

Hearing for life

Facts about hearing



How hearing works, how hearing fades
and how to assist your hearing





Our hearing develops fully while we are still in the womb

Our hearing is the only one of our senses that is constantly active.

It plays an important role from the very first moments of life, allowing us to hear language, understand and develop.

Right from the start, our ears constantly supply us with vital information, enable us to experience emotions. The laughter of children, music, a loving sentiment: they are all just as potent as a movie scene that relies on dramatic music for its emotional effect.

Our sense of hearing allows us to recognize danger. Even when we are sleeping, our ears are still attuned to unusual or important sounds. Whether we hear a fire alarm or a crying child, we can react immediately.

Because our hearing is so precious and such a valuable sense, it deserves special protection.



**Our hearing is
multi talented**

We have two ears and one brain to hear with. And for good reason.

Natural hearing

Healthy hearing can recognize both low sounds (a double-bass or traffic) and high (a violin or the twittering of birds). In technical terms, that means frequencies between around 20 and 20,000 Hertz.

What's more, your brain can process very quiet sounds (the buzzing of a mosquito) and extremely loud sounds (a jet engine starting). This equates to volumes between 0 and more than 120 decibels.

Understanding speech

Our hearing is particularly adept at understanding the nuances of language, even in difficult environments. Whether we are sitting in a cafe, on the phone or in a lecture: our

hearing filters out a flood of irrelevant sounds to concentrate on those that we need to hear. It is thanks to this facility that we are able to focus on a single instrument in a symphony orchestra, or participate in intimate conversations in a noisy environment.

Spatial hearing

Our ears can hear 360 degrees around our heads. They can differentiate between front and back, up and down. This enables us to discern where a sound is coming from, how big a room is or whether there is an obstruction in the area.

How we hear

The outer ear

The outer ear collects sound like a funnel, combines it, and transmits it through the ear canal to the eardrum.

The middle ear

The middle ear is made up of the eardrum and three tiny bones: the 'hammer', 'anvil' and 'stirrup'. Sound travelling from the outer ear causes the thin eardrum to vibrate.

The tiny bones or 'ossicles' concentrate the sound energy from the big area of the eardrum to the small area of the stirrup plate. This then transmits the sound to the fluid-filled inner ear.

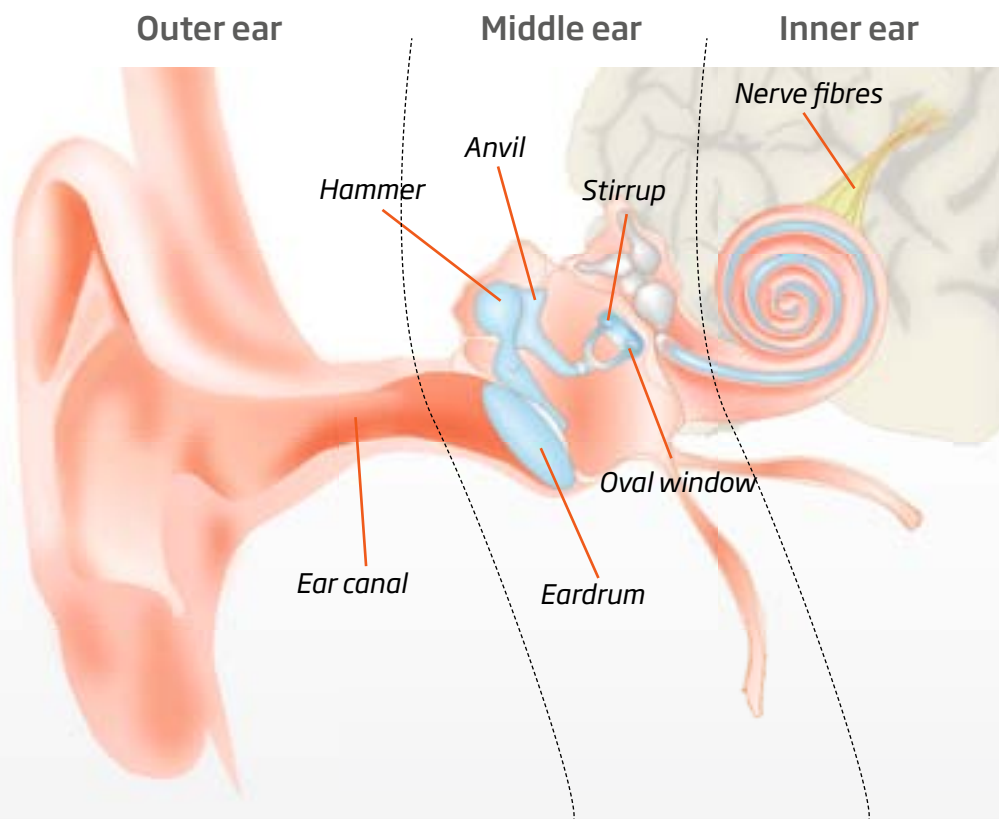
The inner ear

The inner ear begins with the oval window, which is fused to the stirrup bone of the middle ear. The fluid that fills the snail-shaped hearing organ, the cochlea, is set in motion by the powerful vibrations of the oval window.

The 'waves' of the inner ear fluid move tiny hairs in the cochlea. These hairs are the beginnings of nerve strands. Moving them creates electrical pulses that are transmitted to the brain.

The brain

The stimulation of the sensory cells is transmitted via around 30,000 nerve fibres that make up the auditory nerve. This signal is then passed to the region of the brain responsible for the processing, evaluation and interpretation of hearing impulses. It is only within the brain that these sounds are turned into actual hearing. From mechanical sound pulses, the brain creates your individual sound experience.



**It is only within the brain
that sounds are turned into
actual hearing**

It can happen to anyone - regardless of age

For a variety of reasons, hearing loss has increased markedly in recent years.

We live in an ever-louder world that increasingly harms our hearing. Other causes include infections, injuries, diseases, drugs or birth impairments. In addition, hearing slowly deteriorates with increasing age. According to Statistics Canada, more than one million adults across the country reported having a hearing-related issue, a number more than 50% greater than the number of people reporting problems with their eyesight (StatsCan, 2002).

Types of hearing loss:

1. Conductive

This hearing loss occurs in the outer or middle ear, because the transmission of sound to the inner ear is impaired. Possible causes: a hole in the eardrum, a middle ear infection,

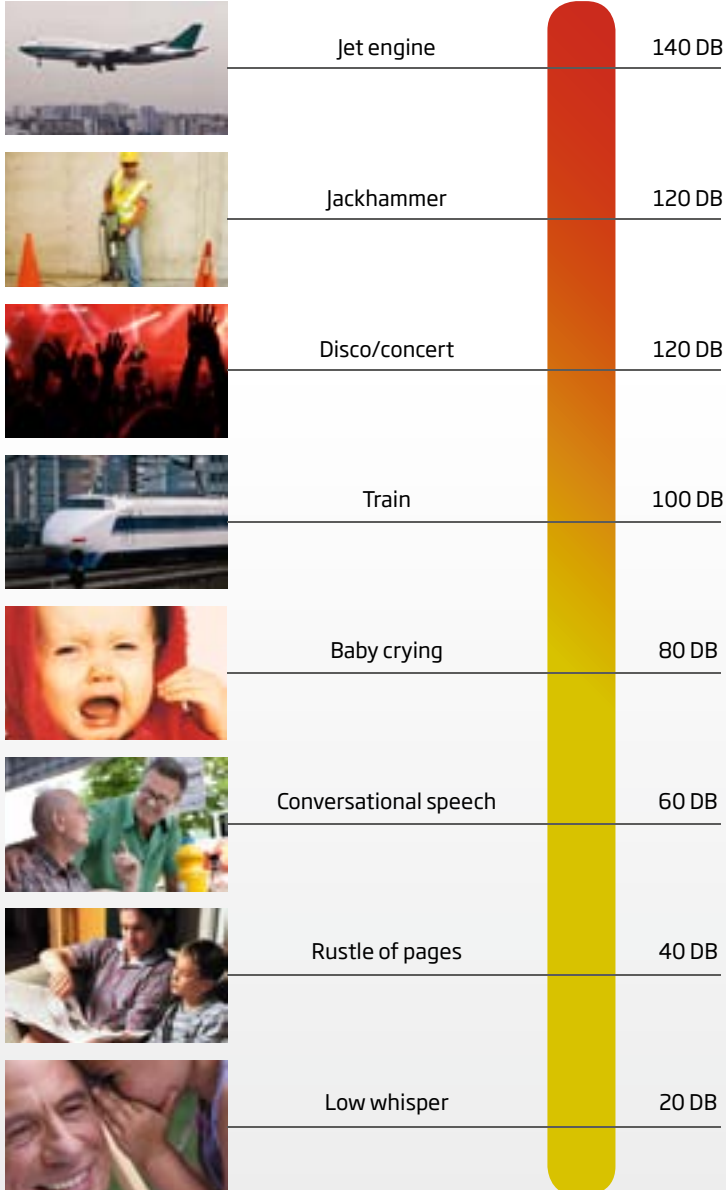
fluid in the middle ear or damaged ossicles. This can often be relieved by a surgical procedure.

2. Sensory

Here, the delicate hair cells in the inner ear are irreparably damaged, or forwarding to the brain is disrupted. The two most common causes are: 1. excessive noise, e.g. construction or factory workers, loud concerts or MP3 players; 2. the natural aging process.

Well-adjusted hearing solutions can even out sounds that natural hearing can no longer cope with.

Common sources of noise



DANGER ZONE Hearing protection in the workplace required by law

**Friends, colleagues
or relatives are often the
first to notice the change
in your hearing**



Because the process is gradual, you may not initially notice your hearing loss

People around you get the impression that you're not listening to them or that you have the TV turned up way too loud. They might notice that conversations with you are suddenly slower and more difficult than before.

When you first notice hearing problems, it's easy to try to compensate for them. This is tiring.

When your hearing begins to get worse, it doesn't mean that everything is suddenly quieter.

Some noises often remain audible and loud - such as a lawnmower - while others become very faint or disappear completely. Voices sound distorted, indistinct and unnatural - you can hear, but you cannot understand.



Conversations in a noisy environment become a challenge.

Softer and high-pitched consonants, which are hard to hear like F, S or T can be masked by the louder, low-pitched vowels A, O and U. So when someone says "Skate" but you can only hear "S_a_e," you have to guess the rest.

By the time you've worked out the solution, the conversation has moved on.

To avoid having to confront such difficult situations in the first place, it makes sense to act early. Complete the simple self-test on the next page to see whether you might be experiencing hearing loss.

Taking the first step

How good is your hearing?

It's time for a few honest answers.

	Yes	No
Do people around you seem to mumble?	<input type="checkbox"/>	<input type="checkbox"/>
Do you find it hard to hear someone who speaks from behind you or from another room?	<input type="checkbox"/>	<input type="checkbox"/>
Do you need to look closely at someone to follow a conversation?	<input type="checkbox"/>	<input type="checkbox"/>
Do you turn up the volume of the TV or radio?	<input type="checkbox"/>	<input type="checkbox"/>
Do you find it hard to hear phone conversations?	<input type="checkbox"/>	<input type="checkbox"/>
Do you find that you can't hear as well as you used to in the cinema, at the theatre or when you're out for the evening?	<input type="checkbox"/>	<input type="checkbox"/>
Do you find it hard to hear in environments with a lot of background noise, such as on the street or in the car?	<input type="checkbox"/>	<input type="checkbox"/>
Do you feel that your effectiveness at work is compromised by your difficulties in hearing and communicating?	<input type="checkbox"/>	<input type="checkbox"/>
Do your relatives, friends or colleagues ever mention that they often have to repeat things for you?	<input type="checkbox"/>	<input type="checkbox"/>

What now?

If you have answered “yes” to some of these questions, it’s time to let your local hearing care professional test your hearing for you. It takes less than an hour and is often free of charge.

In the best case, your hearing care professional will confirm that your hearing is fine and that any possible damage can be easily remedied.

If this is not the case, you should take action as soon as possible. Loss of hearing in the middle or inner ear will not get better on its own.

In fact, the opposite is true. The smaller the number of sounds that the ear captures and relays to the brain, the more hearing capacity the brain will lose. It’s a case of “use it or lose it”.

If a degree of hearing loss is confirmed, take time to let your hearing care professional advise you about all the possible solutions open to you.

You may find that your health insurance will cover some of the cost of any hearing aids you might need.

Call your insurance company or check with a competent advisor.

Please note! If you wait too long before taking action, your brain may lose the ability to process sounds delivered by even the very best hearing systems.



If you have answered “yes” to some of these questions, it’s time for a professional hearing test

Prepare yourself

Experience proves that your first consultation will be more effective if you can provide your hearing professional with some useful basic information.

For example, in which situations is your hearing most important to you (with your family, at work, during recreational activities)? When do you most notice that your hearing is not as good as it was?

0**10**

Not important at all

Extremely important

1. How important is it for you to improve your current ability to hear?

2. What disadvantages do you experience as a result of your hearing difficulties?

3. How do you feel about the hearing difficulties you are experiencing?

4. What advantages do you foresee if your hearing could be improved?

5. What specific questions do you have at this point?



For more information on hearing and
hearing loss please visit:
www.oticon.ca

People First

People First is our promise
to empower people
to communicate freely,
interact naturally and
participate actively

My Hearing Care Professional: