



303

Your hearing

Hearing is a miracle of bioengineering that's taken millions of years to evolve. Every vertebrate on the planet has ears (not true for eyes) because hearing is the primary warning sense. Your hearing is a sphere, which means it can warn of threats behind you. The healthy human hearing range is 10 octaves, from 20 to 20,000 Hertz; by comparison, we see less than one octave, from roughly 430 to 770 teraHertz. Also, your ears are always on: you may have noticed that you have no earlids! A strange noise in your house at night will probably wake you, because your ears are working even while you sleep.

If you can't hear well, listening obviously becomes much more of a challenge. In the noisy modern world, hearing suffers, and many people have hearing damage arising from loud noises (for example explosions, gunfire or industrial or construction noise) or, increasingly commonly, from headphone abuse. Loud sounds effectively flatten the tiny hair-like cells in your inner ear that sense sound, and if the noise is loud enough or repeated often enough those crucial cells become damaged beyond recovery.

If you've ever had ringing in your ears or lost your ability to hear high frequencies like sibilants in speech after a loud concert (this is known as



temporary threshold shift), your ears have suffered damage. Repeat that process often and the damage becomes permanent and noticeable. This, sadly, is what many of you people are doing with headphones – ramming loud music into their ear canals for hours a day. One in six US students already have hearing loss, mainly from this source: we don't want to raise a whole deaf generation because if you can't hear you don't listen, and listening is so important for a world of peace and understanding.

My suggestions for healthy headphone use are below. Even if you don't use headphones, please pass them on to your children!

Limit your listening time. Every increase of 10 decibels (dB) is actually a doubling of the perceived noise level. Recommended exposure times drop rapidly as noise levels increase: at 90 dB (often reached in noisy restaurants), the recommendation from the US National Institute for Occupational Safety is two and a half hours, but at 100 dB (very possible with loud headphones) it's just 15 minutes.

Limit your volume. If you can't hear someone speaking in a loud voice from a metre (three feet) away, it's probably too loud – not to mention the safety implications if you're moving around and you've lost your primary warning sense.



Get good quality headphones. With cheap headphones, the tendency is to turn them up because at lower volumes they simply aren't efficient. Always get the best headphones you can afford, so you don't fall into this trap.

Even without loud noise, hearing degrades with age: in the US, 25 percent of 65-74 year olds, and half of those over 75, have a disabling hearing loss.

Here's a checklist to help you assess whether your issues in communication may come from hearing issues. If any of these ring a bell with you, please contact an audiologist and get a hearing test.

- I have difficulty understanding everyday conversation
- I have a feeling of being able to hear but not understand
- I often have to turn up the TV or radio
- I often ask people to repeat what they're saying
- I tend to avoid social situations that were once enjoyable
- I find it increasingly difficult to communicate in noisy situations like restaurants or large gatherings
- I have tinnitus (ringing and/or buzzing sounds in the ears)
- I find certain sounds unbearable, annoying or disturbing (misophonia or phonophobia)



- I find sound generally too loud (hyperacusis) or some sounds suddenly become unbearably loud (recruitment)

As a first step, you can self-test online or with an app, but these are not very accurate. Your local audiologist is much more reliable.

Please look after your hearing. You need it!