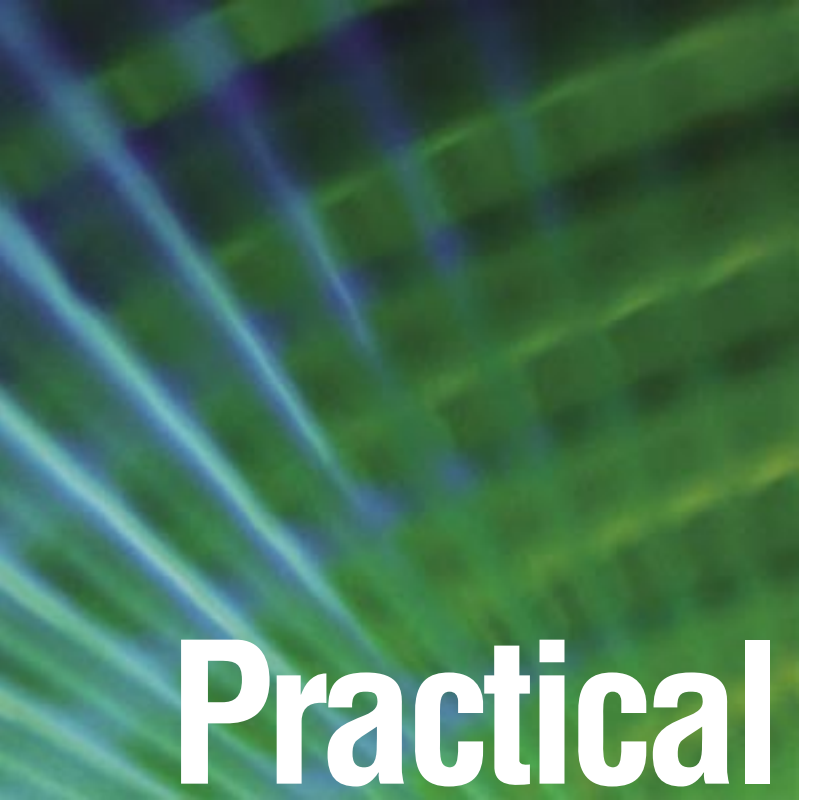

Practical Ophthalmology

TPT1

TPT2

A Manual for Beginning Residents

TPST

Fourth Edition

TPEdition

TPEd

Executive Editor

TPEdT

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Preface

GX

Practical Ophthalmology: A Manual for Beginning Residents is intended to help first-year ophthalmology residents function effectively as soon as possible during the first few months of their residencies. New residents usually have limited ophthalmologic knowledge and clinical capabilities yet are expected to work as clinicians almost immediately. In the hope of easing this abrupt and understandably stressful transition, this manual covers practical principles and techniques that are essential or useful for performing a variety of basic ophthalmologic examinations and tests and interpreting the results. Some clinical theory and background information are included to help the resident understand the practical information presented.

GXi

Although the title and contents have changed, the current manual represents the fourth edition of an earlier Academy publication, A Manual for the Beginning Ophthalmology Resident, third edition, an excellent and popular publication on which the authors of this new manual drew heavily for guidance. All of us involved with the new project acknowledge the contributions of our predecessors who wrote the third edition: James M. Richard, MD (Editor); John A. Carver, MD; Robert L. Estes, MD; Glenn J. Green, MD; Charlene Hsu-Winges, MD; Linda S. Mottow Lippa, MD; Thomas P. Mattingly, MD; David W. Parke II, MD; and Jay G. Prensky, MD.

The current revision was planned in detail by conducting surveys of the needs and desires of ophthalmology residents and by means of intensive meetings and communications between the authors and Academy staff. Preliminary outlines of chapters were critiqued by the authors and Academy staff, and all typescripts were then reviewed and edited extensively "by the authors, Academy

staff, ophthalmology residents, and ophthalmologists in practice. The Academy staff who designed and worked on this project were indispensable for planning it, bringing it to fruition, and improving its quality. The authors and I acknowledge with much gratitude the superb help and advice of Margaret Petela, Managing Editor (who really headed up this undertaking); Margaret Robinson (for developmental assistance); Ruth Modric, Production Manager; and Beth T. Berkelhammer, Production Editor. Jeff Van Bueren provided additional freelance editorial help.

The authors of this manual are ophthalmologists who have much experience and interest in the training of ophthalmology residents: Judith E. Gurland, MD (Bronx, New York); Latif M. Hamed, MD (Gainesville, Florida); Karla J. Johns, MD (Nashville, Tennessee); and Kirk R. Wilhelmus, MD (Houston, Texas). The Academy and I thank them for their expert, enthusiastic, and unflagging devotion to the development of this manual.

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FMAuthor

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ONE

Introduction to the Practice of Ophthalmology

CT

intro

Like most important new endeavors, beginning an ophthalmology residency is both exciting and intimidating. This chapter offers some insights regarding what it means to become an ophthalmologist and to practice ophthalmology ethically, responsibly, and competently. It also describes ways in which this book can help you in your first few months of residency (and beyond if you wish) and offers practical tips on dealing with some of the challenges you will face. Here you will find some general guidelines about how to approach the task of assimilating the large body of knowledge, the skills, and the attitudes needed to practice ophthalmology, your chosen specialty. You successfully addressed similar challenges before when you embarked on your medical training, and you have undoubtedly developed your own system of acquisition and assimilation of knowledge along the way. The material in this chapter may be familiar to many beginning residents, but it is certainly of fundamental enough nature to warrant emphasis.

Practicing Ophthalmology

H1

Congratulations on your decision to study ophthalmology, a discipline with ancient roots dating back 2000 years. The remarkable success of ophthalmology as a discipline is based on two main intertwined elements: ophthalmology's intrinsic strength as a medical and surgical specialty, and its competitive appeal that ensures a perpetual flow of talented individuals into the field. The field has attracted some of the brightest minds throughout history. Several Nobel laureates have been named for their work in vision research. Ophthalmology can claim several firsts in medicine. For example, ophthalmology established the first medical specialty examining board in the world (1916). Originally called the American Board for Ophthalmic Examinations, it was renamed the American Board of Ophthalmology in 1933. Ophthalmology was the first medical discipline to perform randomized clinical trials, the first to use lasers, the first to use antiviral agents, and the first to perform successful homotransplants (corneal grafts).

Practicing ophthalmology is a privilege, and ophthalmologists are intimately familiar with the rewards and personal satisfaction their efforts bring. The broad scope of ophthalmology practice combines medicine and surgery, and treatment of pediatric as well as adult patients. The nature of ophthalmic practice permits the establishment of durable and satisfying doctor–patient relationships, often lasting a lifetime. The subject matter of ophthalmology is intellectually challenging and fulfilling, sufficiently broad to ensure that everyone can find an intellectual niche in its vast array of topics. The intrinsic strengths of our chosen specialty and the love that it inspires in its practitioners will ensure the continued progress of ophthalmology despite the adverse forces facing medicine today.

Ophthalmologic services are regarded with respect by patients. Sight is so valued among Americans that, according to a survey by the National Society to Prevent Blindness, blindness is feared second only to cancer. This fear emanates from the feeling that blindness has a catastrophic effect on one's social, economic, and personal life. It is particularly important for a new resident to understand this attitude, because ophthalmic practice involves the care of patients with vision-threatening disorders. Some such patients may believe, correctly or otherwise, that they will go blind. The treatment of these patients draws not only on the technical skills of the physician but also on the physician's compassion, understanding, and counseling ability.

Much of the practice of medicine, including ophthalmology, involves communication as a key skill. Communication may be with the patient, with the family, with other health care providers, or with various sectors of society. Such communication should always be clear, forthright, timely,

and free of jargon. Communication with patients in general, but especially with patients or parents of children found to harbor serious ophthalmic disease, is an art acquired over many years of experience. However, some general guidelines are helpful for the beginning resident. To start with, you may want to defer breaking the news of a serious ocular condition or the interpretation of a difficult clinical circumstance to the attending physician, who should have more experience in this area and possibly a different interpretation of the patient's condition. It is awkward to have to rescind your earlier message to the patient as well as confusing to the patient to hear two possibly conflicting messages with different implications. In situations where you do break the news, approach the situation truthfully, with clarity, empathy, compassion, and professional kindness. The communication should be done in private, and should be conducted in an unrushed atmosphere. Try to strike a balance between being too exhaustive on the one hand and brief on the other. Finally, most children with blinding conditions still have some visual function, although it may be as poor as mere light perception. It is legally correct to label them as blind, but it may not be a suitable description when counseling parents who build hope on the scenario the physician describes. The terms visual impairment, low vision, or poor vision may be preferable.

Consultation reports to other physicians should be written in clear language with few, if any, abbreviations. A poorly written consultation report, replete with abbreviations and jargon, carries little value if others cannot read the handwriting or understand it; instead, it can create barriers between ophthalmology and other medical fields.

Stress During Residency Training

The formal literature addressing the topic of stress during residency training has increased dramatically since the Libby Zion case, which involved the unexpected death in 1984 of an 18-year-old woman, allegedly caused in part by overworked and undersupervised medical trainees. The cost that stress during residency training can exact on society has since been analyzed, and various steps have been undertaken to reduce stress on trainees. Numerous factors may contribute to stress during residency training, only a few of which are listed below:

BL-f

- Sleep deprivation. Sleep deprivation is considered one of the most significant sources of stress during residency training. Night call may subject residents to a level of repetitive sleep loss unsurpassed in any other work group.

BL-m

- Role conflict and role ambiguity. Role conflict arises when the resident's perceived image of the physician as a kind of superhero clashes with the reality of life as a resident. Although the current trends in health care may reduce this gap as the medical profession diminishes in status, this diminution may in itself bring additional stress to residents whose estimation of the role of the physician may lag behind the realities of the marketplace. Role ambiguity is produced by the resident's status as both practicing physician and student. The resident can occupy the important and dignified role of the primary physician for very ill patients, and at the same time be expected to perform less exalted work, such as transporting patients or materials, and have to answer to nurses and others whom the resident may perceive as lower in status and knowledge. Ambiguity of the job role creates an unfixed and expandable workload. This wide discrepancy between the various roles is often the basis of resident stress and discontent.

BL-l

- Newer stresses. Most research to date has focused on the stresses arising from the residents' work environment. However, other currently evolving factors may be influencing residents' attitudes and feelings about their profession and their patients. The rapid evolution of health care, the diminished status of medicine and societal attitudes about physicians, the rising cost of training, and the uncertainties of job availability and future income are stress factors that are assuming increasing significance. Training in medicine in the AIDS era has introduced some additional stressful, albeit occasionally rewarding, elements to the training environment. AIDS has allowed less time for the care and study of patients with more classic medical illnesses. Despite statistical evidence to the contrary, the AIDS epidemic has caused some residents to fear contracting this deadly disease because of their exposure to patients.

H2

Recognizing Stress and Its Sources

The consequences of stress in residency adversely affect the resident, the resident's family, the patients, and society. Addictive behaviors (alcohol and drug abuse), divorce and broken relationships, psychopathologic behavior and disorders (anxiety, depression, and suicide, anxiety, depression, and suicide, anxiety, depression, and suicide), and professional dysfunction may result. The symptoms and signs may be subtle or overt. Residents and medical educators need to learn to identify the signals of stress and need to establish effective methods to deal with it. These signals can be divided into four categories:

NL-f

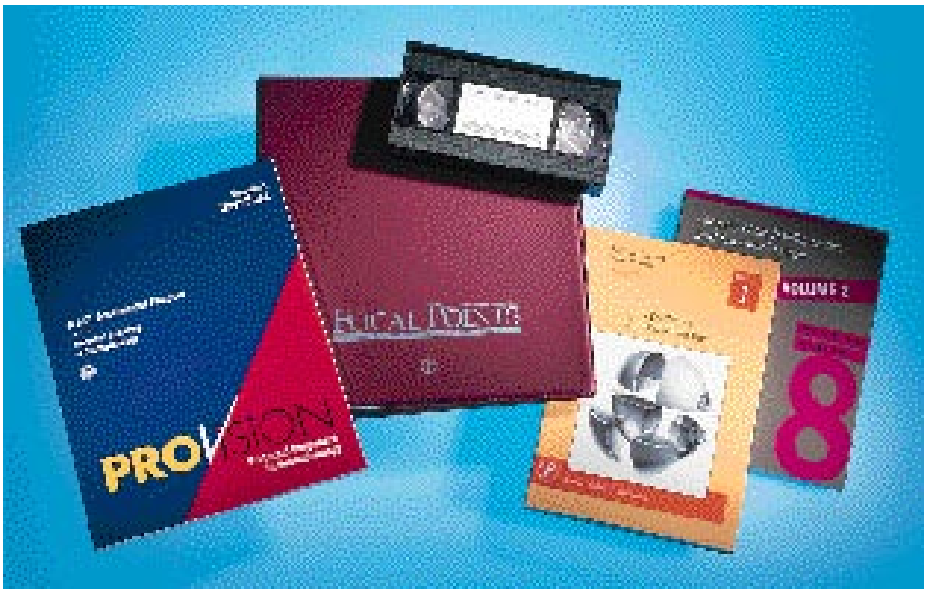
NL-m

1. Physical problems, including sleep and eating disorders, deteriorated personal hygiene and appearance, inability to concentrate, multiple physical complaints, and proneness to accidents.
2. Family problems, including disrupted spousal relationships (separation and divorce, impotence, and extramarital affairs).
3. Social problems, including isolation from peers, withdrawal from nonmedical activities, unreliable and unpredictable behaviors at work, and inappropriate behavior at social functions.
4. Work-related problems, including tardiness, absence without explanation, loss of interest in work, giving inappropriate orders or responses to telephone calls regarding patient care, spending excessive time at the hospital, and demonstrating marked mood changes such as moroseness, irritability, anger, hostility, and difficulty getting along with others.

NL-l

Given all the adverse effects of residency stress addressed above, it may come as a surprise that there is no unanimity among medical educators and trainees about the effect of stress. Some view stress as necessary and beneficial and others see it as harmful. Most would agree, however, that stress becomes pathologic beyond a certain point.

Stress harms the doctor–patient relationship. Patients can be perceived as unwanted impositions during times of stress. The ability to empathize with patients is extremely important for delivery of health care with com-



FigL

Figure 4.5 The Titmus stereopsis test. (A) Light-polarizing eyeglasses and targets. (B) The patient views the target through polarizing filters and reports perception of depth.

Figure 4.5 The Titmus stereopsis test. (A) Light-polarizing eyeglasses and targets. (B) The patient views the target through polarizing filters and reports perception of depth.

Figure 4.5 The Titmus stereopsis test. (A) Light-polarizing eyeglasses and targets. (B) The patient views the target through polarizing filters and reports perception of depth.

passion. It can be argued that a stressed, sleep-deprived physician may be ill prepared to have or to show empathy, often finding the patient's complaints frivolous and minute in comparison to his or her own. Because of the sacrifices they make, trainees may become egocentric and feel that "the world owes us something."

Recognizing the potential sources of stress and its deleterious effects is essential when devising effective coping strategies. There may be circumstances beyond the ability of the individual resident to resolve, for which the resident should consider seeking external help. Residents occasionally fall victim to the common misconception that a physician must have an answer for everything and must be able to cope independently with every problem. This misconception is exemplified by the adage "Physician heal thyself," which may imply to some that asking for help is an admission of unworthiness and may deter residents and trained physicians from seeking help, admitting fault, and accepting guidance. Although many perceive this aura of infallibility to be essential for the doctor–patient relationship and

even to have a therapeutic value to patients, it should be clearly recognized that, like many other medical traditions and mythologies, this perception has not been subjected to scientific scrutiny and could very well be false.

Pitfalls and Pointers

BMH

- Avoid cutting corners or taking shortcuts in your practice as a new resident. Learn it right the first time.
- Do not compromise patient care for the sake of training or any other personal benefit. Always consult a more knowledgeable or experienced physician if you are uncertain about how to proceed in a clinical situation.
- Do not be embarrassed to use this (or any) introductory manual. Adopt a lifelong approach to learning.
- Do not hide your own limitations in skill and knowledge as you begin your residency. Strive to improve upon them and be receptive to criticism.
- Remember that there is more to professional success than learning the medical facts and the surgical techniques. The art of practicing medicine is best achieved by a well-rounded, mature, and compassionate physician who also knows the medical facts well.
- Do not publicly denounce or belittle the care given by previous practitioners by saying, "Your doctor did not know what he or she was doing," or "That was malpractice." Avail yourself of the facts before passing any judgements, but remember that you are a medical resident, not a judge.

Suggested Resources

Ref

The AAO Code of Ethics and You [videotape]. San Francisco: American Academy of Ophthalmology; 1987.

Bettman JW, Demorest BH. Practice Without Malpractice in Ophthalmology: A Compendium of Risk Management Essays. San Francisco: American Academy of Ophthalmology; 1995.

The Ethical Ophthalmologist: A Primer. San Francisco: American Academy of Ophthalmology; 1993.

The Moral and Technical Competence of the Ophthalmologist [Information Statement]. San Francisco: American Academy of Ophthalmology; 1991.

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The Ethical Ophthalmologist: A Primer. San Francisco: American Academy of Ophthalmology; 1993.

CP_Title

Clinical Protocol 8.1

CP_H1

Performing the Confrontation Fields Test

Test Setup

CP_H2

1. Seat the patient and make sure the eye not being tested is occluded.
2. Seat yourself facing the patient at a distance of about 1 m. Close your eye that is directly opposite the patient's occluded eye.
3. Ask the patient to fixate on your nose or on your open eye.

CP_NL1

Check for Scotoma

4. Finger counting. Hold your hands stationary midway between yourself and the patient in opposite quadrants about 30° from central fixation (60 mm [24 inches] from your mutual based axis). Quickly extend then retract a finger or fingers on one hand in one quadrant of the monocular field, asking the patient to state the number. To avoid confusion, limit the number of fingers shown to 1, 2, and 5, and hold the fingers side by side in the frontal plane. Repeat in all four quadrants, testing at least two times per quadrant.
   a. Test patients who have marked visual loss by waving your hand in each quadrant individually and asking if the patient perceives the motion. With patients who can only perceive light, test in each quadrant individually for the ability to correctly determine the direction of light projection by pointing a transilluminator or penlight toward the pupil while keeping the patient's other eye completely shielded.

CP_NL2

   b. Test young children with a finger-mimicking procedure. First teach the child to hold up the same number of fingers as you do, then conduct the test as usual. Test rapidly, because a child will soon glance directly at your hand (although this involuntary movement can also indicate a normal response).
5. Simultaneous finger counting. Present fingers simultaneously in opposite quadrants, asking the patient to state the total number, using the following combi-

8.1

nations: 1 and 1, 1 and 2, and 2 and 2. This test can reveal a more subtle field defect than finger counting in each quadrant separately. Sometimes a patient with a relative scotoma can detect fingers presented to the defective hemifield but has problems with simultaneous targets.

6. Turn the power drum to read high minus (about –10.00).
7. Bring the closely spaced mires (often called single lines) into sharp focus by rotating the power drum counterclockwise while at the same time rotating the cylinder wheel to straighten the single lines where they cross the widely spaced perpendicular set of mires, (often called triple lines).

FIVE

Refraction

intro2

The field of vision is that portion of a subject's surroundings that is visible at any one time. The visual field properly includes central fixation, conventionally measured by visual acuity tests, and extrafoveal (or peripheral) vision. Central fixation, or visual acuity, and the visual field are tested in different ways and provide information on different aspects of visual function. Visual acuity testing measures resolution, the ability to identify forms. Visual field testing measures sensitivity, the ability to detect light thresholds at different locations.

Visual field testing is part of a thorough ophthalmic examination. The visual field of each eye is tested separately by one or more tests. The visual fields are routinely screened with the confrontation fields test. If macular disease is suspected to be causing a central visual field defect, a device called an Amsler grid is used to test the central area of each eye's visual field. If a visual field defect is detected by screening, further evaluation is conducted by manual or automated procedures known as perimetry. Perimetry is used to document the presence and severity of a visual field defect and to monitor progression of previously known visual field loss.

This chapter introduces the concept of the visual field and discusses its anatomic correlates. It describes the most common methods of screening and clinical testing, giving step-by-step instructions in basic methods, and discusses categories of visual field defects.

Retinoscopy and Refinement

The goal of retinoscopy (objective refraction) is to determine the nature of the patient's refractive error (if any) and the approximate lens power that will diminish (neutralize) that error and approach clear vision. In the process of refinement (subjective refraction), the examiner further and exactly determines the patient's final refractive correction by presenting various lenses to the patient until the patient responds that a best—and balanced (if the patient has binocular vision)—Snellen visual acuity has been reached.

Retinoscopy and refinement, perhaps more than most other ophthalmologic examination techniques, require artistry and experience to perform successfully. They demand fine motor skills, ambidextrousness, clinical observation skills, knowledge of optical principles, subjective judgment, and more. For these reasons, and because testing methods and variables can be numerous and complex, retinoscopy and refinement are best learned through hands-on, guided training with an experienced practitioner. This text can only present an overview of the instrumentation and steps in these processes. A list of recommended books and videotapes that treat these topics in greater detail appears at the end of this chapter.

Instrumentation

The examiner must become familiar with and skilled in the use of the variety of specialized instruments that are used in retinoscopy and refinement, namely the retinoscope, trial lenses and frames, refractor, Jackson cross cylinder, and distometer. Other instruments occasionally used in refraction include a single or multiple pinhole occluder and a lensometer. Automated refractors are available that combine many of the individual refraction instruments or duplicate their functions automatically.

The term neutralization refers to the achievement of the point at which a lens placed before the patient's eye effectively "neutralizes" the retinoscopic reflex and the patient's pupil fills with reflected light (anxiety, depression, and suicide, anxiety, depression, and suicide). As mentioned before, because of its subtleties and complexities, retinoscopy is best learned by hands-on instruction. Nevertheless, the basic steps in retinoscopic neutralization are outlined below.

H3

Retinoscope

The handheld streak retinoscope comprises a viewer (peephole), a mirror assembly, and a light bulb with a delicate filament that can be rotated and

focused by manipulating a sleeve on the instrument's handle (Figure 5.12). It produces a streak of light, as differentiated from the round dot of light produced by a spot retinoscope, which is used less frequently. The vergence of the slit (that is, the focus of the beam) on the streak retinoscope is adjusted by moving the sleeve up or down on the instrument's handle. To perform retinoscopy, the examiner looks through the retinoscope peephole viewer and aligns the retinoscope streak with the patient's visual axis. By shifting the position of the instrument, manipulating its light characteristics in specific ways, and observing the reaction of a light reflex from the patient's eye, the examiner can determine the patient's refractive state and much about the corrective needs.

Neutralization With a Retinoscope

The term neutralization refers to the achievement of the point at which a lens placed before the patient's eye effectively "neutralizes" the retinoscopic reflex and the patient's pupil fills with reflected light. As mentioned before, because of its subtleties and complexities, retinoscopy is best learned by hands-on instruction. Nevertheless, the basic steps in retinoscopic neutralization are outlined below.

1. Set the retinoscope so that the light rays emanating are parallel. This can be ensured if the streak cannot be focused on a surface of any sort, such as the wall or the palm of your hand.
2. Adjust the patient and yourself for comfort and appropriate testing positions and distance.
3. Direct the patient to look at a specific distance target, such as an optotype on a vision test chart. If cycloplegia has been used, you may direct the patient to look into your light.
4. Look through the examiner's eyepiece of the retinoscope and direct the light into the patient's pupil. Remember to seat yourself in front of the patient as summarized above. If the reflection from the patient's pupil is not easy to see, consider the following possible reasons:

NL2-m

   a. The retinoscope bulb may be dim, dirty, or turned off
   b. The patient may have a very high refractive error
   c. The room lights may not be sufficiently dimmed
   d. The patient may have a cataract or other media opacity.

   If you see several reflections, the "extra" ones may be coming from other surfaces, such as the cornea or the trial lens that you are using. Try moving slightly to either side, tilting the trial lens slightly, ascertaining that the trial lens surface is clean, or checking that you are not seeing reflections of lights in the examining room.

5. Orient the streak of the retinoscope horizontally and then move it up and down. Alternatively, you may start by orienting the streak vertically and then moving it right and left. Whichever direction you first orient the streak, your hand movement, and that of the retinoscope, is always perpendicular to that direction.

Clinical Protocol 5.1

Performing Manual Lensometry

CP_GX

Focusing the Eyepiece

The focus of the lensometer eyepiece must be verified each time the instrument is used.

1. With no lens in place in the lensometer, look through the eyepiece of the instrument. Turn the power drum until the mires (perpendicular crossed lines) viewed through the eyepiece are grossly out of focus.
2. Turn the eyepiece in a plus direction, normally counterclockwise. This will fog (blur) the target seen through the eyepiece.
3. Slowly turn the eyepiece in the opposite direction until the target is clear, then stop turning. This procedure focuses the eyepiece.
4. Turn the power drum to focus the mires. The mires should focus at a power drum reading of zero (plano). If not, repeat the procedure.

Positioning the Eyeglasses

1. Place the lower rim of the eyeglasses on the movable spectacle table with temple pieces facing away from you. You are now prepared to read the back surface of the lens, normally the appropriate surface from which to measure.
2. Looking through the eyepiece, align the eyeglass lens so that the mires cross in the center of the target by moving the eyeglass lens on the spectacle table.

Measuring Sphere and Cylinder Power

Plus Cylinder Technique CP_H3

1. Turn the power drum to read high minus (about –10.00).
2. Bring the closely spaced mires (often called single lines) into sharp focus by rotating the power drum counterclockwise while at the same time rotating the cylinder wheel to straighten the single lines where they cross the widely spaced perpendicular set of mires, (often called triple lines).

5.1

3. If the single lines and the triple lines come into focus at the same time, the lens is a sphere (Figure 1). If only the single lines focus, you have identified the sphere portion of a spherocylinder. Record the power drum reading at this point as the power of the sphere.
4. If cylinder power is present, after noting the power drum reading for the sphere, measure cylinder power by moving the power drum farther counterclockwise (less minus, or more plus), bringing the triple lines into sharp focus (Figure 2).

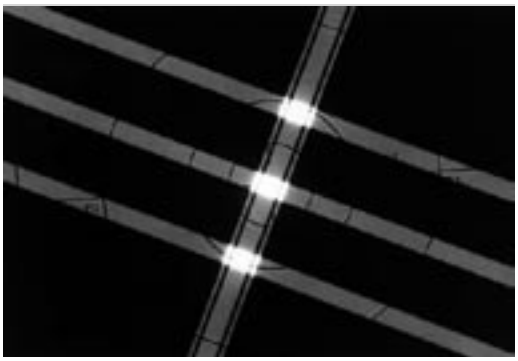

Figure 1

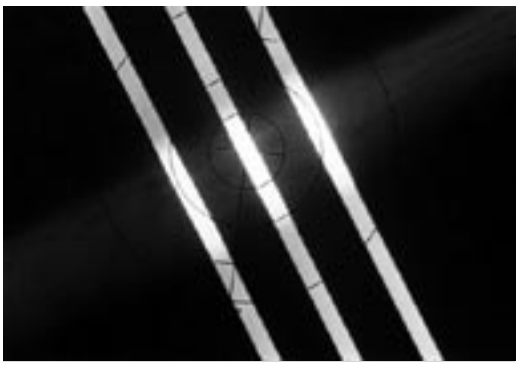

Figure 2

Congratulations on your decision to study ophthalmology, a discipline with ancient roots dating back 2000 years. The remarkable success of ophthalmology as a discipline is based on two main intertwined elements: ophthalmology's intrinsic strength as a medical and surgical specialty, and its competitive appeal that ensures a perpetual flow of talented individuals into the field. The field has attracted some of the brightest minds throughout history. Several Nobel laureates have been named for their work in vision research. Ophthalmology can claim several firsts in medicine. For example,

TT

Table 4.2 Visual Impairment and Estimates of Visual Disability

TH

TB_hang

Visual Impairment	Visual Disability	Comment	Reading Distance: Reading Aids
20/12 to 20/25	Normal vision at normal reading distance	Healthy young adults average better than 20/20.	**>33 cm:** Regular bifocals (up to 3 D)
20/30 to 20/70	Nearly normal vision; normal reading performance using shorter working distance TB	Usually causes no serious problems, but vision should be checked for potential improvement or possible early disease. Most states will issue a driving license to individuals with this level of vision in at least one eye.	**33–20 cm:** Stronger bifocals (3–5 D) Low-power magnifiers (5 D)
20/80 to 20/160	Moderate low vision; (near) normal performance with magnifiers	Strong reading glasses or vision magnifiers usually provide adequate reading ability; this level is usually insufficient for a driving license.	**16–10 cm:** Half-eye glasses (6–10 D), with prisms for binocularity Stronger magnifiers (>8 D)
20/200 to 20/400	Severe low vision: legal blindness by US definition	Gross orientation and mobility generally adequate, but difficulty with traffic signs, bus numbers, etc. Reading requires high-power magnifiers; reading speed is reduced, even with reading aids.	**8–5 cm** (cannot be binocular): High-power reading lenses (12–20 D) High-power magnifiers (>16 D)
20/500 to 20/1000	Profound visual impairment	Limited spot reading with visual aids.	**4–2 cm** (cannot be binocular): High-power reading lenses (24–28 D) High-power magnifiers (>28 D) Video magnifier Talking devices and vision substitutes
CF 8 ft to 4 ft	Unreliable vision	Increasing problems with visual orientation and mobility. Long cane is useful to explore environment. Talking devices and vision substitutes are useful.	
Less than CF 4 ft	Nearly total blindness	Vision unreliable, except under ideal circumstances; must rely on nonvisual devices.	
NLP	Total blindness	No light perception; must rely on talking devices and vision substitutes.	

Table 5.4 Average Accommodative Amplitudes for Different Ages

Age	Average Accommodative Amplitude*
8	14.0 (± 2 D)
12	13.0 (± 2 D)
16	12.0 (± 2 D)
20	11.0 (± 2 D)
24	10.0 (± 2 D)
28	9.0 (± 2 D)
32	8.0 (± 2 D)
36	7.0 (± 2 D)
40	6.0 (± 2 D)
44	4.5 (± 1.5 D)
48	3.0 (± 1.5 D)
52	2.5 (± 1.5 D)
56	2.0 (± 1.0 D)
60	1.5 (± 1.0 D)
64	1.0 (± 0.5 D)
68	0.5 (± 0.5 D)

* Counting back from age 40, accommodation increases by 1 D for each 4 years. Beyond age 40, the decrease in accommodation is somewhat more rapid. From age 48 on, 0.5 D is lost every 4 years. Thus, one can recall the entire table by remembering the amplitudes at age 40 and age 48.

ophthalmology established the first medical specialty examining board in the world (1916). Originally called the American Board for Ophthalmic Examinations, it was renamed the American Board of Ophthalmology in 1933. Ophthalmology was the first medical discipline to perform randomized clinical trials, the first to use lasers, the first to use antiviral agents, and the first to perform successful homotransplants (corneal grafts).

Practicing ophthalmology is a privilege, and ophthalmologists are intimately familiar with the rewards and personal satisfaction their efforts bring. The broad scope of ophthalmology practice combines medicine and surgery, and treatment of pediatric as well as adult patients. The nature of ophthalmic practice permits the establishment of durable and satisfying doctor–patient relationships, often lasting a lifetime. The subject matter of ophthalmology is intellectually challenging and fulfilling, sufficiently broad to ensure that everyone can find an intellectual niche in its vast array of topics. The intrinsic strengths of our chosen specialty and the love that it inspires in its practitioners will ensure the continued progress of ophthalmology despite the adverse forces facing medicine today.

Ophthalmologic services are regarded with respect by patients. Sight is so valued among Americans that, according to a survey by the National

Table 11.1 Grading of Retrolental and Vitreal Flare and Cell

Retrolental Space		Anterior Vitreous	
Mild		*Mild*	
0.5+	Questionable cells	0.5+	Questionable cells
1.0+	1–7 cells	1.0+	1–11 cells
Moderate		*Moderate*	
1.5+	8–13 cells	1.5+	12–19 cells
2.0+	14–19 cells	2.0+	20–34 cells
2.5+	20–25 cells	2.5+	35–60 cells
Severe		*Severe*	
3.0+	26–60 cells	3.0+	61–120 cells
3.5+	Too many to count	3.5+	Too many to count
4.0+	Too many to count	4.0+	Too many to count

TH2

Society to Prevent Blindness, blindness is feared second only to cancer. This fear emanates from the feeling that blindness has a catastrophic effect on one's social, economic, and personal life. It is particularly important for a new resident to understand this attitude, because ophthalmic practice involves the care of patients with vision-threatening disorders. Some such patients may believe, correctly or otherwise, that they will go blind. The treatment of these patients draws not only on the technical skills of the physician.

Much of the practice of medicine, including ophthalmology, involves communication as a key skill. Communication may be with the patient, with the family, with other health care providers, or with various sectors of society. Such communication should always be clear, forthright, timely, and free of jargon. Communication with patients in general, but especially with patients or parents of children found to harbor serious ophthalmic disease, is an art acquired over many years of experience. However, some general guidelines are helpful for the beginning resident. The treatment of these patients draws not only on the technical skills of the physician.

Table 12.1 Conversion Table for Schiotz Tonometers

	Plunger Load			
Scale Reading	**5.5 g**	**7.5 g**	**10.0 g**	**15.0 g**
0.0	41.4	59.1	81.7	127.5
0.5	37.8	54.2	75.1	117.9
1.0	34.5	49.8	69.3	109.3
1.5	31.6	45.8	64.0	101.4