

What Makes Firearm Noise So Dangerous?

Unlike loud continuous noise that causes gradual hearing loss over a long period of time, firearm noise can cause severe instantaneous hearing loss with as little as one exposure.

Gunfire is an intensely loud impulse noise that shatters the acoustic environment with incredible concussion, generating a rapid change in pressure and extremely high sound levels.

Although impulse type noise only lasts for a few thousandths of a second, the extreme force it generates has the potential to destroy the delicate tissue in the inner ear if the sound level reaches a critical level.

This critical level varies from person to person, with some people more susceptible than others to noise-induced hearing loss (NIHL), whether it comes from steady industrial types of sound or the impulse noises associated with gunfire.

Why Can't I Understand My Family?

Because NIHL generally involves more hearing loss in high frequencies than in lower, bass ranges, a person with NIHL can usually hear louder, low frequency vowels better than softer, high frequency consonant sounds. This means that although they may be able to hear speech, they may not be able to understand it clearly. For example, the difference between “mine”, “kind”, and “time” is very hard for someone with NIHL to pick out.

Often, people with NIHL think that others mumble. People with NIHL sometimes give the impression that they are not listening, when in fact, they just don't understand. Many times people with NIHL also have a ringing or roaring in the ears called tinnitus that can be extremely annoying.

How Loud Is Too Loud?

Although there are no clearly defined allowable noise exposure limits for gunfire like those enforced in industrial settings, the Environmental Protection Agency (EPA) has estimated that exposure to one impulse noise per day over about 150 dB has the potential to damage hearing over time. Most shotguns, high power rifles, and pistols can produce sound levels that high or higher.

Large caliber, short-barreled guns that can be rapidly fired are the most dangerous to your hearing.

Modifying the barrel of a gun by drilling holes to reduce recoil (like a muzzle brake) increases sound exposure by sending the shock wave back toward the shooter instead of out of the front of the gun through the barrel. In addition, shooting from an enclosed structure like a duck or deer blind can significantly increase the noise levels reaching to the ear of the shooter.

During Target Practice

Most hearing protection devices (HPD) with a labeled noise reduction rating (NRR) on the package will be adequate for shooting situations when consistently and correctly utilized where hearing verbal communication or environmental sound is not critical. Choose an HPD that attenuates sound adequately and is comfortable to wear for long periods of time. For the ultimate in protection, wear insert type plugs under earmuffs. Using HPD can actually help improve your aim because you will flinch less in anticipation of the “big boom” of your gun.

Ask your audiologist or hearing health professional for more information

What Can I Do to Protect My Ears?

While Hunting

Because most hunting involves listening for approaching game, wearing conventional HPDs is not practical in the field. However, there are two solutions to this problem.

1 Use a specially designed level-dependent HPD with a filter or valve mechanism to let more low level sounds pass and yet provide increasing protection with increasing sound level.

2 A more costly option is to use electronic hearing protective devices (EHPDs). The basic EHPD consists of a microphone, amplifier, volume control, and battery, housed either in a headset, a behind-the-ear (BTE) device, or an in-the-ear (ITE) configuration. The amplifier increases low and moderate level sounds that can improve hearing ability, but is also equipped with a special circuit which prevents loud sounds from reaching damaging levels in the ear. Each type has advantages and disadvantages, as listed below.

EHPD Type	Advantages	Disadvantages
Headset	Least expensive, high amplification, good protection	Bulky, uncomfortable for long periods of use, excessive wind noise, poor localization of sounds
BTE	Moderate amplification, good localization of sounds	More expensive than headset, some types may be uncomfortable, some wind noise
ITE	Moderate amplification, good protection, good comfort, best localization of sounds, least wind noise	Most expensive

