

# WEEK 5

ALTERATIONS IN SENSORY FUNCTION

# CHAPTER 15

DISORDERS OF  
THE EYES, EARS AND  
OTHER SENSORY ORGANS

# LECTURE OBJECTIVES

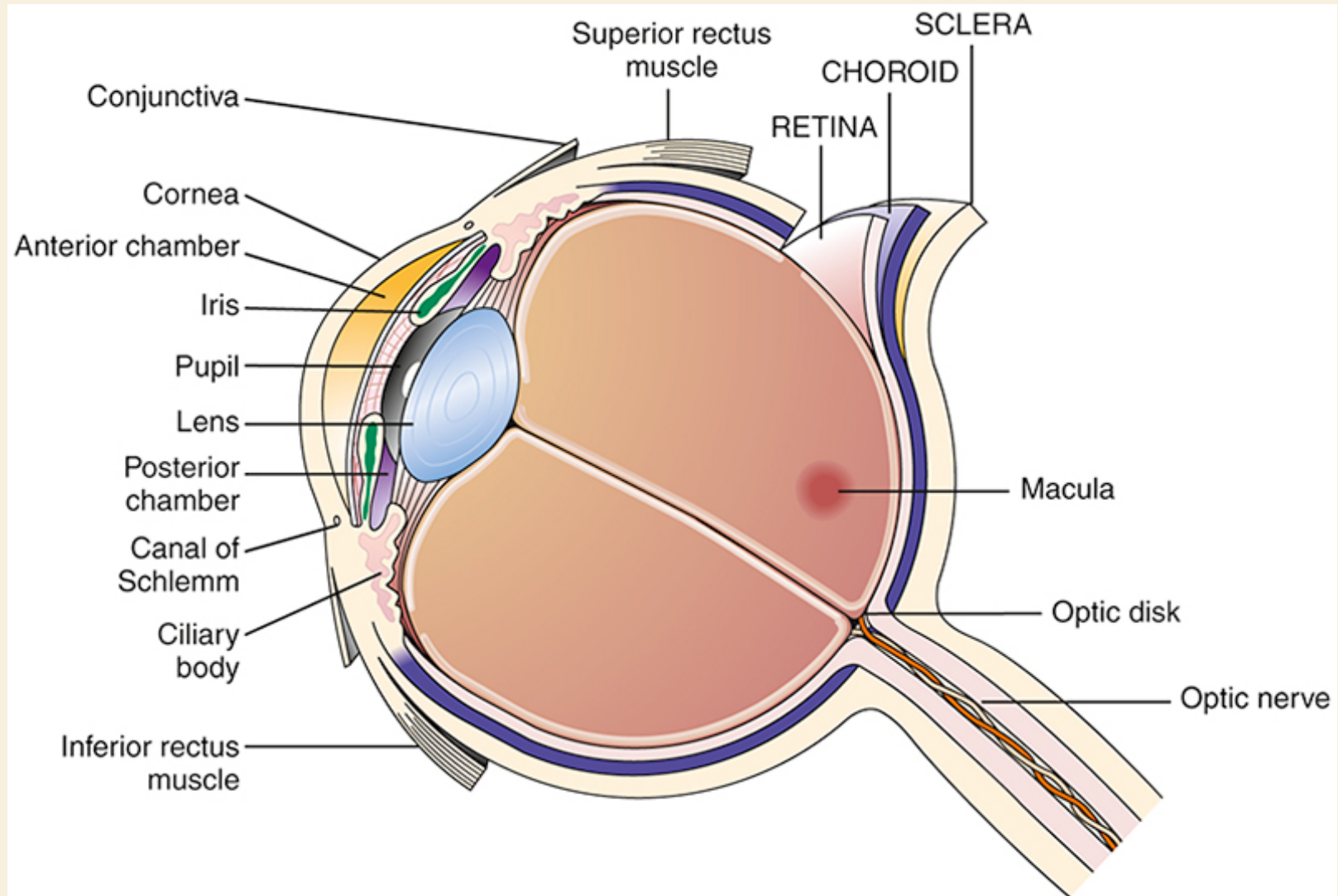
- Describe the general functions and structures of the ear and eye.
- Describe the general manifestations of hearing impairment.
- Explain how conductive and sensorineural mechanisms of hearing loss differ in etiology and treatment.
- Identify the predisposing factors, clinical manifestations, and management of otitis media.
- Describe the general manifestations of visual impairment.
- Describe the causes, clinical manifestations, and management of common visual disorders, including errors of refraction, strabismus, cataract, and retinopathies.
- Distinguish between open-angle and acute angle-closure glaucoma.
- Differentiate the two forms of macular degeneration.
- Describe the causes, clinical manifestations, and management of smell and taste disorders.



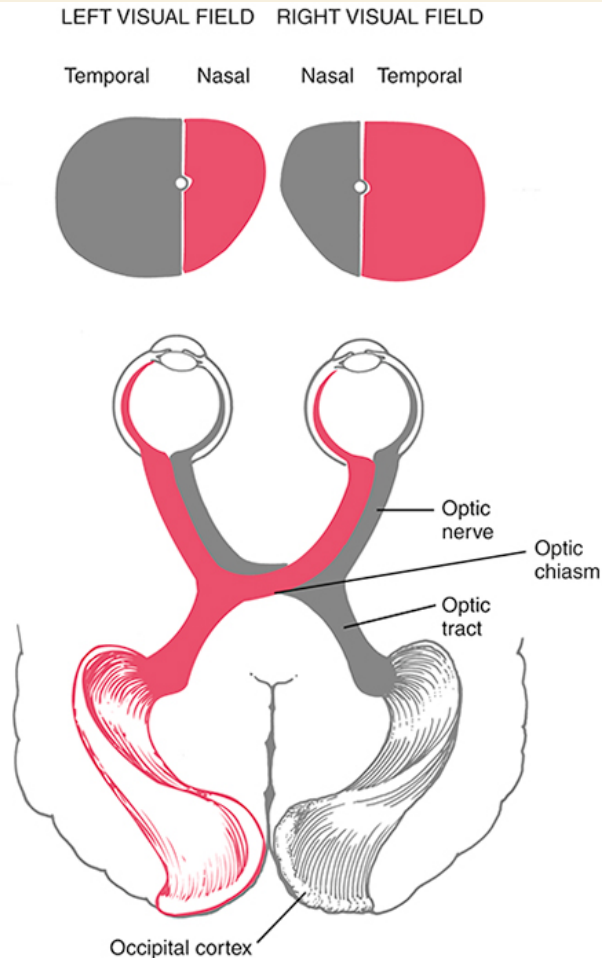
T H E E Y E



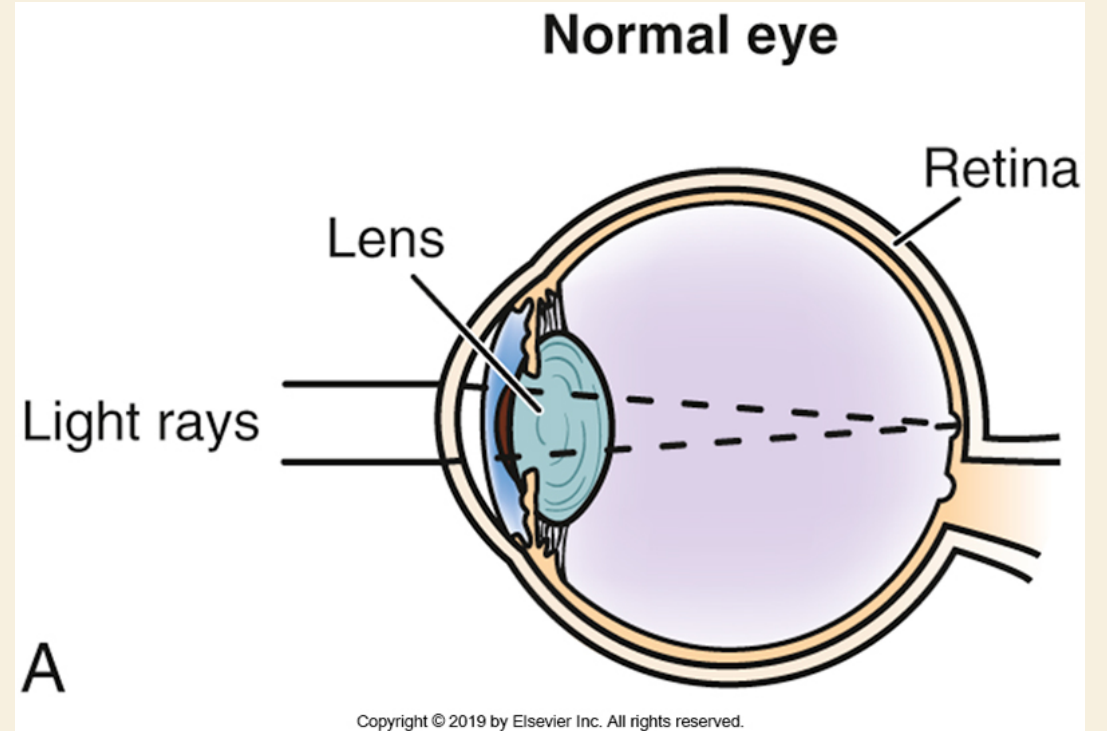
# STRUCTURE OF THE EYE



# VISUAL PATHWAYS



From Jarvis C: *Physical examination and health assessment*, ed 7, Philadelphia, 2016, Saunders, p 285.



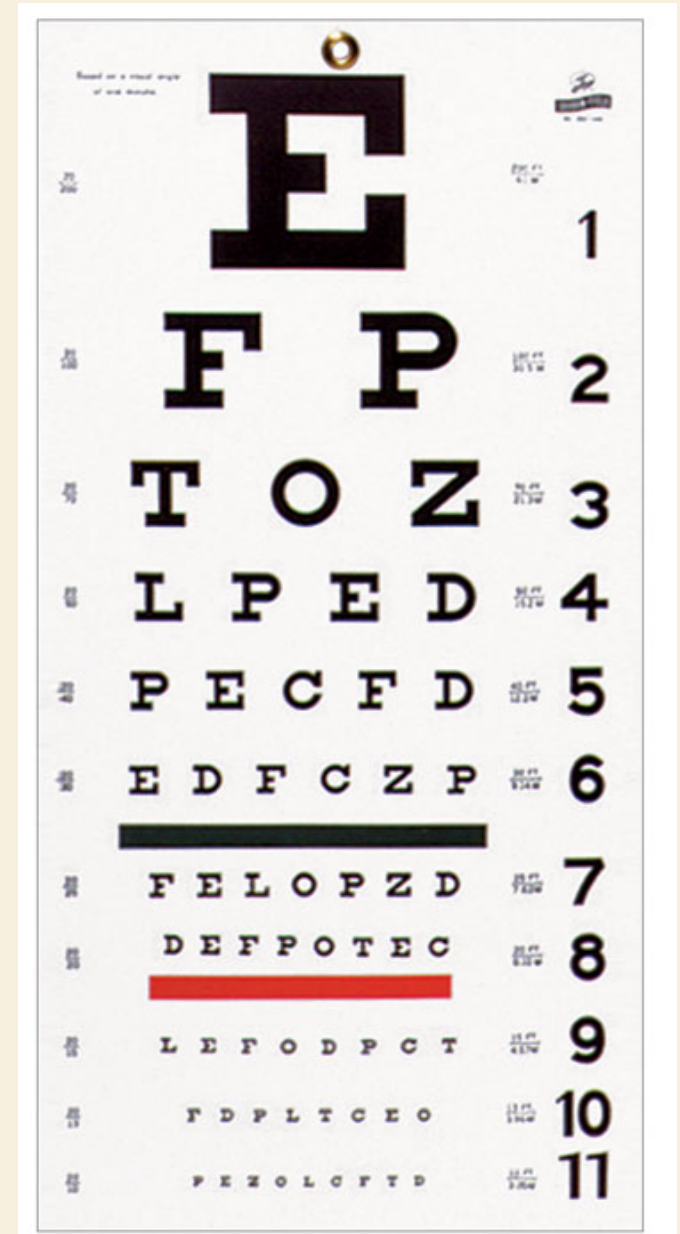
# VISUAL IMPAIRMENT

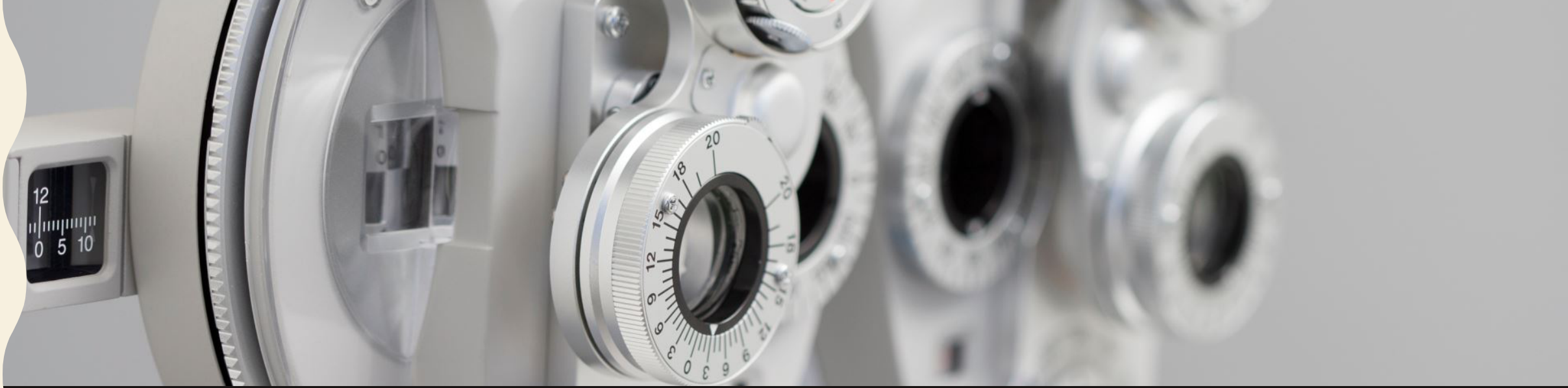
Infancy or early childhood

Older children

In adults

Elderly





# DISORDERS OF THE EYE

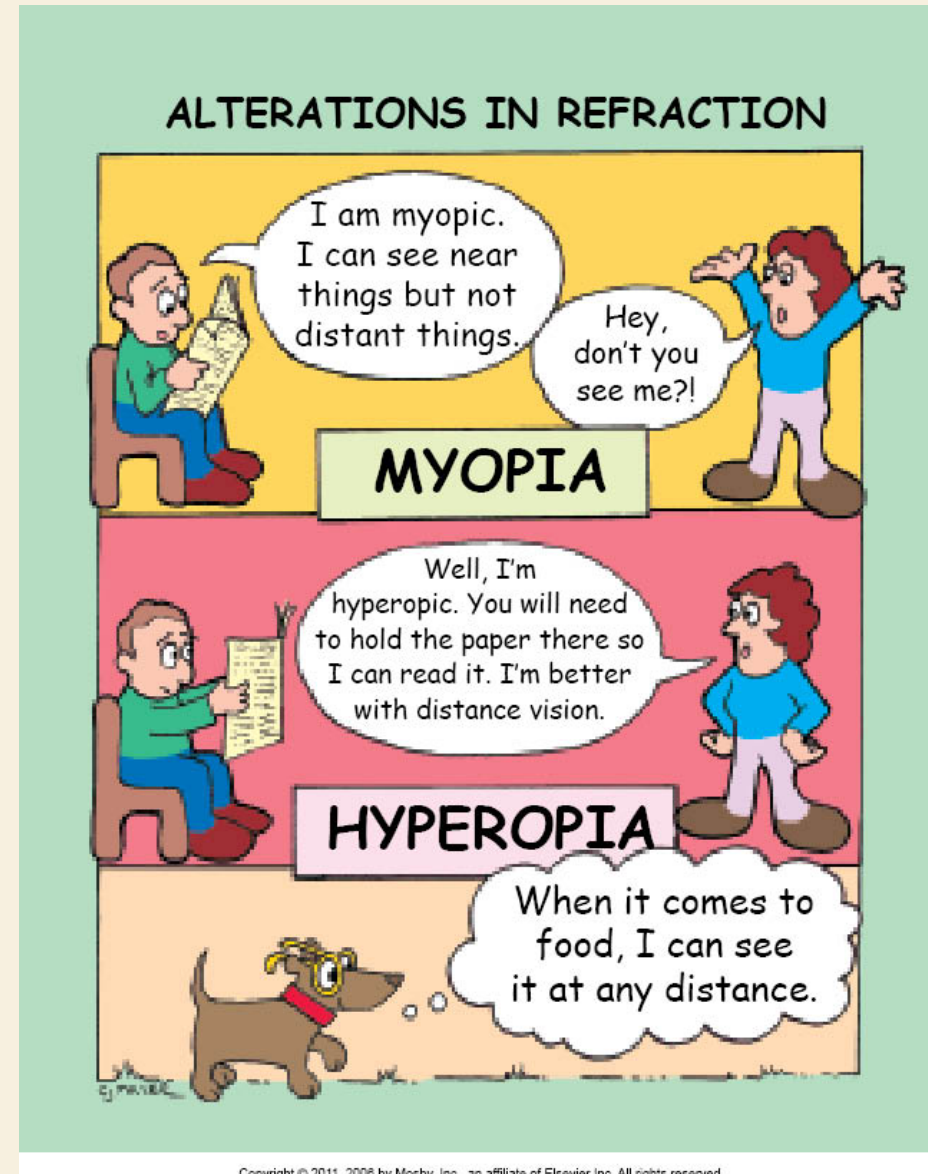
# ERRORS OF REFRACTIO

## N Myopia

- Nearsightedness
- Concave lenses

## • Hyperopia

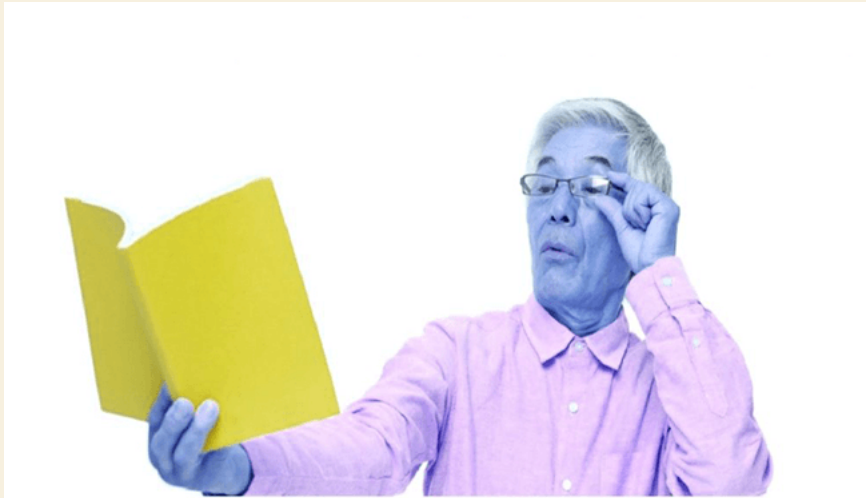
- Farsightedness
- Convex lenses



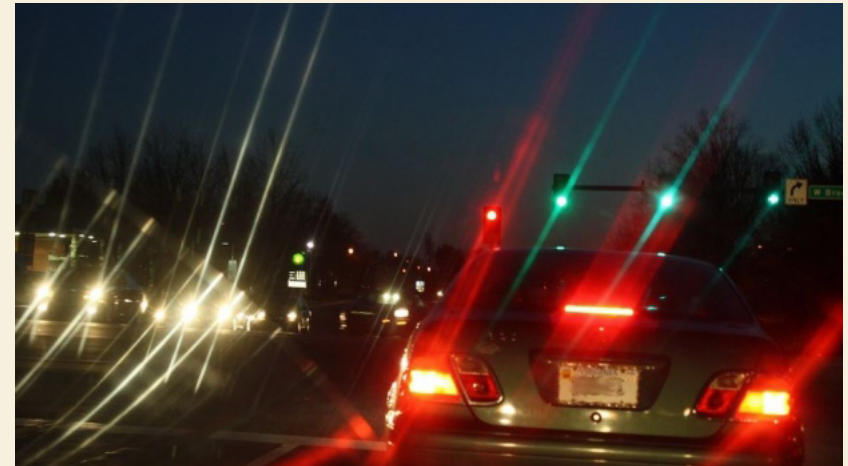


# ERRORS OF REFRACTION

## PRESBYOPIA



## ASTIGMATISM



# AGE-RELATED DISORDERS

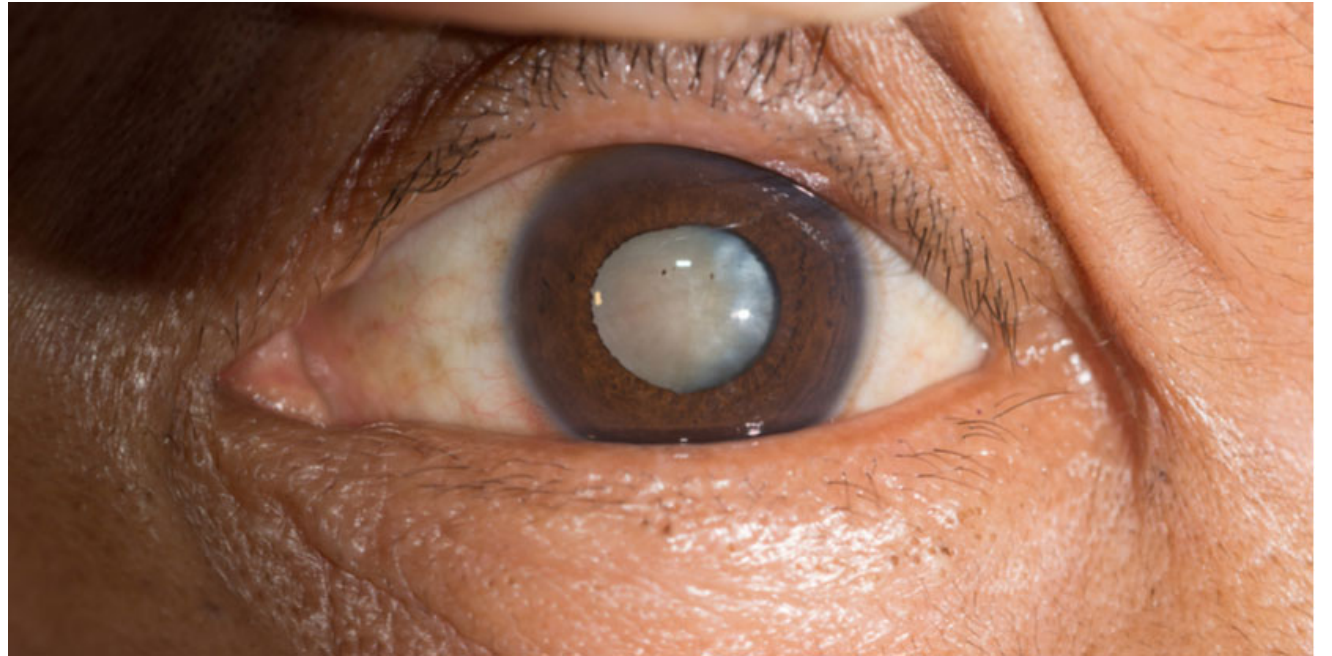
**STRABISMUS**



**AMBLYOMPIA**



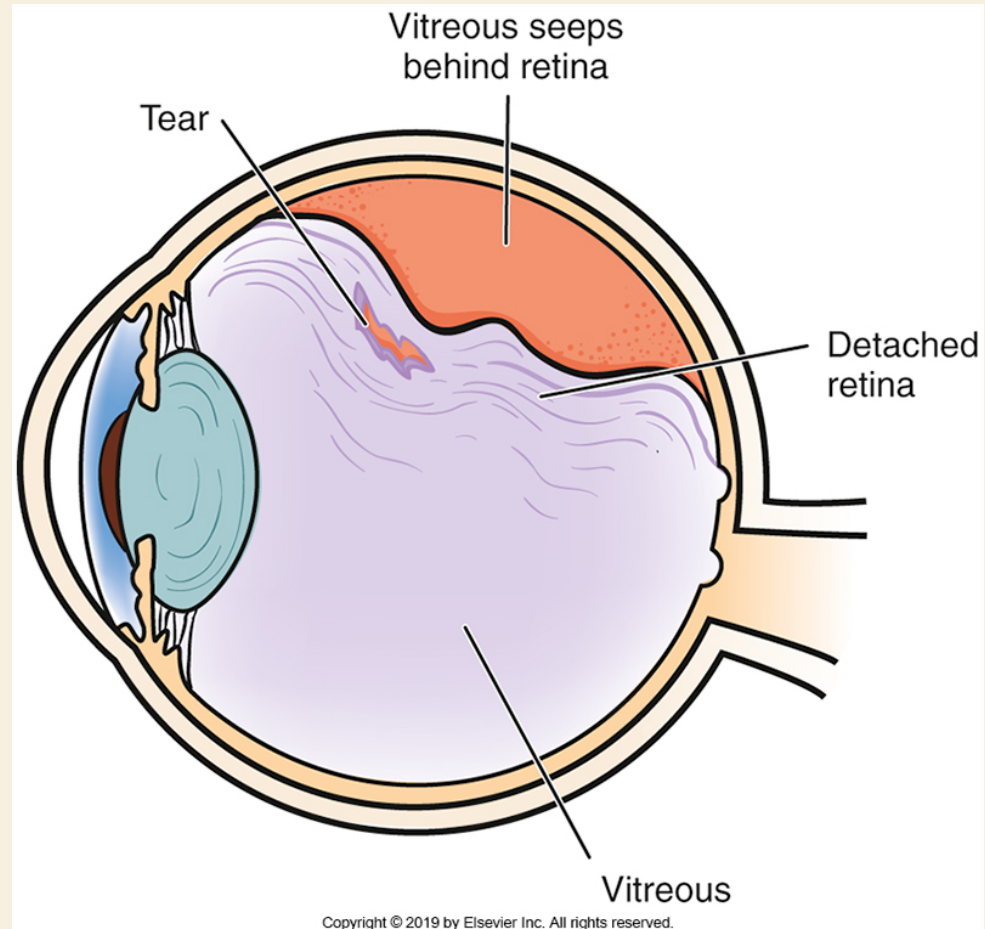
# C A T A R A C T S





# RETINOPATHY

- Retinal detachment



# RETINOPATHY

## DIABETIC RETINOPATHY

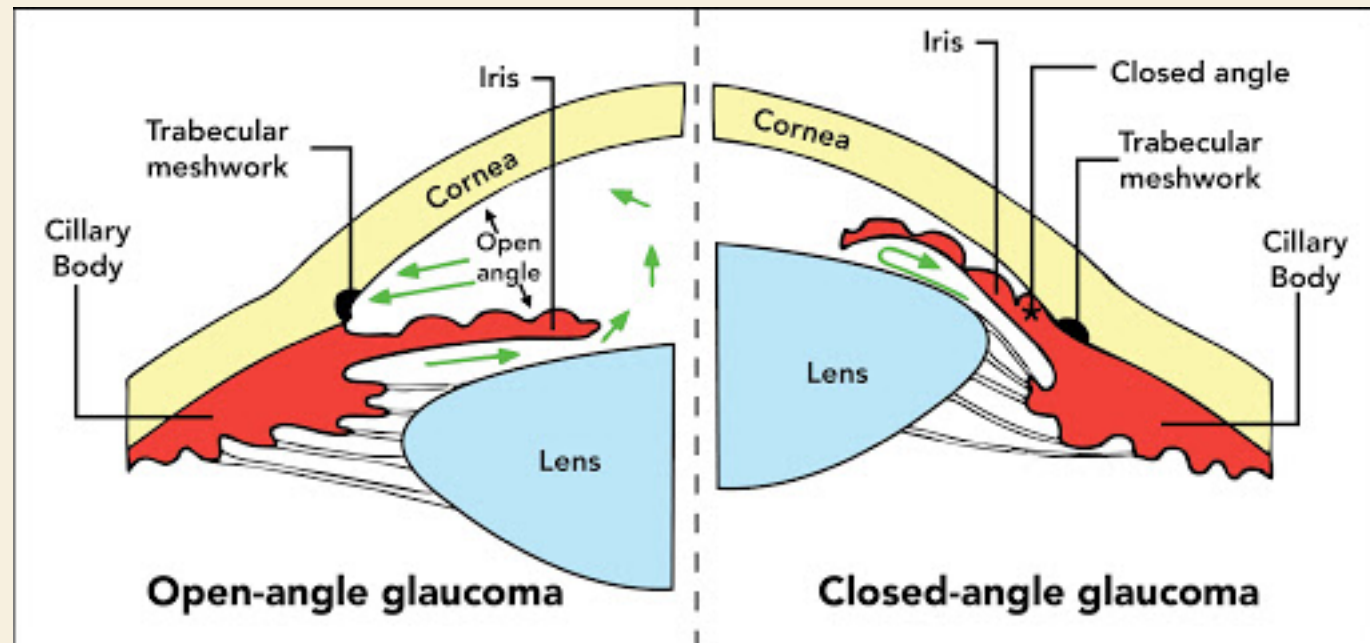


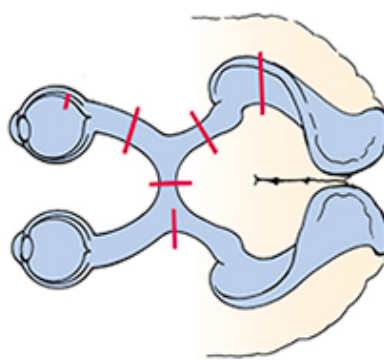
## MACULAR DEGENERATION



# GLAUCOMA

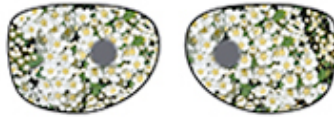
- Chronic Open-Angle
- Acute Angle Closure



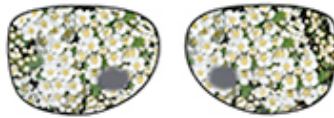


# 1. Retinal damage

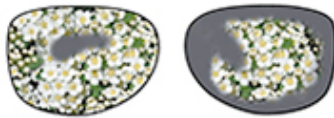
- Macula—central blind area (e.g., diabetes):



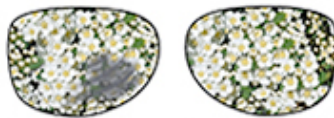
- Localized damage—blind spot (scotoma) corresponding to particular area:



- Increasing intraocular pressure—decrease in peripheral vision (e.g., glaucoma). Starts with paracentral scotoma in early stage:



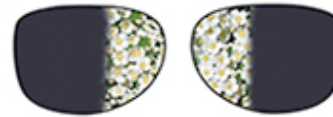
- Retinal detachment. Person has shadow or diminished vision in one quadrant or one half of visual field:



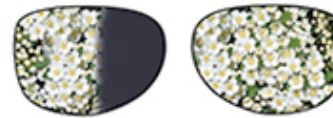
- # 2. Lesion in globe or optic nerve. Injury here yields one blind eye, or unilateral blindness:



- # 3. Lesion at optic chiasm (e.g., pituitary tumor)—injury to crossing fibers only yields a loss of the nasal part of each retina and a loss of both temporal visual fields. Bitemporal (heteronymous) hemianopsia:



- # 4. Lesion of outer uncrossed fibers at optic chiasm (e.g., aneurysm of left internal carotid artery exerts pressure on uncrossed fibers). Injury yields left nasal hemianopsia:



- # 5. Lesion of right optic tract or right optic radiation. Visual field loss in right nasal and left temporal fields. Loss of same half of visual field in both eyes is homonymous hemianopsia:



## VISUAL FIELD LOSS



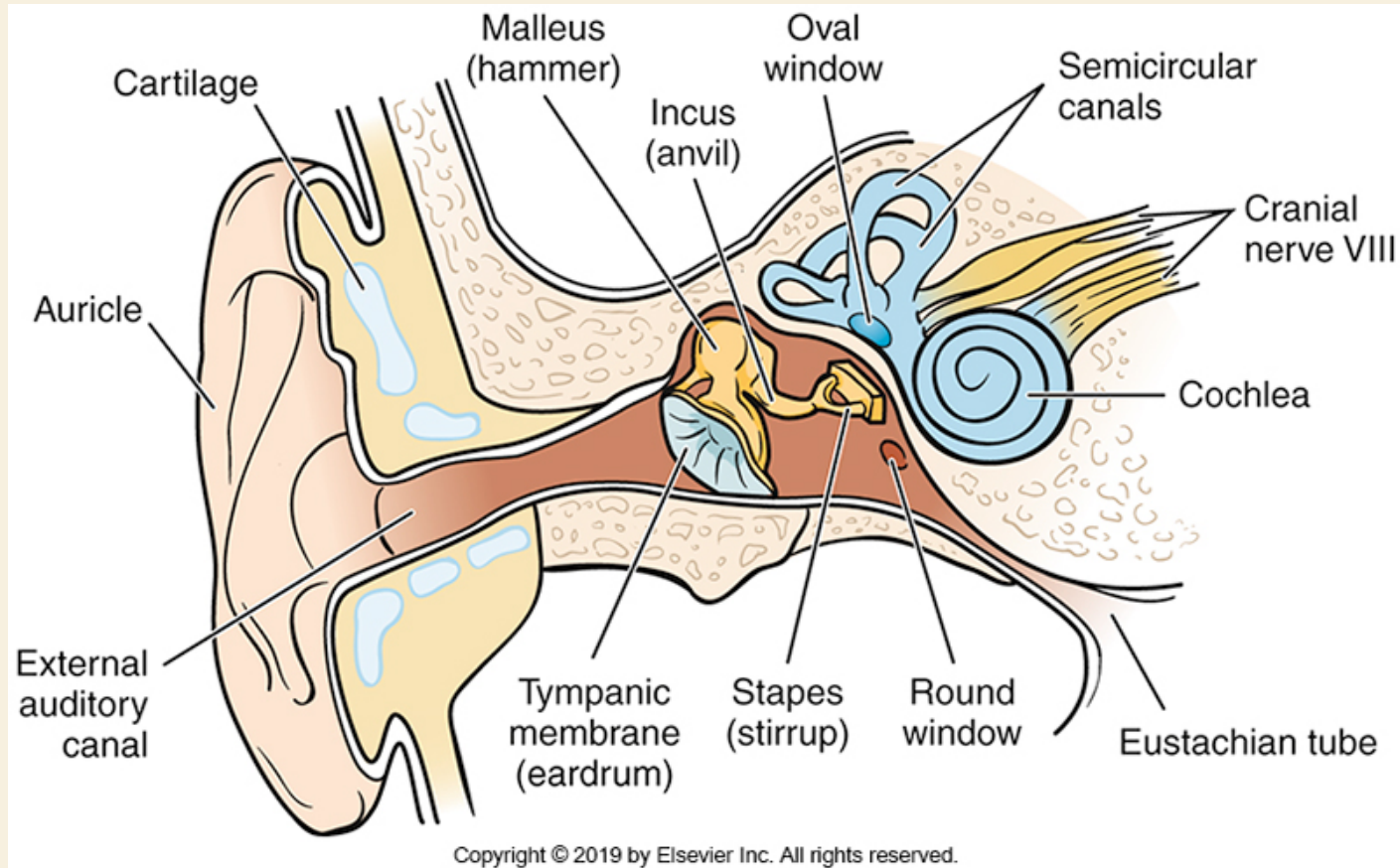
INTERVENTIONS



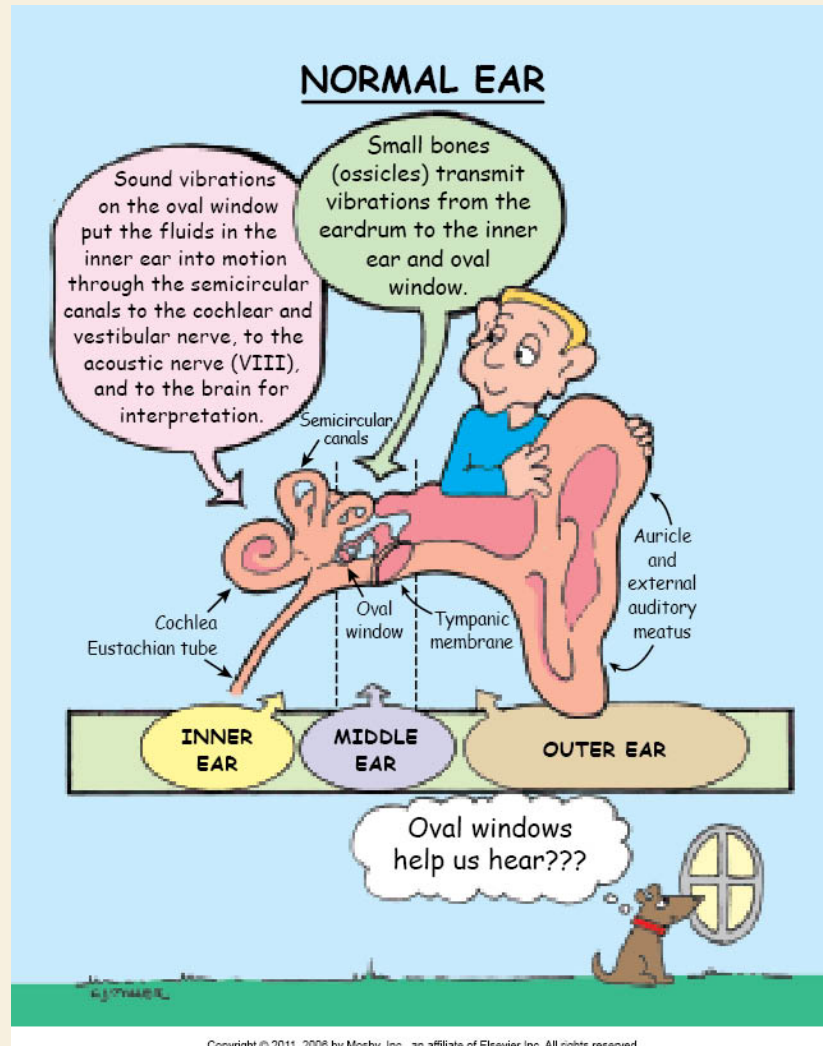
THE EAR







## STRUCTURE OF THE EAR




# FUNCTION OF THE EAR



# HEARING IMPAIRMENT

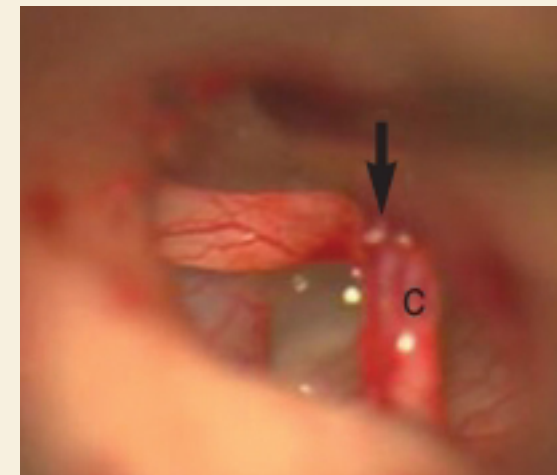
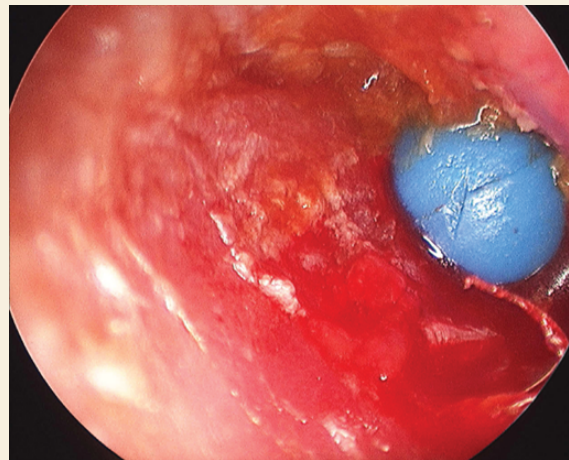
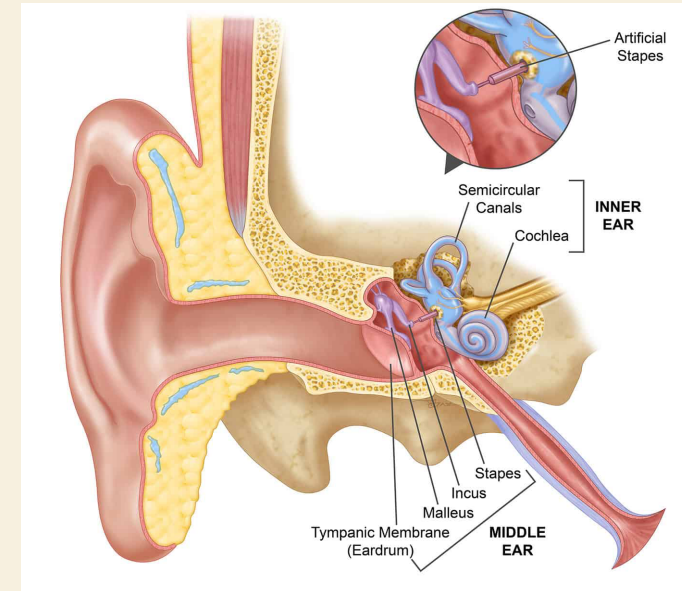
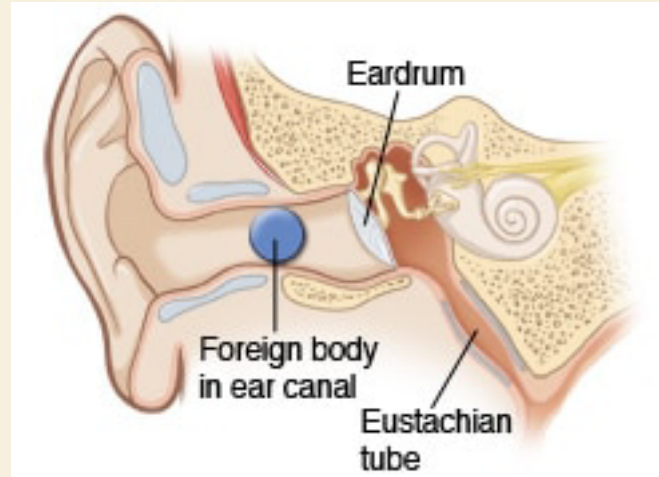
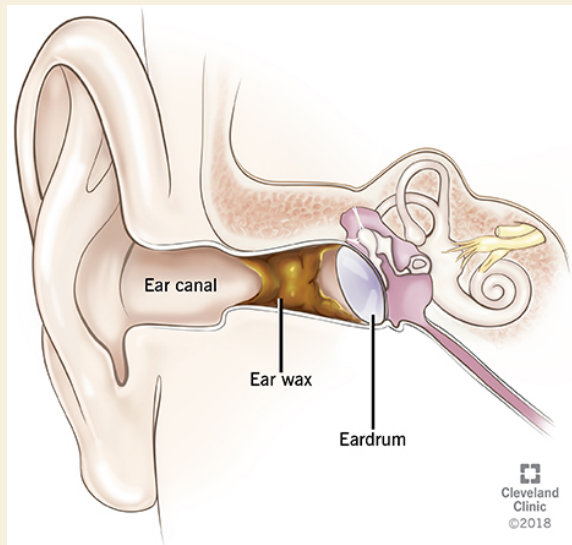
**General  
manifestations**

**Geriatric  
considerations**



# HEARING IMPAIRMENT T DISORDERS

# CONDUCTIVE HEARING IMPAIRMENTS




Source: Usatine RP, Smith MA, Mayeaux EJ, Chumley HS: The Color Atlas of Family Medicine, Second Edition: www.accessmedicine.com  
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# SENSORINEURAL HEARING IMPAIRMENTS

- Ototoxic medications
  - aminoglycoside antibiotics, salicylates, quinine and related antimalarials, and cytotoxic antineoplastic drugs
- Trauma



The image shows two axial MRI brain scans. The top scan is a T2-weighted image showing hyperintense areas in the white matter. The bottom scan is a T1-weighted image showing normal brain anatomy. Technical data is overlaid on both scans, including parameters like TR, TE, SL, and FOV. A 5cm scale bar is visible in the top left of the first scan.

# SENSORINEURAL HEARING IMPAIRMENTS CONT'

- Presbycusis
  - Sensory
  - Neural
  - Metabolic
  - Mechanical
- Meniere's syndrome



# OTITIS MEDIA

- Inflammation of the middle ear
- Acute Otitis Media
- Chronic Otitis Media





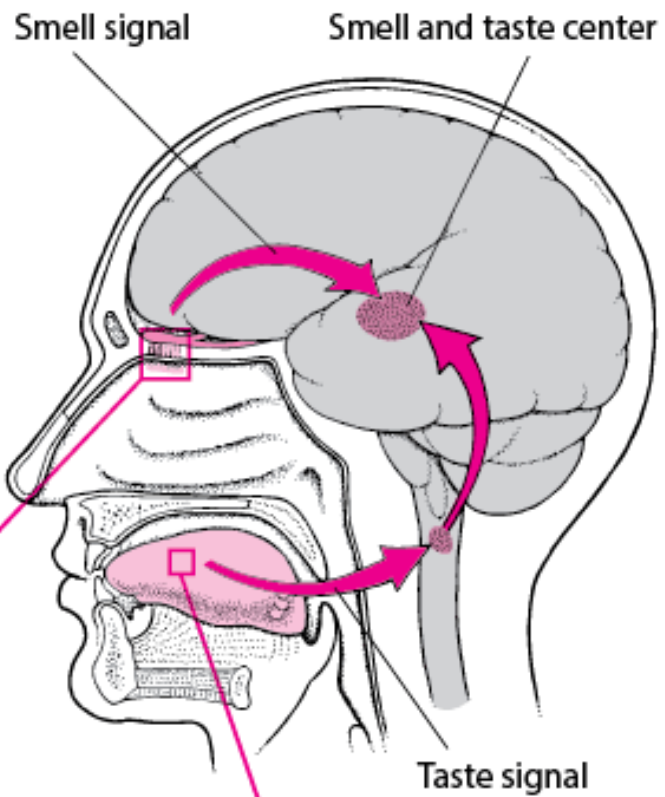
INTERVENTIONS



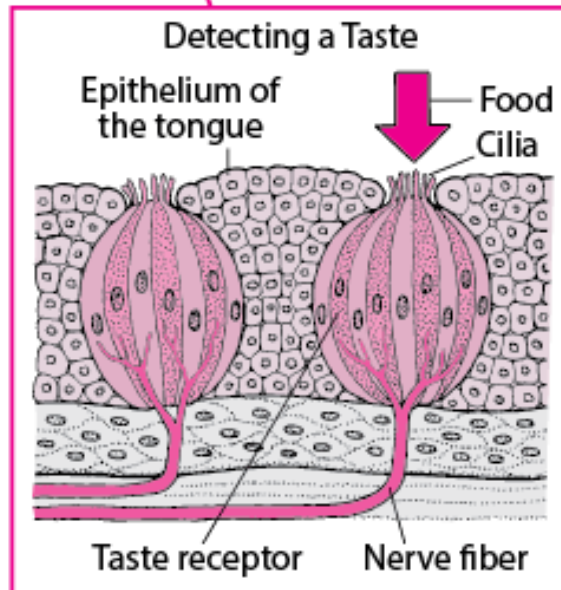
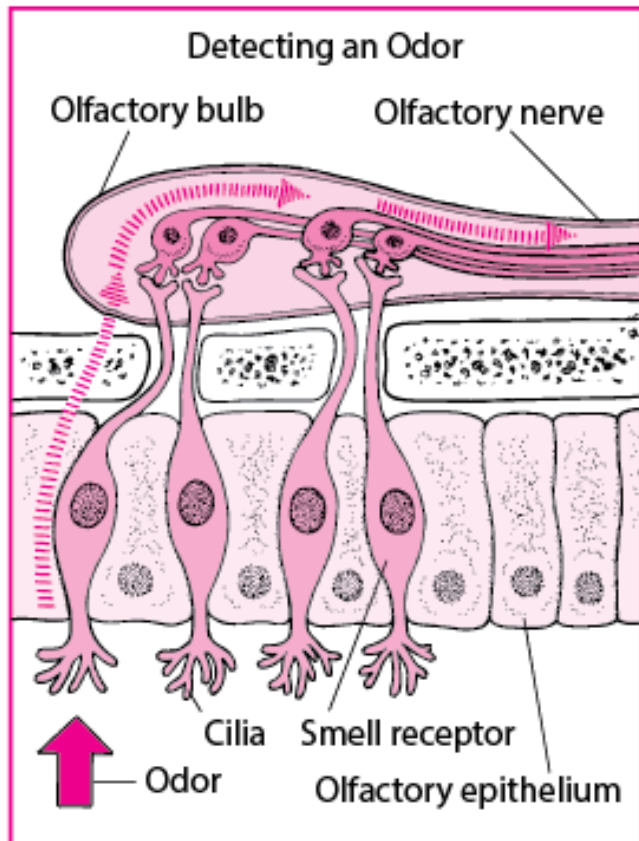
SMELL AND  
TASTE







## STRUCTURE OF SMELL AND TASTE



# DISORDERS OF SMELL AND TASTE



The diagram consists of three identical rectangular boxes arranged horizontally. Each box has a green header bar at the top and a light green body. The text 'Causes', 'Diagnostics', and 'Treatment' is centered in each box respectively. The boxes are slightly offset to the right, creating a layered effect.

Causes

Diagnostics

Treatment



# CHAPTER 24

## COMPLICATIONS OF AGING

# THE AGING PROCESS

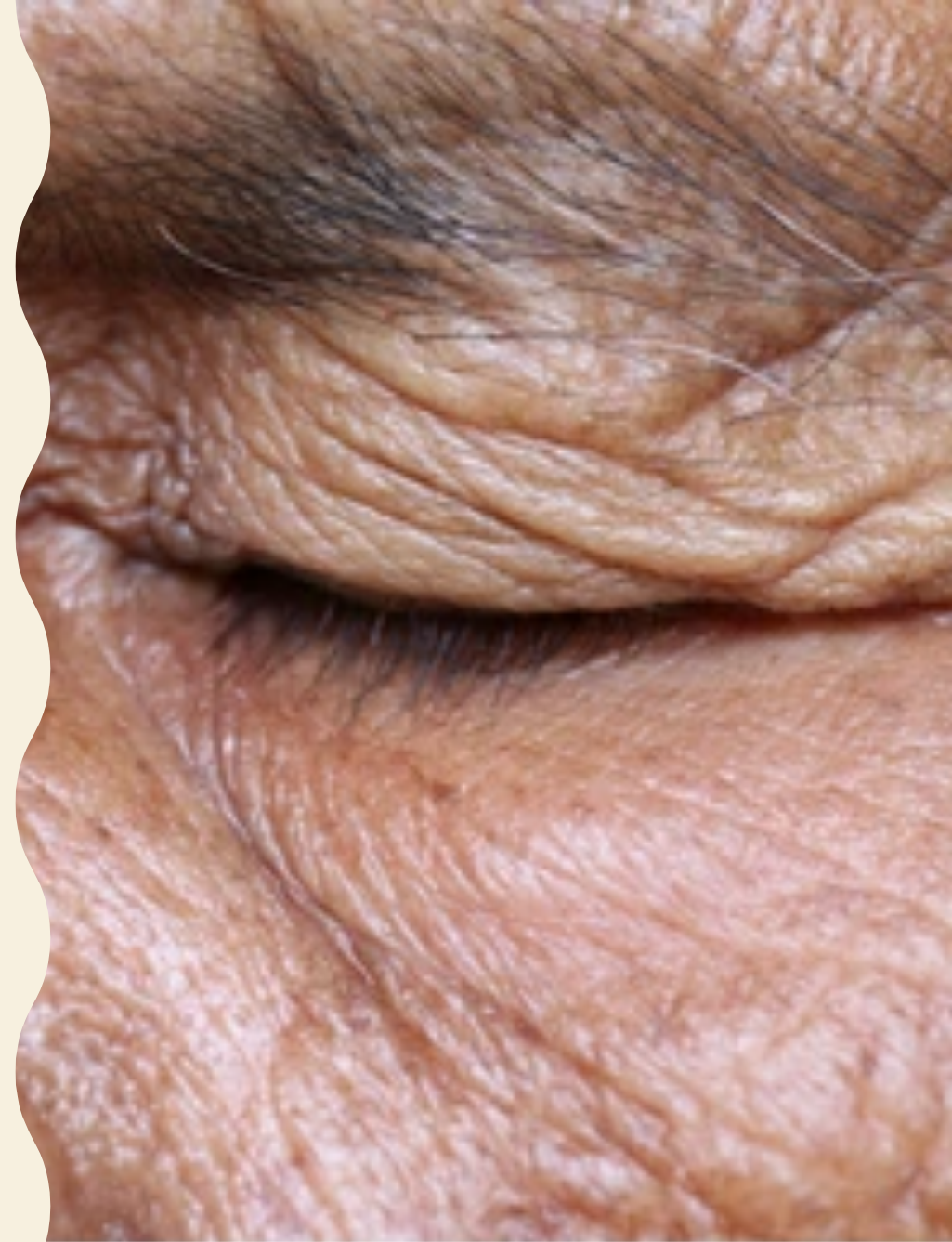
- Rate and effects of aging vary among individuals.
- May not match chronological age
- Rate of changes depend on...
- Overall, women live longer than men.
- General reduction in function occurs throughout body
- Hormonal changes

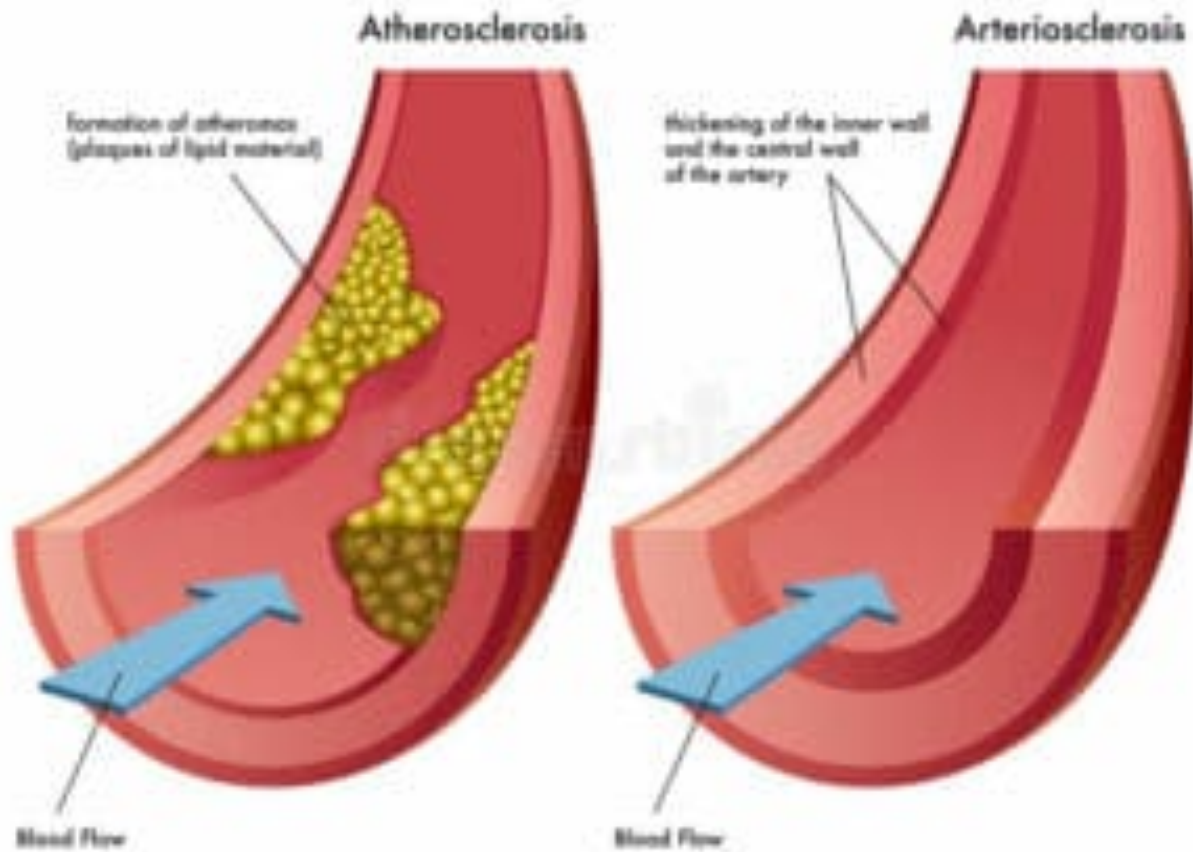
# REPRODUCTIVE SYSTEM

- Females
  - Menopause
- Males
  - Benign prostatic hypertrophy

# INTEGUMENTAR Y

- Exposure
- Skin thins
  - Appears wrinkled
    - Elastic fibers reduced
    - Collagen fibers less flexible
- Lesions include skin tags, keratoses, and lentigines.
- Hair becomes gray and thins.
  - Melanocytes are reduced in number.





## CARDIOVASCULAR

Muscle fibers decrease

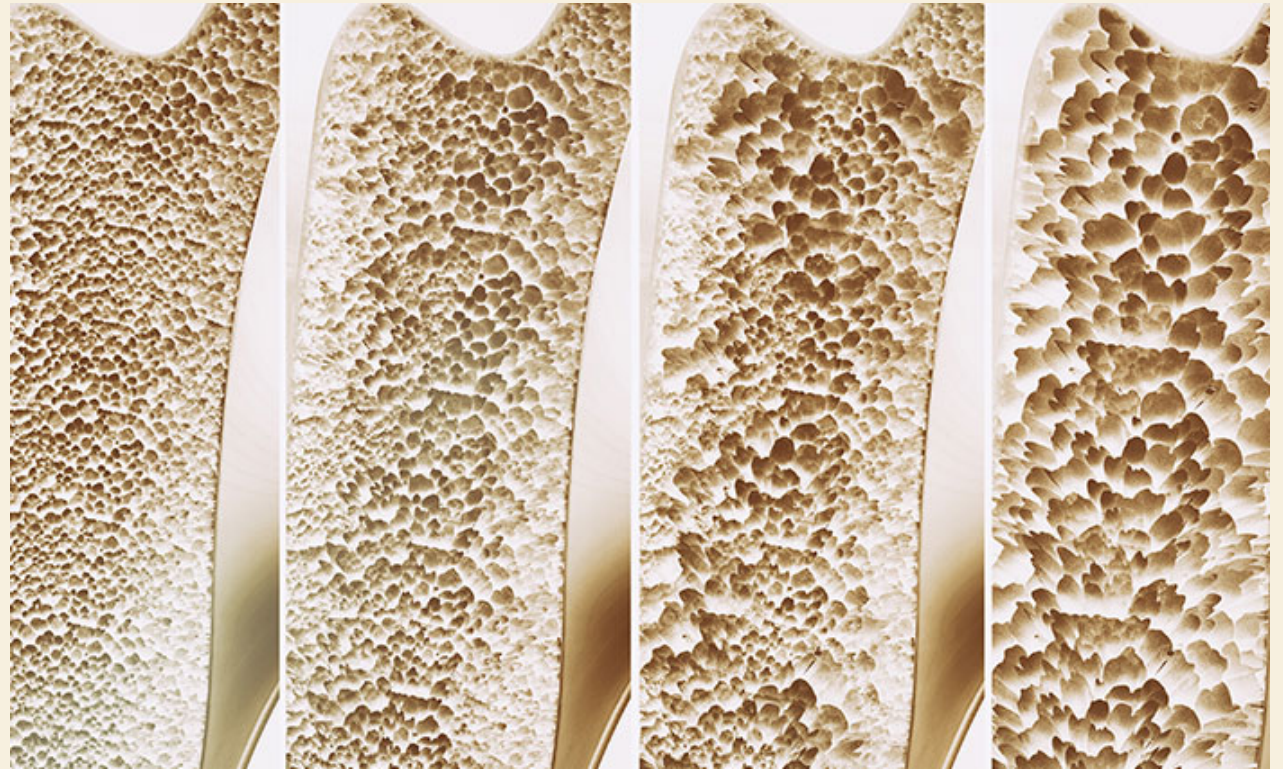
Reduced strength of  
contractions

Arteriosclerosis vs  
Atherosclerosis



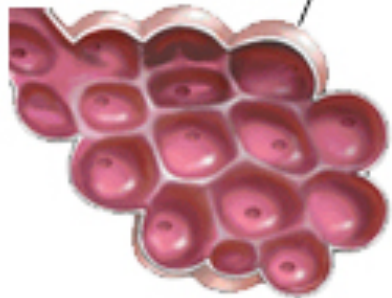
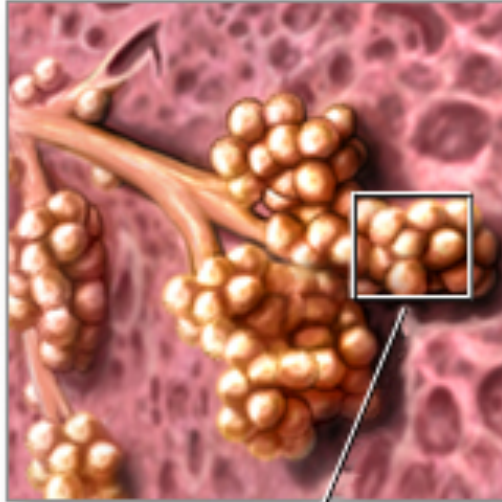
# MUSCULOSKELETAL

- Osteoporosis
- Osteoarthritis

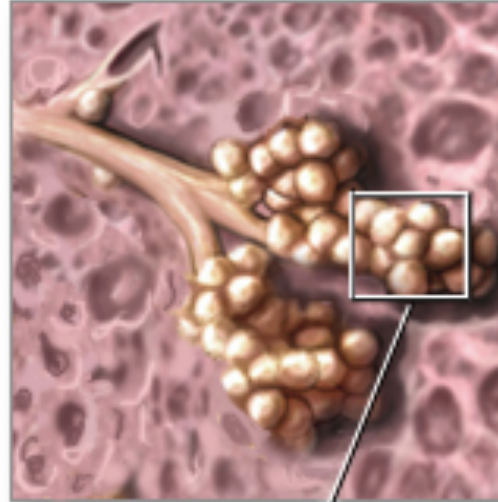




Younger



Older



 ADAM.

## RESPIRATORY

Ventilation is limited

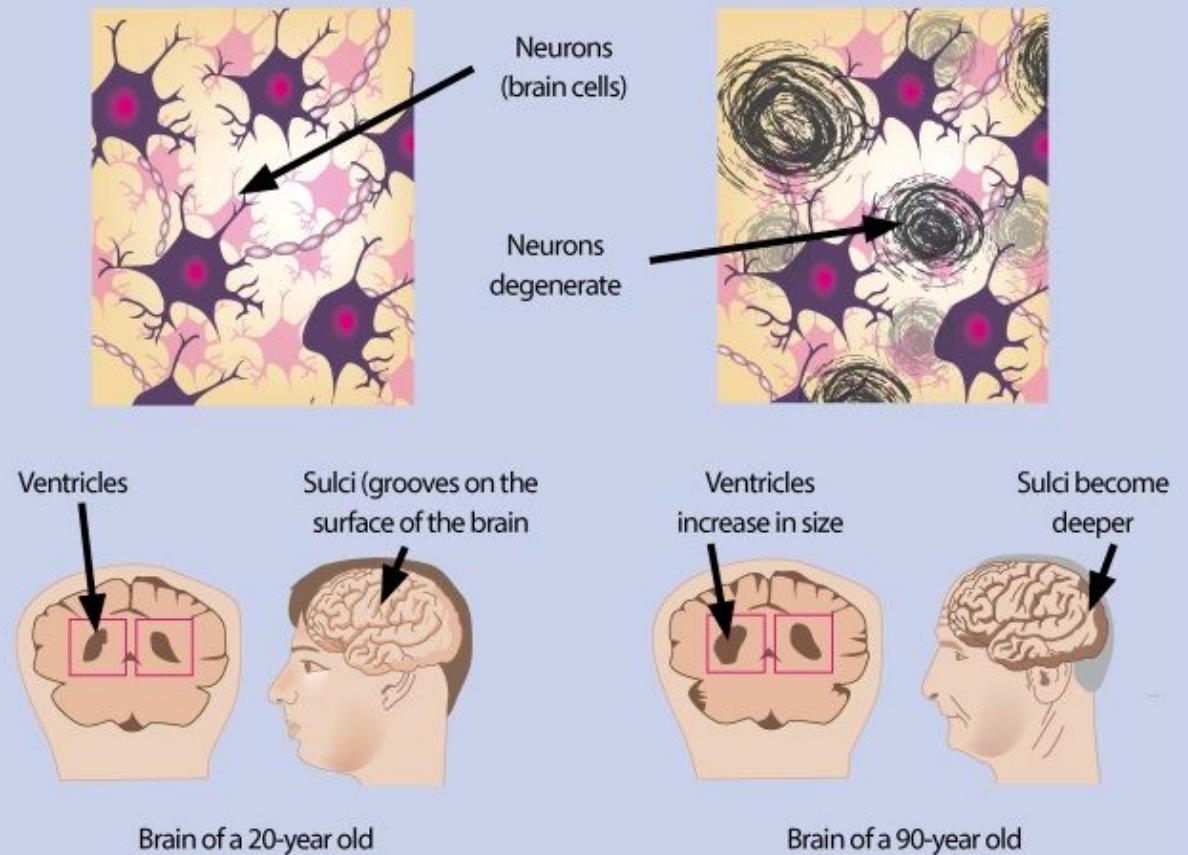
Expiration is reduced

Vascular changes

# NERVOUS SYSTEM

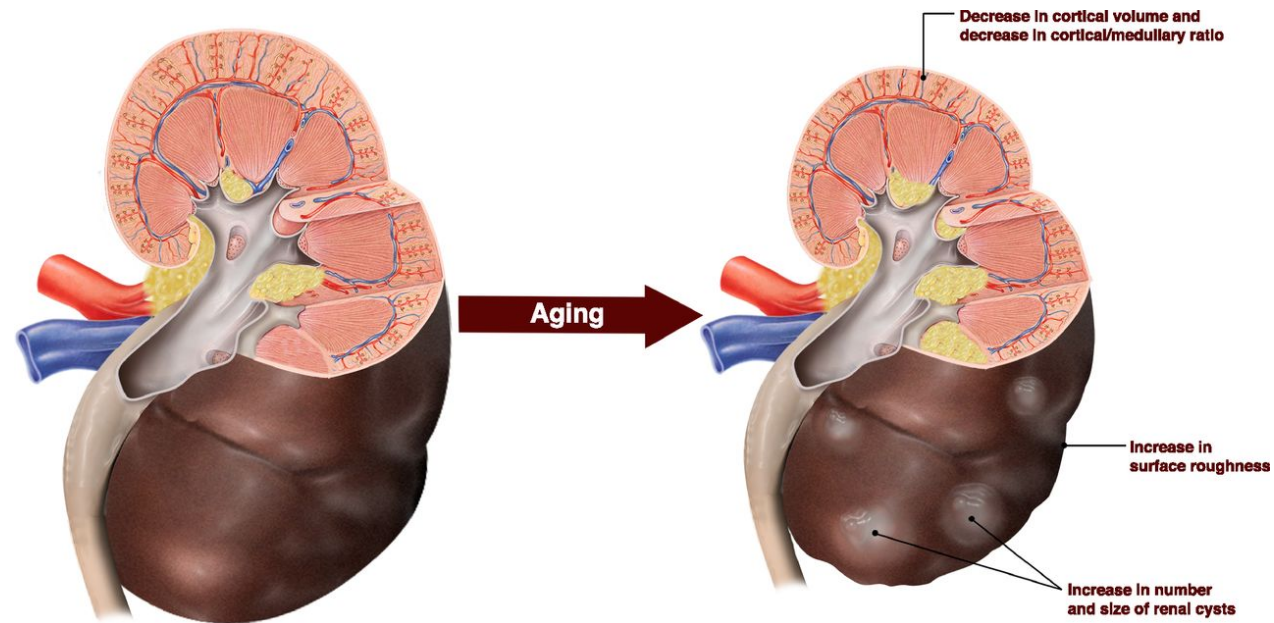
- Natural reduction of brain mass
- Slower response time
- Decreased reflexes
- Short-term memory relapses
- Vision, Hearing and Taste changes (As discussed in chapter 15)

Fig 1. Three age-related changes in the brain



# GASTROINTESTINAL

- Atrophy of mucosa and glands
  - Reduces digestive secretion
  - Impaired absorption of vitamin B<sub>12</sub>, calcium, and iron
- Constipation common in older adults
  - Frequently leads to hemorrhoids



## RENAL

Kidney function reduced

Weakened urinary sphincter  
and bladder

Nocturia (frequent  
urination)

Incontinence (involuntary  
voiding of urine)



QUESTIONS?

# REFERENCES

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