

Course

Medical
Terminology

Unit XI

The Special
Senses

Essential**Question:**

What medical
terms are
associated with
the special
senses?

TEKS

130.203 (c)
(1) (A), (B), (E)
(2)(B)
(4) (A), (B)

**Prior Student
Learning**

None

Estimated time

2-3 hours

Rationale

Healthcare professionals must have a comprehensive medical vocabulary in order to communicate effectively with other health professionals. They should be able to use terminology of the eye to discuss common conditions and diseases.

Objectives

Upon completion of this lesson, the learner should be able to:

- Define and decipher common terms associated with the ear
- Identify the basic anatomy of the ear
- Analyze unfamiliar terms using the knowledge of word roots, suffixes and prefixes gained in the course
- Research diseases and disorders which involve the ear

Engage

Find a free online ear anatomy game. There are several out there. The one I used is puposegames.com. Have the kids play the game naming the parts of the ear. Explain that they will learn terminology related to the ear in this lesson

Key Points

- I. The sense of hearing
 - a. Enhances one's life
 - b. Makes communication easier
 - c. The structure of the ear is divided into three separate regions
- II. Outer Ear
 - a. Sound waves enter the ear through the pinna, or auricle, which is the projecting part or flap of the ear
 - b. The external auditory meatus (auditory canal) leads from the pinna and is lined with numerous glands that secrete a yellowish brown, waxy substance called cerumen, which lubricates and protects the ear
- III. Middle Ear
 - a. Sound waves travel through the auditory canal and strike a membrane, or eardrum
 - b. As the eardrum vibrates, it moves three small bones or ossicles
 - i. Malleus
 - ii. Incus
 - iii. Stapes
 - c. Auditory or Eustachian tube
 - i. A canal leading from the middle ear to the pharynx
 - ii. It is normally closed, but opens on swallowing to equalize pressure
- IV. Inner Ear
 - a. Sound vibrations reach the inner ear via the fluctuation of the oval

- window that separates the middle and inner ears
 b. Sometimes called the labyrinth
 c. Cochlea
 - i. Contains special auditory liquids through which the vibrations travel (Perilymph and endolymph)
 - ii. Organ of Corti: sensitive auditory receptor
 - iii. Auditory nerve fibers end in the auditory cent of the cerebral cortex, where impulse are interpreted and “heard”
- V. Equilibrium
- a. The ear is an important organ of equilibrium (balance)
 - b. Vestibule connects the cochlea (for hearing) to three semicircular canals for balance
- VI. Pathway of sound vibrations
- | | | |
|--|---|-------------------|
| Pinna
External auditory canal
Tympanic membrane | } | outer ear |
| | | |
| Malleus
Incus
Stapes
Oval window | } | Middle ear |
| | | |
| Cochlea
Organ of Corti
Auditory nerve fibers | } | Inner Ear |
| | | |
| Cerebral cortex | } | Brain |
- VII. Vocabulary

Term	Meaning
Auditory canal	Channel that leads from the pinna to the eardrum
Auditory meatus	Auditory canal
Auditory nerve fibers	Carry impulse from the inner ear to the brain (cerebral cortex). These fibers compose the vestibulocochlear nerve (cranial nerve VIII).
Auditory tube	Channel between the middle ear and the nasopharynx; Eustachian tube.
Auricle	Flap of the ear; the protruding part of the external ear, or pinna
Cerumen	Waxy substances secreted by the external ear; also called earwax.
Cochlea	Snail-shaped, spirally wound tube in the inner ear; contains hearing-sensitive receptor cells.
Endolymph	Fluid within the labyrinth of the inner ear.
Eustachian tube	Auditory tube.
Incus	Second ossicle (bone) of the middle ear; incus means anvil.

Labyrinth	Maze-like series of canals of the inner ear, which includes the cochlea, vestibule, and semicircular cans.
Malleus	First ossicle of the middle ear; malleus means hammer.
Oran of Corti	Sensitive auditory receptor area found in the cochlea of the inner ear.
Ossicle	Small bone of the ear; includes the malleus, incus and stapes.
Oval window	Membrane between the middle ear and the inner ear.
Perilymph	Fluid contained in the labyrinth of the inner ear.
Pinna	Auricle; flap of the ear.
Semicircular canals	Passage in the inner ear associated with maintaining equilibrium.
Stapes	Third ossicle of the middle ear. Stapes means stirrup.
Tympanic membrane	Membrane between the outer and middle ear; also called eardrum.
Vestibule	Central cavity of the labyrinth, connecting the semicircular canal and the cochlea. The vestibule contains two structures, the saccule and utricle that help to maintain equilibrium.

VIII. Combining Forms

Combining form	Meaning	Example of term
Acous/o	Hearing	Acoustic
Audi/o	Hearing	Audiogram
Audit/o	Hearing	Auditory
Aur/o, auricul/o	Ear	Aural
Cochle/o	Cochlea	Cochlear
Mastoid/o	Mastoid process	Mastoiditis
Myring/o	Eardrum, tympanic membrane	Myringotomy
Ossicul/o	Ossicle	Ossiculoplasty
Ot/o	Ear	Otic
Salping/o	Eustachian tube, auditory tube	Salpingopharyngeal
Staped/o	Stapes	Stapedectomy
Tympan/o	Eardrum	Tympanoplasty
Vestibu/o	Vestibule	vestibulocochlear

IX. Suffices

Suffix	Meaning	Example of term
-acusis or	Hearing	Hyperacusis

-cuspis		
-meter	Instrument to measure	Audiometer
-otia	Ear condition	Macrotia

X. Pathology

Condition	Description
Acoustic neuroma	Benign tumor arising from the acoustic vestibulocochlear nerve in the brain
Cholesteatoma	Collection of skin cells and cholesterol in a sac within the middle ear.
Deafness	Loss of the ability to hear.
Nerve deafness	Sensorineural hearing loss; results from impairment of the cochlea or auditory nerve
Conductive deafness	Hearing loss resulting from impairment of the middle ear ossicles and membranes transmitting sound waves into the cochlea.
Ménière disease	Disorder of the labyrinth of the inner ear elevated endolymph pressure within the cochlea and semicircular canals.
Otitis media	Inflammation of the middle ear.
Otosclerosis	Hardening of the bony tissue of the middle ear.
Tinnitus	Sensation of noises (ringing, buzzing,) in the ears.
Vertigo	Sensation of irregular or whirling motion either of oneself or of external objects.

XI. Clinical Procedures

Procedure	Description
Audiometry	Testing the sense of hearing.
Cochlear implant procedure	Surgical insertion of a device that allows sensorineural hearing-impaired persons to hear sound.
Ear thermometry	Measurement of the temperature of the tympanic membrane by detection of infrared radiation from the eardrum.
Otoscopy	Visual examination of the ear canal with an otoscope.
Tuning fork test	Test of ear conduction using a vibration source such as a tuning fork

XII. Abbreviations

Abbreviation	Definition
AD	Right ear
AOM	Acute otitis media
AS	Left ear

EENT	Eyes, ears, nose, throat
ENG	Electronystagmography; test of the balance mechanism of the inner ear by assessing eye movements
ENT	Ears, nose and throat
ETD	Eustachian tube dysfunction
HEENT	Head, eyes, ears, nose, and throat
PE tube	Pressure-equalizing tube (to treat recurrent episodes of acute otitis media)
SOM	Serous otitis media

Activity

- I. Make flash cards of ear terms and practice putting the terms together with prefixes and suffixes to make new terms.
- II. Complete the Ear Terms Worksheet
- III. Complete the Ear Vocabulary Worksheet
- IV. Review media terms with the students using review games such as the “Fly Swatter Game” or the “Flash Card Drill” (see the Medical Terminology Activity Lesson Plan - http://texashste.com/documents/curriculum/principles/medical_terminology_activities.pdf)
- V. Research and report on diseases and disorders from the Ear

Assessment

Successful completion of the activities

Materials

Medical Terminology book
List of Ear terminology
Ear terminology Key
Ear vocabulary words worksheet
Ear vocabulary worksheet Key
Index cards
Markers

Accommodations for Learning Differences

For reinforcement, the student will practice terms using flash cards of the ear.

For enrichment, the students will contact a local hearing aid center, and interview (in person or on the phone) a staff member asking what the steps are taken to establish the need for and the fitting for a hearing aid.

National and State Education Standards

National Healthcare Foundation Standards and Accountability Criteria:

Foundation Standard 2: Communications

2.21 Use roots, prefixes, and suffixes to communicate information

2.22 Use medical abbreviations to communicate information

TEKS

130.203 (c) (1) The student recognizes the terminology related to the health science industry. The student is expected to:

- (A) identify abbreviations, acronyms, and symbols;
- (B) identify the basic structure of medical words;
- (E) recall directional terms and anatomical planes related to the body structure

130.203 (c) (2) (B) employ increasingly precise language to communicate

130.203 (c) (4) The student interprets medical abbreviations. The student is expected to:

- (A) distinguish medical abbreviations used throughout the health science industry; and
- (B) translate medical abbreviations in simulated technical material such as physician progress notes, radiological reports, and laboratory reports.

Texas College and Career Readiness Standards

English and Language Arts,

Understand new vocabulary and concepts and use them accurately in reading, speaking, and writing.

1. Identify new words and concepts acquired through study of their relationships to other words and concepts.
2. Apply knowledge of roots and affixes to infer the meanings of new words.
3. Use reference guides to confirm the meanings of new words or concepts.

Cross-Disciplinary Standards,

I. Key Cognitive Skills D. Academic Behavior: 1. Self monitor learning needs and seek assistance when needed, 3. Strive for accuracy and precision, 4. Persevere to complete and master task. E. Work habits: 1. Work independently, 2. Work collaboratively

II. Foundation Skills A. 2. Use a variety of strategies to understand the meaning of new words. 4. Identify the key information and supporting details.

HEARING TERMINOLOGY

Worksheet

Write the meaning of the word in the right column.

Term	Meaning
aur/o- aur/i-	external ear
auricle aural	
tympan/o-	eardrum
tympanitis	
tympanoplasty	
Tympanohyal	
tympanotomy	
myring/o-	tympanic membrane/eardrum
myringectomy	
myringitis	
myringoplasty	
myringotomy	
ossicl/-	little bones
ossiculectomy	
mastoid/o-	air spaces in mastoid process of temporal bone
mastoiditis	
mastoidalgia	
mastoidectomy	
labyrinth/o-	inner ear (maze)
labyrinthectomy	
labyrinthitis	
labyrinthotomy	
audi/o-	hearing
audible	
audiologist	
audiometer	
audiometry	
acou/o-	hearing
acoustic	
acousticophobia	
ot/o-	ear
macrotia	
microtia	
otalgia	
otitis (external, internal, media)	
Otolaryngologist	
otolaryngology	

otomycosis	
otoneuralgia	
otoplasty	
otorrhea	
otoscope	
RELATED TERMS:	
cochlea	
endolymph	
equilibrium	
malleus=hammer / incus=anvil / stapes=stirrup	
Ménière disease	
perilymph	
pinna	
presbycusis	
Reissner's membrane	
sacculle	
tinnitus	
utricle	
vertigo	
vestibule	

HEARING TERMINOLOGY-Key

Term	Meaning
aur/o- aur/i-	external ear
auricle aural	Flap of the ear; the protruding part of the external ear, or pinna
tympan/o-	eardrum
tympanitis	Inflammation of the ear drum (otitis media)
tympanoplasty	Surgical procedure to repair the inflammatory process of the middle ear (repair of the ear drum)
Tympanohyal	Concerning the tympanic cavity and hyoid arch
tympanotomy	Incision of the tympanic membrane
myring/o-	tympanic membrane/eardrum
myringectomy	Excision of all or part of the tympanic membrane
myringitis	Inflammation of the tympanic membrane
myringoplasty	Plastic surgery of the tympanic membrane
myringotomy	Incision of the tympanic membrane
ossicl/-	little bones
ossiculectomy	Excision of an ossicle
mastoid/o-	air spaces in mastoid process of temporal bone
mastoiditis	Inflammation of the mastoid sinus
mastoidalgia	Pain in the mastoid
mastoidectomy	Surgical excision of the mastoid sinuses
labyrinth/o-	inner ear (maze)
labyrinthectomy	Excision of the labyrinth
labyrinthitis	Inflammation of the labyrinth
labyrinthotomy	Incision into the labyrinth
audi/o-	hearing
audible	Capable of being heard
audiologist	A specialist in audiology
audiometer	An instrument for testing hearing
audiometry	Testing of the hearing sense
acou/o-	hearing
acoustic	The science of sound
acousticophobia	Abnormal fear of loud sounds
ot/o-	ear
macrotia	Abnormally large ears
microtia	Abnormally small ears
otalgia	Pain in the ear
otitis (external, internal, media)	Inflammation of the ear
Otolaryngologist	A specialist in otolaryngology
otolaryngology	The medical science that includes otology, rhinology and laryngology.
otomycosis	Infection of the external auditory meatus of the ear,

	caused by fungus
otoneuralgia	The division of otology that deals with the inner ear, especially its nerve supply and nerve connections with the brain
otoplasty	Plastic surgery of the ear to correct defects
otorrhea	Inflammation of ear with purulent discharge
otoscope	Instrument to examine the ear
RELATED TERMS:	
cochlea	Snail-shaped, spirally wound tube in the inner ear; contains hearing-sensitive receptor cells.
endolymph	A pale transparent fluid within the membranous labyrinth of the inner ear
equilibrium	A state of balance
malleus=hammer / incus=anvil / stapes=stirrup	Ossicles
Ménière disease	Disorder of the labyrinth of the inner ear elevated endolymph pressure within the cochlea and semicircular canals.
perilymph	A pale transparent fluid within the membranous labyrinth of the inner ear
pinna	The auricle or projected part of the external ear
presbycusis	Progressive loss of hearing with aging
Reissner's membrane	A delicate membrane separating the cochlear canal from the scala vestibuli
sacculle	A small sac; the smaller of the two sacs of the membranous labyrinth in the vestibule of the inner ear
tinnitus	Sensation of noises (ringing, buzzing,) in the ears.
utricle	Any small sac; the larger of two sacs of the membranous labyrinth in the vestibule of the inner ear
vertigo	Sensation of irregular or whirling motion either of oneself or of external objects.
vestibule	Central cavity of the labyrinth, connecting the semicircular canal and the cochlea. The vestibule contains two structures, the sacculle and utricle that help to maintain equilibrium.

Vocabulary – The Ear Worksheet

In the right column, write the meaning of the term.

Term	Meaning
Auditory canal	
Auditory meatus	
Auditory nerve fibers	
Auditory tube	
Auricle	
Cerumen	
Cochlea	
Endolymph	
Eustachian tube	
Incus	
Labyrinth	
Malleus	
Organ of Corti	
Ossicle	
Oval window	
Perilymph	
Pinna	
Semicircular canals	
Stapes	
Tympanic membrane	
Vestibule	

Combining Forms

Write the meaning of the term in the center column and give an example of a term using the combining form.

Combining form	Meaning	Example of term
Acous/o		
Audi/o		
Audit/o		
Aur/o, auricul/o		
Cochle/o		
Matoid/o		
Myring/o		
Ossicul/o		
Ot/o		
Salping/o		
Staped/o		
Tympan/o		

Vestibu/o		
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Suffixes

Write the meaning of the suffix in the center column and give an example of a term using the suffix.

Suffix	Meaning	Example of term
-acusis or – cusis		
-meter		
-otia		

Abbreviations

Write the meaning of the abbreviation in the right column.

Abbreviation	Definition
AD	
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AS	
EENT	
ENG	
ENT	
ETD	
HEENT	
PE tube	
SOM	

Pathology of the Ear

Write the description of the condition in the right column.

Condition	Description
Acoustic neuroma	
Cholesteatoma	
Deafness	
Nerve deafness	
Conductive deafness	
Ménière disease	
Otitis media	
Otosclerosis	
Tinnitus	
Vertigo	

Clinical Procedures

Write the description of the procedure in the right column.

Procedure	Description
Audiometry	
Cochlear implant procedure	
Ear thermometry	
Otoscopy	
Tuning fork test	

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Audit/o	Hearing	Auditory
Aur/o, auricul/o	Ear	Aural
Cochle/o	Cochlea	Cochlear

Mastoid/o	Mastoid process	Mastoiditis
Myring/o	Eardrum, tympanic membrane	Myringotomy
Ossicul/o	Ossicle	Ossiculoplasty
Ot/o	Ear	Otic
Salping/o	Eustachian tube, auditory tube	Salpingopharyngeal
Staped/o	Stapes	Stapedectomy
Tympan/o	Eardrum	Tympanoplasty
Vestibu/o	Vestibule	vestibulocochlear

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