



Loud Noise Can Cause Hearing Loss

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What Noises Cause Hearing Loss?

Noise is a significant source of hearing loss, but you can protect your hearing. An important first step is to understand how noise causes hearing loss.

Loud Noise Can Cause Hearing Loss Quickly or Over Time

Hearing loss can result from a single loud sound (like firecrackers) near your ear. Or, more often, hearing loss can result over time from damage caused by repeated exposures to loud sounds. The louder the sound, the shorter the amount of time it takes for hearing loss to occur. The longer the exposure, the greater the risk for hearing loss (especially when hearing protection is not used or there is not enough time for the ears to rest between exposures).

Here are some sources of loud noise that you may be exposed to. If you are repeatedly exposed to them over time, they can cause hearing loss.

Everyday Activities

- Music from smartphones and personal listening devices, particularly when the volume is set close to the maximum
- Fitness classes
- Children's toys

Events

- Concerts, restaurants, and bars
- Sporting events, such as football, hockey, and soccer games
- Motorized sporting events, such as monster truck shows, stock car or road races, and snowmobiling
- Movie theaters

Tools and More

- Power tools
- Gas-powered lawnmowers and leaf blowers
- Sirens
- Firearms
- Firecrackers

Common Sources of Noise and Decibel Levels

Sound is measured in decibels (dB). A whisper is about 30 dB, normal conversation is about 60 dB, and a motorcycle engine running is about 95 dB. Noise above 70 dB over a prolonged period of time may start to damage your hearing. Loud noise above 120 dB can cause immediate harm to your ears.

The table below shows dB levels and how noise from everyday sources can affect your hearing.

Everyday Sounds and Noises	Average Sound Level (measured in decibels)	Typical Response (after routine or repeated exposure)

[More about decibels](#)



Sounds May Be Louder Than What You Hear

How loud something sounds to you is not the same as the actual intensity of that sound. Sound intensity is the amount of sound energy in a confined space. It is measured in decibels (dB). The decibel scale is logarithmic, which means that loudness is not directly proportional to sound intensity. Instead, the intensity of a sound grows very fast. This means that a sound at 20 dB is 10 times more intense than a sound at 10 dB.

Softest sound that can be heard	0	
Normal breathing	10	Sounds at these dB levels typically don't cause any hearing damage.
Ticking watch	20	
Soft whisper	30	
Refrigerator hum	40	
Normal conversation, air conditioner	60	
Washing machine, dishwasher	70	You may feel annoyed by the noise
City traffic (inside the car)	80–85	You may feel very annoyed
Gas-powered lawnmowers and leaf blowers	80-85	Damage to hearing possible after 2 hours of exposure
Motorcycle	95	Damage to hearing possible after about 50 minutes of exposure
Approaching subway train, car horn at 16 feet (5 meters), and sporting events (such as hockey playoffs and football games)	100	Hearing loss possible after 15 minutes
The maximum volume level for personal listening devices; a very loud radio, stereo, or television; and loud entertainment venues (such as nightclubs, bars, and rock concerts)	105–110	Hearing loss possible in less than 5 minutes
Shouting or barking in the ear	110	Hearing loss possible in less than 2 minutes
Standing beside or near sirens	120	Pain and ear injury

Also, the intensity of a sound at 100 dB is one billion times more powerful compared to a sound at 10 dB.

Two sounds that have equal intensity are not necessarily equally loud. Loudness refers to how you perceive audible sounds. A sound that seems loud in a quiet room might not be noticeable when you are on a street corner with heavy traffic, even though the sound intensity is the same. In general, to measure loudness, a sound must be increased by 10 dB to be perceived as twice as loud. For example, ten violins would sound only twice as loud as one violin.

The risk of damaging your hearing from noise increases with the sound intensity, not the loudness of the sound. If you need to raise your voice to be heard at an arm's length, the noise level in the environment is likely above 85 dB in sound intensity and could damage your hearing over time.

Firecrackers	140–150	Pain and ear injury
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The time estimates listed in the “Typical Response” column are based on the NIOSH exchange rate of 3 dB. For more information, visit [NIOSH's website](#).

How Do I Know the Sound Level is Safe?

The effect of lower noise levels over long periods is the same as louder noise levels over a shorter period. You can use a sound level meter (SLM) to measure noise around you. Free SLMs developed as smartphone apps are available. Some of these apps can predict your maximum allowable daily noise dose, like the [NIOSH SLM app](#) developed for iOS devices to help promote better hearing health and prevention efforts. The U.S. Environmental Protection Agency (EPA) and the World Health Organization (WHO) recommend maintaining environmental noises below 70 dBA over 24-hours (75 dBA over 8-hours) to prevent noise-induced hearing loss. The EPA also specified limits for speech interference and annoyance at 55 dBA for outdoors activities and 45 dBA for indoor activities. More details about this topic can be found on the NIOSH Science Blog — [Understanding Noise Exposure Limits: Occupational vs. General Environmental Noise](#).

Looking for Data?

If you are looking for data on noise levels from published studies and noise level tests, visit

- [NIOSH Power Tools Database](#)
- [NIOSH Sound Level Meter app](#)
- [NIOSH Science Blog](#)
- [Noise Navigator™ Sound Level Database](#)  
- [Sight & Hearing Association Noisy Toys List](#) 
- [NIOSH Science Blog: NIOSH Sound Level Meter App](#)

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