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Objective One
In addressing eye complaints, always assess visual acuity using history, physical examination, or the Snellen chart, as appropriate.

Visual acuity is THE most important of the 5 eye vital signs: vision, pupils, intraocular pressure, extraocular movements, and confrontation visual fields.

History
So let's start with history: ask them about their vision!

- Maybe they tell you they're slowly progressing to tunnel vision, as in chronic glaucoma.
- Maybe they tell you they've got a new floater, as in posterior vitreous detachment. OR
- flashes and floaters followed later by a curtain falling over their vision, as in retinal detachment.

Basically, use your regular history skills and OPQRST the chief complaint.

For eye complaints, however, we have bonus questions: any history of eye trauma, surgeries or lasers, contact lens use, previous eye problems or diagnoses, family history of eye problems, or use of any eye drops or vitamins.

Per usual, after history, we move on to… physical examination.

Physical Exam
Time to document that visual acuity, starting with the Snellen chart. That's the one with the big E.

The key here is that we want to document "BCVA": best CORRECTED visual acuity. I.e. wearing their glasses or contacts. In medicine, we want to know how their vision performs WITH their corrective lenses.

So they're wearing their glasses standing 20ft from a Snellen chart. Ask them to cover the left eye with their hand or an occluder, if you have one. We always check the right eye first, by convention! Ask them to read the lowest line that they can. Document whichever line they can make it to getting up to 2 letters wrong. Make sure they're not peeking with the other eye!

Then cover the right eye and do it again, this time checking the left eye. Maybe you end up documenting "BCVA right eye 20/50 and left eye 20/40".

But… what if they can't even read the big E?

We have steps that come after the Snellen chart to document visual acuity as needed.

- The order is: Snellen chart, counting fingers, hand motion, light perception, no light perception.
- So if they can't read the big E, ask them to count how many fingers you're holding up from a distance and move closer until they get it correct.

If they can't count fingers, ask if they see you waving your hand. To check, you can ask if it's moving left and right or up and down.

If they can't see that, shine a light into their eye and then move it away multiple times, asking them to tell you when they see the light.

- And document the visual acuity for each eye.

The two take-home points for this section are to
(1) always document visual acuity for eye complaints
AND
(2) do this with their best-corrected vision, i.e. wearing their corrective lenses for each eye individually.

Moving on now from one big objective to the next.

Objective Two
In a patient with a red eye, distinguish between serious causes and non-serious causes. I.e. do not assume that all red eyes are caused by conjunctivitis.

All that is red eye is not conjunctivitis.

We are asked to rule out some serious causes that may present with red eye, such as infectious keratitis, acute angle closure glaucoma, and globe rupture.

For each, we are given sub-objectives to do an appropriate history, physical exam, investigations, and referral as needed.

Let's start with keratitis.

Bacterial keratitis
commonly referred to as a corneal ulcer, is an emergency. This is a white spot on the cornea, which may accompany red eye, foreign body sensation, and photophobia. Suspect this in contact lens wearers or patients with a recent history of a corneal abrasion or minor eye trauma.

To distinguish between a corneal abrasion and a corneal ulcer, look at the eye with a light prior to fluorescein staining. If there is no white opacity on the cornea, this is unlikely to be an ulcer.

Then add fluorescein staining. If there is staining overlying the white opacity, this is likely a corneal ulcer and the patient needs to see ophthalmology immediately. When seen by ophthalmology, the patient may have a sample of the corneal surface sent to microbiology to determine the infectious agent.

They will be started on antibiotic eye drops and followed closely (initially every day) by ophthalmology.

Viral keratitis
is urgent but typically not emergent. The classic example is herpes simplex keratitis.

They present with red eye, foreign body sensation, photophobia, and watery discharge. The key for this spot diagnosis is using orange fluorescein dye and looking with a Cobalt blue light, to see a dendritic branching pattern, which will stain and appear green.

If viral keratitis is suspected, ophthalmology should be consulted immediately.

What about glaucoma? This comes in two main flavours, acute and chronic. Both may be associated with high intraocular pressure, or IOP.

Chronic glaucoma is often asymptomatic, with gradual loss of peripheral vision leading to tunnel vision over many years. Optometrists may screen for this type of glaucoma at routine eye exams, especially if a patient has a family history of glaucoma.

Acute Angle Closure Glaucoma
The need-to-know for red eye is acute angle closure glaucoma, which is an emergency. Picture this patient slumped over, holding the side of their head, in distress, with a periorbital headache and nausea or vomiting.

When you look at their eye, you may see a red eye with a cloudy cornea. Check their eye pressure in your clinic if you can with a TonoPen. They'll have an IOP way above the upper limit of normal, which is 21 millimeters of mercury.

If you can't measure their pressure, send them quickly to someone who can.

For angle closure glaucoma with that skyrocketing IOP, they'll get the kitchen sink approach of all sorts of eye drops like beta blockers, alpha agonists, and carbonic anhydrase inhibitors. They may even need a med called acetazolamide (or Diamox) to help bring the pressure down. This is a true ophthalmic emergency and the patient needs to be seen by ophthalmology immediately!

Globe Rupture

Suspect this if they've had a blunt or penetrating eye injury. If suspected, do not apply pressure to the eye – that will squish everything out of the eyeball!

If an open globe is suspected, place a shield over the eye and send to ophthalmology immediately. Remember, a shield is a firm structure that is elevated off the eye, so that no pressure is on the eye. Do NOT use a pressure patch/pad!

Giant Cell Arteritis

Lastly, we wanted to give a quick mention to temporal arteritis, also known as giant cell arteritis or GCA. We include this only because temporal arteritis is specifically listed as an example under this objective by CFPC.

We find this a bit odd, as GCA rarely presents with red eye. While GCA is a dangerous eye-related problem, red eye is not a common feature.

As a quick review, GCA often presents in patients over 50 years of age, who may describe headache, scalp tenderness, jaw claudication, fatigue, night sweats, weight loss, and possibly even vision loss.

In their bloodwork, ESR and CRP are usually raised. The CBC may also show thrombocytosis and a normocytic normochromic anemia.

If suspected, they are started on high-dose prednisone, but to diagnose, we go with a temporal artery biopsy.

Objective 3

In patients presenting with an ocular foreign body sensation, correctly diagnose an intraocular foreign body by clarifying the mechanism of injury and investigating when necessary.

In all trauma cases, it's important to maintain a high index of suspicion for an intraocular foreign body.

Clarify the mechanism of injury. Was it high speed? Were they wearing glasses, goggles or other eye protection? What materials were involved: were they grinding metal on metal or chopping wood?

Do they have symptoms? An intraocular foreign body may present with a red eye, pain, foreign body sensation, or decreased vision, or no symptoms at all.

Inspect on exam, being extra cautious if you have not ruled out a globe rupture. Remember, we don't want to do tonometry, which is measuring eye pressure, if there's an open globe.

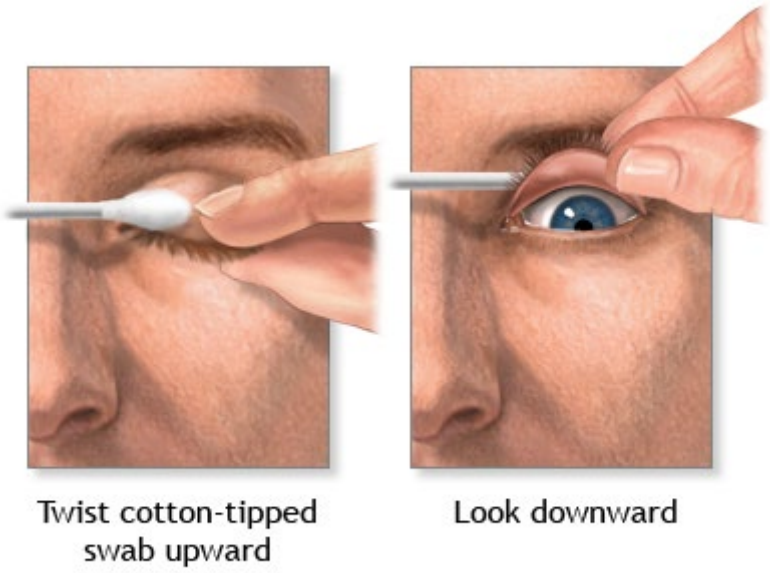
Look for an entry wound, distorted pupil, or brown tissue on the surface of the eye (do not touch this, it may be the inside contents of the eye coming out!), or any other hints of foreign body. Place a shield and send immediately to ophthalmology.

Objective 4
In patients presenting with an ocular foreign body sensation, evert the eyelids to rule out the presence of a conjunctival foreign body.

Sometimes, foreign body sensation is exactly that: a foreign body. The mechanism or history of the injury is critical – make sure there is no concern for a globe rupture before pressing on the eyelids!

- The lower eyelid is easy enough to pull down and check for a foreign body.
- For the upper eyelid, however, the way to check is by everting the eyelid to take a look for yourself.
- You might want to use tetracaine eye drops for this one to avoid the "ouch"

Everyone has their own technique, but a common one to practice is using a cotton tip or Q-tip. Have the patient look down with their eyes, press the swab tip parallel to their face in the middle of their eyelid, then use your other hand to pull from the lashes, bringing the lid up and over the tip.



Et voila! With this view, you can search around for a conjunctival foreign body.

Objective 5
In neonates with conjunctivitis (not blocked nasolacrimal ducts or "gunky eyes"), look for a systemic cause and treat it appropriately (i.e. with antibiotics).

the classic example of neonatal conjunctivitis, or ophthalmia neonatorum, is infection with *Neisseria gonorrhoeae or Chlamydia trachomatis*. In ye olden pre-antibiotic days, gonorrhea in particular was devastating and caused blindness in neonates. Using silver nitrate as prophylaxis was a game changer, which later transitioned to using erythromycin (since silver nitrate is also a cause of neonatal conjunctivitis!).

Red, hyperpurulent, and sticky eyes in a neonate should sound off the alarms in your head for neonatal ophthalmia.

In babies presumed to have acquired gonorrhea from the mother, consult pediatrics immediately! This baby may need an admission to the NICU for appropriate workup and treatment to ensure the infection does not spread systemically.

An immediate ophthalmology consult is also needed as soon as systemic treatment is started.

Objective 6
In patients with conjunctivitis, distinguish by history and physical examination between allergic and infectious causes.

Conjunctivitis is the most common cause of red eye. We sort conjunctivitis as allergic, viral, or bacterial. These are clinically diagnosed and most are self-resolving within a couple of weeks, although allergic conjunctivitis can last for seasons or years if the inciting agent isn't removed from the patient's environment!

Allergic conjunctivitis looks like bilateral ITCHY and gritty eyes with ropey discharge in a patient reporting seasonal allergies, Hay fever, or atopy/asthma.

Viral conjunctivitis is the most common. It is super contagious, so use your hand hygiene here. The patient may have had a recent URTI or been exposed to someone with pink eye. They may describe that it started in one eye and then jumped to the other.

You'll see red and teary eyes with no or very minimal discharge, accompanied by other URTI findings and pre-auricular lymphadenopathy. Counsel them on staying home and washing their hands.

Of note, if you notice a unilateral rash near the eye and you're suspicious of shingles, start valacyclovir, and consult ophtho urgently. Eye shingles is no joke.

bacterial conjunctivitis tends to be unilateral with constant, purulent discharge, and their eyes are glued together when they wake up. Not a pretty sight. Once again, hand hygiene.

If you see rapidly progressive, severe pain, and hyperpurulent discharge, think gonococcal and refer urgently to ophthalmology. We treat with ceftriaxone PLUS azithromycin since we should also cover chlamydia. If your province has a program along the lines of STI Centralized Services, as in Alberta, get them involved with treatment and follow-up.

Objective 7
In patients who have bacterial conjunctivitis AND use contact lenses, provide treatment with antibiotics that cover *Pseudomonas*.

yes, contact lens users are at higher risk of *Pseudomonas*.

We make sure that the antibiotic treatment covers Pseudomonas for these patients, which are your quinolones, such as moxifloxacin or ciprofloxacin eye drops. Make sure the patient stops wearing contact lenses until the eyes are back to normal!

That's for contact lens use, but we would be remiss if we didn't discuss treating bacterial conjunctivitis overall.

If you ask 5 family physicians how they treat bacterial conjunctivitis, you will get 5 different answers. I say this because that's literally what happened when I was writing this episode.

And it's no one's fault, there just aren't clear guidelines for it. Recommendations are… fuzzy.

Due to the self-limiting nature of most infectious conjunctivitis cases along with rising antibiotic resistance, some docs avoid antibiotic drops unless red flags are present.

One great article from the American Academy of Family Physicians sorts these nuances in a very clear way. It's called "Diagnosis and Management of Red Eye in Primary Care".

You can find this linked in the show notes. They describe that if bacterial conjunctivitis is severe, chronic, or gives off gonococcal or chlamydial vibes from history and physical exam, then refer to ophtho urgently.

For all other cases, however, they sort which patients merit consideration of immediate antibiotic therapy vs monitoring for self-resolution.

They recommend antibiotic eye drops for: health care workers, patients in a healthcare facility, immunocompromised, uncontrolled diabetes, *contact lens use*, dry eye, or recent ocular surgery.

Bugs and Drugs recommends tobramycin eye drops, though remember our pearl about quinolones for contact lens users.

Regardless, make sure the patient is referred urgently to ophthalmology.

For patients without these risk factors who you trust to follow up if symptoms do not resolve, you may consider holding off on immediate antibiotic therapy.

Objective 8
Use steroid treatment only when indicated.

Another pearl! Steroids are a huge no-no for eye infections. Do NOT give steroid drops for patients with infectious keratitis or conjunctivitis.

- This impairs healing and gives the pathogens exactly the boost they were hoping for. It can also increase the IOP and lead to glaucoma!
- That is one way to be blacklisted by ophtho.

While we're here, we should mention another no-no for eye infections is patching. Do not patch an infected eye! That's asking for an overgrowth of their infection.

One indication for steroid treatment, however, is iritis.

Also known as anterior uveitis, this is inflammation of the iris. This is NOT an infection.

This presents with a red eye, but is accompanied by:

- throbbing eye pain,
- photophobia, and
- blurred vision.

The pain, photophobia, and visual disturbance differentiate iritis from conjunctivitis.

So we do treat iritis with topical steroids, but please refer these cases to ophthalmology to make the diagnosis and they will start steroids. Remember, no patient should be started on steroids without good ophthalmology follow-up and periodic monitoring of the IOP!

and speaking of iritis…

Objective 9
In patients with iritis, consider and look for underlying systemic causes.

It's true: given that anterior uveitis is an inflammatory condition, it is sometimes associated with systemic inflammatory diseases, including IBD, lupus, ankylosing spondylitis, and many others.

First up,

Inflammatory Bowel Disease

Crohn's disease, in particular, has all those fun extra-intestinal manifestations such as arthritis, aphthous ulcers, erythema nodosum, and of course, iritis.

Lupus

The eye is frequently affected in SLE, although it's not often iritis, but more commonly retinal vasculitis. Look for malar rash, discoid rash, photosensitivity, arthritis, and renal involvement.

Ankylosing Spondylitis

About ⅓ of AS patients will experience uveitis. Look for young adult males with lower back pain and morning stiffness.

At this point, we should just put most types of inflammatory arthritis on our list- it's a safe bet to associate these with uveitis. These include juvenile idiopathic arthritis, reactive arthritis, and psoriatic arthritis.

Inflammation goes along with inflammation. Good to keep in mind!

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