

CHAPTER 13

SPECIAL SENSES: THE EYE AND EAR

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MEDIA LIBRARY

Student DVD-ROM

- Twelve different interactive learning games
- Flash card generator
- Audio Glossary
- Professional Profile videos
 - Optometry
 - Audiology
- Body Rhythms
- Terminology Translator

Companion Website

- Multiple Choice, True/False, and Fill-in-the-Blank practice questions
- Labeling exercises
- Case study
- Additional Professional Profile information

- *New York Times* link for research into specific pathologies
- Web Destination activities
- Audio Glossary
- Link to VangoNotes
- Link to drug updates

IRDVD

- Animations
 - 3D interactive animation of Eye anatomy
 - 3D interactive animation of Ear anatomy
 - How we hear
- Drag-and-drop labeling
 - Eye structures
 - Ear structures

- Videos
 - Conjunctivitis
 - The optometrist
 - Cataracts
 - Macular degeneration
 - Using a Snellen chart
 - Audiography
 - Otitis media
 - Tympanometry
 - Audiometry

- Digital library of all figures from text chapter, labeled and unlabeled
- Test bank with 200 objective questions per chapter plus two short answer questions
- 20 classroom response questions
- PowerPoint presentation for classroom or online utilization

OBJECTIVE 1

Identify and define the combining forms and suffixes introduced in this chapter.

Text pages: 424; 439; PowerPoint slides: 6–10; 89–91

LECTURE NOTES

Eye Combining Forms

ambly/o	dull, dim
aque/o	water
blephar/o	eyelid
chrom/o	color
conjunctiv/o	conjunctiva
core/o	pupil
corne/o	cornea
cycl/o	ciliary muscle
dacry/o	tear, tear duct
dipl/o	double
glauc/o	gray
ir/o	iris
irid/o	iris
kerat/o	cornea
lacrim/o	tears
ocul/o	eye
ophthalm/o	eye
opt/o	eye, vision
optic/o	eye
nyctal/o	night
papill/o	optic disk
phac/o	lens
phot/o	light
presby/o	old age
pupill/o	pupil
retin/o	retina
scler/o	sclera
uve/o	choroid
vitre/o	glassy

Eye Suffixes

-metrist	one who measures
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TEACHING STRATEGIES

- Encourage/remind students to add new word parts to their flash cards.

Medical Terminology Bee

- Create PowerPoint flash cards of new combining forms and suffixes presented in this chapter; have all students stand and then define word part; if student is correct, he or she remains standing; if student is wrong, he or she sits down; continue until only one student is standing.

LEARNING ACTIVITIES

Worksheet 13A

- New Combining Forms and Suffixes Handout

Worksheet 13B

- Medical Term Analysis

Quiz 13A

- May be used as a worksheet

Text

- Practice Exercises

Student DVD-ROM

- Learning games
- Make flash cards

CW

- Practice questions

ASSESSMENTS

Quiz 13A—New Word Parts Quiz

Test Bank—Fill-in-the-Blank questions

-opia	vision
-tropia	to turn
Ear Combining Forms	
acous/o	hearing
audi/o	hearing
audit/o	hearing
aur/o	ear
auricul/o	ear
cerumin/o	cerumen
cochle/o	cochlea
labyrinth/o	labyrinth (inner ear)
myring/o	eardrum
ot/o	ear
salping/o	eustachian tube
staped/o	stapes
tympan/o	eardrum, middle ear
Ear Suffixes	
-cusis	hearing
-otia	ear condition

OBJECTIVE 2

Correctly spell and pronounce medical terms and major anatomical structures relating to the eye and ear.

LECTURE NOTES

Pronunciation for medical terms in this chapter can be found:

- In parentheses following key terms
- In the Audio Glossary on Student DVD-ROM
- In the Audio Glossary at Companion Website

TEACHING STRATEGIES

Emphasize to students:

- Importance of correctly spelling terms.
- How sounding out terms can assist in learning how to spell the terms.

Say each new term in class and have students repeat it.

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension of spelling strategies.

LEARNING ACTIVITIES

Worksheet 13B

- Medical Term Analysis

Terminology Checklist

- Can be used to practice pronunciation using the Audio Glossary as reference

Text

- Practice Exercises

Flash cards

- Look at the definition and write out/pronounce terms

Student DVD-ROM

- Audio Glossary
- Spelling Challenge game
- Crossword and Word Search puzzles

ASSESSMENTS

Quiz 13B—Spelling Quiz

Suggested terms:

1. sclera
2. aqueous
3. nasolacrimal
4. blepharoptosis
5. dacryocystitis
6. ophthalmalgia
7. emmetropia
8. xerophthalmia
9. achromatopsia
10. astigmatism
11. amblyopia
12. pterygium
13. vestibulocochlear
14. eustachian
15. labyrinthotomy
16. otopyorrhea
17. presbycusis
18. otosclerosis
19. myringotomy
20. tinnitus

Test Bank—questions

OBJECTIVE 3

Locate and describe the major structures of the eye and ear and their functions.

Text pages: 426–429; 441–442; PowerPoint slides: 11–39; 92–109

LECTURE NOTES

Anatomy and Physiology of Eye

- **Ophthalmology** (Ophth)—study of eye
- **Eyeball**—organ of sight; transmits external image by way of **optic nerve** to brain; brain translates sensory impulses into image
- Several external structures also play role in vision: **eye muscles**, **eyelids**, **conjunctiva**, and **lacrimal apparatus**

Eyeball

- Eyeball is composed of three layers: **sclera**, **choroid**, and **retina**

Sclera

- Outer layer
- Tough protective coating for inner structures
- Also called *white of eye*
- **Cornea**—anterior portion of sclera (see ■ Figure 13.1); clear, transparent area; allows light to enter interior of eyeball; bends, or **refracts**, light rays

TEACHING STRATEGIES

Visual Aids

- Use full-size anatomical charts and models to illustrate eye and ear structures.

IRDVD

- See PowerPoint presentation on the Instructor's Resource DVD for drag-and-drop activities for both eye and ear structures; display on screen and have students discuss and place labels during class
- See PowerPoint presentation on the Instructor's Resource DVD for 3D animations of both eye and ear structures.

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

Choroid

- Middle layer of eyeball
- Opaque layer provides blood supply for eye
- Anterior portion of choroid layer consists of the **iris**, **pupil**, and **ciliary body** (see ■ Figure 13.1)
- **Iris**—colored portion of eye; contains smooth muscle
- **Pupil**—opening in center of iris; allows light rays to enter eyeball; iris muscle contracts or relaxes to change size of pupil, controlling how much light enters interior of eyeball
- **Lens**—behind iris; not actually part of choroid layer, but is attached to muscular **ciliary body**; by pulling on edge of lens, ciliary body muscles change shape of lens so it can focus incoming light onto retina

Retina

- Innermost layer of eyeball
- Contains sensory receptor cells, **rods** and **cones**, that respond to light rays
- **Rods**—active in dim light and see in gray tones
- **Cones**—active only in bright light and are responsible for color vision
- When lens projects image onto retina, it strikes area called **macula lutea**, or *yellow spot* (see ■ Figure 13.1); in center of macula lutea is depression called **fovea centralis**, meaning *central pit*; pit contains high concentration of sensory receptor cells; point of clearest vision
- **Optic disk**—point where **retinal blood vessels** enter and exit eyeball and where optic nerve leaves eyeball (see ■ Figure 13.2); no sensory receptor cells in optic disk; it causes *blind spot* in each eye's field of vision
- Interior spaces of eyeball are not empty; space between cornea and lens filled with **aqueous humor**, a watery fluid; large open area between lens and retina contains **vitreous humor**, a semisolid gel.

Muscles of Eye

- Six muscles connect eyeball to skull (see ■ Figure 13.3)
- Change direction of each eye's sightline
- Provide support for eyeball in eye socket
- Children may be born with weakness in some muscles and may require treatments such as eye exercises or even surgery to correct problem; commonly referred to as crossed eyes or *strabismus* (see ■ Figure 13.4)
- Four **rectus** and two **oblique muscles**; rectus muscles (meaning straight) pull eye up, down, left, or right in straight line; oblique muscles are on angle and produce diagonal eye movement

Eyelids

- Pair of eyelids over each eyeball (see ■ Figure 13.1)
- Provide protection from foreign particles, injury from sun and intense light, and trauma
- Eyelids have **eyelashes** or **cilia**
- **Sebaceous glands** located in eyelids secrete lubricating oil onto eyeball

Conjunctiva

- Mucous membrane
- Forms continuous covering on underside of eyelid and across anterior surface of eyeball (see ■ Figure 13.1)
- Protection for eye by sealing off eyeball in socket

LEARNING ACTIVITIES

Worksheet 13C

- Chapter Review

Text

- Labeling exercises 13.A1, 13.A2, & 13.B
- Practice Exercises

Student DVD-ROM

- Labeling exercise
- Learning games

CW

- Labeling exercise
- Practice questions

Quizzes 13C & 13D

- May be used as worksheets

Lacrimal Apparatus

- **Lacrimal gland**—located under outer upper corner of eyelid
- Produces **tears**; serves important function of washing and lubricating anterior surface of eyeball
- **Lacrimal ducts**—located in inner corner of eye socket; collect tears and drain them into **nasolacrimal duct**; duct ultimately drains tears into **nasal cavity** (see ■ Figure 13.5)

Anatomy and Physiology of Ear

- **Otology** (Oto)—study of ear
- **Audiology**—study of hearing disorders
- Responsible for two senses: **hearing** and **equilibrium** (sense of balance); hearing and equilibrium sensory information is carried to brain by cranial nerve VIII, **vestibulocochlear nerve**; nerve is divided into two major branches; **cochlear nerve** carries hearing information and the **vestibular nerve** carries equilibrium information
- Ear is subdivided into three areas:
 1. **External ear**
 2. **Middle ear**
 3. **Inner ear**

External Ear

- Consists of three parts: **auricle**, **auditory canal**, and **tympanic membrane** (see ■ Figure 13.14)
- Auricle or **pinna**—commonly referred to as *the ear* because is only visible portion; funnel to capture sound waves as go past outer ear; channels them through **external auditory meatus**.
- Sound moves along auditory canal and causes tympanic membrane (eardrum) to vibrate; tympanic membrane separates external ear from middle ear.
- Ear wax or **cerumen** produced in oil glands in auditory canal; protects and lubricates ear; barely liquid at body temperature; cerumen slowly flows out of auditory canal, carrying dirt and dust with it; auditory canal is self-cleaning.

Middle Ear

- Located in cavity in temporal bone of skull (see ■ Figure 13.15)
- Air-filled cavity contains three tiny bones called **ossicles**—**malleus**, **incus**, and **stapes**; amplify vibrations in middle ear and transmit them to inner ear from malleus to incus and finally to stapes
- Stapes, last of three ossicles, is attached to very thin membrane that covers opening to inner ear called **oval window**
- **Eustachian tube** or **auditory tube**—connects nasopharynx with middle ear (see ■ Figure 13.14); each time person swallows eustachian tube opens; allows pressure to equalize between middle ear cavity and atmospheric pressure

Inner Ear

- Located in cavity within temporal bone (see ■ Figure 13.14)
- Fluid-filled cavity is referred to as **labyrinth** because of its shape; contains hearing and equilibrium sensory organs: **cochlea** for hearing and **semicircular canals**, **utricle**, and **sacculle** for equilibrium
- Each organ contains hair cells, actual sensory receptor cells; in cochlea, hair cells referred to as **organs of Corti**

ASSESSMENTS

Quiz 13C & 13D—Labeling Diagrams

Test Bank—questions

OBJECTIVE 4

Describe how we see.

Text pages: 429–430; PowerPoint slides: 40–44

LECTURE NOTES

- When light rays strike eye, first pass through cornea, pupil, aqueous humor, lens, and vitreous humor (see ■ Figure 13.6)
- Then strike retina and stimulate rods and cones
- Upside-down image sent along optic nerve (see ■ Figure 13.7); optic nerve transmits impulses to brain, where upside-down image is translated into right-side-up image
- Vision requires proper functioning of four mechanisms:
 1. Coordination of external eye muscles so that both eyes move together
 2. Correct amount of light admitted by pupil
 3. Correct focus of light on retina by lens
 4. Optic nerve transmitting sensory images to brain

TEACHING STRATEGIES

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

LEARNING ACTIVITIES

Worksheet 13C

- Chapter Review

Text

- Practice Exercise

Student DVD-ROM

- Learning games

CW

- Practice questions

ASSESSMENTS

Quiz 13G—Chapter Review

Test Bank—questions

OBJECTIVE 5

Describe the path of sound vibration.

Text page: 443; PowerPoint slides: 110–115

LECTURE NOTES

- Path of sound through outer ear and middle ear and into cochlea of inner ear
- Sound waves traveling down external auditory canal strike eardrum, causing it to vibrate
- Ossicles conduct vibrations across middle ear from eardrum to oval window
- Oval window movements initiate vibrations in fluid that fills cochlea
- When fluid vibrations strike hair cell, it bends small hairs and stimulates nerve ending
- Nerve ending sends electrical impulse to brain on cochlear portion of vestibulocochlear nerve
- See ■ Figure 13.16
- Hearing loss divided into two main categories: **conductive hearing loss** and **sensorineural hearing loss**
- Conductive refers to disease or malformation of outer or middle ear; all sound is weaker and muffled since it is not conducted correctly to inner ear

TEACHING STRATEGIES

IRDVD

- See PowerPoint presentation on the Instructor's Resource DVD for an animation showing how we hear

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture

LEARNING ACTIVITIES

Worksheet 13C

- Chapter Review

Text

- Practice Exercises

- Sensorineural hearing loss is result of damage or malformation of inner ear (cochlea) or cochlear nerve; sounds are distorted and heard incorrectly
- Can be combination of both conductive and sensorineural hearing loss

Student DVD-ROM

- Learning games

CW

- Practice questions

ASSESSMENTS

Quiz 13G—Chapter Review

Test Bank—questions

OBJECTIVE 6

Build and define eye and ear medical terms from word parts.

Text pages: 430–432; 444–445; PowerPoint slides: 45–52; 116–122

LECTURE NOTES

Eye Word Building

Combining

Form	Medical Term	Definition
blephar/o	blepharitis	eyelid inflammation
	blepharoplasty	surgical repair of eyelid
conjunctiv/o	blepharoptosis	drooping eyelid
	blepharectomy	removal of eyelid
	conjunctival	pertaining to conjunctiva
corne/o	conjunctivitis	conjunctiva inflammation (pink eye)
	conjunctivoplasty	surgical repair of conjunctiva
	corneal	pertaining to cornea
cycl/o	cycloplegia	paralysis of ciliary body
dacry/o	dacryocystitis	tear bladder inflammation
diplo/o	diplopia	double vision
irid/o	iritis	iris inflammation
	iridal	pertaining to iris
kerat/o	iridectomy	removal of iris
	iridoplegia	paralysis of iris
	iridosclerotomy	incision into iris and sclera
	keratitis	cornea inflammation
	keratometer	instrument to measure (curve of) cornea
lacrim/o	keratotomy	incision into cornea
	lacrimal	pertaining to tears
ocul/o	ocular	pertaining to eye
	intraocular	pertaining to within eye
	oculomycosis	abnormal condition of eye fungus
ophthalm/o	ophthalmalgia	eye pain
	ophthalmic	pertaining to eye
	ophthalmologist	specialist in eye
	ophthalmoplegia	eye paralysis
	ophthalmorrhagia	rapid bleeding from eye

TEACHING STRATEGIES

- Reinforce how many eye and ear terms can be constructed from word parts.
- Read aloud chapter terms that are made up of word parts; have students identify parts and define terms, either aloud or individually on paper.
- Write sentences on the board using common words; have students substitute correct medical terms.

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

LEARNING ACTIVITIES

Worksheet 13A

- New Combining Form and Suffix Handout

Worksheet 13B

- Medical Term Analysis

Worksheet 13C

- Chapter Review

Quiz 13E

- May be used as worksheet

Text

- Practice Exercises
- Terminology Checklist

Student DVD-ROM

- Learning games
- Flash cards

CW

- Practice questions

opt/o	ophthalmoscope	instrument to view inside eye
	optic	pertaining to eye or vision
	optometer	instrument to measure vision
	optometrist	one who measures vision
pupill/o	pupillary	pertaining to pupil
	retinal	pertaining to retina
retin/o	retinopathy	retina disease
	retinopexy	surgical fixation of retina
	scler/o	pertaining to sclera
	scleromalacia	softening of sclera
scler/o	sclerotomy	incision into sclera
	scleritis	inflammation of sclera
	uve/o	inflammation of choroid
	uveitis	

Ear Word Building

Combining

Form	Medical Term	Definition	
acous/o	acoustic	pertaining to hearing	
audi/o	audiogram	record of hearing	
	audiometer	instrument to measure hearing	
	audiologist	hearing specialist	
	auditory	pertaining to hearing	
audit/o	auditory	pertaining to hearing	
aur/o	aural	pertaining to ear	
auricul/o	auricular	pertaining to ear	
cochle/o	cochlear	pertaining to cochlea	
labyrinth/o	labyrinthectomy	removal of labyrinth	
	labyrinthotomy	incision into labyrinth	
	myring/o	myringitis	eardrum inflammation
myring/o	myringectomy	removal of eardrum	
	myringoplasty	surgical repair of eardrum	
	ot/o	otalgia	ear pain
ot/o	otic	pertaining to ear	
	otitis	ear inflammation	
	otomycosis	abnormal condition of ear fungus	
	otologist	ear specialist	
	otopyorrhea	pus discharge from ear	
	otorrhagia	bleeding from ear	
	otoscope	instrument to view inside ear	
	otoplasty	surgical repair of (external) ear	
	salping/o	salpingitis	eustachian tube inflammation
	salpingotomy	incision into eustachian tube	
tympan/o	tympanic	pertaining to eardrum	
	tympanitis	eardrum inflammation	
	tympanometer	instrument to measure eardrum	
	tympanoplasty	surgical repair of eardrum	
	tympanorrhexis	eardrum rupture	
	tympanotomy	incision into eardrum	
	tympanectomy	removal of eardrum	
	Suffix	Medical Term	Definition
-otia	microtia	(abnormally) small ears	
	macrotia	(abnormally) large ears	

ASSESSMENTS

Quiz 13E—New Word Building quiz

Quiz 13G—Chapter Review

Test Bank—questions

OBJECTIVE 7

Identify and define eye and ear vocabulary terms.

Text pages: 432; 445; PowerPoint slides: 53–55; 123–125

LECTURE NOTES

Eye Vocabulary

Term	Definition
emmetropia (EM)	state of normal vision
legally blind	person with severely impaired vision; usually defined as having visual acuity of 20/200 that cannot be improved with corrective lenses or having visual field of less than 20 degrees
nyctalopia	difficulty seeing in dim light; also called <i>night-blindness</i> ; usually due to damaged rods
ophthalmology	branch of medicine involving diagnosis and treatment of conditions and diseases of eye and surrounding structures; physician is <i>ophthalmologist</i>
optician	specialist in grinding corrective lenses
optometry	medical profession specializing in examining eyes, testing visual acuity, and prescribing corrective lenses; doctor of optometry is <i>optometrist</i>
papilledema	swelling of optic disk; often as result of increased intraocular pressure; also called <i>choked disk</i>
photophobia	term translates into <i>fear of light</i> ; it actually means strong sensitivity to bright light
presbyopia	visual loss due to old age; resulting in difficulty focusing for near vision (such as reading)
xerophthalmia	dry eyes

Ear Vocabulary

Term	Definition
American Sign Language (ASL)	nonverbal method of communicating in which hands and fingers are used to indicate words and concepts; used by both persons who are deaf and persons with speech impairments
binaural	referring to both ears
decibel (dB)	measures intensity or loudness of sound; zero decibels is quietest sound measured and 120 dB is loudest sound commonly measured
hertz (Hz)	measurement of frequency or pitch of sound; lowest pitch on audiogram is 250 Hz; measurement can go as high as 8000 Hz, which is highest pitch measured
monaural	referring to one ear
otorhinolaryngology (ENT)	branch of medicine involving diagnosis and treatment of conditions and diseases of ear, nose, and throat; also referred to <i>ENT</i> ; physician is <i>otorhinolaryngologist</i>
presbycusis	normal loss of hearing that can accompany aging process

TEACHING STRATEGIES

Jeopardy Game

- Have students create questions for terms in this section for a Jeopardy game to be played in class—may be combined with Pathology, Diagnostic, and Therapeutic terms.

IRDVD

- See PowerPoint presentation on the Instructor's Resource DVD for a video showing the duties of an optometrist.
- Write sentences on the board using common words; have students substitute correct medical terms.

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

LEARNING ACTIVITIES

Worksheet 13C

- Chapter Review

Text

- Practice Exercises
- Terminology Checklist
- Medical Record Analysis
- Chart Note Transcription

Student DVD-ROM

- Learning games
- Flash cards

CW

- Practice questions
- Case Study

ASSESSMENTS

Quiz 13G—Chapter Review

Test Bank—questions

residual hearing	hearing that is still present after damage has occurred to auditory mechanism
tinnitus	ringing in ears
vertigo	dizziness

OBJECTIVE 8

Identify and define selected eye and ear pathology terms.

Text pages: 433–435; 447; PowerPoint slides: 56–69; 126–130

LECTURE NOTES

Eye Pathology

Term Eyeball

Definition

achromatopsia	color blindness—unable to perceive one or more colors; more common in males
amblyopia	loss of vision not as result of eye pathology; usually occurs in patients who see two images; in order to see only one image, brain no longer recognizes image being sent to it by one of eyes; may occur if strabismus is not corrected; this condition is not treatable with prescription lens; commonly called <i>lazy eye</i>
astigmatism (Astigm)	condition in which light rays are focused unevenly on retina, causing distorted image; due to abnormal curvature of cornea
cataract	damage to lens causing it to become opaque or cloudy; results in diminished vision; treatment usually surgical removal of cataract or replacement of lens
corneal abrasion	scraping injury to cornea; if it does not heal, it may develop into ulcer
glaucoma	increase intraocular pressure; if untreated, may result in atrophy (wasting away) of optic nerve and blindness; glaucoma is treated with medication and surgery; an increased risk of developing glaucoma in persons over age 60, of African ancestry, who have sustained serious eye injury, and in anyone with family history of diabetes or glaucoma
hyperopia	person can see things in distance but has trouble reading material at close range; also known as <i>farsightedness</i> ; corrected with converging or biconvex lenses
macular degeneration	deterioration of macular area of retina of eye; may be treated with laser surgery to destroy blood vessels beneath macula
monochromatism	unable to perceive one color
myopia (MY)	person can see things close up but distance vision is blurred; also known as <i>nearsightedness</i> ; corrected with diverging or biconcave lenses

TEACHING STRATEGIES

- Select two students to do 5-minute presentations of their Internet research in class.
- Write sentences on the board using common words; have students substitute correct medical terms

Jeopardy Game

- Have students create questions for terms in this section for a Jeopardy game to be played in class—may be combined with Vocabulary, Diagnostic, and Therapeutic terms.

IRDVD

- See PowerPoint presentation on the Instructor's Resource DVD for videos on:
 - Conjunctivitis
 - Cataracts
 - Macular degeneration
 - Otitis media

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

LEARNING ACTIVITIES

Internet research

- Have students select a specific pathology and use Internet resources to research its symptoms, diagnosis, and treatments

Worksheet 13C

- Chapter Review

Text

- Practice Exercises
- Terminology Checklist
- Medical Record Analysis
- Chart Note Transcription

Student DVD-ROM

- Learning games
- Flash cards

retinal detachment	occurs when retina becomes separated from choroid layer; separation seriously damages blood vessels and nerves, resulting in blindness; may be treated with surgical or medical procedures to stabilize retina and prevent separation
retinitis pigmentosa	progressive disease of eye resulting in retina becoming hard (sclerosed), pigmented (colored), and atrophying (wasting away); no known cure
retinoblastoma	malignant eye tumor occurring in children, usually under the age of 3; requires enucleation

Conjunctiva

pterygium	hypertrophied conjunctival tissue in inner corner of eye
trachoma	chronic infectious disease of conjunctiva and cornea caused by bacteria; occurs more commonly in those living in hot, dry climates; untreated, leads to blindness when scarring invades cornea; treated with antibiotics

Eyelids

hordeolum	refers to <i>stye</i> (or <i>sty</i>), small purulent inflammatory infection of sebaceous gland of eyelid; treated with hot compresses and/or surgical incision
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Eye Muscles

esotropia (ST)	inward turning of eye; also called <i>cross-eyed</i> ; example of form of strabismus
exotropia (XT)	outward turning of eye; also called <i>wall-eyed</i> ; example of strabismus
strabismus	eye muscle weakness commonly seen in children resulting in eyes looking in different directions at same time; corrected with glasses, eye exercises, and/or surgery

Brain-Related Vision Pathologies

hemianopia	loss of vision in half of visual field; stroke patient may suffer from this disorder
nystagmus	jerky-appearing involuntary eye movements, usually left and right; often indication of brain injury

Ear Pathology

Term Definition

Hearing Loss

anacusis	total absence of hearing; inability to perceive sound; also called <i>deafness</i>
deafness	inability to hear or having some degree of hearing impairment

External Ear

ceruminoma	excessive accumulation of ear wax; results in hard wax plug; sound becomes muffled
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CW

- Practice questions
- Case Study
- Web Destination activities on strabismus and Ménière's disease
- *New York Times* link for research into specific pathologies

ASSESSMENTS

Quiz 13G—Chapter Review

Test Bank—questions

otitis externa (OE)	external ear infection; commonly caused by fungus; also called <i>otomycosis</i> and commonly referred to as <i>swimmer's ear</i>
Middle Ear	
otitis media (OM)	frequently seen in children; commonly referred to as <i>middle ear infection</i> ; often preceded by upper respiratory infection during which pathogens move from pharynx to middle ear via eustachian tube; fluid accumulates in middle ear cavity; fluid may be watery, <i>serous otitis media</i> , or full of pus, <i>purulent otitis media</i>
otosclerosis	loss of mobility of stapes bone, leading to progressive hearing loss
Inner Ear	
acoustic neuroma	benign tumor of eighth cranial nerve sheath; pressure causes symptoms such as tinnitus, headache, dizziness, and progressive hearing loss
labyrinthitis	affects both hearing and equilibrium portions of inner ear; also called <i>inner ear infection</i>
Ménière's disease	abnormal condition within labyrinth of inner ear; can lead to progressive loss of hearing; symptoms are dizziness or vertigo, hearing loss, and tinnitus

OBJECTIVE 9

Identify and define selected eye and ear diagnostic procedures.

Text pages: 435–436; PowerPoint slides: 70–75; 131–137

LECTURE NOTES

Eye Diagnostic Procedures

Term	Definition
Eye Examination Tests	
color vision tests	use of polychromic (multicolored) charts to determine ability to recognize color
fluorescein angiography	process of injecting dye (fluorescein) to observe movement of blood and detect lesions in macular area of retina; used to determine if there is detachment of retina
fluorescein staining	applying dye eye drops that are bright green fluorescent color; used to look for corneal abrasions or ulcers
keratometry	measurement of curvature of cornea using instrument called <i>keratometer</i>
ophthalmoscopy	examination of interior of eyes using instrument called <i>ophthalmoscope</i> ; physician dilates pupil in order to see cornea, lens, and retina; used to identify abnormalities in blood vessels of eye and some systemic diseases

TEACHING STRATEGIES

- Write sentences on the board using common words; have students substitute correct medical terms.

IRDVD

- See PowerPoint presentation on the Instructor's Resource DVD for videos on the topics of using a Snellen chart, audiology, audiometry, and tympanometry.

Jeopardy Game

- Have students create questions for terms in this section for a Jeopardy game to be played in class—may be combined with Vocabulary, Pathology, and Therapeutic terms.

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

Guest speaker

- Invite an optometrist or optician to speak to the class about different eye tests and corrective lenses.
- Invite an audiologist to speak to the class about hearing tests and assistive devices.

refractive error test	vision test for defect in ability of eye to accurately focus image that is hitting it; refractive errors result in myopia and hyperopia
slit lamp microscopy	examining posterior surface of cornea
Snellen chart	chart used for testing distance vision; uses letters of varying size and is administered from distance of 20 feet; person who can read at 20 feet what average person can read at this distance is said to have 20/20 vision
tonometry	measurement of intraocular pressure of eye using <i>tonometer</i> to check for glaucoma; physician places tonometer lightly on eyeball and pressure measurement is taken; generally part of normal eye exam for adults
visual acuity (VA) test	measurement of sharpness of patient's vision; usually, Snellen chart is used for this test in which patient identifies letters from distance of 20 feet

Ear Diagnostic Procedures

Term	Definition
Audiology Tests	
audiometry	test of hearing ability by determining lowest and highest intensity (decibels) and frequencies (hertz) that person can distinguish; patient sits in soundproof booth and receives sounds through earphones as technician decreases sound or lowers tones
Rinne and Weber tuning-fork tests	tests assess both air and bone conduction of sound; physician holds tuning fork against or near bones on side of head
Otology Tests	
otoscopy	examination of ear canal, eardrum, and outer ear using <i>otoscope</i>
tympanometry	measurement of movement of tympanic membrane; indicates presence of pressure in middle ear
Balance Tests	
falling test	test used to observe balance and equilibrium; patient balances on one foot, then with one foot in front of other, and then walking forward with eyes open; same test is conducted with patient's eyes closed; swaying and falling with eyes closed can indicate ear and equilibrium malfunction

LEARNING ACTIVITIES

Worksheet 13C

- Chapter Review

Text

- Practice Exercises
- Terminology Checklist
- Medical Record Analysis
- Chart Note Transcription

Student DVD-ROM

- Learning games
- Flash cards

CW

- Practice questions
- Case Study
- *New York Times* link for research into specific diagnostic procedures

ASSESSMENTS

Quiz 13G—Chapter Review

Test Bank—questions

OBJECTIVE 10

Identify and define selected eye and ear therapeutic procedures.

Text pages: 436–437; 447–448; PowerPoint slides: 76–79; 138–140

LECTURE NOTES

Eye Therapeutic Procedures

Terms

Surgical Procedures

Terms	Definition
cryoextraction	cataract is lifted from lens with extremely cold probe
cryoretinopexy	surgical fixation of retina by using extreme cold
enucleation	surgical removal of eyeball
keratoplasty	surgical repair of cornea is simple translation of term; utilized to mean corneal transplant
laser-assisted in-situ keratomileusis (LASIK)	correction of myopia using laser surgery to remove corneal tissue
laser photocoagulation	laser beam to destroy very small precise areas of retina; treats retinal detachment or macular degeneration
phacoemulsification	high-frequency sound waves to emulsify (liquefy) lens with cataract, which is then aspirated (removed by suction) with needle
photorefractive keratectomy (PRK)	laser to reshape cornea and correct errors of refraction
radial keratotomy (RK)	spoke-like incisions around cornea result in its becoming flatter; surgical treatment for myopia
scleral buckling	placing band of silicone around outside of sclera that stabilizes detaching retina
strabotomy	incision into eye muscles in order to correct strabismus

Ear Therapeutic Procedures

Term

Audiology Procedures

Term	Definition
hearing aid	apparatus used by persons with impaired hearing to amplify sound; also called <i>amplification device</i>

Surgical Procedures

cochlear implant	mechanical device surgically placed under skin behind outer ear; converts sound signals into magnetic impulses to stimulate auditory nerve; can be beneficial for those with profound sensorineural hearing loss
------------------	--

TEACHING STRATEGIES

- Write sentences on the board using common words; have students substitute correct medical terms.

Jeopardy Game

- Have students create questions for terms in this section for a Jeopardy game to be played in class—may be combined with Vocabulary, Pathology, and Diagnostic terms.

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture

LEARNING ACTIVITIES

Worksheet 13C

- Chapter Review

Text

- Practice Exercises
- Terminology Checklist
- Medical Record Analysis
- Chart Note Transcription

Student DVD-ROM

- Learning games
- Flash cards

CW

- Practice questions
- Case Study
- *New York Times* link for research into specific treatment procedures

ASSESSMENTS

Quiz 13G—Chapter Review

Test Bank—questions

myringotomy	surgical puncture of eardrum with removal of fluid and pus from middle ear; eliminates persistent ear infection and excessive pressure on tympanic membrane; pressure equalizing tube is placed in tympanic membrane to allow for drainage of middle ear cavity; falls out on its own
pressure equalizing tube (PE tube)	small tube surgically placed in eardrum to assist in drainage of trapped fluid and to equalize pressure between middle ear cavity and atmosphere
stapedectomy	removal of stapes bone to treat otosclerosis; prosthesis or artificial stapes may be implanted

OBJECTIVE 11

Identify and define selected medications relating to the eye and ear.

Text pages: 437–438; 448; PowerPoint slides: 80–81; 141

LECTURE NOTES

Eye Pharmacology

Classification	Action	Generic and Brand Names
anesthetic ophthalmic solution	eye drops for pain relief associated with eye infections, corneal abrasions, or surgery	proparacain, Ak-Taine, Ocu-Caine; tetracaine, Opticaine, Pontocaine
antibiotic ophthalmic solution	eye drops for treatment of bacterial eye infections	erythromycin, Del-Mycin, Ilotycin Ophthalmic
antiglaucoma medications	drugs that reduce intraocular pressure by lowering amount of aqueous humor in eyeball; either reducing the production of aqueous humor or increasing its outflow	timolol, Betimol, Timoptic; acetazolamide, Ak-Zol, Dazamide; prostaglandin analogs, Lumigan, Xalatan
artificial tears	medications to treat dry eyes	buffered isotonic solutions, Akwa Tears, Refresh Plus, Moisture Eyes
miotic	substance causes pupil to constrict; also used to treat glaucoma	physostigmine, Eserine Sulfate, Isopto Eserine; carbachol, Carbastat, Miostat

TEACHING STRATEGIES

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture.

LEARNING ACTIVITIES

- Have students use a PDR and/or the Internet to look up additional information regarding these medications, such as dosage, side effects, and contraindications.

Worksheet 13C

- Chapter Review

Text

- Practice Exercises
- Terminology Checklist

Student DVD-ROM

- Learning games
- Flash cards

CW

- Practice questions

ASSESSMENTS

Quiz 13G—Chapter Review

Test Bank—questions

mydriatic	causes pupil to dilate by paralyzing iris and/or ciliary body muscles; useful during eye examinations and eye surgery	atropine sulfate, Atropine-Care Ophthalmic, Atropisol Ophthalmic
ophthalmic decongestants	medications constrict arterioles of eye, reduce redness and itching of conjunctiva	tetrahydrozoline, Visine, Murine

Ear Pharmacology

Classification	Action	Generic and Brand Names
antibiotic otic solution	eardrops treat otitis externa	neomycin, polymyxin B, and hydrocortisone solution, Otocort, Cortisporin, Otic Care
antiemetics	medications to treat nausea associated with vertigo	meclizine, Antivert, Meni-D; phenothiazine, Compazine
anti-inflammatory otic solution	reduces inflammation, itching, and edema associated with otitis externa	antipyrine and benzoaine, Allergan Ear Drops, A/B Otic
wax emulsifiers	soften ear wax to prevent build-up within external ear canal	carbamide peroxide, Debrox Drops, Murine Ear Drops

OBJECTIVE 12

Define selected abbreviations associated with the eye and ear.

Text pages: 438; 448; PowerPoint slides: 82–85; 142–143

LECTURE NOTES

Eye Abbreviations

ARMD	age-related macular degeneration
Astigm	astigmatism
c.gl.	correction with glasses
D	diopter (lens strength)
DVA	distance visual acuity
ECCE	extracapsular cataract extraction
EENT	eye, ear, nose, and throat
EM	emmetropia
EOM	extraocular movement
ICCE	intracapsular cataract extraction
IOP	intraocular pressure
LASIK	laser-assisted in-situ keratomileusis

TEACHING STRATEGIES

- Emphasize the importance of learning abbreviations and their full meanings; point out how some abbreviations, such as EENT, LASIK, ASL, and PERRLA are typically used rather than full terms.
- Encourage students to add abbreviations to their flash cards.
- Write sentences on the board using common words; have students substitute correct abbreviations.

Memory Game

- Have students assist in creating a memory game to be played in class.

OD	right eye
Ophth.	ophthalmology
OS	left eye
OU	each eye/both eyes
PERRLA	pupils equal, round, react to light and accommodation
PRK	photorefractive keratectomy
REM	rapid eye movement
s.gl.	without correction or glasses
SMD	senile macular degeneration
ST	esotropia
VA	visual acuity
VF	visual field
XT	exotropia

Ear Abbreviations

AD	right ear
AS	left ear
ASL	American Sign Language
AU	both ears
BC	bone conduction
dB	decibel
EENT	eyes, ears, nose, throat
ENT	ear, nose, and throat
HEENT	head, ears, eyes, nose, throat
Hz	hertz
OM	otitis media
Oto	otology
PE tube	pressure equalizing tube
PORP	partial ossicular replacement prosthesis
SOM	serous otitis media
TORP	total ossicular replacement prosthesis

Pop Questions

- Use Clicker questions as either a pretest or posttest quiz to gauge student comprehension during lecture

LEARNING ACTIVITIES

Worksheet 13C

- Chapter Review

Quiz 13F

- May be used as worksheet

Text

- Practice Exercises

Student DVD-ROM

- Learning games
- Flash cards

CW

- Practice questions

ASSESSMENTS

Quiz 13F—Abbreviations Quiz

Quiz 13G—Chapter Review

Test Bank—questions

Worksheet 13A

New Combining Form and Suffix Handout

Directions: For each combining form below, write out its meaning and then locate a new term from the chapter that uses the combining form or suffix.

Combining Forms	Meaning	Chapter Term	Meaning
1. ambly/o	_____	_____	_____
2. aque/o	_____	_____	_____
3. blephar/o	_____	_____	_____
4. chrom/o	_____	_____	_____
5. conjunctiv/o	_____	_____	_____
6. core/o	_____	_____	_____
7. corne/o	_____	_____	_____
8. cycl/o	_____	_____	_____
9. dacry/o	_____	_____	_____
10. dipl/o	_____	_____	_____
11. glauc/o	_____	_____	_____
12. ir/o	_____	_____	_____
13. irid/o	_____	_____	_____
14. kerat/o	_____	_____	_____
15. lacrim/o	_____	_____	_____
16. ocul/o	_____	_____	_____
17. ophthalm/o	_____	_____	_____
18. opt/o	_____	_____	_____
19. optic/o	_____	_____	_____
20. nyctal/o	_____	_____	_____
21. papill/o	_____	_____	_____
22. phac/o	_____	_____	_____
23. phot/o	_____	_____	_____

(Continued)

Combining Forms	Meaning	Chapter Term	Meaning
24. presby/o	_____	_____	_____
25. pupill/o	_____	_____	_____
26. retin/o	_____	_____	_____
27. scler/o	_____	_____	_____
28. uve/o	_____	_____	_____
29. vitre/o	_____	_____	_____
30. acous/o	_____	_____	_____
31. audi/o	_____	_____	_____
32. audit/o	_____	_____	_____
33. aur/o	_____	_____	_____
34. auricul/o	_____	_____	_____
35. cerumin/o	_____	_____	_____
36. cochle/o	_____	_____	_____
37. labyrinth/o	_____	_____	_____
38. mying/o	_____	_____	_____
39. ot/o	_____	_____	_____
40. salping/o	_____	_____	_____
41. staped/o	_____	_____	_____
42. tympan/o	_____	_____	_____
Suffixes			
43. -metrist	_____	_____	_____
44. -opia	_____	_____	_____
45. -tropia	_____	_____	_____
46. -cusis	_____	_____	_____
47. -otia	_____	_____	_____

Worksheet 13B

Medical Term Analysis

Directions: Below are terms built from word parts used in this chapter that are not analyzed in the Word Building Table. Many are built from word parts you have learned in previous chapters. Analyze each term presented below and list and define the word parts used to build each term.

Medical Term	Word Part Analysis
1. aqueous	_____ _____
2. vitreous	_____ _____
3. nyctalopia	_____ _____
4. optometry	_____ _____
5. presbyopia	_____ _____
6. amblyopia	_____ _____
7. monochromatism	_____ _____
8. exotropia	_____ _____
9. hemianopia	_____ _____
10. keratometry	_____ _____
11. ophthalmoscopy	_____ _____

(Continued)

- 12. cryoretinopexy _____

- 13. keratoplasty _____

- 14. otorhinolaryngology _____

- 15. presbycusis _____

- 16. ceruminoma _____

- 17. otosclerosis _____

- 18. labyrinthitis _____

- 19. otoscopy _____

- 20. tympanometry _____

Worksheet 13C

Chapter Review

Anatomy and Physiology

1. The _____ carries image to the brain.
2. The opening in the center of the iris is the _____.
3. The _____ is the blind spot on the retina.
4. _____ see in gray tones and _____ see in color.
5. The _____ produces tears.
6. The _____ eye muscles produce diagonal eye movements.
7. The inner ear is responsible for the senses of _____ and _____.
8. The _____ divides the outer ear from the middle ear.
9. The incus, malleus, and stapes are collectively called the _____.
10. The _____ is a fluid-filled cavity within the temporal bone.

Word Building

Directions: Build a term that means:

1. drooping eyelid _____
2. paralysis of ciliary body _____
3. double vision _____
4. pertaining to within eye _____
5. softening of sclera _____
6. retina disease _____
7. incision into eardrum _____
8. surgical repair of ear _____
9. instrument to measure hearing _____
10. eustachian tube inflammation _____

(Continued)

Matching

- | | | |
|-------|--------------------------|---|
| _____ | 1. nyctalopia | a. dry eyes |
| _____ | 2. presbyopia | b. ringing in the ears |
| _____ | 3. optician | c. eye tumor in children |
| _____ | 4. papilledema | d. sensitivity to strong light |
| _____ | 5. xerophthalmia | e. middle ear infection |
| _____ | 6. achromatopsia | f. increase in intraocular pressure |
| _____ | 7. photophobia | g. procedure to treat myopia |
| _____ | 8. amblyopia | h. night-blindness |
| _____ | 9. myopia | i. sharpness of vision |
| _____ | 10. glaucoma | j. lazy eye |
| _____ | 11. cataract | k. looks for corneal abrasions |
| _____ | 12. retinoblastoma | l. grinds corrective lens |
| _____ | 13. hordeolum | m. dizziness |
| _____ | 14. trachoma | n. a sty |
| _____ | 15. strabismus | o. loss of vision with aging |
| _____ | 16. fluorescein staining | p. ear wax |
| _____ | 17. visual acuity | q. chronic infection of conjunctiva |
| _____ | 18. binaural | r. allows drainage of fluid from middle ear |
| _____ | 19. tinnitus | s. choked disk |
| _____ | 20. cerumen | t. opaque lens |
| _____ | 21. vertigo | u. dilates the pupil |
| _____ | 22. PE tubes | v. near-sighted |
| _____ | 23. OM | w. referring to both ears |
| _____ | 24. LASIK | x. color blindness |
| _____ | 25. mydriatic | y. caused by eye muscle weakness |

Quiz 13A

New Word Parts Quiz

Directions: Define the combining form or suffix in the spaces provided.

1. blephar/o _____
2. chrom/o _____
3. core/o _____
4. cycl/o _____
5. dipl/o _____
6. glauc/o _____
7. irid/o _____
8. kerat/o _____
9. lacrim/o _____
10. ocul/o _____
11. papill/o _____
12. phac/o _____
13. presby/o _____
14. uve/o _____
15. vitre/o _____
16. audi/o _____
17. aur/o _____
18. acous/o _____
19. myring/o _____
20. staped/o _____
21. salping/o _____
22. tympan/o _____
23. -opia _____
24. -metrist _____
25. -cusis _____

Quiz 13B

Spelling Quiz

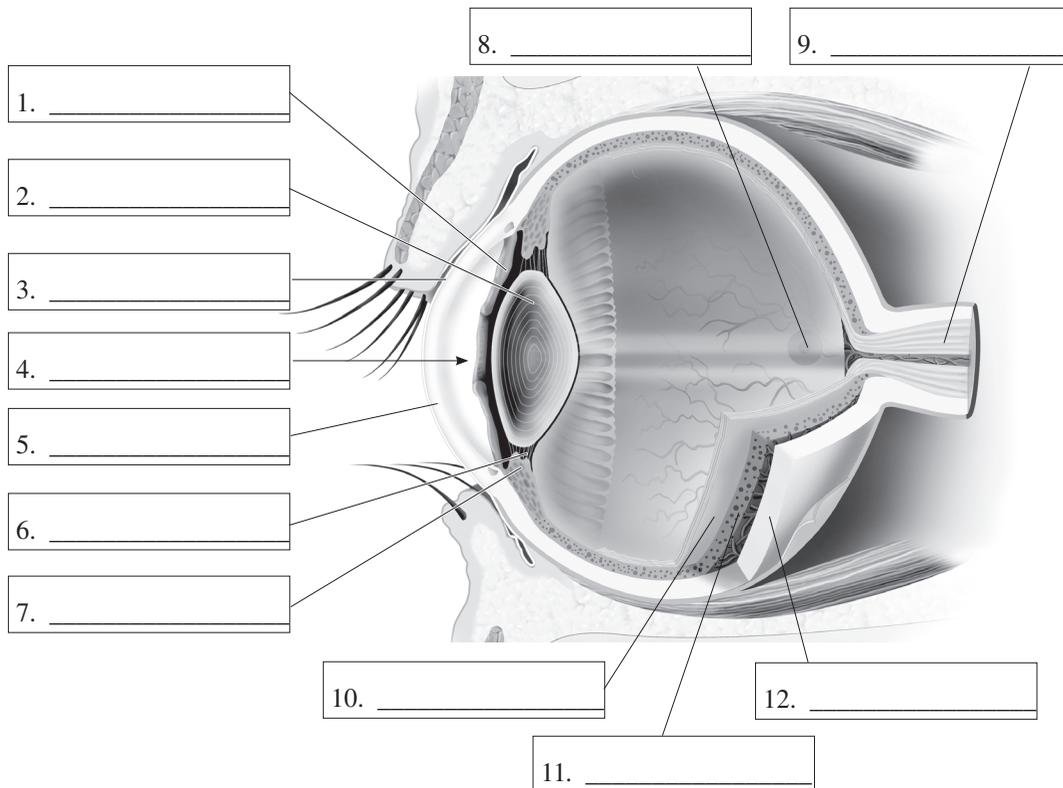
Directions: Write each term as your instructor pronounces it.

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____
10. _____
11. _____
12. _____
13. _____
14. _____
15. _____
16. _____
17. _____
18. _____
19. _____
20. _____

Quiz 13C

Labeling Diagram

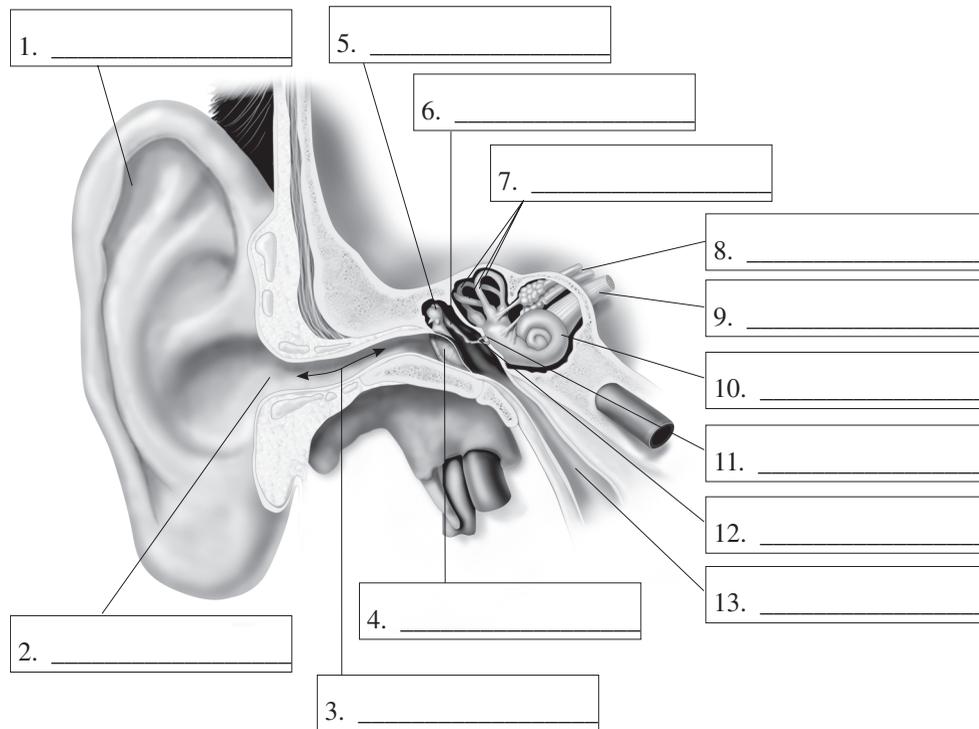
Directions: Label the structures of the eye.



Quiz 13D

Labeling Diagram

Directions: Label the structures of the ear.



Quiz 13E

New Word Building Quiz

Directions: Build a single medical term for each phrase below.

1. pertaining to the conjunctiva _____
2. pertaining to the cornea _____
3. pertaining to the iris _____
4. pertaining to tears _____
5. pertaining to the eye _____
6. pertaining to the pupil _____
7. pertaining to the retina _____
8. pertaining to the sclera _____
9. inflammation of the choroid _____
10. retina disease _____
11. one who measures vision _____
12. eye paralysis _____
13. double vision _____
14. removal of eyelid _____
15. softening of the sclera _____
16. pertaining to hearing _____
17. hearing specialist _____
18. pertaining to the ear _____
19. pertaining to the cochlea _____
20. pertaining to the eardrum _____
21. small ear _____
22. ear pain _____
23. surgical repair of eardrum _____
24. incision into the labyrinth _____
25. pus flow from ear _____

Quiz 13F

Abbreviations Quiz

Directions: Write the medical term for which each abbreviation stands.

1. Astigm _____
2. EM _____
3. EOM _____
4. IOP _____
5. LASIK _____
6. PRK _____
7. REM _____
8. ST _____
9. VA _____
10. XT _____
11. VF _____
12. OD _____
13. PERRLA _____
14. Ophth _____
15. OS _____
16. AD _____
17. ASL _____
18. EENT _____
19. Oto _____
20. PE tube _____
21. OM _____
22. Hz _____
23. BC _____
24. AS _____
25. AU _____

Quiz 13G

Chapter Review

PART I: Multiple Choice

Directions: Circle the correct answer.

- The outermost layer of the eye, referred to as the “white” of the eye, is the
 - sclera.
 - choroid.
 - iris.
 - pupil.
- The medical term for nearsightedness is
 - astigmatism.
 - hyperopia.
 - myopia.
 - presbyopia.
- The condition characterized by an increase in intraocular pressure is
 - cataract.
 - strabismus.
 - trachoma.
 - glaucoma.
- The term for involuntary, jerky movements of the eye is
 - glaucoma.
 - nystagmus.
 - myopia.
 - strabismus.
- The medical term for pinkeye is
 - retinitis.
 - scleritis.
 - blepharitis.
 - conjunctivitis.
- The medical term for normal vision is
 - hyperopia.
 - myopia.
 - emmetropia.
 - presbyopia.
- Which of the following is NOT one of the ossicles of the ear?
 - utricle.
 - malleus.
 - incus.
 - stapes.
- The medical term *anacusis* means
 - pain in the ear.
 - impairment of hearing.
 - absence of hearing.
 - hearing loss due to aging.
- In conductive hearing loss,
 - the sound is conducted normally through the external and middle ear but defective in the inner ear.
 - sound transmission is blocked in the middle and outer ear.
 - sound transmission is blocked in the middle and inner ear.
 - sound is conducted normally through the external ear but defective in the middle and the inner ear.
- The medical term for ringing in the ears is
 - vertigo.
 - tinnitus.
 - hertz.
 - hordeolum.

(Continued)

PART II: Matching

Directions: Match the term with its definition.

- | | |
|----------------------------|---|
| _____ 1. enucleation | a. treatment for sensorineural hearing loss |
| _____ 2. antiemetic | b. treatment for myopia |
| _____ 3. cochlear implant | c. hypertrophied conjunctiva |
| _____ 4. labyrinthitis | d. surgical removal of eyeball |
| _____ 5. otosclerosis | e. treatment for detached retina |
| _____ 6. radial keratotomy | f. loss of half the visual field |
| _____ 7. Snellen chart | g. inner ear infection |
| _____ 8. hemianopia | h. test for visual acuity |
| _____ 9. scleral buckling | i. treats nausea |
| _____ 10. pterygium | j. loss of mobility of stapes |

PART III: Abbreviations

Directions: Write the full meaning of the following abbreviations.

1. EENT _____
2. XT _____
3. VA _____
4. OM _____
5. PE tube _____

Chapter 13 Answer Keys

Worksheet 13A Answer Key

1. dull, dim
2. water
3. eyelid
4. color
5. conjunctiva
6. pupil
7. cornea
8. ciliary muscle
9. tear, tear duct
10. double
11. gray
12. iris
13. iris
14. cornea
15. tears
16. eye
17. eye
18. eye, vision
19. eye
20. night
21. optic disk
22. lens
23. light
24. old age
25. pupil
26. retina
27. sclera
28. choroid
29. glassy
30. hearing
31. hearing
32. hearing
33. ear
34. ear
35. cerumen
36. cochlea
37. labyrinth
38. eardrum
39. ear
40. eustachian tube
41. stapes
42. eardrum

Suffixes

43. one who measures
44. vision
45. to turn
46. hearing
47. ear condition

Worksheet 13B Answer Key

1. aque/o = water; -ous = pertaining to
2. vitre/o = glassy; -ous = pertaining to
3. nyctal/o = night; -opia = vision
4. opt/o = vision; -metry = process of measuring
5. presby/o = old age; -opia = vision
6. ambly/o = dull, dim; -opia = vision
7. mono- = one; chromat/o = color; -ism = state of
8. exo- = outward; -tropia = to turn
9. hemi- = half; an- = lack of; -opia = vision
10. kerat/o = cornea; -metry = process of measuring
11. ophthalm/o = eye; -scopy = process of viewing
12. cry/o = cold; retin/o = retina; -pexy = surgical fixation
13. kerat/o = cornea; -plasty = surgical repair
14. ot/o = eye; rhin/o = nose; laryng/o = voice box; -logy = study of
15. presby/o = old age; -cusis = hearing
16. cerumen/o = cerumen; -oma = tumor
17. ot/o = ear; -sclerosis = hardening
18. labyrinth/o = labyrinth; -itis = inflammation
19. ot/o = ear; -scopy = process of viewing
20. tympan/o = eardrum; -metry = process of measuring

Worksheet 13C Answer Key

Anatomy and Physiology

1. optic nerve
2. pupil
3. optic disk
4. rods; cones
5. lacrimal gland
6. oblique

7. hearing, equilibrium (balance)
8. tympanic membrane (eardrum)

9. ossicles
10. labyrinth

Word Building

1. blepharoptosis
2. cycloplegia
3. diplopia
4. intraocular
5. scleromalacia

6. retinopathy
7. myringotomy
8. otoplasty
9. audiometer
10. salpingitis

Matching

1. h
2. o
3. l
4. s
5. a
6. x
7. d
8. j
9. v
10. f
11. t
12. c
13. n

14. q
15. y
16. k
17. i
18. w
19. b
20. p
21. m
22. r
23. e
24. g
25. u

Quiz 13A Answer Key

1. eyelid
2. color
3. pupil
4. ciliary muscle
5. double
6. gray
7. iris
8. cornea
9. tears
10. eye
11. optic disk
12. lens
13. old age
14. choroid
15. glassy
16. hearing
17. ear
18. hearing
19. eardrum
20. stapes
21. eustachian tube
22. eardrum
23. vision
24. one who measures
25. hearing

Quiz 13B Answer Key

1. sclera
2. aqueous
3. nasolacrimal
4. blepharoptosis
5. dacryocystitis
6. ophthalmalgia
7. emmetropia
8. xerophthalmia
9. achromatopsia
10. astigmatism
11. amblyopia
12. pterygium

13. vestibulocochlear
14. eustachian
15. labyrinthotomy
16. otopyorrhea

17. presbycusis
18. otosclerosis
19. myringotomy
20. tinnitus

Quiz 13C Answer Key

1. iris
2. lens
3. conjunctiva
4. pupil
5. cornea
6. suspensory ligaments
7. ciliary body
8. fovea centralis
9. optic nerve
10. retina
11. choroid
12. sclera

Quiz 13D Answer Key

1. pinna
2. external auditory meatus
3. auditory canal
4. tympanic membrane
5. malleus
6. incus
7. semicircular canals
8. vestibular nerve
9. cochlear nerve
10. cochlea
11. round window
12. stapes
13. Eustachian tube

Quiz 13E Answer Key

1. conjunctival
2. corneal
3. iridial
4. lacrimal
5. ocular, optic, or ophthalmic
6. pupillary
7. retinal
8. scleral
9. uveitis
10. retinopathy
11. optometrist
12. ophthalmoplegia
13. diplopia
14. blepharectomy
15. scleromalacia
16. acoustic or auditory
17. audiologist
18. aural, auricular, or otic
19. cochlear
20. tympanic
21. microtia
22. otalgia
23. myringoplasty or tympanoplasty
24. labyrinthotomy
25. otopyorrhea

Quiz 13F Answer Key

1. astigmatism
2. emmetropia
3. extraocular movement
4. intraocular pressure
5. laser-assisted in-situ keratomileusis
6. photorefractive keratectomy
7. rapid eye movement
8. esotropia
9. visual acuity
10. exotropia
11. visual field
12. right eye
13. pupils equal, round, react to light and accommodation
14. ophthalmology
15. left eye

16. right ear
17. American Sign Language
18. eyes, ears, nose, throat
19. otology
20. pressure equalizing tube

21. otitis media
22. hertz
23. bone conduction
24. left ear
25. both ears

Quiz 13G Answer Key

Multiple Choice

- | | |
|------|-------|
| 1. A | 6. C |
| 2. C | 7. A |
| 3. D | 8. C |
| 4. B | 9. B |
| 5. D | 10. B |

Matching

- | | |
|------|-------|
| 1. d | 6. b |
| 2. i | 7. h |
| 3. a | 8. f |
| 4. g | 9. e |
| 5. j | 10. c |

Abbreviations

- | | |
|-------------------------------|-----------------------------|
| 1. eye, ear, nose, and throat | 4. otitis media |
| 2. exotropia | 5. pressure equalizing tube |
| 3. visual acuity | |