

# SPECIAL SENSES

## Anatomy & Physiology

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- LACRIMAL
- ACHROMATIC
- OTOSCOPE
- TENNITIS
- VERTIGO

# BELL WORK: DEFINE

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Page 3

- 25) Define key terms associated with vision disorders, ear disorders, nose disorders, and mouth disorders. Write a case study based on one of these disorders using appropriate medical terminology, describing the typical profile of a person suffering from the selected disorder.

# STANDARD

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- Identify the structures of the eye, ear, nose, and mouth.

- Create a case study relating a disease or disorder to either the eye or ear.

# OBJECTIVES

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## The Eye: Sense of Sight

- 3 Layers (Tunics)

1. Sclera: Outer Tunic

2. Choroid: Middle Tunic

3. Retina: Inner Tunic

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## Sclera

- Outer, protective, fibrous covering
- “White of the eye”

- Insertion point for muscle attachment that move & control eye.
- Extends from the cornea (front) to the optic nerve (back)
- **Cornea**: Transparent “**window**” in the front of the eye that covers the pupil & iris and aids in light refraction.

## Choroid

- Layer of **blood vessels** & connective tissue.
  - Supplies **nutrients** to the inner eye.
  - **Iris**: Pigmented, circular muscle controls the size of the pupil, letting more or less light in.
  - **Pupil**: Black opening in the center of the pupil that allows light to enter.
  - **Lens**: Works with the cornea to reflect light and focus on the retina.
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# Retina

- Light sensitive tissue that lines the **inner** eye.

- Photoreceptors:

- 1.

**Rods:** Small

photoreceptors that allow for black & white vision and in low levels of light.

- 2.

**Cones:** Large

photoreceptors that allow for **color** vision.

# Retina continued...

- **Macula:** Small yellowish central part of the retina.

- Provides clearest, most distinct vision (reading)
- **Fovea centralis**
  - Center of the macula
  - All cones, no rods
  - The sharpest vision
- **Blind Spot**
  - Where the optic nerve meets the retina.
  - No rods or cones

## Chambers of the Eye

- **Aqueous Humor**
  - Water cushion
  - Between the cornea & iris (Anterior Chamber)
  - Between the iris & lens (Posterior Chamber)
- **Vitreous Humor**
  - Gelatinous cushion

- Between the lens & retina.

## Diseases of the Eye

- **Myopia:**

- Near-Sightedness (Can't see distance)
- Eyeball is too long causing light to focus before the retina.
- PRK or Lasik: removes corneal tissue to allow light to focus on the retina.

- **Hyperopia:**

- Far-Sightedness (Can't focus on close objects)
- Eyeball is too short causing light to focus after the retina.
- Lasik or CK: tightens & steepens the cornea adding depth and allowing light to focus on the retina.

# Diseases of the Eye

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## Glaucoma

□ Eye condition caused by pressure from the Aqueous Humor causing damage to the optic nerve, leading to blindness.

□

## Conjunctivitis

□ Pink Eye

□ Inflammation of the conjunctiva (clear membrane covering the sclera) causing blood vessels to dilate.

□ Contagious: From bacteria or virus

□ Non-contagious: Irritants such as dust, debris, smoke.

# The Ear: Sense of Hearing

## 1. Outer Ear



## 2. Middle Ear

## 3. Inner Ear



Outer & Middle ear function in hearing ONLY.



Inner ear functions in hearing AND balance/equilibrium

## Outer Ear

- **Pinna/Auricle:**
  - External Ear; “Shell-shaped”
  - Collects sound vibrations.
- **External Auditory Canal:**
  - Air-filled, 1” S-Shaped

## Canal

- Secretes earwax
- Channels sound waves to ear drum.

## Middle Ear

- **Tympanic Membrane**
- Ear Drum
- Divides the outer & middle ear
- Sound waves cause it to vibrate.
- **Auditory Ossicles**
- Malleous: Hammer/mallet shaped
- Incus: Anvil shaped
- Stapes: Stirrup shaped
- **Eustachian Tube**
- Connects middle ear to back of nasal cavity
- Closed, except for yawning/swallowing
- Equalizes air pressure and allows drainage of middle ear secretions

# Inner Ear

□

## Oval Window

□ Membrane that connects middle ear with upper portion of cochlea.

□

## Round Window

□ Membrane that connects middle ear with lower portion of cochlea.

□ Moves fluids & equalizes pressure.

□

## Cochlea

□ Snail-shaped, fluid filled bone.

□ Converts stimuli from environment into nerve impulses for the brain

□

## Semicircular Canals

□ 3 loops filled with watery fluid embedded in the temporal bone.

□ Aids in balance only, not hearing.

# The ear

# Disorders of the Ear

## □ Ear Infections

- Common in infants & children
- Bacteria invade the middle ear near auditory ossicles.
- Cause build up of fluids & painful inflammation.

## □ Deafness

- Can be genetic or developmental
- Conductive: Impairment in the outer or middle ear.
- Sensorineural: Impairment in the inner ear.

# The Tongue: Sense of Taste

## □ Papillae

- Taste buds
- Found on the tongue, cheeks, & roof of mouth
- 10,000 taste buds with 100 taste cells (Gustatory Cells)
- **Gustatory cells** send taste impulses to the brain.
- Taste buds have an opening at the end called a Taste Pore.

# Taste Sensations

(Draw and label)

- What happens when you burn your tongue on a hot drink or hot food?

**Think.Pair.Share.**

# The Nose: The Sense of Smell

- Chemoreceptors are located on the **olfactory epithelium**.
- Odor molecules dissolve in mucus & bind to receptors on the cilia.
- Cilia are connected smell receptors.
- Smell receptors bind to the olfactory nerves.
- Olfactory nerves transmit the impulses to the brain.

- What causes a person to have frequent nose bleeds?

# Think.Pair.Share.

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- Create your own “case study” about a patient experiencing an eye or ear disease/disorder.
- Describe his signs and symptoms, what causes him to seek medical attention, the assessment of the physician, and the treatment he will undergo.
- This needs to be about 1 page typed. Feel free to add an image to your document.
- USE APPROPRIATE MEDICAL TERMINOLOGY!!!

## Group Activity

Page 25

- Which part of the eye is considered the “white of the eye”?

- The choroid is the layer of the eye containing connective tissue and \_\_\_\_\_.
- Cones are the receptors that allow us to see (black/white OR color).
- What part of the ear allows equalizes air pressure and allows for drainage?
- Which taste is on the “tip of the tongue”?
- Which special sense contains the olfactory receptors?

## Exit Ticket