



## Noise-Induced Hearing Loss In Children

The National Institute on Deafness and Other Communication Disorders reports that approximately 28 million Americans have lost some or all of their hearing, including 17 in 1,000 children under age 18. There are three types of hearing loss:

### **Conductive hearing loss:**

This occurs when sound is not conducted efficiently through the outer ear canal to the eardrum and the tiny bones of the middle ear. Conductive hearing loss usually involves a reduction in sound level, or the ability to hear faint sounds. This type of hearing loss can be caused by middle ear infection, impacted earwax, or a benign tumor. This type of hearing loss can often be medically or surgically corrected.

### **Sensorineural hearing loss:**

This hearing loss, caused by damage to the inner ear or to the nerve pathways from the inner ear to the brain, is permanent and cannot be medically or surgically corrected. Sensorineural hearing loss not only involves a reduction in sound level, or ability to hear faint sounds, but also affects speech understanding, or ability to hear clearly. Causes of this disorder include drugs that are toxic to the auditory system, and genetic syndromes. Sensorineural hearing loss may also occur as a result of noise exposure, viruses, head trauma, aging, and tumors.

### **Mixed hearing loss:**

Hearing loss can be both conductive and sensorineural. For example, there may be damage in the outer or middle ear and in the inner ear (cochlea) or auditory nerve. When this occurs, the hearing loss is referred to as a mixed hearing loss.

Incidence of this disorder increases with age. For example, approximately 314 in 1,000 people over age 65 have hearing loss and 40 to 50 percent of people 75 and older have a hearing loss.

Although 10 million Americans suffer irreversible noise-induced hearing loss, with 30 million more exposed to dangerous noise levels each day, very little has been reported on children's risk for this type of impairment .

This may soon change. Preteens are attending music concerts with increasing regularity. Additionally, the portable MP3 player, successor to transistor radios and the walkman, is a portable device that can provide up to 15,000 songs through headphones.

### ***Should MP3 player use be limited?***

Ear specialists say a whisper is 30 decibels and that a normal conversation is 60 decibels. The sound from an iPod Shuffle has been measured at 115 decibels. A survey sponsored by the Australian government found that about 25 percent of people using portable stereos had daily noise exposures high enough to cause hearing damage. And further research from the United Kingdom determined that young people, ages 18 to 24, were more likely than other adults to exceed safe listening limits.

Researchers at Boston Children's Hospital determined that listening to a portable music player with headphones at 60 percent of its potential volume for one hour a day is relatively safe.

### ***Why earplugs are important at concerts***

Parents should be aware that various medical studies have found sound levels at rock concerts often to be significantly higher than 85 dBA, with some reports suggesting that sound intensity may reach 90 dBA to as high as 122 dBA.

To experience 85 dBA, listen to an electric shaver or a busy urban street. Experts agree that continued exposure to noise above 85 dBA over time will cause hearing loss. Clearly, if levels are maintained at values greater than 85 dBA for long periods of time, this may lead to a significant noise exposure and frequent concertgoers may experience some potentially irreversible hearing loss from this experience.

A research study, "Incidence of Spontaneous Hearing Threshold Shifts during Modern Concert Performances," from the University of Minnesota Medical Center in Minneapolis examined sound intensity throughout a well-known concert venue and the effectiveness of earplugs.

The findings, presented at the 2005 annual meeting stated that sound pressure levels appeared equally hazardous in all parts of the concert hall, regardless of the type of music played. Accordingly, you should use earplugs at every type of musical concert, regardless of your vicinity to the stage.

A good rule of thumb: When a child accompanies a parent to any activity or location with excessive noise, ear protection should be worn by the entire family.

