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2019
Resident Edition

YO Info

THE YOUNG OPHTHALMOLOGIST'S NEWSLETTER

Your source for clinical pearls, coding, practice management advice and more

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"Dear Dr. Jake": A Practical Advice Column for Residents

In the fictitious advice column below, program director Evan L. "Jake" Waxman, MD, PhD, aka "Dr. Jake," imagines a few sticky situations that residents new and old will all be familiar with. Read on as he combines a bit of wit and humor to tackle some of residency's toughest conundrums and steer a few trainees to safe shores.

Dear Dr. Jake:

I'm a first-year resident on overnight call. I'm writing to you from the emergency department at 2 a.m. There's a patient who's come in for a subconjunctival hemorrhage. She has no pain or change in vision and said she noticed it two days ago. She came to the ED because it hadn't gone away yet. I'm thinking unkind thoughts. Is this allowed? Love your column.

—Hoping to Avoid Hatred

Dear Hoping to Avoid Hatred:

I apologize for not getting back to you more quickly. I'll assume that this problem has been resolved and that you are still in the residency program.

Learning to deal with patients similar to the one you describe is a rite of passage on the road to becoming a practicing physician. Those of us who aren't saints can find ourselves irritated and even angry at patients who "waste our time," "don't do what we tell them to" and "don't take care of themselves." It's especially easy to feel this way when we're experiencing physical (lack of sleep) or mental (the OKAP is coming!) stress.

Mindfulness is a frequently used word these days. IMO it's meant for these situations. Be mindful of how you feel. Separate that from what you need to do. Remember that the patient is truly concerned and that big red blotch on her eye really does look scary. Remember that this situation cannot upset you. Only your reaction to the situation can upset you. You get to choose. Remember also that you'll get back to the call room and back to sleep more quickly if you complete your exam. Don't forget to dilate though! :)

Dear Dr. Jake:

I'm a first-year resident. I frequently get to scrub in on cases, but all I ever get to do is watch. I don't understand how I'm ever going to learn to do surgery if I'm never allowed to operate. Should I switch programs? Awaiting your reply.

—Cornea Waterboy

Dear Cornea Waterboy:

What an excellent question! Don't switch programs yet. Just about every new resident can't wait to operate. It's important to remember though that while your education is a high priority, our most important obligation is to our patients.

Surgery in the OR is for keeps, and your attending can't always undo something you might not do right. There's an ethical tension in learning surgery. Every cataract surgeon must do their first cataract surgery. Very few people would want their mom to be someone's first case though. We address this ethical tension by learning outside the operating room.

You need to read and watch videos to understand the science of surgery. You need to use your opportunities as a "waterboy" to observe and learn from what you see. (Another opportunity to be mindful.) You need to practice in the surgical training lab. Prepare in advance and you'll be ready and on good moral footing when you're eventually handed the instruments.

Dear Dr. Jake:

I'm a third-year resident and an avid reader of your column. The coordinator in my program is so unfair! She is always on me about finishing online modules, filling out faculty evaluations and completing my duty hours. I'm busy learning ophthalmology. Why do I have to do all this paperwork?

—Fed Up

Dear Fed Up:

Thanks for following the column. As I write this reply, having completed my charts, filled out my evaluations of residents and medical students, reviewed resident duty hours, completed my online modules on HIPAA training and coding requirements, renewed my license and DEA paperwork, completed my yearly conflict of interest paperwork, attested to my fitness for duty on recredentialing paperwork and paid the American Board of Ophthalmology to keep track of my continuing medical education hours, I have to say I agree with you. Your coordinator is unfair. Life sometimes is.

For better or worse though, administrative responsibilities are vital to the practice of medicine. They are critical to patient care and to the maintenance of the residency program (and later to maintenance of certification!). Failure to complete these violates the essence of professionalism, one of the six core competencies.

Fortunately, as soon as you've graduated from residency, you'll never have to do any of these ever again.

Dear Dr. Jake:

I'm a first-year resident and first-time writer to your column. I just had my semiannual review with my program director. She said that something called the CCC met and determined that I need to read more. I read all the time though. What's a CCC? How can I read more than I'm already reading?

—BCSC-Related Exposure Keratopathy Victim

Dear BCSC-Related Exposure Keratopathy Victim:

Thanks for writing in. Let's get some basics out of the way. The Clinical Competency Committee (CCC) represents the faculty in your program who are charged with monitoring and recording your progress on the milestones.

Per the Accreditation Council for Graduate Medical Education (ACGME), the milestones are "learning trajectories highlighting significant points in resident development to assess learner competency in six key areas of medical education." In other words, they are a list of things you're supposed to make progress on during residency annotated with descriptions of what progress looks like.

Your program director and your CCC are, of course, right. You need to read more. We all do. Sometimes this is what we routinely tell residents to do when they're doing well, and we can't come up with any action plan for you.

They're also a little bit wrong though. Most of us were never taught best strategies for learning, and many of us equate studying with reading and rereading the material we're supposed to master. It turns out that's not the best strategy. It gives us a false sense of what we know and it's not time efficient. Reading should be followed by immediate reflection and self-assessment.

Journaling, flash cards and practice questions are great ways to self-assess. It's important to follow with delayed assessment down the road. Save the rereading for material you get wrong. The Academy's Basic and Clinical Science Course (BCSC) Self-Assessment Program is designed to help with this. Every question is linked to an excerpt of the BCSC.

Scan the QR code below to check out more of Dr. Jake's pseudo advice column and read additional Resident Edition stories.

Evan L. "Jake" Waxman, MD, PhD, is chair of the Association of University Professors of Ophthalmology's Program Directors Council and program director at the University of Pittsburgh School of Medicine.

From the Editor's Desk

Meet the New Resident Edition

Introductions and first dates are a funny thing — you get one shot to make an impression, to pique interest, to start a relationship.

What if you have lettuce in between your teeth or toilet paper stuck to your shoe? So many things can go sideways, it can be hard to keep track. Don't you wish you had someone in your ear leading you in the right direction, lending the confidence you need to get through the sweaty handshake and awkward pauses?

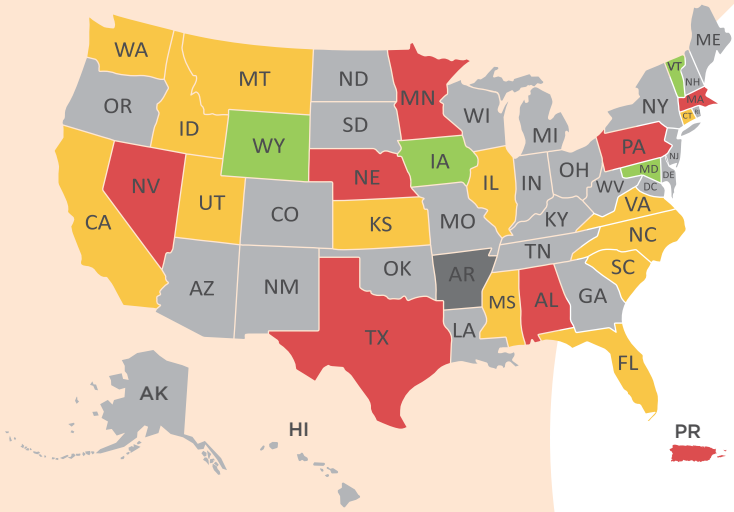
Well, you're in luck, because at *YO Info*, "warm comforting embrace" is our middle name.

You'll start to see what we mean as you read through this Resident Edition of *YO Info* and realize that you CAN do this! You CAN get through long nights of call and Ophthalmic Knowledge Assessment Program (OKAP®) test prep, learning the language that is ophthalmology and building a foundation for your career. We want to hold you up to the light, because you're special and we believe in you!

Throughout the year, you'll see us publish our *YO Info* newsletter, along with articles and pearls on the Academy's Facebook, Twitter and Instagram feeds and on our website. Just look out for the #AAOYO hashtag or head to aao.org/yo.

Have secrets you wish we would unlock for you? Just let us know! We look forward to hearing from you and watching you grow from a wide-eyed resident on your first rotation to the strutting eye surgeon you were born to be!

James G. Chelnis, MD, is chair of the YO Info *Editorial Board. He is an oculoplastics surgeon in private practice in New York City.*



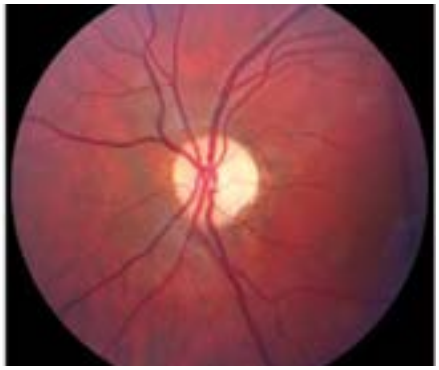
Make an Impact through OPHTHPAC® and Surgical Scope Fund

Stay engaged in state and federal advocacy with these quick tips:

1. **Engage with your state ophthalmological society.** Your state society fights for laws that protect surgery by surgeons, ensures patient safety, and empowers lives.
2. **Become a Congressional Advocate.** Develop a personal relationship with your representative in Congress.
3. **Follow efforts in your state at** safesurgerycoalition.org **and on social media.**
4. **Text EYEYO to 51555** to receive federal advocacy updates in the palm of your hand.
5. **Learn more about OPHTHPAC® and the Surgical Scope Fund by visiting** aao.org/advocacy.

Top 12 Vision-Threatening Diagnoses

Here's a quick refresher of diagnoses that you shouldn't miss … and vital tips for handling these eye emergencies.



1. Ischemic Optic Neuropathy

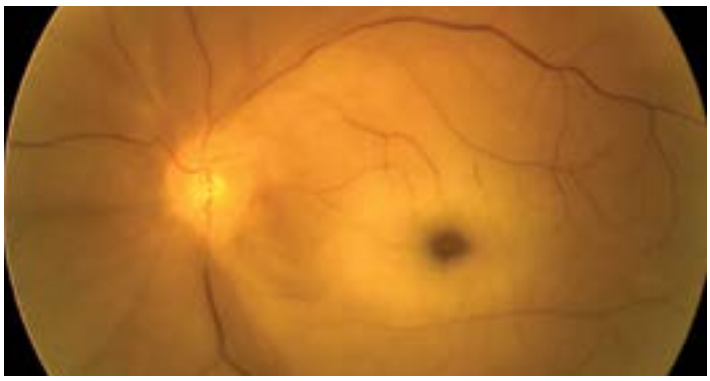
Symptoms: Fundus photo shows a chalky white pallor of the optic nerve from arteritic anterior ischemic optic neuropathy.

Tip: If there is vision loss, but no pain in a patient age 50 or over, consider tests to rule out giant cell arteritis (erythrocyte sedimentation rate [ESR], C-reactive protein [CRP] and complete blood count [CBC]).

2. Retrobulbar Hemorrhage

Symptoms: External photo demonstrates periorbital ecchymosis, proptosis and decreased motility.

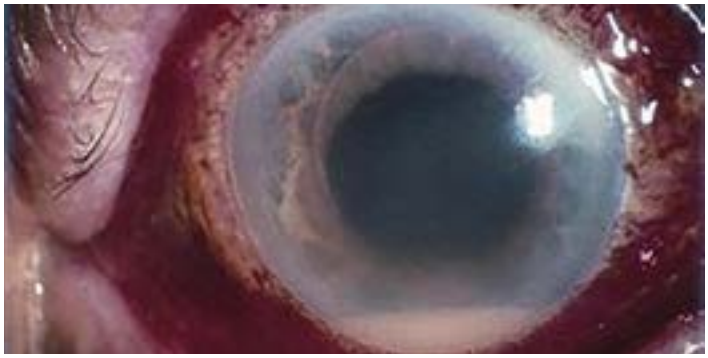
Tip: Do canthotomy and cantholysis immediately.



3. Central Retinal Artery Occlusion

Symptoms: Fundus photo shows diffuse retinal whitening with a foveal cherry red spot.

Tip: Do a time-sensitive workup for giant cell arteritis as well as an embolus/thrombus workup, given the increased risk of a cardiovascular event.



4. Endophthalmitis

Symptoms: Slit-lamp photo shows conjunctival injection, corneal edema and hypopyon.

Tip: Get a tap and injection of intravitreal antibiotics immediately, with or without vitrectomy.

5. Macula-On Rhegmatogenous Retinal Detachment

Symptoms: Fundus photo montage demonstrates a superior macula-on retinal detachment.

Tip: Do surgery/procedure immediately. Don't forget to dilate and evaluate the contralateral eye carefully.

6. Carotid-Cavernous Fistula

Symptoms: External photo highlights dilated episcleral vessels and chemosis in the right eye.

Tip: Supportive findings can include blood in Schlemm's canal on gonioscopy and presence of an orbital bruit. Urgent imaging is warranted.

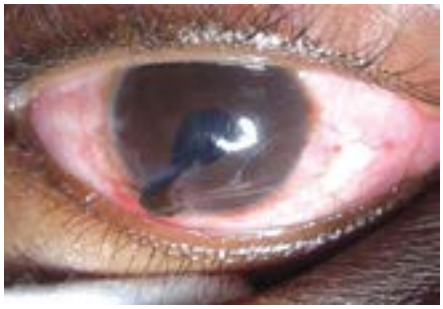
7. Orbital Cellulitis

Symptoms: External photo shows lid swelling, proptosis and limited extraocular motility of the left eye.

Tip: Get a CT scan and a clinical diagnosis.

8. Open Globe

Symptoms: Slit-lamp photo shows uvea protruding through a corneal laceration and a peaked pupil.

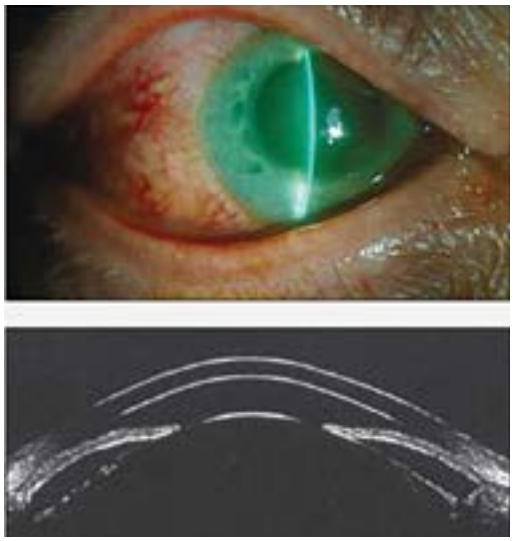


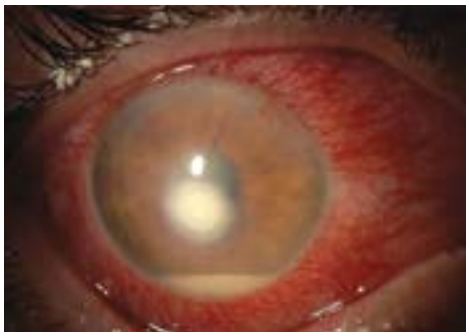
Tip: Get a CT scan to rule out an intraocular foreign body. Place a shield over the eye immediately and examine the eye gently.

9. Acute Angle-Closure Glaucoma

Symptoms: Slit-lamp photo shows corneal edema and shallow anterior chamber. The ultrasound biomicroscopy shows the narrow angle.

Tip: Treat immediately and order laser peripheral iridotomy (LPI). The contralateral eye also may need an LPI.

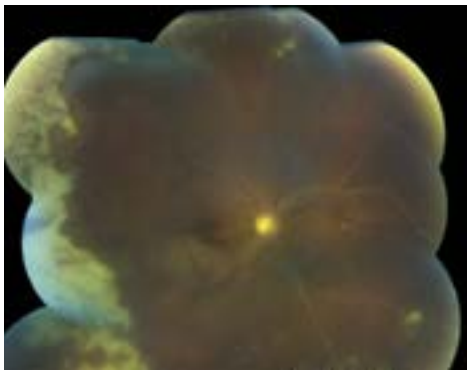




10. Microbial Keratitis

Symptoms: Slit-lamp photo shows conjunctival infection, a central corneal infiltrate and hypopyon.

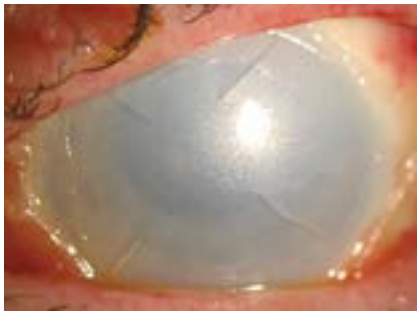
Tip: It's crucial to obtain cultures before the start of treatment.



11. Acute Retinal Necrosis

Symptoms: Color fundus photo montage shows peripheral areas of retinal whitening and vasculitis.

Tip: This condition is most commonly associated with herpes simplex virus or varicella-zoster virus infection. Prompt diagnosis and treatment with systemic and/or intravitreal antivirals are important as it can progress rapidly.



12. Alkali Chemical Injury

Symptoms: Slit-lamp photo showing perilimbal conjunctival blanching, conjunctival injection and diffuse corneal haze.

Tip: Early identification and copious irrigation is imperative. Alkali chemicals can be more harmful than acidic chemicals as they penetrate deeper. An eyelid speculum can be used to keep the eye open, while the irrigating solution is delivered through IV tubing.

Natasha Nayak Kolomeyer, MD, is a glaucoma specialist at Wills Eye Hospital in Philadelphia and joined the YO Info *Editorial Board in 2019.*

Resident's Timeline and Essential To-Do List

Welcome to ophthalmology! Let the academic year begin. You will find that planning out the year in advance will help keep you on track during your busy rotations and crazy call schedules. Not only can you plan out your BCSC reading schedule, but you may want to bookmark meetings throughout the year in your subspecialty area of interest. Stay on top of abstract deadlines, study schedules, research projects, and dates specific to your residency program by creating a yearly timeline for yourself at the start of each residency year. You may also find it helpful to sit down with seniors in your residency to plan out a successful year. Check out this to-do list and timeline for a glimpse of what critical dates you don't want to miss!

2019

July

All:
- Make the most of your Academy membership as a young ophthalmologist. Bookmark the young ophthalmologists and residents landing pages: aao.org/yo and aao.org/residents.

Here are some of the Academy benefits you receive:
- Learn from *Ophthalmology*®, the no. 1 peer-reviewed journal in the profession, with your free subscription.
- Get the latest industry news and clinical roundups with free access to *EyeNet*® *Magazine*.
- Test your clinical knowledge — aao.org/self-assessments.
- View surgical videos and images showing basic skills — aao.org/browse-multimedia.
- Read the Preferred Practice Pattern Guidelines — aao.org/ppp.
- Plan your OKAP® test preparation. Check out *YO Info*'s reading schedule online.

PGY-2 (first-year ophthalmology): Start exploring research projects for residency research day, meeting submissions, etc.

PGY-4 (third-year ophthalmology): Residents who plan to apply for fellowships should submit applications to SF Match (registration begins June 1, 2019). This does NOT include those applying for American Society of Ophthalmic Plastic and Reconstructive Surgery (ASOPRS) fellowships.

August

All:
- American Society of Cataract and Refractive Surgery (ASCRS) abstract submission opens.
- Women in Ophthalmology annual meeting, August 22 to 25, in Coeur D'Alene, Idaho.
- Check out the Academy's physician wellness focus on mindfulness aao.org/member-services/physician-wellness.

September

PGY-4: Fellowship interviews start.

All:
- Prospective residency interviews start. Get involved in the process that selects those who will follow in your footsteps!
- American Association for Pediatric Ophthalmology and Strabismus (AAPOS) abstract submission opens.

October

All:
- American Glaucoma Society (AGS) abstract submissions due.
- AAO 2019, October 12 to 15, in San Francisco. The single largest meeting on the ophthalmology calendar offers many courses and opportunities for young ophthalmologists.
- Download the YO guide to AAO 2019 — aao.org/yo.
- Visit the YO Lounge and attend one of the daily power hours.

PGY-3: ASOPRS fellowship applications open.

November

All:
- Begin your investment in ophthalmology. Give to three critical funds: the Surgical Scope Fund, the OPHTHPAC fund and your state eye PAC — aao.org/advocacy/action/give.
- Consider submitting an EyeWiki article for a chance to attend the Academy's Mid-Year Forum: eyewiki.org/Residents_and_Fellows.
- Become a volunteer for EyeCare America aao.org/eyecare-america/volunteer-pledge.

December

All:
- Association for Research in Vision and Ophthalmology (ARVO) poster/paper submissions open.

PGY-4: SF Match fellowship rank lists due and SF Match fellowship results released.

(Continued on page 8)

IOLs: These Aren't Your Grandma's Lenses … or Maybe They Are?

Understanding the various intraocular lenses (IOLs) for cataract surgery is crucial for an ophthalmologist.

Here's a quick primer on types of IOLs and some factors both you and your patients should consider when choosing a lens.

For a surgeon, the integrity of the capsular bag can narrow the options of lens choices. Although both a foldable one-piece IOL and three-piece IOL can be placed in the capsular bag, in an uncomplicated surgery, the goal is typically to place the one-piece version in the bag.

However, if cataract surgery is complicated by a posterior capsular rupture and there is sufficient anterior capsular support, a three-piece IOL can be placed in the ciliary sulcus. Remember, a one-piece IOL should not be placed in the sulcus because chafing of the haptics against the iris can cause uveitis-glaucoma-hyphema (UGH) syndrome. If there is complete lack of capsular support, anterior chamber IOLs (ACIOLs) can be used. ACIOLs have four-point fixation that is supported by the anterior chamber angle.

The visual goal of a patient can also help determine the type of lens implanted. In patients who are amenable to wearing glasses, a monofocal IOL can be used. In fact, monofocal IOLs that have one focusing distance are the most common type of implantable lens.

Most patients prefer to be set for distance and wear reading glasses for close work. For patients who would like to be spectacle-free, however, next-generation or "premium" IOLs have been developed to address presbyopia and astigmatism. These include multifocal, accommodating and toric IOLs.

Multifocal IOLs

Current multifocal IOLs have alternating zones for near and distance correction using a combination of geometric optics and diffraction optics. Patients considered for a multifocal IOL should have good potential vision without macular pathology or corneal endothelial dysfunction. You should spend extra time counseling patients about the goals of multifocal IOLs as well as their limitations.

Although multifocal lenses allow for an increased range of focus and reduced dependence on spectacles, their disadvantages include reduced contrast sensitivity and distance vision, as well as the presence of glare and halos, especially at night. The surgeon should be prepared to manage residual postoperative refractive errors with refractive surgery, spectacle or contact lens correction and possibly IOL exchange.

Tecnis Symfony IOL Implant

Accommodating IOLs

Accommodating and pseudoaccommodating lenses incorporate different mechanisms designed to generate forward IOL displacement during accommodative effort, but it is unclear if these lenses work by IOL movement or another mechanism.

Toric IOLs

Toric IOLs are designed to correct astigmatism without incisions in the cornea. Current toric IOLs in the United States come in powers that can correct from 1.00 to 4.00 D in the spectacle plane. To accurately determine the power of the toric IOL, a surgeon must measure the amount of corneal astigmatism and not the total refractive astigmatism.

AcrySof Toric IOL Implant

Choosing the ideal IOL should offer advantages to both the surgeon and the patient. Hopefully, this overview will help you choose the best lens for your patient.

Victoria H. Yom, MD, MSCI, is a cornea specialist at UCLA and joined the YO Info *Editorial Board in 2018.*

2020

January	**All:** • OKAP studying kicks into high gear. Amplify your studying with the Academy's BCSC Self-Assessment Program — store.aao.org/basic-and-clinical-science-course-self-assessment-program.html. • American Society of Retina Specialists (ASRS) abstract submissions due.
	PGY-3: ASOPRS fellowship interviews start.
February	**All:** • AGS meeting, February 27 to March 1, in Washington, D.C.
March	**All:** • OKAP exam. • ASOPRS fall meeting abstract submission opens. • North American Neuro-Ophthalmology Society (NANOS) annual meeting, March 7 to 12, in Amelia Island Plantation, Fla. • AAPOS annual meeting, March 25 to 29, in Austin, Texas.
April	**PGY-3:** ASOPRS rank lists due, and ASOPRS match occurs.
	All: • Submit papers/posters abstracts for AAO 2020, November 14 to 17, in Las Vegas. Be sure to enter the YO surgical video competition! • Women in Ophthalmology (WIO) abstract submissions due. • Engage with your state society • Attend the Academy's Mid-Year Forum, April 22-25, in Washington, D.C. • Learn how to advocate for your patients and profession — aao.org/advocacy (click "Get Involved").
May	**PGY-3:** (or PGY-2 for oculoplastics): Prepare for fellowship applications (draft personal statement and CV, identify letters of support, etc.).
	All: • ARVO annual meeting, May 3 to 7, in Baltimore. • ASCRS annual meeting, May 15 to 19, in Boston.
June	**PGY-4:** Local residency research day presentations/recognition of graduating residents.
	PGY-3: (or PGY-2 for oculoplastics): Continue preparation for fellowship applications.
	All: Congratulations on a successful year!

Andrea A. Tooley, MD, is doing an oculoplastics fellowship at Manhattan Eye and Ear Hospital/Institute of Reconstructive Plastic Surgery-New York University Medical Center in New York City.

Refraction 101: Go Forth and Refract

Congratulations! You've just treated your patient's diabetic macular edema or maybe you've taken out their dense cataracts.

Now, with a pair of glasses, your patient's vision will be correctable to 20/20. Remember you're the one responsible for providing them with a prescription for glasses, so let's get you prepared.

What Is Refraction?

Refraction is the measurement of the eye's focusing characteristics and the determinant of a prescription. A prescription has three main components: sphere, cylinder and axis.

There are also different types of refraction:

- Objective (streak): Using a retinoscope to measure a patient's refraction.

  For more information, read "Retinoscopy 101" at aao.org/young-ophthalmologists/yo-info/article/retinoscopy-101.

  Also check out an excellent video tutorial that describes loose-lens retinoscopy from start to finish at timroot.com/retinoscopy-workshop-video/.

- Subjective (manifest, dry): Using a refractor (also known as a phoroptor) to allow a patient to provide their subjective response about their prescription.

- Cycloplegic (wet): A refraction after a patient has had cycloplegic drops to paralyze their accommodation.

Know Your Equipment

For this tutorial, we will cover manifest refraction. First, know your refractor instrument. In general, minus (divergent) lenses will be in red and plus (convergent) lenses will be in white or black. Familiarize yourself with all of the knobs. Here are the most important:

1. Sphere power control
   a. When rotated downwards, you add plus sphere.
   b. When rotated upwards, you add minus (or take away plus).

2. Cylinder power control
   a. When rotated clockwise, you add plus cylinder.
   b. When rotated counterclockwise, you take away plus.

3. Cylinder axis knob
   a. Ophthalmic scale = 1 to 180 degrees. Using this scale, 185 degrees should be noted as 5 degrees.

How to Refract

When you perform a manifest refraction on a patient, occlude the contralateral eye (OC on the auxiliary lens knob) and keep the tested eye open (O on the auxiliary lens knob). The details on how to refract are too complicated to cover in this short article, so please watch this excellent video tutorial from the University of Iowa (vimeo.com/135867809). The animation will help you understand how images are focused on the retina through refraction.

Before actually refracting, it's important to prepare your patient for the process of refraction. You might say, "I am going to show you a series of two different choices. Please let me know which option is clearer. If they are the same, that is a perfectly good answer."

Then open the projector to show as many lines as possible and ask the patient to identify the lowest line of letters they can read (this will save you some time). Isolate that line. Then proceed with the four steps of a refraction (see the animation referenced above). Here are some key tips for each step:

1. Spherical power: Always add +0.50 D (diopters) first to decrease the risk of over-minusing the patient (when patients accommodate in the refractor, they will need more myopic lenses, which can lead to eye strain). Make your patients "earn" more minus—they must see a smaller line on the chart with the increased myopic lenses.
2. Cylinder axis: First, increase the Snellen acuity one line. The larger letters will make it easier for the patient to help you find the correct axis.
3. Cylinder power: Go back down a line on the chart to the smallest line the patient can read. Key step: When you add +0.50 D of cylinder power (two clicks clockwise, or right), you must take away 0.25 D of sphere (one click UP). This maintains the spherical equivalent. Therefore, if you take away 0.50 D of cylinder (two clicks counterclockwise, or left), you must add 0.25 D of sphere (one click DOWN), and vice versa (see animation). **Think**: *up* the plus cylinder, move the sphere wheel *up*; *down* the plus cylinder, move the sphere wheel *down*.
4. Spherical power refinement: For this step, go in 0.25-D increments. At the end, perform the duochrome test and ask the patient if the letters are clearer on the red or the green side. Remember it with these letters, "RAM-GAP," which stands for "if the Red is clearer, Add Minus; if the Green is better, Add Plus."

Here are some general tips to get the best refraction for your patient:

- Work with the smallest line that the patient can read.
- "Which do you see better, #1 or #2?" Go all the way up to #10 (#3 or #4, #5 or #6, etc.) and then back to #1 versus #2.
- If the patient pauses, show them the two options again, providing for two seconds on each option.

Refraction requires practice, so practice often on cooperative patients at first. You can do this. You will do this. Go forth and refract.

Evan Silverstein, MD, is an assistant professor of ophthalmology and associate resident program director at Virginia Commonwealth University in Richmond, Va.

Drop It Like It's Hot: Common Eye Drops and Options

Over the last several years, you may have become knowledgeable about a whole host of medications for many different conditions.

But soon you'll encounter a new realm of medications — eye drops. The names will probably be unfamiliar, and to further complicate matters, patients will be more likely to know the color of the lid than the name of the medication.

This is an introduction to the most common drops you'll encounter in the first few months of residency. It also includes indications as well as cautions. This is not a comprehensive list, nor should these descriptions be a substitute for medical advice or training. Eye drops have multiple indications and side effects beyond what is listed here.

In the charts below, the branded name is listed in parentheses.

Anesthetic Drops

Drug	Lid Color	Duration	Indications	Cautions
Proparacaine (Alcaine) **Tetracaine** (Pontocaine)	White	10–30 min	Topical anesthesia Breaks down corneal epithelium ulcers Speeds absorption of subsequent drops	Long-term use causes corneal ulcers Check corneal sensation before use in setting of ulcers
Benoxinate + **Fluorescein** (Fluress)	N/A, dropper	10–20 min	Applanation tonometry Stains defects on corneal/conjunctival surface Topical anesthesia	Not for Seidel tests (use fluorescein paper strips) Patient may see yellow when they blow their nose

Dilation Drops

Drug	Lid Color	Duration	Indications	Cautions
Phenylephrine 2.5%, 10% (Neosynephrine)	Red	3 hours	Use with tropicamide for adult dilation	Avoid 10% in hypertensive crisis, pediatrics and the elderly
Tropicamide 1% (Mydriacil)	Red	4–6 hours	Use with phenylephrine for adult dilation	
Cyclopentolate 1%, 2% (Cyclogyl)	Red	24 hours	Cycloplegic refractions	
Atropine 1%	Red	7–10 days	Breaks posterior synechiae Decreases ache from ocular inflammation Fogging for amblyopia treatment	Avoid in angle-closure glaucoma

Steroid Drops

(In order from strongest to weakest)

Drug	Lid Color	Indications	Cautions
Difluprednate 0.05% (Durezol)	Pink	Postoperative inflammation Iritis	Causes highest incidence of elevated IOP and cataracts compared with steroid drops below
Prednisolone acetate 1% (PredForte)	Pink/white	Postoperative inflammation Iritis	Can cause elevated IOP and cataracts
Fluorometholone 0.1% (FML) **Loteprednol** 0.5% (Lotemax gel)	Pink/white	Ocular surface inflammation/dry eye Postoperative inflammation	Can cause elevated IOP and cataracts, but to a much lesser extent than the two above
Loteprednol 0.2% (Alrex)	Pink/white	Seasonal allergies	

Glaucoma Drops

Drug	Lid Color	Dosing	Class	Cautions
Timolol 0.5% (Timoptic) + several others	Yellow	QAM or BID	Beta blocker	Avoid in patients with asthma, COPD, CHF and bradycardia
Brimonidine 0.1%, 0.15%, 0.2% (Alphagan)	Purple	BID-TID	Alpha agonist	Avoid in patients under 3 years of age Avoid in women who are nursing or who are near their delivery date (though it is the only class B glaucoma drop)
Dorzolamide (Trusopt) **Brinzolamide** 1% (Azopt)	Orange	TID	Carbonic anhydrase inhibitor	Avoid in sulfa allergy Avoid in sickle cell patients with hyphema (can induce sickling in anterior chamber) Patients may complain of bitter or metallic taste
Bimatoprost 0.01%, 0.03% (Lumigan) **Travoprost** 0.004% (Travatan Z) **Latanoprost** 0.005% (Xalatan) **Tafluprost** 0.0015% (Zioptan) These drops come in single-use vials, so there is no lid color.	Teal green	QHS	Prostaglandin agonist	May reactivate herpes simplex virus keratitis Darkens hazel irides Conjunctival hyperemia is common Avoid in uveitic glaucoma and late pregnancy (may induce labor)
Dorzolamide 2%/ **Timolol** 0.5% (Cosopt)	White with dark-blue stripe or solid dark blue	BID	Carbonic anhydrase inhibitor + beta blocker	
Brimonidine 0.2%/ **Timolol** 0.5% (Combigan)	Dark blue	BID	Alpha agonist + beta blocker	
Latanoprostene bunod 0.024%	Teal green	QHS	Nitric oxide donating prostaglandin analog	
Netarsudil 0.02% (Rhopressa)	White	QHS	Rho kinase inhibitor	Conjunctival hyperemia is common
Acetazolamide 250-mg, 500-mg extended release (Diamox)	N/A	BID-QID	Carbonic anhydrase inhibitor	Avoid in sulfa allergy Avoid in sickle cell patients with hyphema (can induce sickling in anterior chamber) Avoid in patients with a history of kidney stones Beware with potassium-losing diuretics or digitalis Common side effects include peripheral limb tingling/ weakness, bad taste with carbonated beverages and diarrhea
Methazolamide 25-mg (Neptazane)	N/A	BID-TID	Carbonic anhydrase inhibitor	Same as above, but less severe

Antibiotic Drops

Drug	Lid Color	Indications	Cautions
Moxifloxacin (Vigamox) **Gatifloxacin** (Zymaxid)	Tan	Fourth-generation fluoroquinolone Postoperative Corneal ulcers	
Ofloxacin (Ocuflox)	Tan	Third-generation fluoroquinolone Postoperative	
Erythromycin (Emycin)	N/A, ointment/tube	Macrolide Bacterial conjunctivitis Sterile corneal defects to prevent infection Prevents ophthalmia neonatorum	
Bacitracin ointment (Bacitracin)	N/A, ointment/tube	Cationic polypeptide Methicillin-resistant *Staphylococcus aureus*	
Tobramycin/ Dexamethasone ointment (Tobradex)	Pink/white, also available as ointment/tube	Aminoglycoside Gram negatives (Pseudomonas)	
Neomycin/ Polymyxin/ Dexamethasone ointment (Maxitrol)	N/A, ointment/tube	Aminoglycoside + cationic polypeptide + strongest topical steroid Postoperative Common gram positives	Neomycin is the most common cause of contact dermatitis

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OCT: How It Works and When to Use It

Optical coherence tomography (OCT) is the gold-standard imaging modality for monitoring the posterior segment and a technique that residents will encounter early on in their training.

This article provides a concise summary of how OCT works and also offers some common disease presentations.

How It Works

Spectral-domain OCT (SD-OCT) is the most likely form of OCT that you will encounter in a clinic. SD-OCT provides two- and three-dimensional images with near-cellular resolution (<10 µm). It uses a long-wavelength (near-infrared), broad-bandwidth light source to illuminate the retina and assess the light reflected from retinal tissue interfaces using a spectrometer and Fourier transformation.

This allows for imaging speeds of 40,000 A-scans per second. These rapid imaging speeds can be used to measure the light reflectance from the surface of moving red blood cells. The result is a segmented angiography of the retinal microvasculature, or OCT-angiography (OCT-A).

When to Use OCT

The first important clinical decision is when to order an OCT. Although you will use the OCT regularly, it is not advisable for every patient. Asymptomatic patients with excellent visual acuities, for example, may not benefit from imaging.

The highest-yield imaging is performed on symptomatic patients experiencing metamorphopsia, blurred vision

or unexplained vision loss. In addition, patients with microvascular disease or structural changes on exam should be imaged. However, OCT should not be used to replace a high-magnification fundus exam.

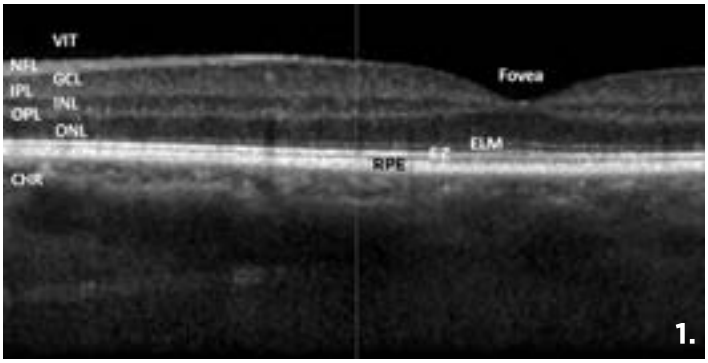

Figure 1 shows an SD-OCT image from a healthy patient. The important layers from the inner to outer retina are: vitreous (VIT), nerve fiber layer (NFL), ganglion cell layer (GCL), inner plexiform layer (IPL), inner nuclear layer (INL), outer plexiform layer (OPL), outer nuclear layer (ONL), external limiting membrane (ELM), inner segment ellipsoid zone (EZ), retinal pigment epithelium (RPE) and choroid (CHR).

To properly evaluate an OCT image, answer these initial structural questions. Is there a normal central macular thickness (CMT) and a normal foveal contour? Is there any retinal thinning or thickening? Is the EZ intact? Is there any outer retinal thinning? Finally, how thick is the choroid?

Common Disease Presentations

Let's review some clinical images to demonstrate a few important SD-OCT findings.

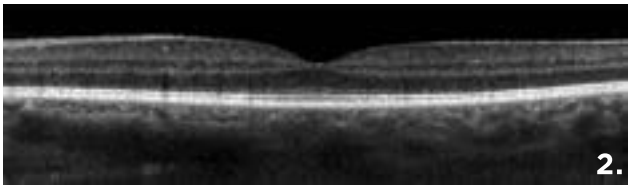

Figure 2 is an image from a healthy patient. Note the foveal contour and CMT (250 µm).

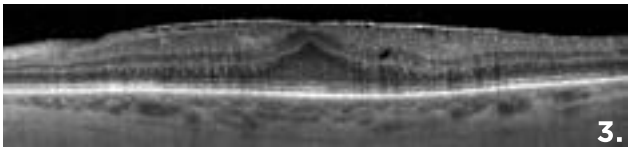

Figure 3 demonstrates an epiretinal membrane on the surface of the retina with a thickened CMT and loss of foveal contour.

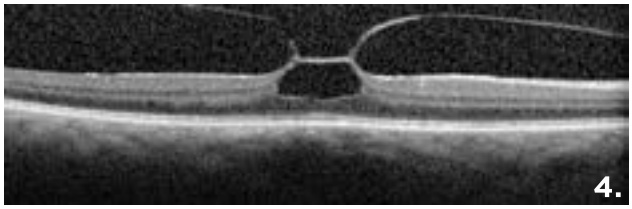

Figure 4 depicts vitreomacular traction with an inverted foveal contour and underlying cavitation.

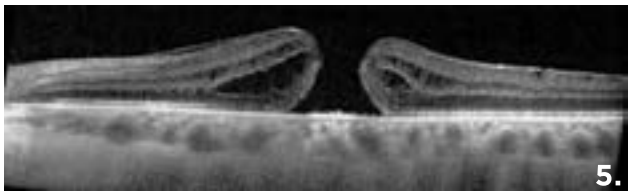

Figure 5 demonstrates a full-thickness macular hole.

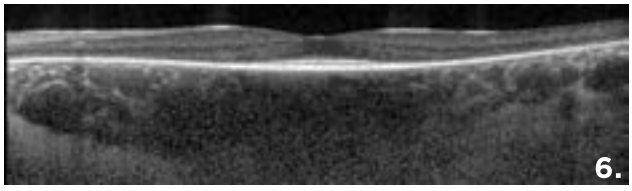

Figure 6 shows severe thinning of the outer retina with sparing of the central EZ. This patient has retinitis pigmentosa.

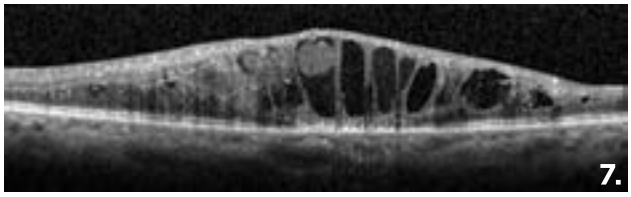

Figure 7 shows diffuse diabetic macular edema with EZ loss at the fovea.

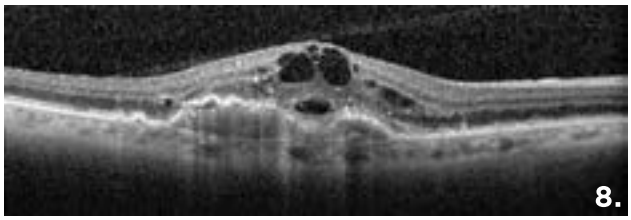

Figure 8 shows a choroidal neovascular membrane in a patient with exudative age-related macular degeneration. Note the fibrovascular pigment epithelial detachment, retinal edema and subretinal fluid.

Hopefully, this concise review will give you a head start in reviewing clinical OCTs. There are many more pearls you will learn in the years to come. Good luck with imaging rounds!

Christopher Nathaniel Roybal, MD, PhD, is a retina specialist in private practice at the Eye Associates of New Mexico in Albuquerque and joined the YO Info *editorial board in 2017.*

Organic Politics and Local Produce

Sometimes we meet people in unexpected places. That is what happened when I finally met with my Illinois state representative, Rep. Sonya Harper.

Dr. Paul Phelps with Illinois state representative Sonya Harper discussing policy at a local Whole Foods Market.

I wanted to meet my representative because there was a major scope battle underway in Illinois at the time. As a board member of the Illinois Society of Eye Physicians and Surgeons (ISEPS), it was time to touch base with my local representatives.

I had never reached out to or met a representative before. There were some things I thought about what to expect, but I did not realize how different the experience would be from what I had imagined.

When I called Rep. Harper to arrange a meeting, I had some difficulty at first. The office she normally worked out of was being remodeled. But I talked with her assistant and set up a meeting with her a week or two later.

To my surprise, her assistant requested that I meet with her during "office hours" in the Whole Foods café on the south side of Chicago. It's a place I go to frequently, but not a location that I pictured being the venue for political discussion.

It turned out, she was having meetings there all afternoon! Politicians also have to make things work when their offices are being remodeled.

We talked about the scope of practice battle in Illinois. It was interesting to share the basics with her. She understood that the place where people go to get glasses in the strip mall shouldn't be where eyelid surgery is being performed.

Rep. Harper also seemed to connect with the idea that even though most optometrists may not want to do eyelid surgery, if the optometrist works for a corporation that may profit from having them do surgery, many of them may be required by their managers to do procedures because it could improve the business' bottom line.

A few months later, I made the trip down to Springfield, Ill., to spend time at our state capitol and check in with my representatives. The day was busy, heading into and out of committees, offices and the house and senate floors.

Our ophthalmology lobbyist and I managed to track down several elected officials who were supportive of our cause, including Rep. Harper. She made time to talk with us and generally catch up. We even talked about our original Whole Foods meeting. What I realized is that personal relationships are so important. It's not just talking about our issue of the day, or how we want the representative to vote on a particular issue — politics is about having conversations and sharing thoughts and ideas. It is about building lasting relationships.

Although the experience I had meeting my representative wasn't exactly what I expected, it was enlightening, and I am excited to continue to build relationships with my elected officials. The connections we make as constituents are important, and as ophthalmologists, we all have opportunities to build these relationships and be advocates for our patients and our profession.

Be available to your representatives for any type of advice on medicine and health policy and make sure they know you are there for them. Meet with them before you need them and establish a good relationship. Hopefully, when we need them, they will be there for us.

Paul O. Phelps, MD, is an oculoplastics surgeon at North Shore University Health System in the northern suburbs of Chicago and a member of the Academy's YO Advocacy Subcommittee.

OKAP® Resources

The Ophthalmic Knowledge Assessment Program (OKAP®) is designed to help residents gauge their academic strengths and weaknesses and prepare for the written qualifying exam (boards). The OKAP consists of 260 multiple-choice questions and is administered annually in the spring. Here's a list of Academy and third-party resources to help you prepare.

1. The ONE® Network

The Academy's premiere online educational resource, the Ophthalmic News and Education (ONE®) Network includes hundreds of clinical and surgical videos as well as cases and self-assessment quizzes. The ONE Network also offers hundreds of bite-size pieces of knowledge that allow you to learn on the go or during a brief pause in a busy day. Be sure to check out the weekly "Diagnose This" quizzes, including the lively comments that follow.

2. *Basic and Clinical Science Course* (BCSC®)

This series of books is the foundational resource of a resident's ophthalmic education. Published by the Academy, the BCSC serves as the basis of questions that appear on the exam. The books provide a high density of information and demand a strict schedule to review all the information they offer. Follow our reading schedule as a cheat sheet: aao.org/young-ophthalmologists/yo-info/article/first-year-resident-reading-guide. Leverage the questions at the end of each book to gauge your retention and understanding of the contents.

3. BCSC® Self-Assessment Program

The Academy provides a new online resource for residents that was developed in collaboration with residency program directors to direct learning and OKAP prep. The BCSC Self-Assessment Program is written and approved by an Academy committee of experienced question writers, with well-formed discussions for each answer. There are currently more than 1,600 questions and the collection is always growing. Questions are tied directly to BCSC content, and each is supplemented with excerpts from the BCSC and complete references to guide further study.

4. Ophthoquestions.com

This online question book for OKAP prep offers more than 4,000 questions, but be aware that it costs extra to gain access to what it dubs "high-yield" data sets and other premium features. There are a number of good discussion points in the answers, and just like with the Academy offering above, there are discounts for groups of residents or programs that subscribe together.

5. *Review of Ophthalmology*, by William Trattler, MD, Peter K. Kaiser, MD, and Neil Friedman, MD

This review uses an abridged, rapid-fire style to highlight the highest-yield information. Reading through the many bullet points will take you on a densely packed but well-organized journey. As with any guide book, add in your own commentary and references as you read along to make your own map of ophthalmology.

6. *Last-Minute Optics: A Concise Review of Optics, Refraction, and Contact Lenses*, by David G. Hunter, MD, PhD, and Constance E. West, MD

This quick reference can be useful in the weeks before the exam to brush up on optics, a topic residents often overlook. There is also a four-part lecture series available on iTunes.

7. *The Massachusetts Eye and Ear Infirmary Review Manual for Ophthalmology*, by Veeral S. Sheth, MD, Marcus M. Marcet, MD, Paulpoj Chiranand, MD, Harit K. Bhatt, MD, Jeffrey C. Lamkin, MD, and Rama D. Jager, MD, MBA

This portable reference book offers many high-yield photos and quick reviews covering every subspecialty in ophthalmology. As you review, you can use the question-and-answer sections to track your progress.

8. *Review Questions in Ophthalmology: A Question and Answer Book*, by Kenneth C. Chern, MD, and Kenneth W. Wright, MD

This resource is not a standalone source of knowledge — it really just provides questions and short reviews. However, it is a nice, complementary piece for your exam prep. The questions aren't too difficult, but they can be used to help guide your study plan.

James G. Chelnis, MD

5 Tips for Yoga and Mindfulness at Work

For more information on practicing wellness, visit aao.org/member-services/practice-wellness.

1

Side bend: Start in mountain pose, grab left wrist with right hand and arch up and over to the right. Repeat on left. Maintain core throughout.

Standing spinal twist: Place right palm or elbow on chair. Bend right knee. Align left hip directly over left heel, maintain straight spine and lift left arm to ceiling. Repeat on other side.

2

3

Wrist exercises: Extend fingers fully. Make fist with both hands and repeat five times. Roll fists clockwise and then counterclockwise.

4

Box breathing: This lowers stress by activating the parasympathetic nervous system. Inhale through nose for a count of four. Hold for a count of four. Exhale through mouth for a count of four. Hold for a count of four. Repeat 5 to 10 times.

5

Good posture: Practice good posture as often as you can. When sitting, lengthen spine from tailbone to the crown of head. Engage core. Relax shoulders. Keep both feet flat on ground. When standing, root both feet into ground. Lift through inner arches of feet and anchor pelvis.

Camille Palma, MD, is a retina specialist and practices in Chicago. She is also a certified yoga instructor and has been practicing yoga on a regular basis since fellowship.

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