



HEARING GUIDE

PREPARED FOR CLINICAL PROFESSIONALS

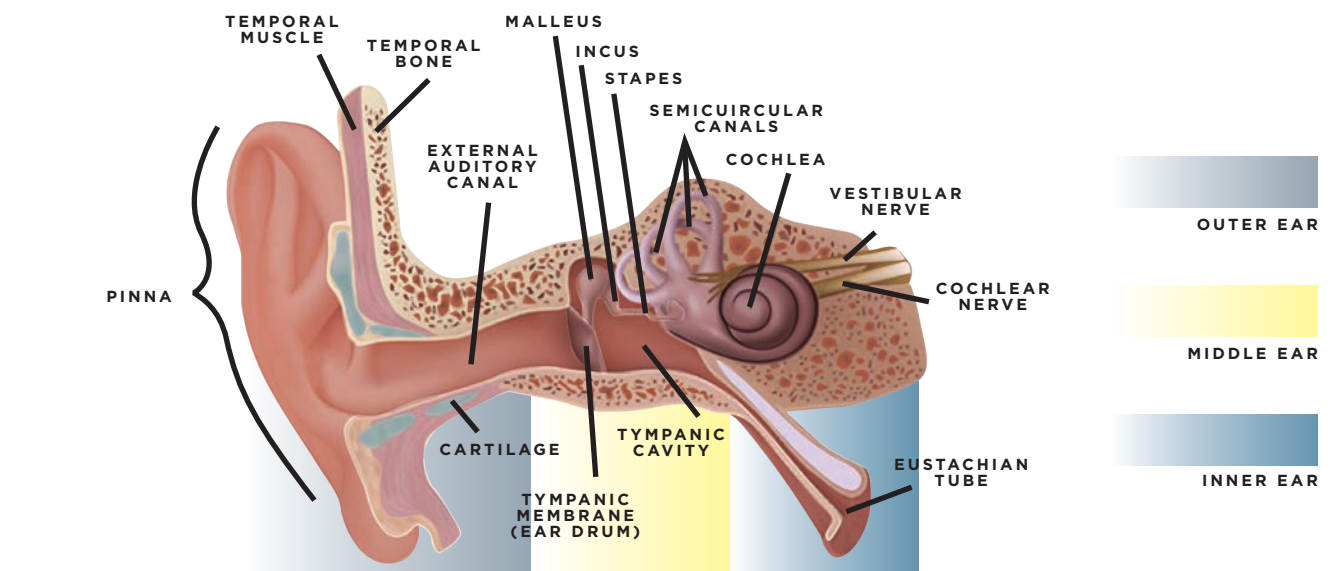


HEARING.HEALTH.MIL



DEPARTMENT OF DEFENSE
**HEARING CENTER
OF EXCELLENCE**





THE EAR is the organ of hearing and balance. It is divided into three parts:

- Outer ear
- Middle ear
- Inner ear

THE OUTER EAR consists of the:

- Pinna
- External auditory canal

THE EAR DRUM, or tympanic membrane, separates the outer ear from the middle ear.

THE MIDDLE EAR is an air-filled chamber containing three small bones called ossicles. They're named the:

- Malleus, or hammer
- Incus, or anvil
- Stapes, or stirrup

Collectively, these bones are known as the Ossicular Chain. Normal hearing occurs when sound waves pass through the ear canal and vibrate the ear drum, setting the ossicular chain into motion transmitting vibration through the middle ear to the inner ear.

THE INNER EAR has two major parts:

- Cochlea
- Vestibular system

THE COCHLEA:

- Is the organ of hearing
- Is shaped like a snail's shell
- Has small hair cells called cilia that are bathed in fluid

THE CILIA respond based on the frequency of sound and create signals that become nerve impulses.

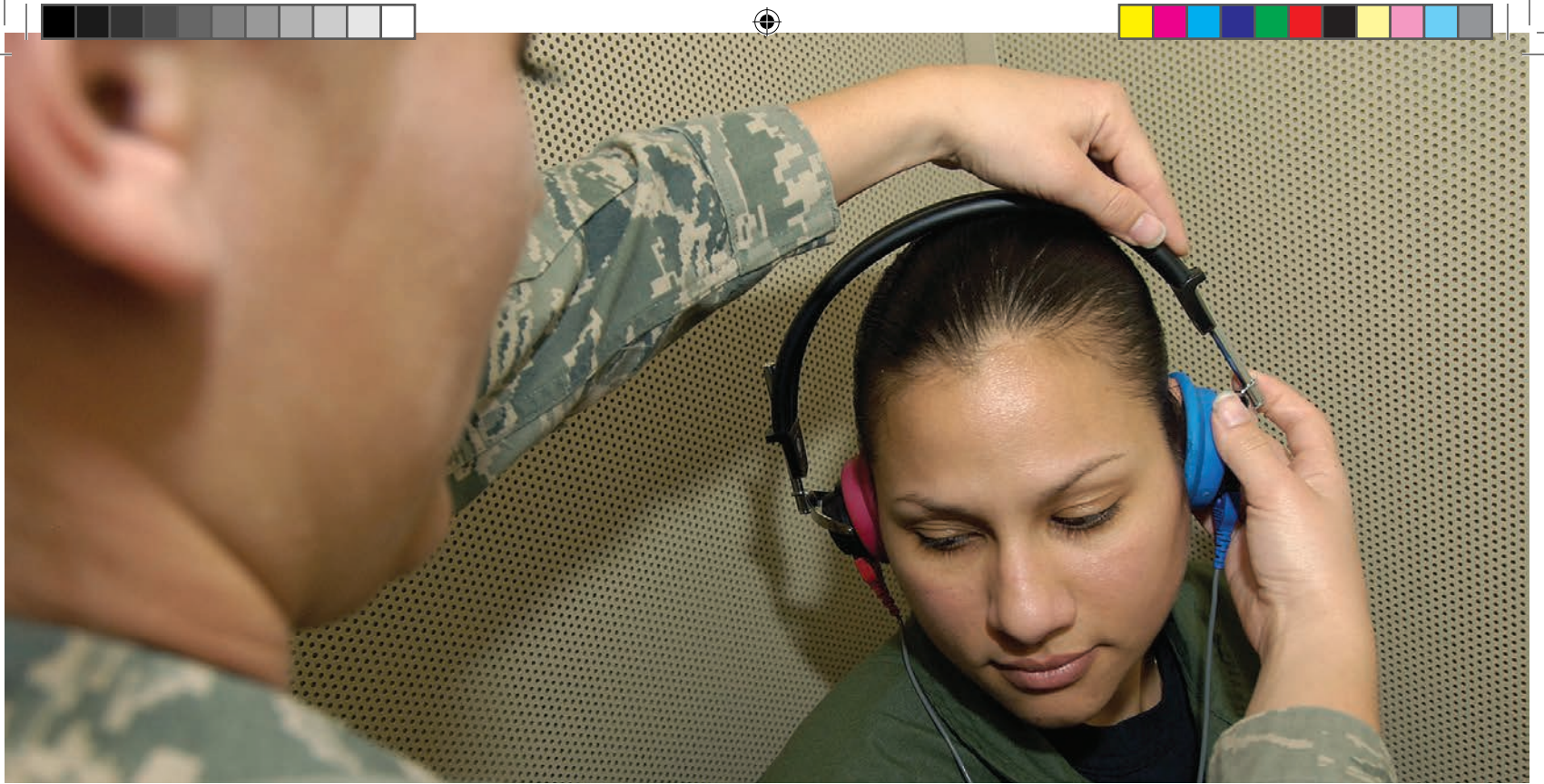
THE VESTIBULAR SYSTEM is made up of:

- The utricle
- The saccule
- Three fluid-filled semi-circular canals

The semi-circular canals signal the brain regarding the direction of body movement. The utricle and saccule respond to changes in linear acceleration and control posture and balance.

HEARING.HEALTH.MIL

ANATOMY



HEARING LOSS IS CATEGORIZED INTO THREE BASIC TYPES:

CONDUCTIVE HEARING LOSS is the result of a problem in the outer or middle ear, such as:

- Ear canal blockage
- Ear drum perforation
- Ear infection
- Fluid in the middle ear space
- Damage to the tiny bones of the middle ear

SENSORINEURAL HEARING LOSS is the most common type of permanent hearing loss and results from:

- Damage to the cilia, or hair cells, in the inner ear
- Damage to the nerve pathways from the inner ear to the brain

MIXED HEARING LOSS is a combination of conductive and sensorineural hearing loss. Damage may occur:

- To the outer or middle ear and in the inner ear or auditory nerve
- Because of a head injury, chronic infection, or an inherited disorder

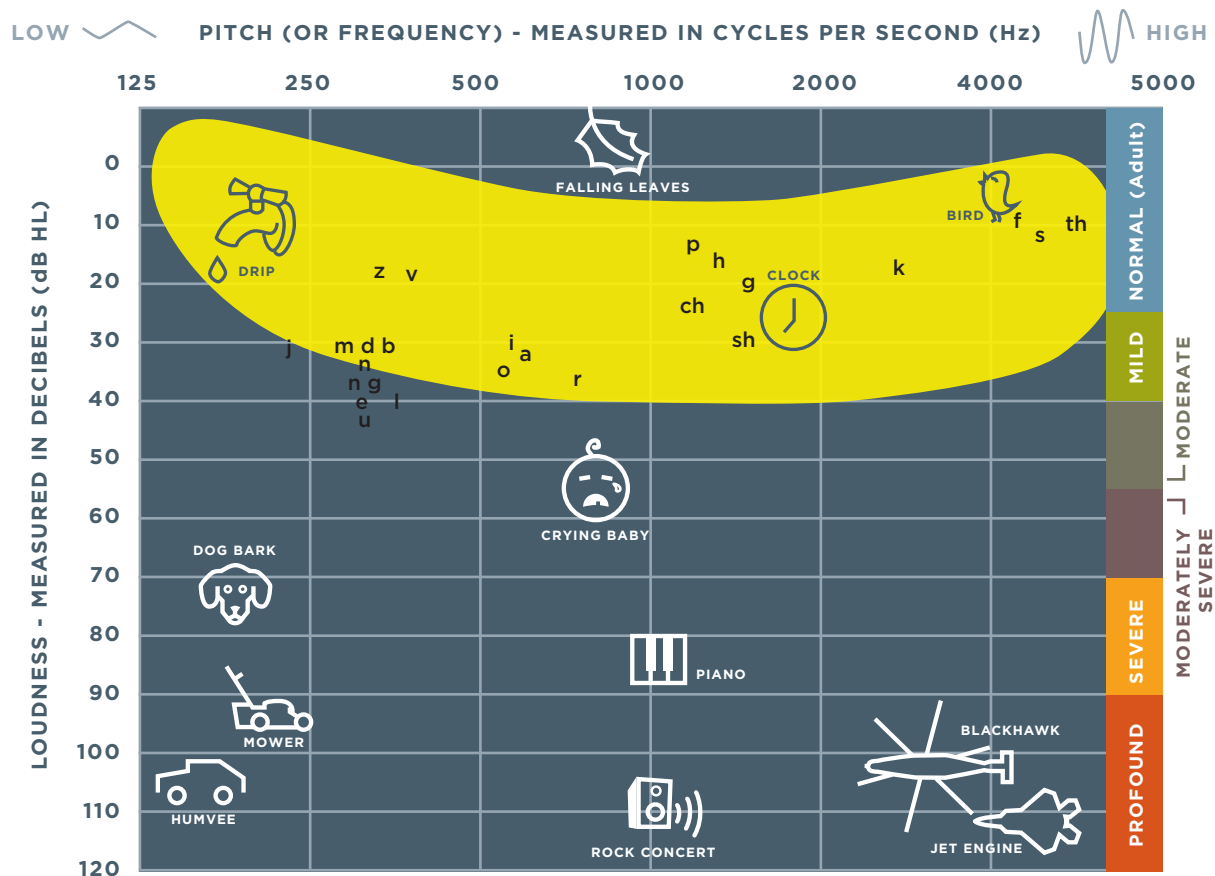
HEARING LOSS IS CLASSIFIED BY DEGREE OR SEVERITY:

- Mild hearing loss
- Moderate hearing loss
- Moderately severe hearing loss
- Severe hearing loss
- Profound hearing loss

HEARING.HEALTH.MIL

HEARING LOSS

When the sounds of human speech, or phonemes, are plotted on an audiogram, they take the shape of a banana. This is often referred to as the speech banana.



Hearing loss within the frequencies of the speech banana can:

- Affect a child's ability to learn language
- Hinder communication in those with noise-induced hearing loss and age-related hearing loss

People with normal hearing can also hear sounds outside of the speech banana. These sounds include:

Ambient natural sounds

- Rustling leaves in the wind
- Chirping birds

Artificial sounds

- Music
- Mechanical noises, such as automobiles and lawn mowers

Hearing aids are electronic devices that pick up and increase sound. They’re available in the following styles:



1	COMPLETELY-IN-CANAL, OR CIC — the smallest hearing aids
2	IN-THE-CANAL, OR ITC — fit in the ear canal
3	IN-THE-EAR, OR ITE — the largest custom-made style
4	RECEIVER-IN-CANAL, OR RIC — come in standard or mini BTE options
5	OPEN-FIT BEHIND-THE-EAR — available in standard or mini BTE options
6	BEHIND-THE-EAR, OR BTE — the largest hearing aids

ASSISTIVE LISTENING DEVICES
INCLUDE:

- Alerting devices that use loud sounds or visual signals, such as a blinking light
- Hearing assistive technology systems help reduce background noise and strengthen sounds. These include:
 - ✓ Personal FM systems
 - ✓ Infrared systems
 - ✓ Induction loop systems
 - ✓ Personal amplifiers

COMMUNICATION STRATEGIES
INCLUDE:

- Be positive and relax
- Face the speaker directly
- Avoid back lit situations
- Avoid settings with excess background noise
- Maintain a sense of humor
- Ask the speaker to speak clearly and at a moderate pace
- Ask the speaker to use visual cues, facial expressions, and gestures
- Don’t get discouraged
- If you don’t understand, ask the speaker to repeat
- Learn to lip read
- Let the speaker know how they can improve communication

HEARING.HEALTH.MIL
It’s a noisy world ... Protect your hearing.

