



AMERICAN
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AUDIOLOGY

Information Series

Recreational Firearm Noise Exposure

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Firearms are loud

Exposure to noise greater than 140 dBA can permanently damage hearing. Almost all firearms create noise that is over the 140-dBA level. A small .22-caliber rifle can produce noise around 140 dBA, while big-bore rifles and pistols can produce sound over 175 dBA. Firing guns in a place where sounds can reverberate, or bounce off walls and other structures, can make noises louder and increase the risk of hearing loss. Also, adding muzzle brakes or other modifications can make the firearm louder. People who do not wear hearing protection while shooting can suffer a severe hearing loss with as little as one shot, if the conditions are right. Audiologists see this often, especially during hunting season when hunters and bystanders may be exposed to rapid fire from big-bore rifles, shotguns, or pistols.

Hearing loss due to firearm noise

People who use firearms are more likely to develop hearing loss than those who do not. Firearm users tend to have high-frequency permanent hearing loss, which means that they may have trouble hearing speech sounds like “s,” “th,” or “v” and other high-pitched sounds. The loss is often worse in the ear that is closer to the rifle or shotgun. So, right-handed shooters typically suffer more hearing loss in the left ear (when shooting rifles and shotguns) because the muzzle of the firearm is closer to and more directly in line with the left ear, called the “gun blast ear.” People with high-frequency hearing loss may say that they can hear what is said but that it is not clear, and they may accuse others of mumbling. They may not get their hearing tested because they don’t think they have a problem. They may also have ringing in their ears, called tinnitus. The ringing, like the hearing loss, can be permanent.

Protecting your hearing from firearm noise

The good news is that people can prevent hearing loss by using appropriate hearing protective devices (HPDs), such as earmuffs or earplugs. However, studies have shown that only about half of shooters wear hearing protection all the time when target practicing. Hunters are even less likely to wear hearing protection because they say they cannot hear approaching game or other noises. While some HPDs do limit what a person can hear, there are many products that allow shooters to hear softer sounds while still protecting them from loud sounds like firearm noise.

Two types of HPDs designed for shooting sports are electronic HPDs and nonlinear HPDs. Electronic HPDs make softer sounds louder but shut off when there is a loud noise. The device then becomes hearing protection. Electronic HPD styles include earmuffs, custom-made in-the-ear devices, one-size-fits-all plugs, and behind-the-ear devices.

Nonlinear HPDs are not electronic and are designed to allow soft and moderate sounds to pass through, while still reducing loud sounds. Nonlinear HPDs can be either earplugs that are inserted into the ear or custom-made earmolds. Nonlinear HPDs that have filters are the best choice. They are better than those that use mechanical valves. This is because the valves may not close fast enough to protect hearing from loud noise.

The U.S. military uses both electronic and nonlinear HPDs to protect soldiers’ hearing during combat and weapons training. Electronic HPDs cost from less than \$100 for earmuffs to over \$1,000 for high-technology custom-made devices. Insert plug-type nonlinear HPDs cost around \$10–\$20, while custom-made nonlinear devices cost around \$100–\$150 per pair. Talk with your audiologist to choose the type of hearing protection that is right for you.

Tips to protect your hearing

- Always use some type of hearing protection any time you fire a gun.
- Always have disposable HPDs handy—make them part of your gear.
- Double-protect your ears, like putting muffs over plugs, when shooting big-bore firearms.
- Choose smaller caliber firearms for target practice and hunting.
- Choose single-shot firearms instead of lever action, pump, or semi-automatic guns.
- Avoid shooting in groups or in reverberant environments.
- Use electronic or nonlinear HPDs for hunting.

NOTES:

For more information and to view the entire Audiology Information Series library, visit www.asha.org/aud/pei/.

For more information about hearing loss, hearing aids, or referral to an ASHA-certified audiologist, contact:



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