World Health Organization

Make Listening Safe


PARK


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Concern is growing about the rising exposure to loud sounds in recreational settings such as nightclubs, discotheques, pubs, bars, cinemas, concerts, sporting events and even fitness classes. With the popularization of technology, devices such as music players are often listened to at unsafe volumes and for prolonged periods of time. Regular participation in such activities poses a serious threat of irreversible hearing loss.

Cause for concern…

The World Health Organization (WHO) estimates that billion young people worldwide could be at risk of hearing loss due to unsafe listening practices.

Over 43 million people between the ages of 12–35 years live with disabling hearing loss due to different causes.

Among teenagers and young adults aged 12–35 years in middle- and high-income countries:

- Nearly 50% are exposed to unsafe levels of sound from the use of personal audio devices.
- Around 40% are exposed to potentially damaging sound levels at clubs, discotheques and bars.

Analysis of the National Health and Nutrition Examination Survey (NHANES) data from the United States suggests that between 1994 and 2006, the prevalence of hearing loss[a] among teenagers 12 to 19 years old rose significantly from 3.5% to 5.3%. This rise may be expected to continue as the number of people listening to music through headphones increased by 75% from 1990 to 2005 in the United States. A 2008 European Commission report states that personal audio devices are being used by an increasing proportion of the population. The increasing sales of smartphones, with 470 million devices sold globally in 2011 alone, is another indicator of potential risk. This increased accessibility and use of personal audio devices for listening to music is coupled with their use at high volume and for long durations. Such risk-associated behaviours can permanently damage hearing capacity.

[a] Hearing loss = A person has hearing loss if he or she is not able to hear or has a hearing threshold of 25 dB or more.

Noise-induced hearing loss is irreversible.

Exposure to loud sounds for any length of time causes fatigue of the ear's sensory cells. The result is temporary hearing loss or tinnitus (a ringing sensation in the ear). A person enjoying a loud concert may come out experiencing 'muffled' hearing or tinnitus. The hearing improves as the sensory cells recover. When the exposure is particularly loud, regular or prolonged, it can cause permanent damage of the sensory cells and other structures, resulting in irreversible hearing loss. The high-frequency range (i.e. high-pitched sounds) is impacted first and may not be noticeable immediately. Continued exposure leads to progression of hearing loss, ultimately affecting speech comprehension and having a negative impact on the individual's quality of life

Some people may be more susceptible to noise-induced hearing loss than others. Genetic predisposition, chronic conditions such as diabetes and exposure to cigarette smoke are known to increase the risk of acquiring noise-induced hearing loss. Because we cannot tell who the most susceptible individuals are, prevention is the most effective way to avoid such hearing loss.

Noise-induced hearing loss can affect many aspects of life, including a person's social and educational development and their ability to work. Children and adults who live in noisy environments may face increased psychological stress and anxiety.

In young children, noise-induced hearing loss hinders language acquisition. Learning disabilities, anxiety and attention-seeking behaviours are also common outcomes of hearing loss. Chronic noise exposure in classrooms can impede academic performance in areas such as reading ability, comprehension, short- and long-term memory, and motivation. On average, children who are exposed to noisy learning environments have lower assessment scores on standardized tests.

Noise exposure in young people also contributes to age-related hearing loss. Inadequate hearing protection during activities such as shooting firearms or listening to loud music during adolescence may lead to significant communication difficulties much later in life.

Listening to devices with earphones can also be unsafe in additional ways. For example, use during walking or cycling decreases auditory perception and increases the listener's chances of being involved in a collision.

Permissible daily noise exposures

SAFE LISTENING TIME

What is safe listening?

Safe listening levels depend on the intensity (loudness), duration (length of time) and frequency (how often) of the exposure. These three factors are interrelated and contribute to the overall sound energy level that a person's ears are exposed to. The total amount of sound energy a person can safely receive is effectively constant. We can be exposed to the same amount of energy at lower volumes listened to over long periods of time as we might receive when louder sounds are heard for a short duration. Permissible levels of daily exposure to noise have been identified accordingly, taking into account the total permissible 'dose' of sound. Permissible exposure levels have been calculated for occupational settings and are extrapolated to recreational settings. Eighty-five decibels is considered the highest safe exposure level up to a maximum of eight hours. The permissible time for safe listening decreases as sound levels increase. For example, a sound as high as 100 dB – the level produced by a subway train – can be safely listened to for only 15 minutes each day.

The output of personal audio devices may range from 75 dB to as high as 136 dB . The maximum output levels vary depending upon regulations and legislation in different countries. Typically, users of personal audio devices choose to set the volume between 75 to 105 dB.

At nightclubs, discotheques and bars, average sound levels can range from 104 to 112 dB; noise levels at pop concerts may be even higher. Patrons may expose themselves to the same level of loudness in 15 minutes of music at 100 dB that an industrial worker gets in an 8-hour day at 85 dB. Noise levels at sporting venues have been found to range from 80 dB to 117 dB. The average noise exposure during the Football World Cup in 2010 was as high as 100.5 dB. Even a short duration of exposure to high-decibel levels such as these can be harmful. Habitual exposure almost certainly leads to hearing loss over time.

The good news is that noise-induced hearing loss can be prevented by following safe listening practices.

How to make listening safe

There are many actions which can be taken to make listening safe for all. These include measures put in place by individual users, as well as parents, teachers, managers, manufacturers and governments. Select actions are highlighted below.

What can individuals do?

Keep the volume down

As noted, the daily recommended safe volume level is below 85 dB for duration of a maximum of eight hours. Sounds may be too loud if people must raise their voice to make themselves understood to a listener; it is difficult for the listener to understand someone who is an arm's length away; or listeners develop pain or a ringing sensation in their ear(s). Even a small reduction in volume can offer significant protection. Volume can be reduced when listening to personal audio devices by:

- Wearing earplugs. When frequenting nightclubs, discotheques, bars, sporting events and other noisy places, use earplugs as hearing protection. Well-inserted earplugs can help to reduce the level of exposure considerably. If inserted properly, earplugs can reduce the exposure by 5 to 45 dB, depending on the type of earplugs.
- Using carefully fitted, and if possible, noise-cancelling earphones/headphones. Earphones and headphones which are suited to the individual user allow music to be heard clearly at lower levels of volume. In addition noise-cancelling earphones and headphones cut down the background noise, so that users can hear sounds at lower volumes than otherwise needed. For example, frequent users of personal audio devices on trains or airplanes should consider using noise-cancelling earphones or headphones in these settings.
- Respecting safe listening levels. Determining the safe listening level on personal audio devices by setting the volume to a comfortable level in a quiet environment to no more than 60% of maximum volume is another way to keep the volume down.

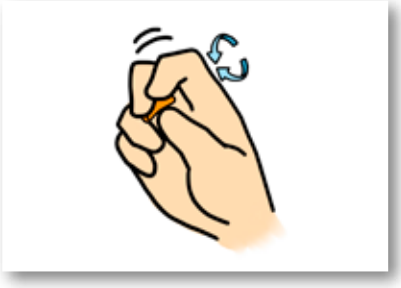
Limit time spent engaged in noisy activities

As indicated, the duration of the exposure to noise is one of the key factors contributing to overall sound energy levels. The duration can be minimized by:

- Having short listening breaks. When going to nightclubs, discotheques, bars, sporting events and other noisy places, people should take short listening breaks to help reduce the overall duration of noise exposure.
- Moving away from loud sounds. At a noisy venue, people should stay as far away as possible from sound sources such as loudspeakers. Moving to quieter locations within venues can reduce the level of exposure.
- Limiting the daily use of personal audio devices. While it is important to keep the volume down, limiting the use of personal audio devices to less than one hour a day would do much to reduce noise exposure.

How to use earplugs

1. Roll



2. Pull

3. Hold

Monitor safe listening levels

People should be empowered with the correct information about the safe listening of their personal audio devices by knowing the products and their safety features. Smartphone technology can be used to measure noise exposure levels and inform users about their risk for noise-induced hearing loss. Applications or "apps" accessible through the phones display noise intensity levels in decibels and indicate whether exposure is risky. These apps are easy to download and can be used to collect information about noise levels in the environment and the risk of hearing loss.

Heed the warning signs of hearing loss

People who suspect hearing loss should seek help from a hearing health care professional in case of tinnitus or difficulty in hearing high-pitched sounds such as doorbells, telephones or alarm clocks; understanding speech, especially over the telephone; or following conversations in noisy environments, such as in restaurants or venues for other social gatherings.

Get regular hearing check-ups

This helps to identify the onset of hearing loss at an early stage. High-risk populations including adolescents and young adults should be informed and encouraged to have regular hearing screening. In order to facilitate this, schools, workplaces and communities are encouraged to organize hearing screening opportunities.

What can parents do?

Parents need to play an active role in educating their children about safe listening and monitoring their exposure to loud noise; they also need to be role-models of safe listening for their children.

What can teachers do?

Children and adolescents must be educated about the possible dangers of exposure to loud sounds from the misuse of personal audio devices and encouraged to develop safe listening habits. Such information should be part of the health education curriculum and also be taught as part of music and dance classes.

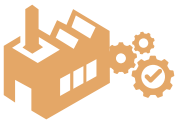
What can physicians do?

Physicians have a significant opportunity to educate and counsel adolescents and young adults regarding hearing protection. Physicians, nurses, audiologists and speech-language pathologists can convey appropriate messages about the risks and promote healthy listening habits among users.

What can managers do?

Managers of venues in which noise levels are high – nightclubs, discotheques, bars, pubs, cinemas, concerts, sporting events and even fitness classes – have an important role to play in ensuring the personal safety of people who frequent such venues. To make listening safe, they can: monitor and apply the safe noise limit set by the establishment itself; make use of sound limiters to control noise levels in such settings; provide free earplugs to all patrons along with information about their proper use as well as "chill out" rooms, where volume levels are monitored and safe; and prominently display messages about the risk of hearing loss during moments when the volume goes beyond safe levels.

What can manufacturers do?



Manufacturers of personal audio devices possess the technical know-how to design these devices with appropriate safety features, and a number have already taken steps to put in place these features. For example, software developed by a leading manufacturer of personal audio devices allows customers to easily set their own customized maximum volume limit. It also gives parents the ability to set a maximum volume limit on their child's device and lock it with a combination code. Another device displays an on-screen message displaying the average dB level at different volume settings, along with a warning to keep the output below 85 dB. Such measures offer protection and help raise awareness about the harmful effects of loud music and other noise. Manufacturers can also provide prominent warning labels on the products themselves, as well as on the external packaging and accompanying information materials.

What can governments do?

For their part, governments are encouraged to develop stricter laws and rigorously enforce already existing legislation regarding non-occupational noise. Governments can raise awareness about the issue through targeted public information campaigns highlighting the potential consequences of hearing loss. Creative use of those means of communication which are most often used by teenagers and young adults, including various social media platforms, would help to disseminate messages on the importance of safe listening.

Making a difference: some examples

Although governments do have an important role to play, it is true that at this stage while legislative measures related to environmental and occupational noise exposure are in place in many countries, relatively few countries have enacted specific legislation aimed at reducing recreational noise exposure. Two examples of such recent efforts include:

In 2009, the European Commission mandated that output levels in new personal audio devices should be set to a standard of 85 dB, allowing users to increase the volume to a maximum of 100 dB. According to the directive, when users raise the volume to maximum level, a message should pop up that warns of the potential for hearing loss.

In April 2014, Minneapolis City Council, in the State of Minnesota, United States, passed an ordinance making it compulsory for bars and clubs to offer free earplugs to patrons. Such a directive could have far-reaching effects, reducing the risk of noise exposure for those who frequent such venues.

Other public information campaigns that have helped raise awareness about safe listening practices include:

- Listen To Your Buds: A public education campaign launched by the American Speech and Hearing Association (ASHA). The campaign educates children and parents about practising safe listening habits when using personal
- Dangerous Decibels: This public health campaign, initiated in the US, aims to reduce the incidence and prevalence of hearing loss by changing knowledge, attitudes and behaviours of children and adults regarding sound exposure and use of hearing protective strategies. Through education and use of exhibits, the programme has been successful in producing long-term improvements in hearing health behaviours.
- It's a Noisy Planet: Protect their hearing: This programme of the US National Institute on Deafness and Other Communication Disorders (NIDCD) promotes healthy hearing habits among parents and pre-teens. It does so through social media, school presentations, awareness materials, conferences and exhibits.
- Don't Lose the Music: by Action on Hearing Loss, a UK-based hearing loss charity, aimed at increasing awareness and promoting safe listening habits amongst music lovers through innovative messages.
- The ESIA Cheers for Ears: This Ear Science Institute of Australia (ESIA) campaign is a school health programme designed to educate and encourage healthy behaviours among young people to prevent noise-induced hearing loss.
- NOISE (Non-occupational Incidents, Situations and Events) database: The National Acoustic Laboratories in Australia maintains a detailed