



# Recreational Firearm Noise Exposure

## Noise and Firearms

Every year, millions of Americans participate in recreational firearm activities such as target shooting and hunting. These firearms can produce dangerously high sound levels. For example, small-caliber rifles, air rifles, shotguns, and pistols can generate noise up to 140 decibels peak pressure level (referred to as dBP); higher-caliber rifles can produce sounds over 175 dBP. It's crucial to understand that exposure to noise greater than 140 dBP can permanently damage hearing, even from a single occurrence.

The Occupational Safety and Health Administration noise standard (29 CFR 1910.95) states that impulse noise should not exceed 140 dBP due to the risk of permanent hearing damage. While this standard is primarily for occupational noise exposures, it's important to note that the risk of hearing loss caused by noise applies to firearm users as well. The ear does not differentiate between occupational and recreational noise. People who do not wear hearing protection while shooting—or who do not wear it properly—can suffer hearing loss or ringing in their ears (known as *tinnitus*) with as little as one shot.

## 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 “f” and other high-pitched sounds. The loss is often worse in the ear closer to the firearm muzzle. This means that, when shooting rifles and shotguns, right-handed shooters typically suffer more hearing loss in the left ear. In contrast, left-handed shooters typically suffer more hearing loss in the right 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 think that others are mumbling. They may not get their hearing

tested because they don't think they have a problem.

Audiologists encounter noise-induced hearing loss more frequently during hunting season—when hunters and bystanders may be exposed to noise from firearms.

## Protecting Your Hearing From Firearm Noise

Noise-induced hearing loss is a serious issue, but the good news is that it's preventable.

Individuals can reduce their risk of hearing loss by using appropriate *hearing protection devices* (HPDs), such as earmuffs or earplugs. However, studies have shown that only about half of target shooters wear hearing protection all the time when target practicing, and 70%–80% of hunters never wear hearing protection. Hunters are less likely to wear hearing protection because they say it prevents them from hearing approaching wildlife. It is important for target shooters and hunters to know multiple types of HPDs are available, including HPDs that can amplify speech and environmental sounds (such as wildlife) while lowering loud sounds from gunfire.

## Hearing Protection Devices (HPDs)

Several HPD options are designed to protect against firearm noise. *Electronic HPDs* allow for sounds to pass through that are soft or average in volume but detect when there is a loud noise. The device then becomes hearing protection. Electronic HPDs contain a power supply and may also be a communication device. Styles for electronic HPDs come in custom options or “one-size-fits-all” styles, including earmuffs and in-the-ear plugs.

*Standard HPDs* do not contain any electronic parts inside the devices. They are designed to decrease the volume of sounds that enter the ear canal. Standard HPDs can be either earplugs inserted into the ear, earmuffs, or even custom-made earplugs. HPDs must be properly selected and fit to individuals to ensure loud sounds will be lowered effectively. If the HPDs are ill fitting, loud sounds will not be reduced, and the

