

Component III: Clinical

Module B: Specialty Procedures

Topic 1: Vision Screening

Statement of Purpose

To provide learner with basic understanding of skills necessary to perform visual screening in order to help with diagnosis and treatment associated with the eye or eyes and vision of patient.

Student Learning Outcomes

Upon completion of this topic, the learner will be able to:

1. Spell and define the key terms.
2. Explain the differences among an ophthalmologist, optometrist, orthoptist and an optician.
3. Differentiate between near and distance visual acuity screening.
4. Explain the significance of the top and bottom numbers next to each line of letters on the Snellen eye chart.
5. Explain the difference between congenital and acquired color vision.
6. Describe the Ishihara color vision test.
7. Recall the anatomic structures that constitute the eye.
8. Document vision screening accurately.

Terminology

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|--------------------|-------------------|
| 1. Amblyopia | 9. Optometrist |
| 2. Astigmatism | 10. Optotype |
| 3. Canthus | 11. Orthoptist |
| 4. Hyperopia | 12. Presbyopia |
| 5. Myopia | 13. Refraction |
| 6. Occluder | 14. Strabismus |
| 7. Ophthalmologist | 15. Visual acuity |
| 8. Optician | |

References

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Content Outline/Theory Objectives	Suggested Learning Activities
<p>Objective 1 Spell and define key terms.</p> <ul style="list-style-type: none"> A. Review the terms listed in the terminology section. B. Spell the listed terms accurately. C. Pronounce the terms correctly. D. Use the terms in their proper context. E. Error prone abbreviations for eyes (OD-right, OS-left, and OU-both) should not be used to assure correct eye is noted. 	<ul style="list-style-type: none"> A. Games: word searches, crossword puzzles, family feud, jeopardy, bingo, spelling bee, hangman, and concentration. B. Administer vocabulary pretest and post-test. C. Discuss learning gaps and plan for applying vocabulary.
<p>Objective 2 Explain the differences among an ophthalmologist, optometrist, orthoptist, and an optician.</p> <ul style="list-style-type: none"> A. Ophthalmologist <ul style="list-style-type: none"> 1. A licensed medical Physician. 2. Specializes in the treatment of disorders of the eye. 3. Qualified to prescribe drugs and corrective lenses. 4. Qualified to perform eye surgery. 5. Graduate of medical school. B. Orthoptist <ul style="list-style-type: none"> 1. Specialized health care professional in ophthalmology. 2. Evaluates and treats imbalances of the muscles of the eye and the nerves that serve those muscles <ul style="list-style-type: none"> a. For example, amblyopia and strabismus. 3. Orthoptists commonly work in pediatric ophthalmology settings. C. Optometrist <ul style="list-style-type: none"> 1. A doctor of optometry (OD); a primary health care provider who practices optometry. 2. Trained to prescribe eyeglasses and contact lenses, examine eyes, and detect diseases. 3. Not a physician. 4. Graduate of school of optometry. D. Optician <ul style="list-style-type: none"> 1. Specializes in filling prescriptions for corrective lenses for eyeglasses and contact lenses. 2. Graduate of certificate program. 	<ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings
<p>Objective 3 Differentiate between near and distance visual acuity screening.</p> <ul style="list-style-type: none"> A. Near visual acuity <ul style="list-style-type: none"> 1. To measure the near vision of the patient. 2. Determines the presence of hyperopia and presbyopia. 3. Conducted with a card that has various sizes of typed print. 	<ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Have students screen one another's eyes using the Snellen chart, near vision acuity cards.

4. Procedure

- a. Wash hands.
 - b. Position patient in a well-lit room.
 - c. Seat patient comfortably.
 - d. Identify patient and explain procedure.
 - e. Position the near visual acuity card 14 inches between the card and the patient's eyes by measuring with a tape measure.
 - f. Measure visual acuity in each eye separately, beginning with the right eye.
 - g. Have patient cover the left eye with occlude.
 - h. If the patient uses reading lenses, these should be worn during the test. Document in chart if reading lenses are worn.
 - i. Have patient read each line or paragraph aloud.
 - j. Observe the patient for unusual symptoms such as squinting, tilting the head, trying to peek around the occluder, or watering of the eyes.
 - k. Repeat process to measure the left eye.
 - l. Repeat process to measure both eyes together.
 - m. Documentation
 - 1) Results are recorded on the chart as the smallest type that was comfortably read with each eye.
 - 2) Chart the distance at which the card was held.
 - n. Discard the testing card and occluder or disinfect.
 - o. Wash hands.
- B. Distance visual acuity screening using a Snellen chart
1. To perform a visual screening test to determine a patient's distance visual acuity.
 2. Types
 - a. Letter, used for adults and children who comfortably know their letters.
 - b. Big E, used for children and non-English speaking adults.
 - c. Optotypes are arranged from smallest on the bottom to largest on top of the chart.
 - d. Normal vision
 - 1) Should see figures that are 20 inches high while standing at a distance of 20 feet from the chart.
 - 2) The person would have 20/20 vision.
 3. Procedure
 - a. Position chart in a well-lit room, free from distractions.
 - b. Have patient stand 20 feet from chart.

- c. Make sure chart is eye level to patient with no glare.
- d. Explain procedure to patient.
- e. Measure each eye separately beginning with the right eye.
- f. Patient may keep corrective lenses on while performing the test. Document in chart if corrective lenses are worn.
- g. Close and cover the eye not being tested with an eye occluder.
 - 1) Disinfect occluder after each use or dispose of appropriately.
 - 2) Although covered, the eye is to remain open.
 - 3) Do not allow patient to cover eye with hand due to possibility of pushing on eyelid.
- h. Start by asking patient to read aloud the 20/70
 - 1) Proceed down the chart until the smallest line of letters is reached.
 - 2) If patient mistakes a letter on a line, ask the patient to read the previous line.
 - 3) Go again to the line that was not correctly read.
 - 4) If the patient mistakes the letter again, chart the line and the number of mistakes in that line.
- i. Observe the patient for squinting, tilting of the head, attempting to peek around the occluder, or watering of the eyes while performing the test.
- j. Repeat procedure for left eye.
- k. Repeat procedure testing both eyes.
- l. Chart the procedure
 - 1) Date and time of screen.
 - 2) Name of the screen.
 - 3) Visual acuity results.
 - 4) Unusual symptoms displayed by the patient.
 - 5) Whether the patient was using corrective lenses.
- m. Charting the visual acuity results
 - 1) Observe the numbers to the side of the smallest line patient was able to read
 - 2) If one or two letters are missed, chart using a minus sign next to the bottom number, along with how many number letters missed (e.g. 20/20-2).
 - 3) If more than two errors are made the previous line should be documented.

<p>Objective 4 Explain the significance of the top and bottom numbers next to each line of letters on the Snellen eye chart.</p> <ul style="list-style-type: none"> A. Top number represents distance (in feet) at which the screen is conducted. B. Bottom number represents the distance from which a person with normal visual acuity read the line. 	<ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings
<p>Objective 5 Explain the difference between congenital and acquired color vision deficiency.</p> <ul style="list-style-type: none"> A. Congenital <ul style="list-style-type: none"> 1. Present at birth. 2. Deficiency may be due to hereditary factors. 3. Most often found in males. B. Acquired <ul style="list-style-type: none"> 1. Not hereditary or innate. 2. Acquired after birth. 3. Usually the result of injury, disease, or use of certain drugs. 	<ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Have students screen one another's eyes using the Ishihara book.
<p>Objective 6 Describe the Ishihara color vision deficiency screen.</p> <ul style="list-style-type: none"> A. Tests for color vision deficiency and for congenital red-green blindness. B. Assessment of client's ability to perceive primary colors and shades of color. C. Series of polychromatic plates (pages) consisting of primary colored dots that form a number contrasted against similar colored dots in the background. D. Patients with normal color vision read the appropriate number. E. Patients with color vision defects <ul style="list-style-type: none"> 1. May not see the number at all. 2. May see a number different than the one seen by someone with normal color vision. F. Procedure <ul style="list-style-type: none"> 1. Place patient in well-lit room, preferably one with natural light. 2. Instruct patient to verbally identify numbers formed by the color dots within three seconds. 3. Hold the color plate 30 inches from the patient at a right angle to the patient's line of vision. 4. Documentation <ul style="list-style-type: none"> a. Date and time. b. Name of test. c. Unusual symptoms. d. Results. 	<ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Invite an optometrist or ophthalmologist to speak to the class on vision tests. D. Students to set up a display on vision defects and rules to protect eyesight. Students could screen vision of other students.
<p>Objective 7 Recall the anatomic structures that constitute the eye.</p> <ul style="list-style-type: none"> A. Eye <ul style="list-style-type: none"> 1. Orbit, bony depression of skull which protects and holds the eye. 	<ul style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. Review anatomy of the eye.

2. Chambers of the eye
 - a. Anterior chamber contains aqueous humor, providing nutrients to structures in the anterior cavity of the eyeball.
 - 1) Too much fluid produces a condition that is a major cause of blindness, Glaucoma.
 - b. Posterior chamber is behind the lens and is filled with a thick liquid called vitreous humor. Vitreous humor keeps the lens flat and helps maintain the shape of the eye.
3. Outer layer
 - a. Sclera, white of the eye.
 - b. Cornea
 - 1) Clear layer of the sclera that covers the pupil and iris.
 - 2) Contains no blood vessels but many sensory receptors that can detect even the smallest of particles on the surface of the eyeballs.
 - 3) Helps keep fluid in the eye.
 - 4) Functions in focusing light.
4. Middle layer, vascular and pigmented
 - a. Richly supplied with blood vessels and pigments.
 - b. Consists of choroid, ciliary body, and iris
 - 1) Choroid lines the eye.
 - 2) Ciliary body functions to hold and move the transparent lens.
 - Cataract, cloudy lens that prevents light from reaching the visual receptors.
 - 3) Iris, most anterior structure, colored portion of external eye.
 - c. Pupil, hole in the iris
 - 1) Adjustable opening of the eye.
 - 2) Dilates in darkness.
 - 3) Constricts in bright light.
5. Conjunctiva
 - a. Delicate, thin membrane.
 - b. Covers the sclera, cornea and under surface of the eyelids.
6. Lens
 - a. Located behind the pupil.
 - b. Biconvex transparent body situated behind the iris in the eye; its role (along with the cornea) is to focus light on the retina.
 - c. Filled with a clear, watery substance known as the aqueous humor.
 - d. Accommodation, the automatic adjustment in the focal length of the lens of the eye to

D. Use diagrams and images from online resources
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<p>permit retinal focus of images of objects at varying distances.</p> <ol style="list-style-type: none"> 7. Vitreous humor <ol style="list-style-type: none"> a. Transparent jelly-like substance. b. Important to maintaining shape of eye. c. Cannot be replaced. d. Body does not restore. 8. Retina <ol style="list-style-type: none"> a. Cells in the back of the eye. b. Converts light into electrical impulses. 9. Optic nerve transports electrical impulses to brain for interpretation. 10. Visual pathway sends information to optic nerves that cross at a structure (optic chiasm.) 11. Common diseases of the eye <ol style="list-style-type: none"> a. Amblyopia or “lazy eye” is the developmental abnormality occurring during childhood. b. Astigmatism is a vision condition that causes blurred vision due to the irregular shape of the cornea. c. Conjunctivitis or “pink eye” is caused by bacteria, viruses, or allergies. d. Dry eye syndrome, common eye problem resulting from decreased production of oil within tears, which normally occurs with age. e. Hyperopia, farsightedness. f. Myopia, nearsightedness. g. Presbyopia is a condition in which the lens of the eye loses its ability to focus, making it difficult to see objects up close. Occurs in older adults. h. Retinopathy is a pathological disorder of the retina, for example, diabetic retinopathy. i. Strabismus or “crossed eyes” is when the eyes do not focus on the same image. 	
<p>Objective 8 Document vision screening accurately.</p> <ol style="list-style-type: none"> A. Date and time. B. Name of procedure and equipment used. C. Unusual signs and symptoms. D. Results. E. Your initials. 	<ol style="list-style-type: none"> A. Lecture/Discussion B. Assigned Readings C. When performing vision screening in practice, have student take turns documenting.