
**A DISPENSING OPTICIAN
MANUAL**

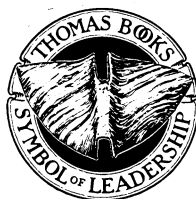
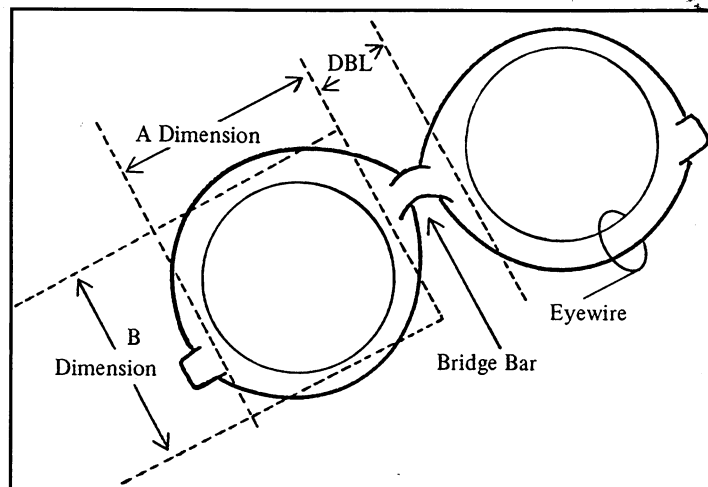
A DISPENSING OPTICIAN MANUAL

An Introduction to Vision Care For the New Ophthalmic Technician

By

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*This book is affectionately
dedicated to
Jan and Heather*

PREFACE

OPTICAL DISPENSING is a field that is rapidly becoming an entry position for dispensing vision care. Vision care is a subtle and a vitally important profession for the health of our society. Often the eye serves as a window to the health of the individual. Beyond the technical skills and the art of giving good service, the optician must keep in mind that people rely on their vision for many functions that even the patient may be unaware until the sight is diminished or gone.

It is my hope that this serves as an able text for your study and that it contains concrete, practical information for your own career needs and goals.

A J ZELADA, OD

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**INTRODUCTION TO
VISION CARE**

THE HUMAN EYE

WHEN YOU look at a person's eye, one of the first things that lay people think of is the color of the eye. That is only one part.

The eye consists of many parts. Notably, you will need to know several terms:

ciliary muscle
cornea
conjunctiva
emmetropia
hyperopia
iris
lens
limbus
myopia

optic nerve
presbyopia
pupil
pupillary distance
refractive error
retina
sclera
vitreous

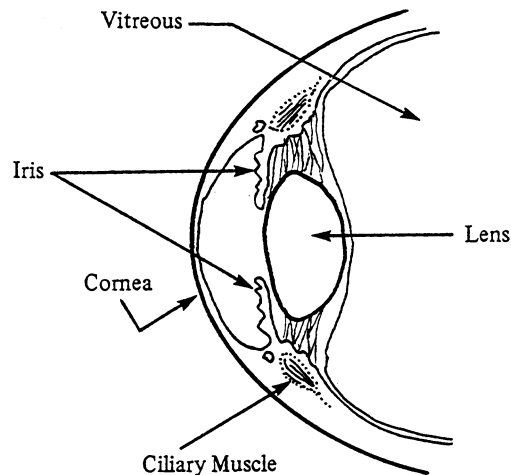


Figure 1. Cross section of the human eye.

Light enters the eye and is bent by the **cornea**. This is where most of the correction takes place. If the cornea had no power (curve or ability to bend the light), the light would not be focused on the **retina**. The cornea does, however, change the light so that it falls on the retina, the cell layers at the back of the eye.

Refractive error is commonly used to describe what lenses a person needs to see clearly in the distance. If a person requires no correction, it

is because the light falls properly in focus. Those individuals are called **emmetropic**.

If the light falls short of the retina, the persons are called **myopic** or **nearsighted** and if the light falls behind the retina (theoretically), then the person is **farsighted** or **hyperopic**. The farsighted person has the advantage over the myopic person, because all humans can accommodate.

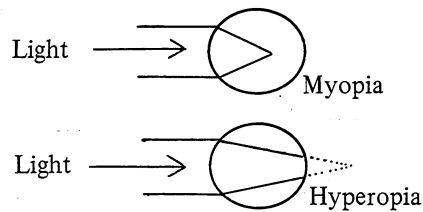


Figure 2. Refractive error by eyeball length.

Accommodation is a contraction of the **ciliary muscle**. This forces the lens of the eye to bulge forward, which in turn allows us to focus clearly on objects that are near us. Thus a farsighted person may spend a lot of energy by keeping things in focus by accommodation. As farsighted people get older and begin to lose their ability to accommodate, they may complain of not being able to see clearly after a long day's work. Small amounts of concentrated reading will increase their difficulty in accommodating.

Presbyopia is the age related **loss of accommodation**. This process has already started at age one year, and generally becomes a problem in the early forties. The ability to focus closely may be completely gone by the age of sixty. The problem is simply that the patient cannot focus closely enough and their arms are too short! Supposedly, only 5 percent of the population does not lose their ability to accommodate.

Around the cornea is the **conjunctiva**: cell layers filled with blood vessels that swell with infections, with eye strain, and with certain eye diseases. The **sclera** is a layer of white tough cells beneath the conjunctiva.

The **iris** is, of course, the colored part of the eye. At the meeting place of the iris and of the cornea/sclera is an elaborate filter system that keeps the eye pressure in balance. If the filtration system is not working properly or too much fluid is being produced, **glaucoma** may develop.

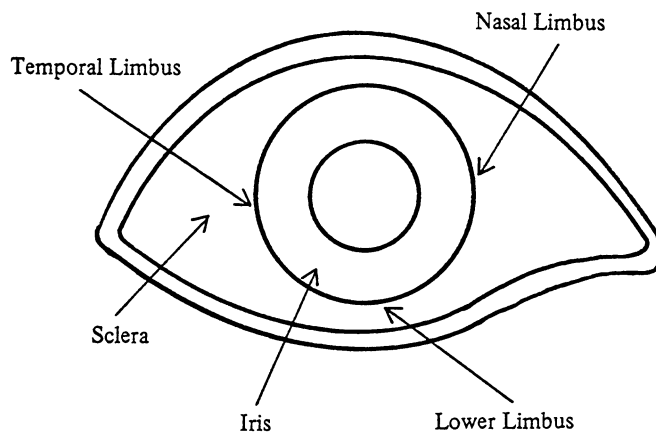


Figure 3. The external eye.

The **retina** is the magic part of the eye. There are millions of cells (rods and cones) which contain chemicals that translate light into impulses which the brain can organize and make meaningful: "I see!" The photoreceptors (**rods** for night vision and **cones** for day/color vision) talk to other cells (about 6 layers worth of cells) and then group themselves into cables called nerve fiber layers which plug into the **optic nerve**. The optic nerve looks like a whitish/yellowish crater with blood vessels. The optic nerve which is seen by the eye doctor has distinct features and changes with increased pressure (e.g. glaucoma) and also with unusual pressure from the fluid surrounding the brain. The optic nerve leaves the retina and connects directly in the lower part of the brain, where more electronic switching occurs, and then follows highways of nerve fibers to the back of the brain where the visual center (**visual cortex**) of the brain sits.

Pupillary distance (pd) measures the distance between the centers of the pupils. **Distance pd** is measured when the eyes are focused at infinity, and **near pd** is measured when the eyes are focused at something close (about 16 inches from the face). The near pd is always smaller than the distance pd.

THE VISION CARE PEOPLE

An **Ophthalmologist** is a medical doctor (MD). Ophthalmologists have had four years of medical school after their undergraduate degree

study, plus one year of internship, plus three (soon to become four) years of residency training. "Board Certified" means they have successfully passed an extensive exam given throughout the training. "Board Eligible" means they have completed the training and did not take or pass the exam.

An **Optometrist** is an optometric doctor (OD). Optometrists have had four years of training after their undergraduate degree study. During their fourth year, clinic training occurs. All but two states allow them to use diagnostic drugs (to dilate the eyes), and fifteen states allow them to use topical drugs to treat eye infections.

An **Optician** is a licensed profession in many states. There are programs in the United States which train opticians. A dispensing optician is the person who is the last person to see the patient and who must adjust the glasses for the patient and perhaps dispense and instruct patients in contact lens use.

THE VISION EXAM

Refraction is what the doctors and automated refractors determine is the necessary **prescription** for giving the person the best vision. Traditionally, 20/20 means good vision. This, however, may not be the rule. The testing for best vision is done at near and far. Hopefully the examination will include a test for eye pressure, an internal look at the retina, a check for how the eyes work together and how they focus together. Most exams include tests at the near point. The near point is generally about 16 inches away from the person's eyes. VDT operators may request that their working distance to the computer be used as the correct distance for their near prescription.

R _x for <u>Nitch Shulman</u>	
OD	<u>-0.25 - 0.75 x 165</u>
OS	<u>-0.25 - 0.50 x 020</u>
Add	<u>+1.25</u>
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<u>9/2/87</u>	<u>AJ Zelada</u>
A. J. Zelada, Doctor of Optometry	

Figure 4. The prescription card.