Noise-Induced Hearing Loss in Children

The National Institute on Deafness and Other Communication Disorders reports approximately 28 million Americans have lost some or all of their hearing, including 17 in 1,000 children under age 18. Noise exposure is increasingly common in the age of iPods and other personal music players. Overexposure to noise can cause both temporary and permanent hearing loss.

Loudness of common sounds:

30 decibels (dBA)	**whisper**
60 decibels	**Normal conversation**
60 – 80 decibels	**Cars to a close observer**
Above 85 decibels	**Can cause permanent 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 the risk of such hearing loss in children.

How does noise exposure cause hearing loss?

Very loud sounds damage the inner ear by damaging the hair cells of the cochlea. When loud sounds are exposed to the ear for a short time, one may experience what's called a temporary threshold shift, or a temporary hearing loss. This hearing loss may be accompanied by tinnitus (a ringing in the ears). One may recover from the temporary loss. But if the ear is exposed to loud sounds over longer periods of time, the hair cells can be permanently damaged, causing permanent sensorineural hearing loss.

Should MP3 player use be limited?

The maximum sound from an iPod Shuffle has been measured at 115 decibels, a level that can cause hearing loss to listeners of all ages. 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. Further research from the Netherlands reports that 90 percent of adolescents listened to music through earphones on MP3 players, almost half used high-volume settings, and only 7 percent used a noise limiter.

1650 Diagonal Road, Alexandria, Virginia 22314-2857 U.S.A. 1-703-836-4444 1-703-683-5100 fax www.entnet.org

Researchers at Boston Children's Hospital determined that listening to a portable music player with headphones at 60 percent of their potential volume for one hour a day is relatively safe. The maximum volume limit is adjustable on many current MP3 players.

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. If levels are maintained at values greater than 85 dBA for long periods of time, this may lead to a significant noise exposure. Frequent concertgoers may experience some potentially irreversible hearing loss from their experience.

A research study, "Incidence of spontaneous hearing threshold shifts during modern concert performances" (Opperman, Reifman, Schlauch, Levine; Otol-HNS 2006, 134:4: 667-673), examined sound intensity throughout a well known concert venue, and the effectiveness of earplugs. The findings 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 distance 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.