

ART105

general health series

The Eyes Have It: a look at the anatomy and physiology of the eyes, common eye diseases, and how exercise and proper nutrition can positively affect eyesight

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ACCORDING TO THE NATIONAL EYE INSTITUTE, 2.4 MILLION AMERICANS ARE VISUALLY IMPAIRED. THESE NUMBERS ARE EXPECTED TO DOUBLE OVER THE NEXT 30 YEARS AS THE BABY BOOMER GENERATION AGES. A recent study on the prevalence of eye disease reports that more Americans than ever are facing the threat of blindness. The director of the National Eye Institute, Paul A. Sieving M.D., and Ph. D. called for an increase in public attention to eye health and asked community health leaders to begin educating the public about it. Most eye diseases can be prevented with education, early detection, and healthy lifestyle.

THE MAJOR EYE PROBLEMS ACCORDING TO THE NATIONAL EYE INSTITUTE

- **DIABETIC RETINOPATHY** - a disease in which blood vessels break down, leak or become blocked. Nearly half the people with diabetes will develop this condition. It is believed to be the leading cause of blindness in people between the ages of twenty-five and seventy-four.
- **AGE-RELATED MACULAR DEGENERATION (AMD)** - a disease which affects the parts of the retina responsible for sharp central vision. It normally affects people over the age of sixty.
- **CATARACT** - a clouding of the eye's naturally clear lens.
- **GLAUCOMA** - damage to the optic nerve. Half of the people with glaucoma are unaware they have it.

DIABETES IS ONE OF THE MAJOR RISK FACTORS IN DEVELOPING SERIOUS EYE DISEASE. Other risk factors include improper diet, lack of exercise, hypertension, and excessive exposure to sunlight. Smoking increases the risk for macular degeneration by six hundred percent.

Normal Eye Anatomy

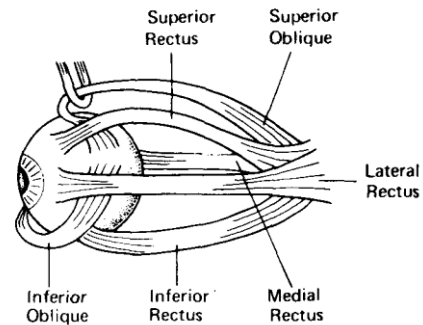
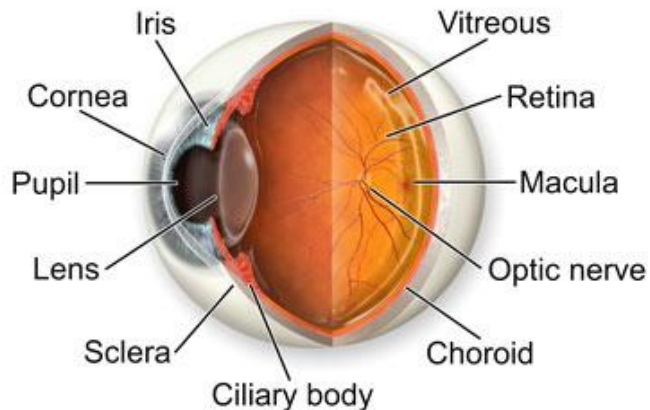


Diagram of eye muscles. Left orbit (lateral aspect).

THE ABILITY TO SEE IS DEPENDENT ON THE ACTIONS OF SEVERAL

STRUCTURES IN AND AROUND THE EYEBALL. The eyeball (filled with aqueous fluid and vitreous jelly) is suspended inside a skeletal socket called the orbit. The **sclera** is the white tough outer wall of the eye covered by a membrane called the **conjunctiva**. The **choroid** is the thin spongy layer filled with blood vessels. The **iris** is the colored part and the **pupil** is the dark spot in the center front of the eye. The central transparent part is the **cornea**. The **optic nerve** and **central retinal blood vessels** enter the back of the eyeball. The back two thirds of the eye is called the **retina**. It contains millions of rods and cones that convert light energy into electric signals. The **macula** is a tiny spot on the back of the retina where detail focus occurs. The **fovea** just behind the macula is where fine and straight-ahead vision occurs. The **lens** is in the front of the eye where light rays are focused into the macula and fovea.

Light enters through the cornea, pupil, lens and vitreous and is focused on the retina where the rods and cones send the signals through the optic nerve to the brain where we interpret what we see.

The six small muscles that surround the eyeball and are responsible for its movement are: the **medial and lateral rectus** (on the lateral portion), the **inferior and superior oblique** (on oblique angles) and the **superior and inferior rectus** (on the top and bottom).

Eyesight contributes to the overall health and well-being of the body. Our sight guides us through our world. Without healthy eyesight many daily activities would be limited.

ACCORDING TO THE GLAUCOMA RESEARCH FOUNDATION, REGULAR EXERCISE MAY BE A USEFUL ADDITION TO THE PREVENTION OF VISUAL LOSS.

It is important for people with eye disease to keep their intraocular eye pressure (IOC) low. In a recent study, people with glaucoma who exercised regularly for three months reduced their eye pressure an average of 20%. In an ongoing study, glaucoma patients who walked briskly 4 times per week for 40 minutes were able to eliminate their need for beta blockers. Cardiovascular exercise increases the peristalsis (pumping action) of the blood vessels which keeps them flexible and free of fatty plaque deposits. These are important factors in the prevention of retinopathy and macular degeneration, where the blood vessels are weak.

JUST LIKE THE REST OF THE BODY, IT IS IMPORTANT TO EXERCISE THE MUSCLES IN THE EYE.

Specific eye exercises are important to keep the small intraocular muscles of the eyes dynamic, strong, and flexible. In 1891, Dr. William Horatio Bates, a prominent New York physician, developed ideas about exercising the eyes. In 1920, he published a book called, "The Cure of Imperfect Eyesight by Treatment Without Glasses. He is quoted as saying, "Once you begin to wear glasses, the strength of the lenses must be increased periodically (because your eyes are getting weaker). Glasses...act as a crutch and do not treat the cause of poor eyesight." Although very controversial, his ideas are still used today. Eye-Robics is an exercise program based in California that is an entire workout for the eyes. Ted Williams, a famous Boston Red Sox baseball player who had the best batting average in baseball in the early 1950's studied with an eye exercise instructor. At the age of 78, he still did not wear glasses. Vision Therapy is a eye exercise program directed by a licensed optometrist to train the entire vision field. 3-D viewing is another method of exercise for the eyes.

For healthy individuals without eye disease, inverted yoga postures like downward dog, rag doll and headstands may have benefit by reducing stress and increasing circulation to the upper body. Relaxation and breathing exercises can also help to reduce blood pressure and eye pressure. The corpse position is an excellent exercise to promote relaxation. Paul E McGhee Ph. D. recommends laughter therapy.

PROPER NUTRITION CONTRIBUTES TO EYE HEALTH. "Researchers now believe diets rich in fruits and vegetables...might help to prevent certain eye conditions," said Dr. Krista Davis, director of low vision services at the Columbia Lighthouse in Washington D.C. Dietary recommendations include eating 5-9 servings of fresh fruits and vegetables each day. In a major clinical study sponsored by the National Eye Institute, high levels of antioxidants and zinc were found to slow the progression of age-related macular degeneration. "The key vitamins and minerals that help to prevent these conditions appear to be Vitamin A (as beta carotene), C, E and Folic Acid and Zinc." said Dr. Davis. "These vitamins and minerals are found in fruits and vegetables such as melons, citrus, carrots, spinach and kale The Glaucoma Research Foundation supports the view that these vitamins and minerals are important to eye health and adds copper, and selenium. They also state that Bilberry, a European blueberry extract has some evidence of strengthening capillary walls, helping to improve night vision and

contributing to the prevention of eye diseases. An article published in the “Archives of Ophthalmology” reported that the types of fats consumed may influence the risk of developing macular degeneration. The report suggests that eating fish, which contains omega fatty acids has a protective effect. Other nutritional experts suggest: B complex (supports ocular tissue), vitamin D (for eye muscles), calcium (influences blood coagulation and nerve transmission) and magnesium (essential for metabolism of calcium). Following the food pyramid is the best way to maintain overall health including eye health.

OTHER GENERAL RECOMMENDATIONS FOR EYE HEALTH INCLUDE:

- Avoid the risks for developing adult-on-set diabetes.
- If you have diabetes, control it.
- Control blood pressure and cholesterol levels.
- Have the eyes tested every two years; include Glaucoma screening.
- Reduce caffeine intake. Significant caffeine intake can elevate eye pressure.
- Always perform detailed work in good light.
- Rest your eyes every 30 minutes when performing detailed or computer work.
- Make sure your TV and computer screen are sharply focused. Don't sit too closely.
- Wear protective shatterproof safety goggles when playing sports like squash.
- Wear goggles when swimming to protect from chlorine and chemicals.
- Wear UV protective sunglasses that provide 99-100 percent protection.
- Don't look directly at the sun or any bright light.
- Don't rub the eyes.
- If something enters the eye try to blink or wash the eye out with water.
- Don't try to pick objects out of the eye.
- See an eye doctor if you experience any changes or unusual eye symptoms
- See an eye doctor if you experience blurred or cloudy vision.

ADD VARIETY: CREATE AN EYE-HEALTH THEME WORKOUT

BEFORE YOU START - SOME SAFETY NOTES.

People with known eyes disease should follow doctor recommendations. They should not raise their eye pressure. Inverted body positions, high intensity or vigorous aerobic exercise, and exercises using the Valsalva maneuver should not be performed. Persons with pigmentary glaucoma should avoid bouncing activity. Use progression when performing eye exercises. Do not strain the eyes or overwork them.

BREATH-RELAX-BLINK-SMILE

LAUGHTER THERAPY

Make a big eye and place it in front of the class where everyone can see. Play eye games during the workout. like having the students with specific eye color when cued yell or perform a specific movement.

EDUCATIONAL HANDOUT

Develop a handout with information about the eyes, eye disease and recommendations for healthy eyes.

PERFORM MODERATE AEROBIC EXERCISE OF CHOICE

Select a few pieces of music with eye titles, references or lyrics (“Hungry Eyes,” “She’s got Betty Davis Eyes,” “Don’t it Make My Brown Eyes Blue,” “I Only Have Eyes For You.”)

CREATE A VARIETY EYE CIRCUIT

Draw a series of big eye posters with a different eye exercise on it. Make stations and post one at each station.

EYE EXERCISES

- Slowly move the eyes up and down as far as possible. Repeat several times. Blink to relax the muscles.
- Slowly roll your eyes in a large circle clockwise and then counterclockwise direction. Do not strain.
- Eyes of the Clock - Visualize a clock in front of your face. Slowly look at each number on the clock while keeping the head stationary.
 - Line your thumbs up in front of your nose. Alternately look at nose & thumb.
- Squeeze the eyes tightly together. Hold for a few seconds. Relax. Open the eyes as widely as possible.
 - Gaze up at the eyebrow center with both eyes. Hold for a few seconds. Relax
- The Crow - Puff up your cheeks. At the same time look with both eyes at your nose.
 - Breathe in. Purse your lips as in a whistle. Breathe out. Relax

EYE RELAXATION, VISUALIZATION, GUIDED IMAGERY, POSITIVE AFFIRMATION

Close your eyes. Focus on relaxing the eye muscles. Feel the muscles surrounding the eyes relax. Focus on the top, sides and bottom of the eyeballs. Relax the smile lines at the corner of the eyes, the forehead, temples, jaw, sinuses and back of the skull. Breathe cleansing oxygen into the eye. See the circulation in the eyes flowing smoothly and regularly. Say, "I see with clarity.", "My eyes are healthy and strong."

SEATED MEDITATION EXERCISES

SOFT EYES - Close your eyes. Relax. As you open your eyes, focus on the first thing you see. Instead of looking out at it, allow it to come in to your vision. Look through the eyes instead of with them.

RADAR EYES - Close your eyes. Relax. Visualize the room in front of you. What do you see? See detail.

EAGLE EYES - Select an object in front of you. Zoom in on one detail and focus until the detail is clear.

GAZING - Select an object and gaze it for one minute without letting the eyes wander. Relax and breathe.

THIRD EYE - Close your eyes. Visualize the space between the eyebrows. Relax and breathe

YOGA POSTURES

Perform the Down Dog. Breathe. Feel energy flowing to the upper body. Relax the eyes.

SELF MASSAGE

REFLEXOLOGY POINTS ON THE FEET - ACCUPRESSURE POINT ON THE FACE

With shoes off, gently rub the area on the ball of the foot, close to the heads of the second and third metatarsal (bottom of the toes) in a circular motion for 10 to 30 seconds. Repeat on both feet. Rub the area about the size of a dime, at the end of the eyebrow, at the top of the nose toward the edge of the bony orbit.

AROMATHERAPY AND CUCUMBER COOLER

Burn lavender candle or place a lavender oil ring on a light bulb. Slice a cucumber into 1/2-inch slices. Give each person 2 pieces. Place on the eyes during relaxation.

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END

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ART105 QUIZ

In the body of an email to askesaoffice@gmail.com, place your first and last name on the first line and number the page from 1 to 10. DO NOT SEND AS AN ATTACHMENT. Answer TRUE or FALSE to the accuracy of each of the 10 statement below based on the information in this ESA article. You will be emailed a CEC validation certificate of completion, which you must keep for your records. ESA cannot replace lost forms and the article would need to be resubmitted.

1 - Most eye diseases can be prevented with education, early detection and healthy lifestyle.

2 - According to the National Eye Institute, a cataract is damage to the optic nerve.

3 - Diabetes is one of the major risk factors for developing eye disease.

4 - Smoking increases the risk for macular degeneration by six hundred percent.

5 - The eyeball is filled with aqueous fluid and is suspended inside the orbit.

6 - The **pupil** is the colored part and the eye.

7 - The **cornea** enters the back of the eyeball.

8 - The **macula** is a tiny spot on the back of the retina where detail focus occurs.

9 - People with eye disease must keep their intraocular eye pressure (IOC) low.

10 - In a recent study, people with glaucoma who exercised regularly for three months reduced their eye pressure an average of 20%.