



IT'S YOUR HEALTH

Personal Stereo Systems and the Risk of Hearing Loss

The Issue

Personal stereo systems offer a convenient way to listen to music in public without disturbing others. However, there are growing concerns that these devices may cause temporary and permanent hearing loss if they are not used with some degree of caution.



How Sound Levels and Listening Times are Linked to Hearing Loss

Scientists measure the levels of different sounds with a unit called the A-weighted decibel (dBA).

Sounds with levels below 70 dBA pose no known risk of hearing loss, no matter how long they last. A sound level of 70 dBA is about what you would experience while driving alone in a family car at highway speeds with the windows closed and the radio off.

If you listen to music at levels higher than 70 dBA, the amount of time you spend doing so becomes an important factor. For example, listening to music at 85 dBA for 45 minutes a day poses no known risk of hearing loss. On the other hand, listening at that level (or higher) for 8 hours a day can pose a significant risk of hearing loss.

This threshold, exposure to 85 dBA for eight hours daily, has been adopted by nine Canadian provinces and one Territory as the limit for occupational noise.

Minimizing Your Risk

Protect Your Hearing

Here are some tips to reduce the risk of **noise-induced hearing loss** from personal stereo systems:

- Keep the sound at enjoyable, but safe levels. If someone a metre away must shout to be understood, the sound level of the music is probably higher than 85 dBA, and may be hazardous.



Use various system controls to increase enjoyment while decreasing your risks. For example, you could turn down the volume and increase the bass boost. You could also use a feature that is available on many MP3 players to reduce volume differences between songs. Names for this type of feature range from the more general term "Replay Gain (RG)" to "Sound Check" on the iPod® to "Volume-Leveling" on Microsoft® products.

- Limit the amount of time you spend listening to loud music.
- If possible, reduce background noise so you can use a lower volume level.

Other Safety Concerns

There is more at stake than your hearing. Excessive sound levels can create dangerous situations. If your personal stereo system is so loud that you cannot hear sounds around you, such as traffic, your personal safety may be at risk.

Also, if you use noise-reducing headphones to reduce background noise, be aware that it is not safe to tune these sounds out when you are walking or cycling along a busy street, because you need to be aware of what is going on around you.

Know the Early Signs of Hearing Loss

If you experience early signs of hearing loss, you should contact your doctor's office to discuss the need for a test or examination. Early signs include:

- Difficulty trying to follow a conversation in the midst of background sounds (e.g. at a social gathering or in a cafeteria).

- The perception that people around you are mumbling.
- Hearing a ringing, buzzing, roaring, or rushing sound in your ear when there is nothing making these sounds. This condition is called tinnitus.

Background

Personal stereo systems combine headphones or earphones with portable music players.

Although the players might be radios, or play compact discs or cassettes, the most common portable music players are now digital audio players (for example MP3s or iPod®). Digital audio players (DAPs) are easy to carry and can store a lot of music, so their rise in popularity adds new concerns about listening to high sound levels for long periods of time. According to anecdotal reports from hearing specialists, the number of young people who show signs of hearing loss is increasing.

Health Canada's Tests on Personal Stereo Systems

Health Canada's experts have reviewed scientific literature on personal stereo systems and have conducted tests to assess their potential to cause hearing loss. These tests measured the sound levels generated at maximum volume settings using a variety of headphones/earphones, and portable compact disc (CD) players and more recently digital audio players (DAPs). The music selected for the tests



included pop songs from the "top ten" charts, and heavy metal tracks.

The findings:

- All combinations of headphones/earphones and CD players and DAPs could generate potentially harmful sound levels.
- Pop music sound levels ranged from 86 to 102 dBA when researchers used the headphones that came packaged with the CD player and 101 to 107 dBA for the DAPs. When researchers combined CD players or DAPs with headphones purchased separately, the sound levels could reach 125 dBA if music was played back through earphones that seemed to form the tightest seal.

If you played the pre-packaged systems at maximum volume, it would take from 10 minutes (at 102 dBA) to six hours (at 86 dBA) for the CD players studied to exceed the occupational noise limit noted above. For DAPs it would take from 3 minutes (at 107 dBA) to 12 minutes (at 101 dBA). Furthermore, you would exceed the limit in a few seconds if you played heavy metal or pop music at full volume on the combination CD or DAP headphone systems that produced sound levels of 125 dBA. At this sound level, exposure for longer durations can pose a risk of immediate, serious and permanent hearing loss.

Another key finding was that sound levels from earbuds vary significantly from person to person, because the level depends on how well the "buds" fit into your ears. Tight-fitting earbuds tend to produce higher sound levels than other headphones.



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A recent European report (listed in the Need More Info section below) suggests that about 5-10% of listeners are at risk of hearing impairment because they listen to sound levels that are too high, for too long a time. The studies were done primarily on users of CD players but more studies of MP3 player use are needed because of their potential for higher risk.

The bottom line is that personal stereo systems are capable of causing permanent hearing loss when used to play the kind of music that is most popular with teenagers and young adults. The risk should not be ignored, as so many young people use these devices.

Health Canada's Role

Health Canada provides information to help prevent hearing loss from exposure to excessive noise at work, at home and at play. Given the recent surge in the popularity of digital audio players, Health Canada is currently evaluating their risk by studying user listening habits. The department is also working

with stakeholders to educate Canadians about safe use.

Need More Info?

For more information, including references for the studies mentioned in this fact sheet, contact:

- **The Consumer and Clinical Radiation Protection Bureau** at:
www.hc-sc.gc.ca/ahc-asc/branch-dirgen/hecs-dgsesc/psp-psp/ccrpb-bpcrpcc-eng.php
Health Canada
775 Brookfield Road
Ottawa, ON, K1A 1C1
Tel: (613) 954-6699

For more information about noise-induced hearing loss visit:

- Health Canada, **Noise web section** at:
www.hc-sc.gc.ca/ewh-semt/noise-bruit/index-eng.php
- It's Your Health, **Noise Induced Hearing Loss** at:
www.hc-sc.gc.ca/iyh-vsv/environ/leisure-loisirs_e.html
- **The Wise Ears website** at:
www.nidcd.nih.gov/health/wise/
- **Hearing Foundation of Canada** at:
www.thfc.ca/Default.aspx
- For information on the European Union's Scientific Committee on Emerging and Newly Identified Health Risks (SCENIHR) report,

Canada

**Potential health risks of exposure
to noise from personal music
players and mobile phones
including a music playing function**

(September 23, 2008) go to:

[http://ec.europa.eu/health/opinions/
/en/hearing-loss-personal-music-
player-mp3/#11](http://ec.europa.eu/health/opinions/en/hearing-loss-personal-music-player-mp3/#11)

- For information on **hazards in
your environment** go to :

[www.hc-sc.gc.ca/ewh-semt/
hazards-risques/index-eng.php](http://www.hc-sc.gc.ca/ewh-semt/hazards-risques/index-eng.php)

- For additional articles on health
and safety issues go to the ***It's
Your Health*** web section at:
www.healthcanada.gc.ca/iyh

You can also call toll free at

1-866-225-0709

or TTY at 1-800-267-1245*