



2022
Resident Edition

TENTH
Edition



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YO Info

THE YOUNG OPHTHALMOLOGIST'S NEWSLETTER

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

Why Ophthalmology?



Jeff H. Pettet, MD, MBA, and Moran resident Brad H. Jacobsen, MD, discussing mentoring and patient care.

I know you've answered it a hundred times, especially if you're coming off the heels of interview season.

However, as you stand at the doorstep of the next stage of your career journey, take a moment to consider how you arrived in ophthalmology.

My journey started in 2000 when I pulled my 1977 VW bus off the road to pick up an abandoned backpack. I'll talk more on that later.

Reflecting on how you arrived at your particular program at this specific time will take you back to discrete turning points along your path, like picking up a book or hearing a lecture. "How" may stir memories of an interview you

nailed at your program or one you bombed at another. It will undoubtedly include encounters with mentors, advisors and helpful peers.

Regardless of how you've arrived at this moment, it's certain you never planned for it to look exactly the way it unfolded. Likewise, as you look toward the next stage of your journey, you can't predict what lies ahead or where it will lead. However, you can stack the cards in your favor to find joy in the journey and success in the destination.

You can't connect the dots looking forward; you can only connect them looking backward. So you have to trust that the dots will somehow connect in your future.

— Steve Jobs

Don't weaponize email. Never email while you're angry. Just hit save and sleep on it. Many of life's apologies can be traced to rage writing.

"Help me understand." We are good at assuming we know what others are thinking; it's one of the mental shortcuts we use to make sense of people's actions. However, evidence is clear we are awful at it. Asking someone to



help you understand allows you to learn something new, shows them you care and is a better start than, “What the hell are you thinking?”

Comparison is the thief of joy. Need a boost of confidence, score 50th percentile on OKAP’s and have it



Teaching small-incision cataract surgery with Seva global ophthalmology (GO) fellow Gena M. Damento, MD, at the GO fellows symposium in Park City.

be the highest in the program? Of course, that same score hits different if you’re the lowest. You will not be good at everything and will always find someone in the program better at something. Some of these will be shiny (OKAP scores, extroversion, surgical prowess) and stand out more than others. Your value is unique and not measured by anyone else’s scores or talents. You made it this far; don’t let comparison steal your joy or confidence in being your unique, fantastic self.

The “and” stance. Reframe negative characteristics and behaviors using “and” instead of “but.”

Example: “My program director is a great resident advocate but is too busy to find time to meet.”

Instead say, “My program director is a great resident advocate and is too busy to find time to meet.”

Subtle, yes, but this reframes your comments more positively.

Assume goodwill. People are great, sincere and endearing in some ways, and the same people are insecure, frustrating and annoying in some other ways. As humans, we are wired to assume ill will of others while giving ourselves grace and understanding for our same shortcomings. It is so pervasive that the concept is called the “fundamental attribution bias” in social psychology. When someone in your life falls short, give the grace you hope to receive when you’re in a similar boat.

Now back to the year 2000. The backpack I found belonged to Devin Griner, a student at the University of Utah (whom I also met six months earlier in Rostov, Russia). I gave him a ride to his job at the Eye Institute of Utah, where I was offered a job as an ophthalmic scrub tech and where I scrubbed in on cataract surgeries with Alan Crandall, who 10 years later taught me cataract surgery in residency ... and eventually became my faculty colleague at the Moran Eye Center.

We can’t predict our paths, but we can trust it will work out in the end and fill the journey with joy and meaning.

Jeff H. Pettey, MD, MBA, is the vice chair of education and program director at John A. Moran Eye Center in Salt Lake City, UT. He is also president of the Association of University Professors of Ophthalmology (AUPO) Program Directors Council.



Dr. Pettey and residents on the Research-Clinical Bridge at the Moran Eye Center.

From the Editor's Desk

YO's! Welcome to the fabulous world of ophthalmology. We are thrilled you are joining our specialty. The 10th anniversary *YO Info Resident Edition* will serve as an excellent resource as you embark on your journey into ophthalmology. I also encourage you to view our previous versions at aao.org/young-ophthalmologists/yo-info. We will provide you with tips on how to get started in your residency training, work up and present a glaucoma patient, become an expert in indirect ophthalmoscopy, prepare for cataract surgery, know your ophthalmic drops and more.

But what is a YO? A YO is a young ophthalmologist: those in residency/fellowship training and their first five years of practice. The *YO Info* newsletter provides resources tailored just for YOs. To receive our newsletters, it is essential to opt in to Academy communications through your member profile.

YO Info is just one of the many resources the Academy provides to its members. These resources are free to you, our members-in-training! Take a deep dive into the Academy's [website](http://aao.org), check out the ONE® (Ophthalmic News and Education) Network and remember to opt in to Academy communications.

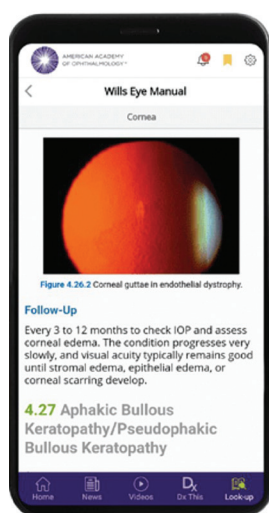
Welcome to *YO Info*, the Academy and ophthalmology.

Evan Silverstein, MD, is chair of the *YO Info* editorial board. He is a pediatric ophthalmologist and an assistant professor of ophthalmology and associate resident program director at Virginia Commonwealth University in Richmond, VA.



10 Things I Wish I Knew as a First-Year Resident

The past 10 years of *YO Info Resident Edition* have provided new residents with a treasure trove of information. Here are the top 10 things I have learned from these past editions that I wish I had known starting out as an ophthalmology resident.



1. Call is tough and stressful but establishing a routine will help you standardize your approach to every patient and prevent you from missing any steps. Keep a *Wills Eye Manual* in your call bag or pocket and refer to it often — the Academy has made the *Wills Eye Manual* available to all members through the AAO Ophthalmic Education App.

2. Part of your examination routine is the 8-point eye examination. Write it down, print it out and follow it for

every patient every time. The results are your eye vitals — and are truly vital for every patient. At the [slit lamp](#), follow your routine on every patient.

3. Learn from every patient encounter in clinic and every experience in the operating room (OR). In the OR, find a goal for each case. When you're a

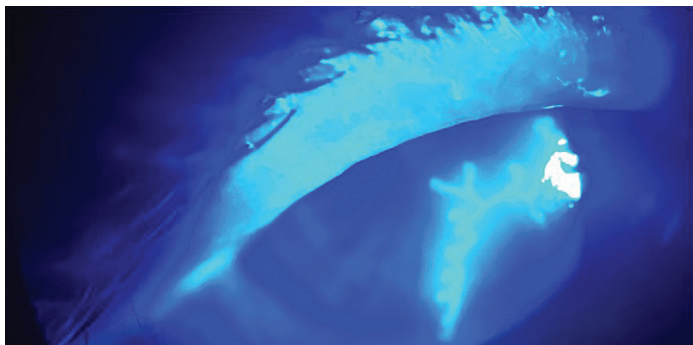


Dr. Silverstein models the correct posture and hand positions at the slit lamp.

PGY-2 in the cataract OR, learn to set up and troubleshoot the phacoemulsification machine, learn the name and purpose of every instrument and learn the names and purposes of each viscoelastic device. These tips [and more](#) will help you become a master learner in the OR.

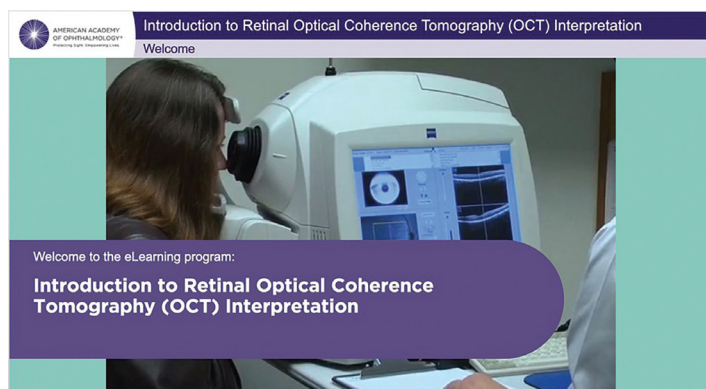
4. Always keep your differential diagnosis broad when encountering patients in the clinic, emergency room and hospital. What are the most common diagnoses for this constellation of

findings and history? What are the worst things this could be? Check out this list of [Top 9 Mistaken Diagnoses](#) and [Top 12 Vision-Threatening Diagnoses](#).



Dendritiform epithelial keratitis, suspicious for herpetic keratitis.

5. We are not only ophthalmologists, but also radiologists. Look at every MRI and CT scan you order. Learn to read and interpret optical coherence tomography (OCT) scans — a frequently ordered test in our clinic. [Learn how OCTs work](#) and when to use them and explore the [OCT course](#).



6. Be an advocate for your patients and your profession. Advocacy [starts in the clinic](#) and continues into the [legislative bodies](#) of your state and country. As a new resident, you bring a fresh and new perspective to our profession — don't accept the status quo. How can we better serve our patients, protect sight and empower lives? Be engaged within your [state ophthalmology society](#) as well as the Academy.

7. Use your time wisely. As a resident, you have many responsibilities: call, clinic, grand rounds, didactics, self-directed learning. Be efficient with your time. We practice evidence-based medicine. We should also practice evidence-based learning! Read [Make It Stick](#) and [Ultralearning](#). As [Laura Green, MD writes](#), "The most important techniques demonstrated in these books are effortful practice, drilling and varied practice." Use these techniques every time you sit down to study.



"Most Creative Post" from Mid-Year Forum 2022. Image courtesy of Advocacy Ambassador Emily Michelle Schehlein, MD.

8. Take care of yourself. If you don't take care of yourself, you can't take care of others. This means something different for every person. Take a moment and think, "What do I need to be my best self?" Schedule "me" time and find people you can talk with about stressors in your life.



Get together with your co-residents and do something fun. Go out, explore and make memories! Image courtesy of Viraj J. Mehta, MD, MBA.

9. Adhere to deadlines. There are a lot of things going on behind the scenes of your residency program, and many require you to respond to emails in a timely manner. Turn in your goals/objectives early, do your required online training modules and respond to your program coordinator. These little things are noticed and will make everyone's lives better.

10. Follow Dr. Mike Siatkowski's 8 keys to a successful ophthalmology residency. My personal favorites: embrace/own your cluelessness and don't take constructive criticism personally. You are new to ophthalmology! You know it and your attendings know it. But listen carefully to feedback. Learn, incorporate the feedback into your own practice and move forward!

Evan Silverstein, MD



Scan this QR code to access YO Info Resident Edition and more.

4 Steps to Achieve Financial Wellness During Residency

As you continue to advance in your medical career, it is critical not only to maintain your mental, physical and emotional health, but also your financial health. Nearly half of all graduating doctors already owe the amount of money it takes to buy a Ferrari. By following a few guiding principles outlined below, you can ensure your financial wellness during your residency and throughout your career.

1. Protect your credit score

A credit score provides a snapshot of your financial health to lenders anytime you need to make a purchase, like a car or a house. Many factors affect your credit score. Here are a few ways to improve it:

- Pay all bills on time
- Limit excess credit card debt while maintaining a high credit limit
- Maintain a long credit history (i.e., don't open and close new credit cards frequently)

A high credit score can make you eligible for preferential interest rates, saving you thousands of dollars over the lifetime of a loan. Periodically check your score for free via credit bureaus like Experian, TransUnion or Equifax to make sure everything is in order.

2. Optimize your cash flow

The first step toward personal financial independence (or even running a business) is to optimize your cash flow. Simply put, this means you need to have more money coming in than you are spending. Throughout residency, your cash flow should be predictable with guaranteed monthly income and anticipated expenses, which you should try to minimize as comfortably as possible. A budget is the best way to visualize and manage your cash flow, and there are many apps that can link all of your financial accounts. My favorite is [Personal Capital](#). Others include [Mint](#) and [YNAB](#).

By minimizing your expenses, you can develop a positive cash flow that you can use for other things. It's important to build an emergency fund in case you have unexpected expenses. After that, use any extra money to further pay down your student loans, save for a vacation and/or invest.



3. Invest

We live in a time of market uncertainty and volatility due to the pandemic, inflation and other global events. Despite these challenges, investing your money is an excellent way to achieve positive cash flow. Small investments can compound and grow rapidly over years as you advance in your career. Contribute first to a retirement account, whether it's offered through your hospital or a personal retirement account like a Roth IRA. Then set up a taxable brokerage account and create a simple portfolio of investments that will form the foundation of your financial growth. You can do this on your own through companies like Schwab, Fidelity, SoFi, E-Trade and others.

As you invest, it's easy to get caught up in hype stocks, which are sometimes as much of a gamble as going to Vegas. The S&P 500, which includes around 500 of the largest and best-known companies in the United States, has historically returned an average of approximately 8%. The reality is also that more than 85% of professional fund managers fail to beat their benchmarks (like the S&P 500) consistently over the long term. Save yourself unnecessary fees and invest in a foundation of low-cost index funds.

If you want a truly hands-off approach, consider investments like [Betterment](#) or [WealthFront](#), both of which automatically create portfolios of low-cost index funds based on your risk tolerance. Once you have that established, feel free to roll the dice with stocks you read about on Reddit or Twitter.

4. Educate yourself

The most important thing you can do to ensure financial wellness is to educate yourself. Many resources are available to get you started. Here are some of my favorites:

- [American Academy of Ophthalmic Executives \(AAOE®\)](#) has great resources on personal finance and more.
- [Physician on FIRE](#): This blog is an excellent place to find resources geared toward financial independence.
- [The White Coat Investor](#): This blog is full of resources for all things related to personal finance. A book by the same name offers a basic overview of finance relevant for physicians.
- [Bogleheads](#): This site will teach you how to invest, with a focus on low-cost index funds. Remember that most professional, active investment managers do not beat the market over the long term.

Residency is an exciting time with so much to learn. While you're focusing on medicine and ophthalmology, take time to build the foundation of your financial future.

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There's an App for That: Top Ophtho Apps Useful for Residents

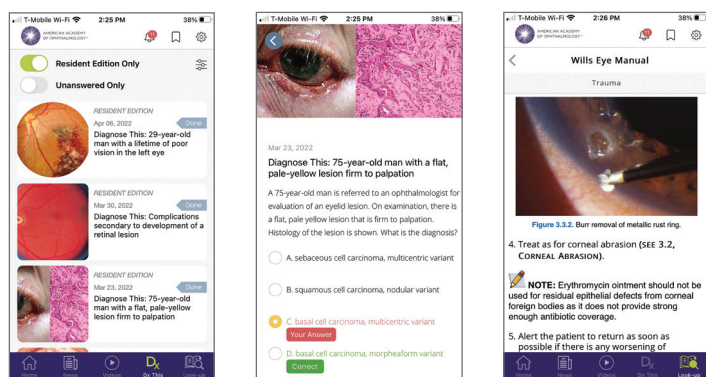
Congratulations! You've landed an ophthalmology residency. Now it's time to load up on ophthalmology smartphone apps. These free apps can help take you from "good" to "great" while seeing patients, performing consults and studying for the Ophthalmic Knowledge Assessment Program (OKAP) exam.

OE Acronyms

Acronyms abound within the field of ophthalmology, making our notes harder to decipher than hieroglyphics. Getting a handle on these acronyms can be a nightmare for brand-new residents and experienced attendings alike. The free app [OE Acronyms](#) decodes confusing acronyms used within ophthalmology. Don't see an acronym? Submit it and claim credit on your CV! This crowdsourced list of acronyms is also helpful for nonophthalmologists who read our clinical notes. So tell your emergency medicine and primary care friends about it as well.

Eye Handbook

Need to test a patient's vision on the go while on consults, but forgot your near card? Perhaps you desperately need an Amsler grid, but you haven't used graph paper since high school geometry class. No problem! [Eye Handbook](#) contains multiple useful ophthalmic tests, including visual acuity, Amsler, color vision, contrast sensitivity and an optokinetic drum. It also includes useful reference calculators, information on ophthalmic medications and an atlas of ophthalmic images. Although the app is free, it does include multiple popup advertisements.



AAO Ophthalmic Education

The Academy has created a mobile application specifically for practicing ophthalmologists and trainees. After logging in with your membership credentials, you can use the [AAO Ophthalmic Education app](#) to readily access EyeWiki® and the *Wills Eye Manual*, watch one-minute surgical videos, participate in weekly case challenges

designed expressly for residents and stay up to date on the latest news and literature in our field. This app is truly a must have.

AAO eBooks

The Academy didn't stop there! AAO eBooks is an app available for [Apple](#) and [Android](#) users, providing convenient access to essential Academy textbooks. Examples include the *Basic and Clinical Science Course*™ (BCSC®) and *Focal Points* publications on hot topics, both of which are written and reviewed by board-certified ophthalmologists. While the app is free, some of the content needs to be purchased from the Academy before it will be available to you on the app.

Doximity

The [Doximity](#) app is so much more than just a social media platform for physicians. Using the Doximity app, you can initiate calls to patients while hiding your own phone number and instead display the phone number of your hospital or clinic. You can also initiate video calls to patients by conveniently sending them a hyperlink to the video chat without requiring them to download any application. And of course, you can also use Doximity to connect with your medical school and residency classmates.

OphthoQ

When you gear up for your OKAP examination, don't forget about the OphthoQuestions app, [OphthoQ](#). This ophthalmology board review application has over 4,000 questions and is regularly updated. Some residency programs subscribe to this question bank on your behalf, making this app a must have. It puts the question bank right in your pocket!

Medical Surgical Acronyms

If you think it's difficult to learn all the acronyms in our specialty, imagine the difficulty of deciphering acronyms from across the entirety of medicine. [MS Acronyms](#) puts a free dictionary of medical acronyms in your pocket. Don't see an acronym? Submit it and get credit on your CV.

AAO Advocacy

With the Academy's [AAO Advocacy app](#), it's easy and convenient to get involved in advocacy. Learn about pressing issues, send a letter to your legislators or donate to OPHTHPAC® or the Surgical Scope Fund. You're one click away from Capitol Hill with this free app.

Grayson W. Armstrong, MD, MPH, is a comprehensive ophthalmologist and director of ophthalmic emergency services at Massachusetts Eye and Ear in Boston. He joined the YO Info editorial board in 2022.



Performing the Perfect Inpatient Ophthalmology Consult

Inpatient consults are a large part of residency training, and there is much to be learned by seeing these complex patients. In some programs, inpatient consults may be shouldered largely by junior residents. In other programs, consult responsibility may be shared by junior and senior residents. Regardless of how long you've been training, you'll find these tips helpful when heading out to perform inpatient consults.

1. Think Ahead

Bring everything you need in your consult bag. In some training programs, residents may only have to perform consults at one hospital setting. In other programs, residents may be responsible for patients at multiple facilities. Ensure that your program invests in a large, ergonomic consult bag that you can easily bring with you to any location when seeing consults. Sometimes this can be a large backpack or a rolling suitcase. Every week, check and make sure that you have all of the necessary supplies in this bag. Never leave for a consult without anesthetic and dilating drops, a near vision acuity card, a tonopen with sufficient tonopen covers, fluorescein strips, a portable indirect headset and your lenses. The worst scenario is to arrive at a consult far from your outpatient clinic and not have the correct equipment.

Think ahead and bring specialty equipment for the condition the consult might be for.

For a patient with a possible corneal perforation or corneal ulcer, it is helpful to have an eyelid speculum, plenty of fluorescein strips, culture plates and culture swabs handy along with a portable slit lamp to optimally visualize the corneal surface.

For a patient with a history of glaucoma who may have uncontrolled eye pressure, pack pressure-lowering drops in your consult bag to use if necessary.

If a patient has signs concerning for a retrobulbar hemorrhage, be prepared with local anesthetic, surgical loupes and Stevens or Wescott scissors in case you need to perform an emergent canthotomy/cantholysis.

When seeing a patient with possible optic nerve concerns, bring color plates to check for changes in color vision.

2. Communicate respectfully with the consulting inpatient team.

Ask the right questions. When an inpatient team calls you for an ophthalmology consult, always be respectful and ask appropriate questions. They are calling you for your ophthalmologic expertise, and it is important to triage



Nandini Venkateswaran, MD, pictured as a first-year resident performing consults.

every scenario and determine the best next steps. Always find out why they are asking for a consult, get a summary of the patient's medical and ocular history and ask what the team knows about the patient's current symptoms and vision. If the team doesn't immediately know the answers to your questions, have them get back to you so you can better prepare. For instance, if a patient has a history of recent trauma and has not yet had orbital and head imaging, request this from the primary team before heading in so you can have that information to help better assess the patient.

Make a timeline. It is also important to establish a clear timeline with the inpatient team. Depending on the severity of the case and the time sensitivity of the consult, you should let them know when you will be able to see this patient (e.g., within the next hour versus within the next few days) and set appropriate expectations. Some consults may be best suited for evaluation in the clinic setting. For instance, if a patient is seeking a new glasses prescription because they broke their glasses while in the hospital, it is appropriate to explain to the inpatient team why this patient would be better suited for a scheduled outpatient clinic appointment where a thorough refraction can be performed.



Dr. Venkateswaran performing laser retinopexy for a consult patient with an acute retinal tear.

Okay to dilate? When you're ready to see the patient, always ask the consulting team if it is okay to dilate the patient, as dilation drops can last for several hours. This can be especially important for patients in the medical or surgical intensive care setting. For instance, a co-consulting neurosurgical team for a patient with recent intracranial surgery may have requested the nurses to perform pupil exams every few hours and dilating patients in this scenario for your eye exam can be disconcerting for the other team.

If you're performing consults on pediatric patients or in the neonatal intensive care unit, ask the inpatient team for support if extra sedation or help is needed when examining these patients to ensure you can perform a thorough exam.

Provide an update. Lastly, once you have seen the patient, take an extra few minutes to personally update the medical and nursing team on your findings rather than just leaving a note in the medical record that may not be seen immediately. Let them know at what time you dilated the patient (if you did) and how long the effects will last so the nurses are not alarmed. Make a sign or write it on the whiteboard. Present your recommendations and

let them know if you are starting any new ophthalmic medications and how often they should be administered.

Other times, you may request that the inpatient team obtains additional consults (i.e., infectious disease) to help guide antimicrobial therapy management for an ophthalmic infection.

If your patient will need surgical intervention, communicate clearly with the inpatient team that the patient needs to remain NPO after a certain time to ensure the patient gets to the OR on time.

3. Be efficient with your time.

It is not uncommon for you to be asked to see multiple consults within a short period of time. Your time (and sleep) is valuable, and you need to be strategic about how to tackle all of these consults. Do research beforehand on the patient and their reason for hospitalization as well as their medical and ocular history. Make a list of what equipment you need for each consult. Ask the inpatient team to obtain necessary imaging or have supplies ready for you at bedside if you need to perform an emergent procedure.

Also prioritize your consults in order of severity and, sometimes, based on location, whether there are multiple consults at a given hospital. When seeing multiple patients in the same location, it is helpful to start with a patient who may be new to you, complete the initial exam and place dilating drops. While this patient is dilating, you can see some quicker or more established consult patients before returning to complete the dilated exam.

4. Ask for help if you need it.

If you think a patient is critically ill and needs subspecialty care, see if a senior resident, subspecialty fellow or attending can come with you to follow up on the patient. Other times, you can bring a patient to the clinic setting to be better examined by specialists and obtain any necessary imaging (i.e., a visual field, optical coherence tomography or slit-lamp photos) and then have them brought back to their inpatient ward for ongoing care.

With time and persistence, all trainees will grow more comfortable with inpatient consults. Inpatient teams and your colleagues will always be willing to help, and you will learn so much from these patients.

By following these strategies, you will certainly excel at your inpatient ophthalmology consults!

Nandini Venkateswaran, MD, is a cataract, cornea and refractive surgery specialist at the Massachusetts Eye and Ear Infirmary in Waltham, MA. She is also a clinical instructor of ophthalmology at Harvard Medical School. She joined the YO Info editorial board in 2020.



Pearls to Prep for Cataract Surgery

You've done a lot to get to this point. And as you've come to learn, diligence and preparation will serve you well as you embark on the steep and rewarding learning curve of cataract surgery.

These tips will help you build your surgical skillset.



Cataract surgery instrument tray. Image courtesy of Uday Devgan, MD.

1. Know your instruments and the steps of the surgery

During your first few cases, it can feel like a lot is happening all at once. Take control of the situation by mentally mastering the steps ahead and knowing which instruments to ask for next. The Academy's [Basic Techniques of Ophthalmic Surgery](#) provides a concise list of instruments. As you become more comfortable with the procedure, begin to familiarize yourself with various second instruments and hydrodissection cannulas to figure out what works best for you. Don't become stagnant in your learning. Early on, it's important to be consistent with your tools and settings to develop muscle memory.

2. Practice in the wet lab

Practice at your wet lab early on in your learning curve. If your training program has a virtual simulator, try to work through as many of the high-yield training modules as possible before your first few cases. The capsulorhexis modules are particularly helpful. These training modules have also been shown to [improve dexterity in your nondominant hand](#). Doing daily activities with your nondominant hand (e.g., brushing your teeth and your hair) can also help.

Model eyes can also be useful for practicing incisions, capsulorhexis, nuclear disassembly, using both hands and lens insertion.

3. Get comfortable with the microscope and pedals

Few things we've done in the past have required using both hands and feet at the same time. Futzng with the microscope and pedal during surgery can create unnecessary stress. So learn how to adjust the magnification and fine focus with your pedal as soon as possible. Also practice the foot pedal positioning differences between irrigation, aspiration and phacoemulsification.

4. Watch lots of videos, especially your own

There are so many lessons to be learned from watching how things went in your cases. Make sure to record and review your videos regularly, taking time to pause and think about what made the case flow or what made a certain step particularly tricky. It's an added bonus if you can review these cases with a surgical mentor. Your mentor can help evaluate your cases and identify what steps you can work on in and outside of the operating room.

It's also helpful to review the plethora of resources available online. Make sure to check out Dr. Uday Devgan's Cataract Coach [website](#) and YouTube channel. He has curated a beginner's playlist of some of the most critical steps of cataract surgery. I highly recommend the videos that show multiple iterations of incision creation and capsulorhexis formation.

5. Review helpful handbooks like [Cataract Surgery for Greenhorns](#)

I found Dr. Tom Oetting's manual to be very helpful when I first started learning cataract surgery. Not only does he walk you through the basics of phacoemulsification, but he also highlights how to talk to your patients about surgery and what they can expect postoperatively. He also highlights potential intraoperative and postoperative complications and how to manage them. In addition, Dr. Oetting has created a set of benchmarks that help you gauge where your skillset could be by a certain number of cases.

Another helpful reading resource is Dr. Bonnie Henderson's *Essentials of Cataract Surgery*, which has great diagrams showing how to employ different surgical techniques.

Learning cataract surgery is exciting, but it requires deliberate practice, review and a commitment to continually improve. These are great starter guides. You will soon learn what works best for you!

Cherie A. Fathy, MD, joined the YO Info editorial board in 2022. She completed her residency at Wills Eye Hospital in Philadelphia and is finishing her cornea fellowship in 2022 at Wilmer Eye Institute at Johns Hopkins Hospital in Baltimore.



3 Tips for Indirect Ophthalmoscopy

Indirect ophthalmoscopy is one of the most challenging but essential techniques for new residents to learn. Practice makes better — it takes extensive practice to get good, so don't worry if it takes a while to get it right. Here are three tips to get you off to the races.

1. Get Ready ...

Dilation: Make sure your patient is well-dilated with both 1% tropicamide and 2.5% phenylephrine to get the iris aperture as large as possible.

Lenses: The two main lenses used are the double aspheric 20-D and 28-D lenses. The 20-D lens is most commonly used, with up to 3.13 degrees of magnification and a 60-degree field of view. The 28-D lens is more commonly used for pediatric retinal evaluations due to its larger 69-degree field of view, despite less magnification (2.27 degrees). These features allow the 28-D lens to provide a view even with a smaller pupil.

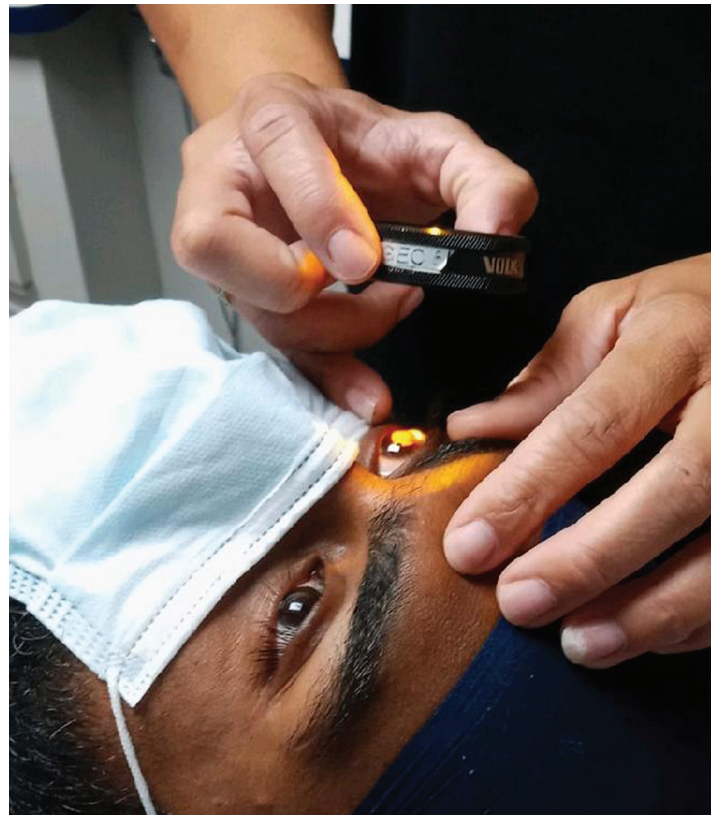
2. Get Set ...

Patient positioning: Exam chairs for ophthalmology are designed to raise up and down, swivel and recline. Use these features to recline the patient, with room for you to move around the head of the bed. Remember: Light travels in a straight line, so moving around the patient will allow easier examination of the retina on the opposite side. For example, if you want to examine the patient's temporal retina in the right eye, stand on the patient's left side.

Indirect headset: Center the headset on your head and adjust the oculars so that you can see out of both eyes. Most people use their thumb extended at an arm's length to check their light and alignment, making sure they can see their thumb in the same spot from both eyes. Set the light settings to the largest size and consider turning the light intensity down to about 70%, using the yellow light or using the diffuser to improve patient comfort. In children or patients with small pupils, using a smaller light size helps with visualization.

3. Go!

Examination: Use your thumb and forefinger to hold the lens with the silver ring pointing toward the patient. Place your pinky finger on the patient's head for stability. Hold the lens close to the patient and move it toward you until the retina comes into view. Keep your arm extended. Beginners often move their head closer to the patient, but this disrupts the view. Keep the lens perpendicular to your light to create the best view. Do this by "aligning the stars," or bringing the two light reflexes together on the lens itself. Establish a routine for examining each clock hour of the retina. This makes it easier to remember where you see pathology. I usually start at 12 o'clock and work



Be sure to keep your lens perpendicular to your light and use a finger to stabilize yourself on the patient's face. Image courtesy of Jessica Randolph, MD.

my way around the retina clockwise. Don't forget the area just temporal to the macula.

Scleral depression: Scleral depression helps reveal the most anterior parts of the retina, including the ora serrata, by deforming the globe and therefore bringing these parts into view. It also can dynamically highlight subtle retinal pathology like retinal dialyses.

With the patient looking opposite, position a scleral depressor or cotton-tipped applicator on the eyelid. Gently push inward as the patient moves the eye to bring the peripheral retina into the light beam. For example, to examine the superior retina with scleral depression, have the patient look inferiorly, place the depressor in the superior lid crease and gently press inward while the patient looks up.

When recording your findings, remember that everything in your view is upside down and backward, but in the same clock hour you are examining.

Take your time and keep practicing! Indirect ophthalmoscopy is a skill that requires repetition to perfect. You can do it!

Jessica D. Randolph, MD, is a vitreoretinal surgeon, assistant professor of ophthalmology and medical student educator at Virginia Commonwealth University in Richmond, VA. She joined the YO Info editorial board in 2021.



Techniques for a Glaucoma Workup

Throughout your residency, you will frequently encounter patients who show up for a comprehensive eye exam but quickly need to be transitioned into a glaucoma workup. The high incidence of glaucoma and its asymptomatic presentation often means that an ophthalmologist needs to be able to access the following framework quickly and smoothly.

History

Symptoms: While open-angle glaucoma is typically asymptomatic, patients can present with late-stage symptoms. Subtle symptoms may vary from blurred vision and difficulty driving to difficulty adjusting to the dark. When glaucoma has been diagnosed and visual acuity drops below 20/20, a subjective decrease in vision should always warrant more testing.

Angle-closure glaucoma, on the other hand, presents acutely with severe pain, significantly decreased vision and even nausea and vomiting from the pain.

Duration of disease and prior treatment: I like to start with, “How long have you been diagnosed with glaucoma?” Ask about adverse events in the past, such as bradycardia or bronchospasm with beta blockers or contact dermatitis with brimonidine.

Medical history and systemic medications: If a patient discloses highly uncontrolled diabetes and an acute rise in intraocular pressure (IOP), think neovascular glaucoma. History of facial trauma or orbital contusion? Think angle recession glaucoma. If there are signs of acute angle closure, ask about sulfa drugs, topiramate and anticholinergics.

Family history: A strong family history of glaucoma in immediate family members raises the risk of developing glaucoma and is an independent risk factor. Ask about the severity of glaucoma in family members (including use of eye drops, any surgeries and any vision loss).

Exam

The basic 8-point eye exam always needs to be completed for a new patient. Here are some specific pointers for a glaucoma patient.

Visual acuity: Even patients with 20/20 central visual acuity can have a severely constricted visual field. Don't let the patient's central vision fool you into a sense of false security.

Intraocular pressure: Normal IOP ranges from 12 to 21 mmHg. Goldmann applanation is the gold standard for IOP measurement.

Central corneal thickness (CCT): This averages 530 to 540 μm . A thicker CCT tends to confer a “protective” factor, and the patient's nerve is able to tolerate a higher pressure. Conversely, a thin CCT tends to increase the risk of glaucoma development or progression.

Slit lamp exam:

Cornea: Look for Krukenberg spindles (i.e., endothelial pigment deposits indicative of pigment dispersion glaucoma).

Iris: Transillumination defects (TIDs) help guide toward glaucoma subtypes:

- Peripupillary TIDs: pseudoexfoliation glaucoma
- Midperipheral TIDs: pigment dispersion
- Other TIDs: prior history of herpetic disease or a haptic in the sulcus space uveitis-glaucoma-hyphema

Optic nerve: Be aware of significant cupping, disc hemorrhages and changes to the nerve (compare exam to previous pictures).

Retina and macula: Look for other diseases such as macular edema that could cause visual field defects.

Visual fields:

Reliability: First look at reliability. High fixation losses are typically a result of when the patient is looking around. False positives may happen if the patient is “trigger happy” and clicks when there is no stimulus. False negative can happen when a patient does not click even



Roma Patel, MD, MBA, applanating a patient to obtain intraocular pressure.

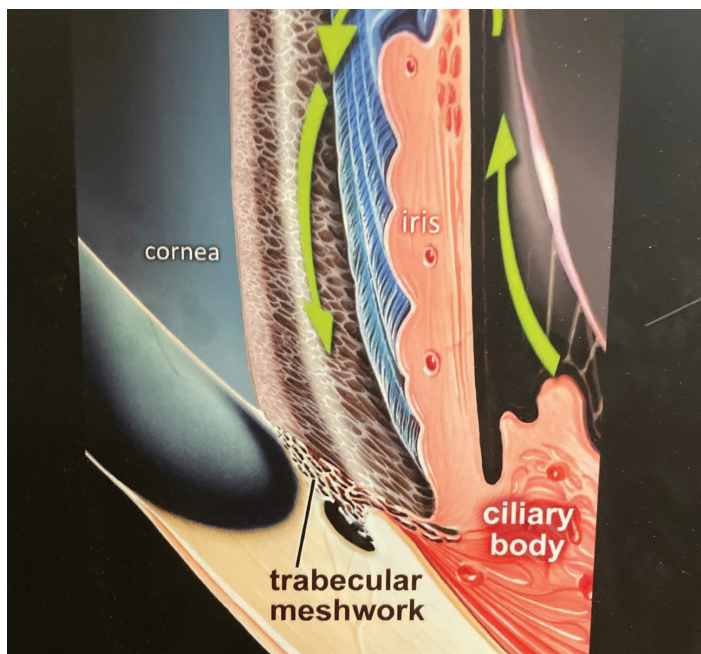
though they previously saw the light in the same position.

Pattern of loss: Look for typical patterns of nasal defects, plus arcuates, and be very cautious in patients with central vision threatening fields. Recognize common artifacts such as cloverleaf defects and lid and rim artifacts.

Mean deviation and pattern standard deviation: These measurements help you track progression over time. Mean deviation is how much the defect deviates from an age-matched patient. Pattern standard deviation is a difficult concept to understand but basically it reveals the significance of a defect in an individual test point, relative to the rest of the patient's mean deviation.

Progression of defects: The more fields, the more powerful your testing is. Always compare your current fields to all the patient's older fields (not just those from last year).

OCTs: The OCT reflects the status of the nerve structure. After assessing for reliability, evaluate the nerve for thinning in a vertical fashion. The retinal nerve fiber layer clock diagram will help you determine focal thinning in the superotemporal and inferotemporal sectors, which is typical of glaucoma. The most important use is in comparison year after year to determine if there is progressive thinning.



An illustration of the trabecular meshwork and aqueous outflow pathway of the eye.

Jenny Chen, MD, MS, is an assistant professor of ophthalmology and a glaucoma specialist at UC Davis. She also serves as the chief of ophthalmology at the VA hospital in Mather, CA.



Roma Patel, MD, MBA, is an associate professor of glaucoma at Baylor College of Medicine in Houston, where she also serves as the chief of ophthalmology for Ben Taub Hospital.

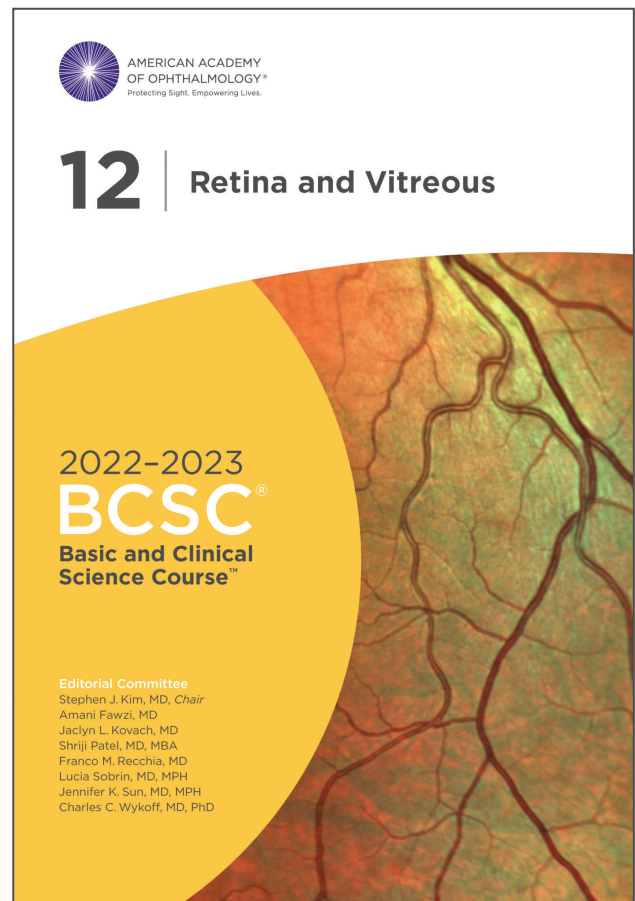


Academy OKAP Resources for Residents

The Ophthalmic Knowledge Assessment Program (OKAP) exam is a 260-item, multiple-choice examination taken by U.S. and Canadian ophthalmology residents. It measures your progress throughout residency and helps prepare you for the boards..

If you are just beginning your residency, there's a multitude of resources available to help you prepare for the exam. Below are resources I found useful during residency to build a solid foundation of knowledge, strengthen traditionally challenging topics, complete regular self-assessment and share helpful study tools.

Build a solid foundation of knowledge



Basic and Clinical Science Course™ (BCSC®)

Published by the Academy, this series of 13 textbooks is essential to ophthalmology residency education. I highly recommend taking your own notes as you read to serve as a supplement. You can then return to the original text as a reference when needed. Completing all 13 books is no easy task for a busy resident, and it will require a well-planned reading schedule. Luckily, YO Info offers a suggested guide: aao.org/young-ophthalmologists/yo-info/article/first-year-resident-reading-guide.

Review of Ophthalmology

By William Trattler, MD, Peter K. Kaiser, MD, and Neil Friedman, MD

This book is written in a study guide format. It can be helpful to add your own notes, mnemonics and references as you review the text. This may prove most helpful as you complete the BCSC above and focus on retention.

Strengthen traditionally challenging topics

Last Minute Optics: A Concise Review of Optics, Refraction, and Contact Lenses

By David G. Hunter, MD, PhD, and Constance E. West, MD

This popular optics review manual offers many practice problems with detailed answer explanations allowing you to test your knowledge and increase your understanding of optics. Additionally, Dr. Hunter's four-part lecture accompanies the text and is available at lastminuteoptics.com. The geometric optics course (aao.org/course/geometric-optics) from the Academy also reviews basic principles for understanding optics of the eye, optical instruments and correction of ametropia.

Academy Pathology Atlas

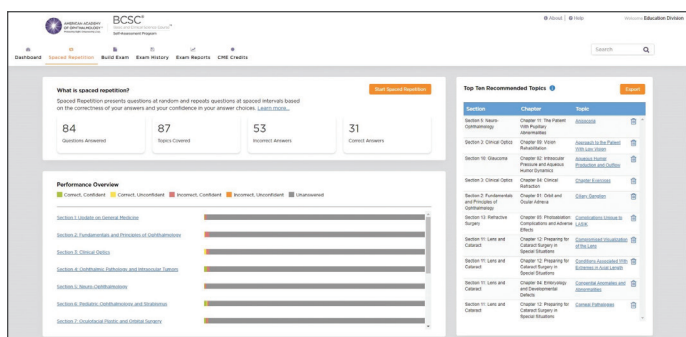
Available at aao.org/resident-course/pathology-atlas, the Pathology Atlas offers virtual microscopy images of both ophthalmic disease and normal eye anatomy. Additionally, you can view images with annotations to help orient the novice resident ophthalmic pathologist. New content includes video learning and interactive cases.

Complete regular self-assessment

Questions, questions and more questions! It is important to use a question bank to become familiar with how the material above is presented on the exam.

BCSC Self-Assessment Program

In this Academy question bank, all questions are directly tied to the BCSC, and each answer includes references to relevant excerpts. The new spaced repetition mode will help you enhance knowledge retention and maximize your study time.



OphthoQuestions

This question bank is written by recently board-certified ophthalmologists. It allows the user to compare their performance with that of other residents at their training level, which may prove helpful in identifying areas in need of improvement.

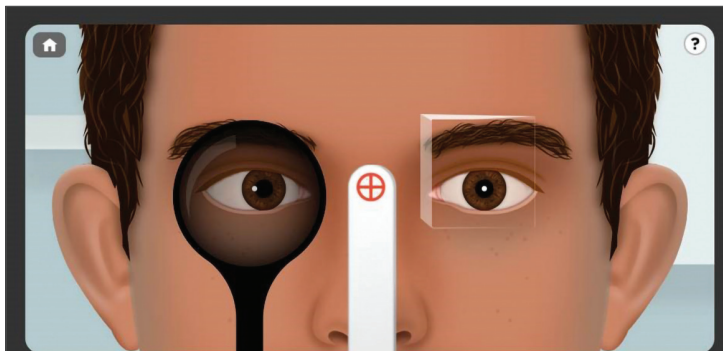
Share helpful study tools

Residents Section of ONE Network

The Residents section of the Academy's Ophthalmic News and Education (ONE®) Network (aao.org/residents) is a one-stop shop for ophthalmology residents. It features the hugely popular OKAP and board review presentations, ophthalmic knowledge flashcards and PGY-1 and PGY-2 resources, plus hundreds of clinical and surgical videos, interactive cases and simulations.

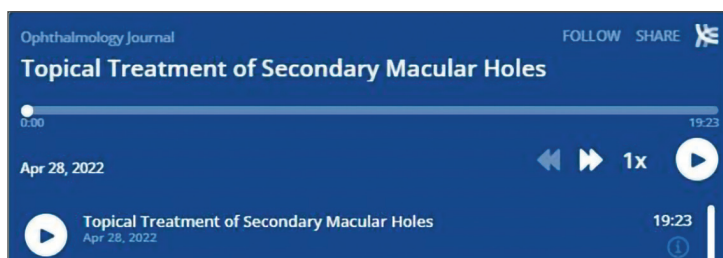
Resident Knowledge Exchange

Launched in 2021, the Academy's Resident Knowledge Exchange is an online platform to review and share study materials, such as helpful external resources, mnemonics, videos and flashcards.



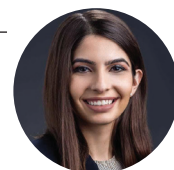
Ophthalmology Journal Podcast

Keep on top of cutting-edge therapies and trials as the *Ophthalmology*® journal social media editors interview authors about their groundbreaking work. The Ophthalmology Journal Podcast takes you on a deep dive into the latest discoveries.



Happy studying!

Liane O. Dallalzadeh, MD, is a resident physician at UCSD Shiley Eye Institute in La Jolla, CA.



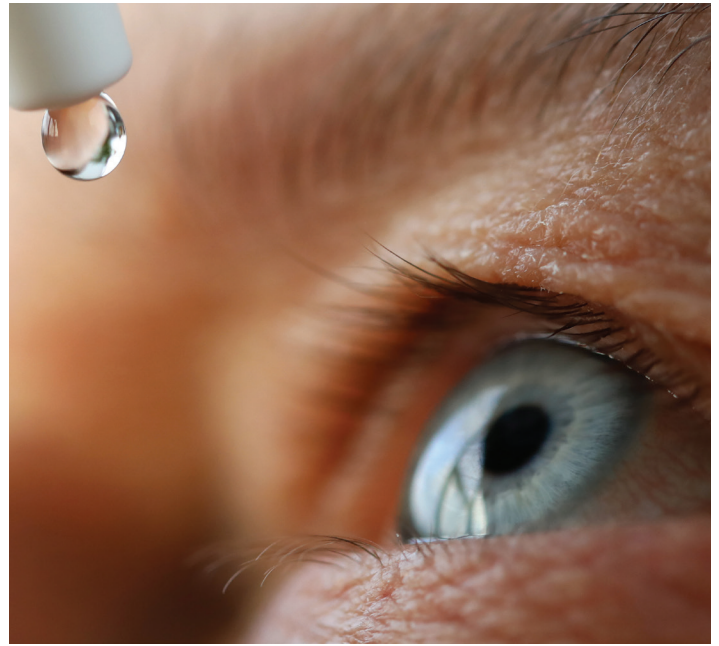
Know Your Drops by Color

As a medical student and intern, you memorized hundreds of medications, drug classes and mechanisms of action. But now you've entered a new realm of medication memorization and management: eye drops and cap colors.








As a new ophthalmology resident, you'll inevitably get a phone call in the middle of the night asking for a refill of an eye drop. Many times, the only detail the patient may have is the color of the cap.

The chart below is an introduction to the most common drops you will come across in your first months of residency. Although this is not a complete list of uses or complications, it's a starting point and may serve as a good reference on those late-night consults.






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




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)	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 0.5% (Lotemax gel)	Pink/white  	Seasonal allergies	



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% (Mydrilacil)	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
Cyclopentolate 0.2%/ Phenylephrine 1% (Cyclomydril)	Red 	24 hours	Cycloplegic refraction, dilated exam in infants (lower concentration may require repeat dosing)	Bradycardia, apnea in neonates





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 or other corneal pathology
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) Patients may see yellow when they blow their nose

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) <i>These drops come in single-use vials, so there is no lid color.</i>	Teal green 	QHS	Prostaglandin agonist	May reactivate herpes simplex virus keratitis Darkens hazel irides Increases eyelash length, amount Conjunctival hyperemia is common Avoid in uveitic glaucoma and late pregnancy (may induce labor)
Dorzolamide 2%/ Timolol 0.5% (Cosopt)	White with dark-blue strip 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 acetazolamide, but less severe

Antibiotic drops

Drug	Lid Color	Indications	Cautions
Moxifloxacin (Vigamox)	Tan 	Fourth-generation fluoroquinolone	
Gatifloxacin (Zymaxid)		Postoperative Corneal ulcers	
Ofloxacin (Ocuflox)	Tan 	Third-generation fluoroquinolone Postoperative	
Erythromycin (Emycin)	N/A, ointment/ tube	Macrolide Bacterial conjunctivitis Sterile cornea defects to prevent infection Prevents ophthalmia neonatorum	
Bacitracin ointment (Bacitracin)	N/A, ointment/ tube	Cationic polypeptide	
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

Bradley S. Henriksen, MD, joined the YO Info editorial board in 2022. He is a pediatric ophthalmologist in Provo, UT, who completed his residency and fellowship at Oregon Health Science University, Casey Eye Institute, in Portland, OR.



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