

Chapter 51 and 52-
understanding the
sensory system- med
surgical- eyes
external ...



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Chapter 51 and 52- Understanding the Sensory System- Med Surgical- EYES

External eye structures Eyelids-protective cover for the eyeball * Has a thin transparent membrane called "conjunctiva" Eyelashes-keep dust out of eyes

Each eyelid has a lacrimal gland at the upper outer corner of the eyeball

Question: how do tears come in front of the eyeball? A: small ducts bring

tears to the front and blinking help spread the tears over the surface Q: what

enzyme inhibits the growth of bacteria on the surface of the eyes? A: tears

have enzymes called lysozyme How to collect tears? Tears from Lacrimal

canals drain into lacrimal sac nasolacrimal duct nasal cavities Question: How

do we do a nursing assessment of the eyes? Answer: Inspect and palpate of

the external eye Internal Anatomy of the Eye Eyeball Layers: Outer Sclera

Middle Choroid Inner Retina Choroid layer: Prevents glare Ciliary Body:

Circular Muscle changes the shape of lens Circular Iris: Dilates, Constricts

Pupil Eyeball Cavities Vitreous Humor: Holds Retina in Place Aqueous Humor:

Nourishes Lens/Cornea Retina: Lines Posterior Eyeball Contains Rods (Light

black and white Cones (Color) for Vision Fovea: Most Acute Color Vision Optic

Nerve: Transmit Image Color Blind * Retina: Lines Posterior Eyeball, Problem

with * Cones (Color) for Vision * Usually can not see colors red, green, blue or

a mix of these colors. * Mostly men * Genetic predisposition Internal Eye The

retina is a light-sensitive layer at the back of the eye that covers about 65

percent of its interior surface. Photosensitive cells called rods and cones in

the retina convert incident light energy into signals that are carried to the

brain by the optic nerve. In the middle of the retina is a small dimple called

the fovea or fovea centralis. It is the center of the eye's sharpest vision and

the location of most color perception. Eye Movements: There are 6 intrinsic

muscles that move the eyeball are attached to the orbit and outer surface

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of the eyeball The cranial nerves that innervate these muscles are: *

Oculomotor 3rd * Trochlear 4th * Abducens 6th EYEBALL has 3 layers 1.

Outer fibrous tunic(sclera and cornea) -sclera- white part of the eye/cornea-

no capillaries and 1st part refract light rays 2. Middle vascular tunic(choroid,

ciliary body, and iris) * Choroid= has BV and dark pigment melanin(prevent

glare)/anterior of chroid is mmodified into ciliary body and iris 3. Inner

nervous tunic (Retina) * Lines 2/3of eyeball, has rods and cones,

photoreceptors, fovea= only see color b/c only has cones. * Rods are more

abundant toward periphery vision see best at night at side of visual field

Nursing Assessment for Cranial Nerves of the eyes by eye movements:

Physiology of Vision: * Involves Focusing of Light Rays on Retina and

transmission of Subsequent Nerve Impulses to Visual Areas of Cerebral

Cortex * Light rays strike the retina, it stimulates chemical RX in rods and

cones. Retinal(a receptor) bonds to a protein called a opsin. In rods, the light

rays stimulate the breakdown of rhodopsin into opsin and retinal resulting to

chemical changes and generates a nerve impulse for transmission. Cones

have a similar RX that takes place. Nursing Assessment of the eye and visual

status: * Peripheral vision/by confrontation — how far you can follow the light

while looking straight. decreases as age increases * Visual Fields- * Full

peripheral fields * Movements in all 6 cardinal fields of gaze * Corneal light

reflex test (light is at the same place in both pupils) * Cover test- steady

gaze ** Also test with Snellen's chart- read from smallest letter to biggest.

20/20- the vision is normal 20/70visual impairmentit takes the eye 70 ft to

read what a normal eye is able to 20/200legal blindness ** THE E chartpt

that has literacy problemsask to indicate what direction E shape figure.

Muscle Balance and Eye movement Instruct pt to look straight ahead and

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follow examiner's finger w/o moving head. Examiner moves finger in the 6 cardinal fields of gaze, coming back to each point of origin between each field of gaze * Patient follow examiner finger w/o nystagmus (involuntary rapid movements of the eyes vertical, horizontal, or rotary) pt have adequate extraocular muscle strength and innervations Corneal reflex test assess muscle balance shine penlight toward cornea while pt stare straight ahead. The light reflection should be at the same place for both pupils Cover Test- evaluate muscle balance Pupillary Reflex PEARRL- Pupils, Equal, Round, and, Reactive, to Light PERRLA- Pupils equal round reactive to light accommodation Pupils should constrict when pen light is shown consensual response Test for ACCOMODATION ability of pupil respond to far and near distances. * Pt, focus on object that is far away examiner observe size and shape of pupil 5 inches away * Pt focus on near object examiner observe size and shape of pupil 5 inches away * NORMAL= eyes turn inward and pupil constrict Internal Eye Examination * Only for advanced practitioner * LPN explains procedure Pt should hold head still looking at a distant object. The instrument called " ophthalmoscope" will magnify structure of eye to see internally. The bright light might be uncomfortable for the pt * Intraocular Pressure- tonometer testing using a puff of air to indent cornea and measure pressure. Above normal range may indicate glaucoma Diagnostic Tests for the EYE * Culture- ordered when exudate from eye are present/rule out infection * Fluorescein Angiography- Asses for dye allergies B4 starting/ fluorescence dye inject into venous system * Electroretinography- evaluate difference of electrical potential between cornea and retina in response to wavelengths and intensities/contact electrode on eye to check rods and cones * Ultrasonography- eye instill with anesthesia drops, and perform <https://assignbuster.com/chapter-51-and-52-understanding-the-sensory-system-med-surgical-eyes-external-eye-structures/>

ultrasound with transducer probe/picture by sound * Radiologic Test- Xray, CT, MRI to view bone and tissue around eye * Digital Imaging- take digital pictures of retina in 2 seconds/ eyes don't need to be dilated VISUAL FIELD ABNORMALITIES A. Normal vision B. Diabetic Neuropathy C. Cataracts- blurry D. Macular degeneration- can't see middle E. Advanced Glaucoma- can only see middle AMSLER GRID: Q: What are we testing? - Used to identify central vision distortions and blind spots * If you can see the middle dot in the grid then you pass Nursing Assessment of the Eyes- SUBJECTIVE DATA * Family History * Glaucoma * Diabetes * General Health * Trauma to Eyes * Medications * Data on Visual Acuity * Double Vision * Difficulty seeing things near? Far? Visual Acuity * Snellen's Chart/E Chart/Rosenbaum * Visual Impairment — 20/70 * (You must be at 20 feet to see what a normal person sees at 70 feet) * Legal Blindness - 20/200 or Less with Correction Question: A patient is diagnosed with a refractive error and asks the nurse what this mean. What would be the appropriate explanation by the nurse? A: You will need corrective lenses in order to see clearly REFRACTOR ERRORS: - Bending light rays as they enter the eye 1. Emmetropia: Normal Vision A. Hyperopia: Farsightedness Eyeball is too short, causing image to focus beyond the eyeball (Can see objects far away) B. Corrected with convex lense C. Myopia: Nearsightedness (can see near objects) D. Corrected myopia * Astigmatism: Unequal Curvatures in Cornea * Presbyopia: Loss of Lens Elasticity Normal aging after age 40 become- farsighted Astigmatic Mirror If you a " typical" astigmatic, you may see the lines near the horizontal are clearer and darker than the lines vertically. You may also find the lines near the horizontal are spaced further apart and the vertical spaced closer together. You might also find the inner circle in not quite round. Nursing Assessment for the EYE: * <https://assignbuster.com/chapter-51-and-52-understanding-the-sensory-system-med-surgical-eyes-external-eye-structures/>

Usually test for children * Corneal Light Reflex * To test for lazy eye or strabismus: * A condition in which the visual axes of the eyes are not parallel and the eyes appear to be looking in different directions. Nursing

Assessment of the eye OBJECTIVE DATA * Pupillary Reflex * Pupil size ___ mm

* PERRLA? * Pupils * Equal * Round * Reactive to * Light and * Accommodation

* Consensual? — reaction of both pupils when only one eye is exposed to

change in light intensity EYES CHANGE AS WE AGE * Decreased Elasticity of

Lens: Presbyopia * Difficult peripheral vision: Narrowed visual field *

Decreased pupil size and response to light * Poor night vision * Sensitivity to

glare * Yellow lens — harder to differentiate colors * Distorted or poor depth

perception * Decreased lacrimal secretions or tears Eye Health Promotion

Regular Eye Examinations Nutrition for eye health * Eye Protection * Safety

goggles * Sunglasses * Avoid eye strain from computer use * Keep contact

lenses clean * Eye hygiene is hand hygiene! * Eye irrigation INFECTIONS AND

INFLAMMATION 1. Conjunctivitis “ PINK EYE” * Inflamed conjunctiva * Cause:

virus, bacteria, or allergic RX * S/Sx: red conjunctiva, crusting exudate, itchy

or painful eyes, excessive tearing * Tx: Antibiotic drops or ointments 2.

Blepharitis- inflammation of the eyelid margins, chronic inflammatory

process 3. Hordeolum- eyelid infection due to staph abscess in the

sebaceous gland at base of eyelash 4. Chalazion- eyelid infection 2nd type of

abscess form in connective tissue of eyelid 5. Keratitis- inflammation of

cornea Blindness- complete or almost absence of the sense of light aka

visually Impaired * Types include Glaucoma and Cataracts GLAUCOMA

Pathophysiology: abnormal pressure in the eye causing damage to the optic

nerve Most common: Primary (primary open-angle vs. acute angle-closure

glaucoma) * Secondary caused by infections, tumors, or trauma * Third kind:

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congenital Risk factors: family hx, African-American race Signs and

Symptoms: * Acute angle-closure: unilateral and rapid onset; severe pain, blurred vision, rainbows around lights, nausea and vomiting * Primary open-angle: bilateral and gradual onset, no pain, aching eyes, headache, halos around lights, visual changes not corrected by eyeglasses * Early detection may require tx to PREVENT optic nerve damage during asymptomatic period.

Medications/Prescriptions: * Cholinergic agents (miotics) * Cause pupil constriction * Isopto (carbachol) * Carbonic anhydrase inhibitors * Slow production of aqueous fluid * Diamox (acetazolamide) * Adrenergic agonists * Slow production of aqueous fluid * Propine (dipivefrin) * Beta blockers * Slow production of aqueous fluid * Timoptic (timolol) * Surgery, if treatment is not successful. CATARACTS * Pathophysiology: opacity in the lens that can cause loss of vision; light can't get through to the retina * Ultraviolet rays damage lenses over time. * S/sx: painless, halos around lights, difficulty reading fine print, difficulty seeing in bright light, sensitivity to glare, double vision, hazy vision, decreased ability to see colors * Tx: Surgery: surgical removal of clouded lens and replacement or accommodation with special eyeglasses or contact lenses Pt Teaching after Cataract Surgery: * Make sure you make arrangements for a ride. * You may need to instill eye drops or take pills to help healing and to control pressure inside your eye. * You will need to wear an eye shield or eyeglasses to help protect the eye. * Avoid rubbing or pressing on your eye. * Try not to bend or lift heavy objects because bending increases pressure in the eye. * You can walk, climb stairs, and do light household chores. Macular Degeneration Pathophysiology: * It's age related leading cause of visual impairment in US adults older than age 50

* Deteriorate in the macula area where retina light rays converge for sharp, <https://assignbuster.com/chapter-51-and-52-understanding-the-sensory-system-med-surgical-eyes-external-eye-structures/>

central vision, needed for reading and seeing small objects * 2 types of ARMD * Dry (atrophic): photoreceptors on the macula fail to function and aren't replaced secondary to advancing age * Wet (exudative): retinal tissue degenerates allowing vitreous fluid or blood into subretinal space; new blood vessels form -> subretinal edema -> scar tissue * LIMITED CENTRAL VISION
Dry: cellular debris accumulate behind retina Wet: blood vessels grow behind the retina Without treatment the retina can become detached * S/sx: * Dry: slow, progressive vision loss of central and near vision * Wet: sudden onset of central and near vision, blurred vision, distortion of straight lines, dark or empty spot in the central field of vision * Tx: * Dry: no treatment * Wet: argon laser photocoagulation EYE MEDICATIONS: Ophthalmic antibiotics * Bacitracin * Erythromycin Cholinergic agents (miotics) * Carbachol * Pilocarpine Beta blockers timolol NURSING CARE: * Post a sign over bed or door that identifies the patient's visual status * Identify and announce yourself as you enter the room and leave the room * Ask the patient, " Is there anything I can do for you? " * Orient the pt to the room * Keep objects in the same location on the bedside table at all times per patient preference. * Explain procedures before you begin * Tell the pt what you are doing before you touch them * At mealtime, explain location of food like the hands of a clock (your milk is at 2 o'clock) * Keep call light within reach! Do not play with the Seeing Eye dog that is working * Teach patient how to properly administer eye drops and/or ointment. * Teach patients to get regular eye examinations. * Allow patients to talk about their anxiety and fear. * When ambulating with the patient place the patient's hand on your elbow. * Assist blind patient with objects such as audio books or watch with audio.