Do You Have a Hearing Loss? Self-Test

The following questions will help you determine if you have a hearing loss and need to have your hearing evaluated:

	Yes	*Sometimes*	*No*
1. Do you have a problem hearing over the telephone?			
2. Do you hear better on one ear than the other when you are on the telephone?			
3. Do you have trouble following the conversation with two or more people are talking at the same time?			
4. Do people complain that you turn the TV volume up too high?			
5. Do you have to strain to understand conversation?			
6. Do you have trouble hearing in a noisy background?			
7. Do you have trouble hearing in restaurants?			
8. Do you have dizziness, pain, or ringing in your ears?			
9. Do you find yourself asking people to repeat themselves?			
10. Do family members or co-workers remark about your missing what has been said?			
11. Do many people you talk to seem to mumble (or not speak clearly)?			
12. Do you misunderstand what others are saying and respond inappropriately?			
13. Do you have trouble understanding the speech of women and children?			
14. Do people get annoyed because you misunderstand what they say?			

If you have answered yes to more than two of these questions, have your hearing tested by a certified audiologist.

Unfair Hearing Test

http://www.irrd.ca/education/slide.asp?slideid=1

Type, Degree, and Configuration of Hearing Loss

When describing hearing loss we generally look at three attributes:

1. type of hearing loss,
2. degree of hearing loss, and
3. the configuration of the hearing loss.

Type of Hearing Loss

Hearing loss can be categorized by where or what part of the auditory system is damaged. There are three basic types of hearing loss: ***conductive hearing loss, sensorineural hearing loss and mixed hearing loss.***

Conductive Hearing Loss

Conductive hearing loss occurs when sound is not conducted efficiently through the outer ear canal to the eardrum and the tiny bones, or ossicles, of the middle ear. Conductive hearing loss usually involves a reduction in sound level, or the ability to hear faint sounds. This type of hearing loss can often be medically or surgically corrected.

Examples of conditions that may cause a conductive hearing loss include:

- *Conditions associated with middle ear pathology such as fluid in the middle ear from colds, allergies (serous otitis media), poor eustachian tube function, ear infection (otitis media), perforated eardrum, benign tumors*
- *Impacted earwax (cerumen)*
- *Infection in the ear canal (external otitis)*
- *Presence of a foreign body*
- *Absence or malformation of the outer ear, ear canal, or middle ear*

Sensorineural Hearing Loss

- Sensorineural hearing loss occurs when there is damage to the inner ear (cochlea) or to the nerve pathways from the inner ear (retrocochlear) to the brain. Sensorineural hearing loss cannot be medically or surgically corrected. It is a permanent loss.
- Sensorineural hearing loss not only involves a reduction in sound level, or ability to hear faint sounds, but also affects speech understanding, or ability to hear clearly.
- Sensorineural hearing loss can be caused by diseases, birth injury, drugs that are toxic to the auditory system, and genetic syndromes. Sensorineural hearing loss may also occur as a result of noise exposure, viruses, head trauma, aging, and tumors.

Mixed Hearing Loss

Sometimes a conductive hearing loss occurs in combination with a sensorineural hearing loss. In other words, there may be damage in the outer or middle ear and in the inner ear (cochlea) or auditory nerve. When this occurs, the hearing loss is referred to as a mixed hearing loss.

Unilateral Hearing Loss

Unilateral hearing loss (UHL) means that hearing is normal in one ear but there is hearing loss in the other ear. The hearing loss can range from mild to very severe. Approximately one out of 1000 children is born with UHL. Unilateral hearing loss can occur in both adults and children. Nearly 3% of school-aged children have UHL.Children with UHL are at higher risk for having academic, speech/language and social/emotional difficulties than their normal hearing peers. Some children with UHL experience these difficulties but others do not.

Many times we do not know the cause of hearing loss. Below are some possible causes of UHL:

- *Hearing loss that runs in the family (genetic or hereditary)*
- *An outer, middle or inner ear abnormality*
- *Specific syndromes*
- *Specific illnesses or infections*
- *Skull (temporal bone) fractures*
- *Excessive or extreme noise exposure*
- *Traumatic brain injury*

Degree of hearing loss refers to the severity of the loss. The numbers are representative of the patient's thresholds, or the softest intensity at which sound is perceived. The following is one of the more commonly used classification systems:

Degree of hearing loss	Hearing loss range (dB HL)
Normal	-10 to 15
Slight	16 to 25
Mild	26 to 40
Moderate	41 to 55
Moderately severe	56 to 70
Severe	71 to 90
Profound	91+

The configuration or shape of the hearing loss refers to the extent of hearing loss at each frequency and the overall picture of hearing that is created. For example, a hearing loss that only affects the high frequencies would be described as a high-frequency loss. Its configuration would show good hearing in the low frequencies and poor hearing in the high frequencies. On the other hand, if only the low frequencies are affected, the configuration would show poorer hearing for low tones and better hearing for high tones. Some hearing loss configurations are flat, indicating the same amount of hearing loss for low and high tones.

Other descriptors associated with hearing loss are:

- **Bilateral versus unilateral.** Bilateral hearing loss means both ears are affected. Unilateral hearing loss means only one ear is affected.
- **Symmetrical versus asymmetrical.** Symmetrical hearing loss means that the degree and configuration of hearing loss are the same in each ear. An asymmetrical hearing loss is one in which the degree and/or configuration of the loss is different for each ear.

- **Progressive versus sudden hearing loss.** Progressive hearing loss is a hearing loss that becomes increasingly worse over time. A sudden hearing loss is one that has an acute or rapid onset and therefore occurs quickly, requiring immediate medical attention to determine its cause and treatment.
- **Fluctuating versus stable hearing loss.** Some hearing losses change—sometimes getting better, sometimes getting worse. Fluctuating hearing loss is typically a symptom of conductive hearing loss caused by ear infection and middle ear fluid, but also presents in other conditions such as Meniere's disease.

The Interactive Ear
http://www.hearingcenteronline.com/ear2.shtml

QUESTION: Do insects have ears?
ANSWER: Many insects can hear sounds but they do not hear in the same way as you or I. Cicadas have their hearing organs in their stomachs. Crickets have their hearing organs in their knees. Male mosquitoes hear with thousands of tiny hairs growing on their antennae.

QUESTION: Do fish or snakes have ears?
ANSWER: Fish do not have ears but they can hear. They hear pressure changes through ridges on their bodies. Snakes do not have ears, but their tongues are sensitive to sound vibrations.

QUESTION: Do you know any interesting stories about hearing?
ANSWER: Here is an interesting story. In World War One (WWI) Parrots were kept on the Eiffel Tower in Paris, France because of their remarkable sense of hearing. When the Parrots heard the enemy aircraft coming they would warn everyone of the approaching danger long before any human ear would hear it.

QUESTION: Where does the sound in a seashell come from?
ANSWER: Contrary to popular myth, the sound of waves in a seashell are not made by the echo of blood pulsing in the ear. In fact, what we are hearing is environmental noise that sounds different because it is reflected off of the interior of the seashell. This distorts the sound we hear, and depending on the size and shape of the shell, amplifies certain frequencies and muffles others. Take a look at Discovery Online's article The Skinny On...The Ocean in a Seashell by Hannah Holmes for an interesting explanation of this phenomenon.

QUESTION: What causes you to hear your heartbeat in your ear?
ANSWER: Our ears are very sensitive. The eardrum reacts to very small movements in the air, which we cannot feel on our skin but the ear picks up. Most people can hear their heartbeats when they go into a very quiet room. Because the ear is so sensitive, it is able to pick up the pulse from our bodies. If you hear a loud pulse all the time, you should go see your doctor.

The Ocean in a Seashell *By Hannah Holmes*

"Why is it that you hear a sound when you put a glass or seashell to your ear?" -- Greg Rudy

Oh, the allure of the inobvious answer! Someone once told me that when you put a shell to your ear, you're hearing the sound of blood coursing through your own skull. It was such a surprising notion that I assumed it had to be true. It's not.

"Do you have a coffee cup on your desk?" asked Dr. Charles Berlin, an audiologist talking to me from the Kresge Hearing Research Laboratory in New Orleans.

"Yeah."

"Put it up against your ear. Wait -- it's an empty cup, right?" (I'm working on a theory: Scientists think English majors have a dusty tangle of old typewriter ribbons where the brain is supposed to be.)

"OK. Press it against your head, then rock it. Hear the change?" (To try this at home, alternately seal the glass against your head then break the seal.)

"Around you is this constant barrage of noise that you tend to ignore," he continues. "When you put something near your ear, it strengthens a certain group of frequencies. You're just enhancing environmental noise with that cup."

Even when the cup is sealed against your head, some sound waves are beating through the ceramic and bouncing around inside the cavity, then registering on your ear drum.

The dimensions of the cup -- or shell, or organ pipe, or mandible -- determines which sound waves will be amplified and which will be squelched. Wait ... mandible?

Dr. Berlin tells me to put down the cup and press the phone to my ear. I hear a musical, "tloonk!" like a wooden stick on a wooden bowl. It's actually his wooden finger against his wooden throat. He plays me a series of notes. It's not a song, thank heavens, just a fleshy, tubular sort of scale.

"Just by changing the shape of the resonating cavity, I'm changing the pitch," he explains. Certain wavelengths prefer a wide-open mouth; others thrive in a cramped space. You can do a cheap imitation of this trick by snapping a finger against your cheek as you form smaller and larger Os with your lips.

That's the basic answer: There's all this noise flying around all the time. Forcing these sound waves to bounce off something before they enter your ear changes the mix of frequencies that are resonated, or strengthened. So the sound waves suddenly sound different. And sometimes, they sound like waves on a beach.

But there's another dynamic at work in the seashell or the coffee cup.

This second type of resonance is called "Helmholtz," after the guy who described mathematically what happens when you blow across the mouth of a bottle. Helmholtz's resonance is caused by the vibration of a "spring" of air inside the bottle, which quakes under the assault of your breath. (It's nothing personal, I'm sure.) Both the Helmholtz and "coffee cup" kinds of resonance contribute to the noise you hear in a seashell.

Helmholtz is described to me by an Illinois acoustician who makes high-performance hearing aids and ear plugs. This guy, Dr. Mead Killion, talks to me on the speaker phone in his car as he drives. He's talking a blue streak, thinking a red streak, and the white noise punctuated by toll-booth exchanges and cell-phone static make him impossible to follow. But I do prick up my ears when he tells me that people used to break the tip off big seashells and use them as hearing aids.

"As the sound goes through the shell, it's forced into a smaller and smaller space," he explains, every other word lost to a fire engine or an underpass. "There's less motion, and higher pressure." When the sound waves are finally freed at the end of the shell, they rap much harder on the eardrum.

Straining to hear Dr. Killion, I roll a cone of paper, put my phone in the big end and stick the little end in my ear. I hear nothing. And when I pull it out, it is limp with coffee, and bits of old typewriter ribbon cling to the end.

Vocabulary

intensity, n.: "You know that old thing, 'If a tree falls in the forest and no one hears it, did it make a sound?'" Berlin asks me. "Well, the answer is pretty simple: There is intensity, but there is no loudness." Physicists think of sound waves in terms of their intensity, or forcefulness. Psychologists describe them in terms of how people perceive them, or their loudness. No people in the forest, no loudness.