:

It is important to discuss with your doctor the potential for hearing or balance damage of any medication. Sometimes there is little choice because treatment with a particular medication may provide the best hope for curing a life-threatening illness or infection.

Hearing and balance systems should be monitored before and during treatment. A baseline test should be performed by an audiologist who understands how to monitor hearing for ototoxicity. This information can guide important decisions to stop or change the drug therapy before damage occurs. For cases in which the drugs cannot be stopped or changed, the patient and the audiologist can take steps to manage the effects of the hearing loss that results.

Hearing loss linked to Dementia

A recent study by Johns Hopkins and National Institute on Aging researchers suggested seniors with hearing loss are significantly more likely to develop dementia over time than those who retain their hearing. Although the reason for the link between the two conditions is unknown, the investigators suggested that a common pathology may underlie both or that the strain of decoding sounds over the years may overwhelm the brains of people with hearing loss, leaving them more vulnerable to dementia. They also speculated that hearing loss could lead to dementia by making individuals more socially isolated, a known risk factor for dementia and other cognitive disorders. This finding offers a hopeful starting point for interventions — even as simple as hearing aids — that could delay or prevent dementia by improving patients' hearing (1).

1. Lin FR, Metter EJ, O'Brien RJ, Resnick SM, Zander A, Ferrucci L. Hearing loss and incident dementia. *Arch Neurol*. 2011 Feb;68(2):214-20.

Baltimore City Medical Society Foundation thanks The Hearing and Speech Agency for this important information. To learn more about The Hearing and Speech Agency, please call 410-318-6780 or visit www.hasa.org. As always, talk to your doctor if you have any questions about these topics.

THE HEALTHIER YOU WILL BE!