



Physician Update

on Hearing and Balance Disorders

A Clinical Newsletter for Physicians

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It is estimated that 26 to 32 million Americans live with hearing loss. In some cases, this type of hearing loss is preventable. The most recent available estimates find that 12.5 percent of U.S. children between 6 to 19 years old (approximately 5.2 million) may have noise-induced hearing damage. Understanding and promoting prevention options may help avoid this currently irreversible condition.^{1,2}

EXPOSURE TIME	dB	SOUND
Instantaneous permanent damage	140+	Shotgun, rifle, jet engine
Less than one second	130	Jackhammer, heavy industrial
Less than ten seconds <i>Threshold of pain</i>	120	Rock concert
1.5 minutes	110	Power tools, snowmobile
15 minutes	110	Chainsaw, motorcycle
2.5 hours	90	Lawn mower
8 hours	85	Beginning of Danger Zone

A Physician's Guide to Noise-Induced Hearing Loss and Hearing Protection

The communication difficulties caused by hearing loss create stress and put an individual at increased risk for both depression and decreased cognitive function.^{3,4} In addition to hearing loss, excessive noise exposure can also cause tinnitus, which is often very bothersome and, in some cases, debilitating for the sufferer.

Noise-induced hearing loss occurs when loud sounds (85 dB or louder) enter the ear with such force that the delicate structures of the inner ear are damaged or even destroyed completely. These delicate structures do not regenerate themselves, making this condition permanent. That is why prevention and appropriate management are so important.

Preventing Noise-Induced Hearing Loss

The most effective way to prevent noise-induced hearing loss is to reduce the level of environmental sounds or reduce the amount

of time spent in these loud environments. We understand that those two options are not always feasible for those who work around noise or participate in noisy hobbies.

Thankfully, there are also many types of effective hearing protection now available. There are custom-molded hearing protective devices available for industrial workers that can double the amount of protection provided compared to generic foam earplugs. There are specialized electronic devices for hunters which allow the wearer to hear, and even enhance, the natural environmental sounds around them while compressing the dangerously loud sound of the gunshot. Musicians can use specialized monitors to allow them to monitor their own sounds, while safely reducing the volume from stage monitors, speakers and other musicians.

In addition to physical hearing protective devices, there is also exciting research regarding

the role that anti-oxidant agents may play in protecting hearing from within. A recent study by Ashanti Dooshi, et. al. concludes that agents such as N-acetylcysteine (NAC) and ginseng offer inner ear protection from excessive noise, more so for NAC.⁵

In addition to medical breakthroughs in preventing noise-induced hearing loss, research is now focusing on restoring acquired hearing loss. Researchers such as Dr. Hinrich Staecker at the University of Kansas Medical Center are investigating the regenerative properties of the Atoh1 gene. It is believed

that with a direct delivery to the inner ear, the gene could potentially form new hair cell growth, improving damaged hearing.⁶

We encourage physicians to talk to their patients about the risks associated with excessive noise exposure and help educate them on how to prevent it. With the combination of education, improved technology to reduce exposure and future medical breakthroughs, we hope to see noise-induced hearing loss join the ranks of conditions and illnesses that have been eliminated.

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