

# Notes for nursing eyes and ear

[Health & Medicine](#), [Nursing](#)



## 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 moves the eyeball are attached to the orbit and outer surface of the eyeball The cranial nerves that innervate these muscles are: \* Oculomotor 3rd \* Trochlear 4th \* Abducens 6th EYEBALL has 3 layers . 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 choroid is modified into ciliary body and iris 3. Inner nervous tunic (Retina) \* Lines 2/3 of 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 20/70 visual impairment it takes the eye 70 ft to read what a normal eye is able to 20/200 legal blindness \* THE E chart pt that has literacy problems ask to indicate what direction E shape figure. Muscle Balance and Eye movement Instruct pt to look straight ahead and 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

EYECulture- 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 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

\*FamilyHistory \* Glaucoma \*DiabetesGeneralHealth\* 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: \* 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 \* Accomodation \* Consensual? - reaction of both pupils when only one eye is expose 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: 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 \* Iopto (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, 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.