

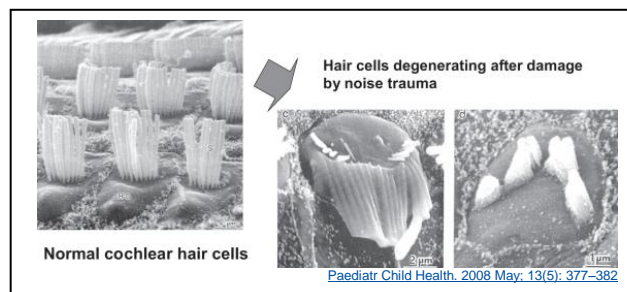


NOISE – Lifelong Harm to Children’s Hearing

Parents know to prevent their child from looking directly at the sun because it will cause permanent damage to eyesight. They also know that children should wear helmets when riding a bike because a fall to the head can cause traumatic brain injury that could be prevented by a helmet. Most parents also realize that really loud sound can be harmful to hearing. Yet loud sound is all around us – lawnmowers, movie theatres, hair dryers, loud personal music devices (MP3 players) and even some toys. We live in a noisy world – some even call it noise pollution. What kinds of sounds are harmful to hearing?

What happens when sound is too loud?

Tiny hair cells in the cochlea are the nerve receptors for hearing. Signals from these hair cells are translated into nerve impulses that are sent to the brain via the acoustic nerve. Loud sound destroys these tiny hair cells in the inner ear that are responsible for converting sound waves into electrical impulses. Once 25% to 30% of these cells disappear, you begin to experience hearing loss.



Hearing damage can occur in two ways. Brief exposures to extremely loud sounds can cause permanent damage. Consistent exposure to moderate-level loud sounds wears out the hair cells in the inner ear and weakens their ability to recover. Over time as these cells die permanent hearing loss occurs. There is no medical or surgical treatment to fix noise-induced hearing loss.

How common is noise-induced hearing loss?

- Excessive noise exposure is the most common cause of hearing loss
- More than 30 million Americans are exposed to hazardous sound levels on a regular basis.
- It is estimated that **1 in every 8 children** age 6-19 years and 1 in 6 adults age 20-69 have permanent hearing loss due to noise.

100% of noise-induced hearing loss is PREVENTABLE!

Dangerous levels:

- 150 dB = rock music peak
- 140 dB = firearms, jet engine
- 130 dB = jackhammer
- 120 dB = jet plane take-off, amplified rock music at 4-6 ft., car stereo, band practice
- 120 dB = ambulance siren
- 120 -140 dB = Motorcycles, firecrackers

Extremely loud:

- 105 dB = helicopter
- 100 – 115 dB = iPods used at maximum levels
- 100 dB = snowmobile, chain saw, pneumatic drill, night clubs
- 95 dB = motorcycle
- 90 dB = lawnmower, shop tools, truck traffic, subway
- 90 dB = noisy toys
- 80-96 dB = restaurants

Very loud:

- 80 dB = alarm clock, city street traffic
- 70 dB = vacuum cleaner

Normal levels:

- 60 dB = normal conversation
- 35 dB = whispered voice

Unsafe Levels of Exposure:

- **110 decibels or louder:** regular exposure of more than one minute risks permanent hearing loss.
- **100 decibels:** No more than 15 minutes of unprotected exposure is recommended.
- **85 decibels:** Prolonged exposure to any noise above 85 decibels can cause gradual hearing loss.

*The maximum sound from an iPod is 115 dB – almost **half** of adolescents listen at high volumes that are dangerous to hearing!*

Hearing loss can happen after ONE noisy event or after exposure to loud sound many times.

What are signs of possible damage to hearing?

- Ringing in the ears, or tinnitus, is a sign that the ear has been exposed to harmful levels of sound. Ringing in the ears and a sense of muffled hearing or fullness in the ears that lasts up to 24 hours is typical after exposure to loud concerts or events like a NASCAR raceway. In-ear headphones that send sound directly into the ear canal are a common cause of tinnitus – and potential hearing loss – whenever the volume is set beyond a moderate level. Consider tinnitus a warning that your inner ear hair cells have received some damage. Enough damage and hearing loss will result.
- Missing endings of words, having to ask for something to be repeated and preferring a louder TV volume are all signs of hearing loss. Noise-induced hearing loss always harms the high pitch sounds first, like the speech sounds s, f, t. A person who listens more than an hour or so to a personal music device at a high volume may be experiencing the muffled hearing (temporary threshold shift) and ringing ears that happens after exposure to dangerous sound levels. This too can cause soft word sounds to be missed.

What can a parent do to help prevent their child from developing noise-induced hearing loss?

1. Your role in preventing hearing loss is important. Too much exposure to loud sound in childhood can result in a need for hearing aids when your child is in their 30s and possible employment issues. Career fields that require excellent hearing may not be an option.
2. Many people now use personal music devices. If you can hear the music when you stand arms-length from your child then the volume setting is too high. The best option is to allow your child to only use a personal music device that has a way to limit the volume to safe levels. If he or she insists on listening to music at a high volume level, then limit the listening time to no more than one hour per day.
3. Some people are more prone to developing noise-induced hearing loss than others. A firecracker going off a few feet away from the ears can cause permanent hearing loss after only one time. Watching a fireworks display is often followed by experiencing ringing ears. Use earplugs and caution your children on the dangers of fireworks to hearing.
4. Hunting or shooting is a popular sport for many young people. Earplugs and earmuffs (both) should be used for target practice. Specially made shooter's earplugs are custom-made and can be obtained at gun shows and from places that sell hearing aids. The plugs allow a person to hear and yet filter out most of the harmful loud sound.
5. Band practice can also be very loud. H.E.A.R. or Hearing Educators and Awareness for Rockers is an organization started in 1988 by rock and roll musicians who damaged their hearing. Wearing earplugs at concerts is very important. If your child is a musician or frequently goes to concerts then invest in musician's earplugs that are custom-made at places that sell hearing aids.
6. Expect that your child will wear earplugs when involved in noisy activities such as mowing the lawn, snowmobiling, jet skiing, shooting, helping around power-tools such as saws.
7. Get rid of (or do not buy) loud toys, such as those with loud sirens, horns, loud musical instruments, squeeze toys and battery-operated toys that make loud sound.
8. Keep earplugs handy – in the car, purse and on trips. In general, if it is necessary to shout to hear yourself or someone else over noise, the level of the sound can be damaging. When your family attends a loud event, model using ear plugs and insist that your children use them too.

9. Finally, if you are concerned that your child may be experiencing hearing loss, have him or her receive a thorough hearing test by an audiologist.

Information and Resources

- The Children’s Hearing Institute
Hearing Health/Preserving Hearing
http://www.childrenshearing.org/custom/hearing_health.html
- Noise-Induced Hearing Loss
Centers for Disease Control and Prevention
<http://www.cdc.gov/healthyyouth/noise/>
- Noise-induced hearing loss in children: A ‘less than silent’ environmental danger. RV Harrison
<http://www.ncbi.nlm.nih.gov/pmc/articles/PMC2532893/>
- Fact Sheet: Noise-Induced Hearing Loss in Children
American Academy of Otolaryngology – Head and Neck Surgery
<http://www.entnet.org/HealthInformation/Noise-Induced-Hearing-Loss-in-Children.cfm>
- Noise-Induced Hearing Loss in Children – What Educators Need to Know
Speech and Language.com
<http://www.speechandlanguage.com/PDF/june20042.pdf>
- Noise-Induced Hearing Loss
National Institute on Deafness and Other Communication Disorders
<http://www.nidcd.nih.gov/health/hearing/noise.asp>

