PART 3:

Additional Information and Resources

Glossary of Terms

Many people—including those who wear glasses or contacts—confuse the word "nearsighted" with "farsighted." And most are unfamiliar with the technical names of the basic visual problems for which glasses or contacts lenses are worn. So while we've written this Manual for the layperson, there are a few words you might not be familiar with. Their definitions are given below.

Astigmatism. A condition in which images appear blurred and distorted, usually at all distances, caused by uneven focusing of light inside the eye.

Cataract. A clouding of the normally clear lens of the eye due to an accumulation of dead cells. A cataract is not a tumor or growth, but can be caused by ultraviolet radiation and/or poor diet.

Ciliary Muscle. A muscle surrounding the eye's inner lens and enabling it to change focus.

Convergence. The ability to turn your eyes inward when looking at an object that is close to you.

Cornea. The transparent, domed, front part of the eye that allows light to enter.

"Corrective" Lenses. The lenses that are typically prescribed and are primarily intended to make the images of distant objects appear clear. "Corrective" lenses should be called "compensatory" lenses, because they do not fix the underlying optical problem, but allow you to see clearly with the vision condition you have.

Extraocular Muscles. A group of six muscles surrounding each eye that enables you to move your eyes and to point them at an object.

Farsightedness. A condition in which you have to use more focusing power to see near objects clearly than to see far objects clearly. The technical term for this condition is "hyperopia" (pronounced hy-per-O-pia). A person with hyperopia is called a "hyperope."

Glaucoma. A degenerative disease often caused by blockages in the eye's drainage system that increase the pressure inside the eye. Glaucoma damages the optic nerve and may lead to partial or total blindness.

Hyperopia. See "Farsightedness."

Inner Lens. A transparent capsule of living cells inside the eye behind the iris that focuses light onto the retina.

Iris. The colored part of the eye, which acts as a circular diaphragm to control the amount of light entering the eye.

Macular Degeneration. A condition in which cells die in the central part of the retina at the back of the eye (the "macula"), often resulting in partial blindness.

Nearpoint Stress. The body's response to sustained, close-up focus, such as reading or working at a computer. The response can result in a change in the physical structure of the eye, a reduction of normal blinking, and reduced tear fluid formation. Symptoms include blurred vision, double vision, eyestrain, headaches, and sore or dry eyes.

Nearsightedness. A condition in which a person sees near objects better than distant objects. The technical term for this condition is "myopia" (Pronounced my-O-pia).

Optic Nerve. The nerve pathway that transmits signals from the eyes to the brain.

Presbyopia. A condition in which a person loses the ability to change the focus of the eye from far to near or from a distant object to a near object. It is thought to be primarily related to the aging process, because it is most commonly found in people over the age of 40. (Pronounced prez-be-O-pia.)

Progressive Undercorrection. A technique for helping you change how you use your visual system and your eyes by making step-by-step reductions in the strength of your glasses. These reductions may help your vision shift toward a more normal or healthy state. For more information, see page 61of this manual.

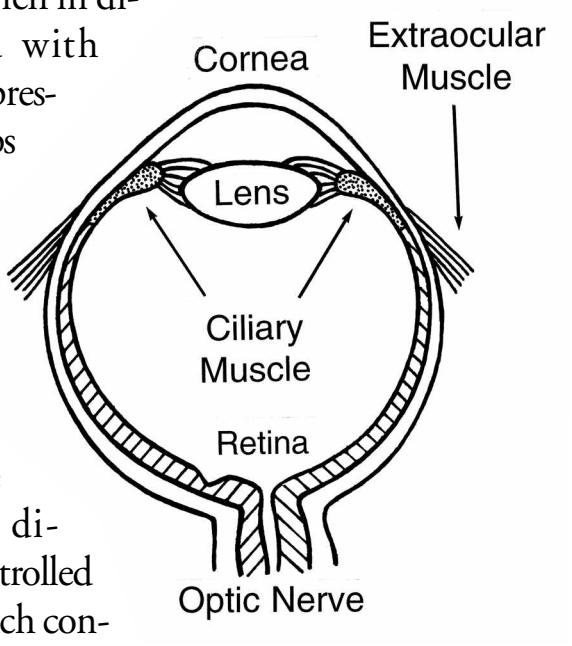
Pupil. The dark hole in the center of the iris, which becomes larger or smaller as the iris expands or contracts, allowing more or less light to enter.

Retina. A complex network of nerve cells that converts the light entering the eye into nerve impulses that travel to the brain.

Retinal Detachment. A very serious condition in which the retina becomes separated from the supporting tissue at the back of the eyeball, often leading to partial or complete blindness.

Structure and Function of the Eye

The eye is a bag of living cells shaped like a sphere approximately one inch in diameter, and filled with transparent jelly and pressurized liquid that keeps it inflated like a balloon. At the front of the eye is the cornea, which is a transparent window that allows light to enter. Behind the cornea is the iris, a diaphragm of tissue controlled by small muscles, which controls the amount of light entering the eye. The pupil is the dark hole in the center of the iris, which becomes larger or smaller as the iris expands or contracts. Just behind the iris is the lens, which is in a transparent capsule of living cells with the consistency of rubber. Adjusting the lens changes the distribution of light on the retina. This helps us to select and gather the visual information necessary to efficiently derive meaning and direct action.



The ciliary muscle surrounds the lens and is used to change the focus of the lens. When the ciliary muscle expands, it pulls on the lens and makes it thinner, bringing distant objects into focus. When the ciliary muscle contracts, it makes the lens thicker, bringing near objects into focus.

Six extraocular muscles are attached to and surround each eyeball. These enable the eyes to move and point at the same object at the same time. The power and precision

of the extraocular muscles is amazing: during the course of a typical rapid eye movement (lasting about 1/10 of a second), the eyeball accelerates at a tremendous rate and decelerates almost instantly. To be able to do this, the extraocular muscles are more than 100 times stronger than is necessary to turn the eyeballs slowly in their sockets!

At the back of the eye is the retina, a complex network of nerve cells that converts the light into electrical impulses, which then travel up the optic nerve to the brain. Protecting the front of the eye is the eyelid, a retractable covering of skin and muscle, which performs a variety of necessary functions. By blinking frequently and normally every few seconds throughout the day, the eyelids bathe and polish the cornea with antiseptic tears, protecting the eyes against bacteria, dryness, pollutants and foreign objects.

The partnership between the eyes and the brain is so close and complex that it is impossible to discuss vision without describing this remarkable interaction. It takes place in five steps:

1. Electrical impulses from the eye allow the brain to "observe" a scene and choose an object to inspect more closely. The eyes are not yet directed specifically to the object.
2. The brain determines the relative position of the object; computes the direction and power necessary to move the eyes into position to point to it; and directs the extraocular muscles to rotate the eyeballs to the correct position.
3. With the eyes pointed at the object, the brain directs the ciliary muscles to focus the lenses and make the images on the retina as clear as possible.
4. The retina processes the images for basic information such as outlines, colors and motion, and

passes them along to the brain via the optic nerve. The brain completes the processing and derives more information about detail, distance and dimension. Because the eyes are a few inches apart, each receives a slightly different image—in two dimensions. The brain, like a computer, integrates the separate images into a three dimensional representation. The brain then determines the meaning and significance of the completed image.

5. The brain decides if the body needs to respond to the viewed object, and uses the eyes to coordinate any body movements necessary to carry out the intended action.

Effects of Glasses and Contacts: Insight and Comment From Eye Doctors

Surprising as it may seem, no clinical or statistical studies have ever demonstrated the long-term safety or effectiveness of "corrective" lenses (glasses and contacts). All that is really known about these products is that the vast majority of people who wear them get progressively worse and need stronger prescriptions every few years. In fact, it is widely believed that "corrective" lenses (also known as "compensatory" lenses) usually create dependency and make the eyes lose even more of their natural focusing power. These concerns have been voiced in the professional literature by doctors not affiliated with the See Clearly Method.

"The use of compensatory lenses to treat or neutralize the symptoms does not correct the problem. The current education and training of eye care practitioners discourages preventive and remedial treatment."
R.L. Gottlieb, Journal of Optometric and Vision Development, 13(1): 3-27, 1982.

"The emphasis on compensatory lenses has posed a problem for many years in our examinations. These lenses do not correct anything and may not serve the patient in his best interests over a period of time."

CJ. Forkiortis, OEP Curriculum, 53:1, 1980.

"There are frequently ignored patterns of addiction to minus lenses. The typical prescription tends to overpower and fatigue the visual system and what is often a transitory condition becomes a lifelong situation which is likely to deteriorate with time."

S. Gallop, Journal of Behavioral Optometry, 5(5):115-120, 1994.

"I have yet to hear of a research paper confirming the beneficial effects of compensatory lenses. I'm sure most optometrists will confirm the clinical observation that patients who receive compensatory lenses for full time wear are usually the ones who need stronger prescriptions."

J. Liberman, Journal of the American Optometric Association, 48(8): 1058-1064, 1976.

"Single-vision minus lenses for fulltime use produce accommodative insufficiency associated with additional symptoms until the patient gets used to the lens. This is usually accompanied by a further increase in myopia and the cycle begins anew."

M.H. Birnbaum, Review of Optometry, 110(21): 23-29, 1973.

"Minus lenses are the most common approach, yet the least likely to prevent further myopic progression. Unfortunately, they increase the nearpoint stress that is associated with progression."

B. May, OEP Publications, A-112, 1984.

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Note: *DPJ=Daily Progress Journal*