EM Basic- Eye Complaints

Visual Acuity- The vital sign of the eye

-Make sure it is done in triage
-If not done, get it done ASAP- hanging eye chart in the ED or iPhone app (EyeChart- Free at Apple Store)
-If patient can't see anything- can they see fingers, light, or motion
-If patient doesn't have glasses/contacts- use a pinhole viewer or poke a hole in an index card/piece of paper and have patient hold up to their eye

PEARL- Only exception to getting a visual acuity first is a chemical burn to the eye- "test answer" is to get patient irrigated first with copious amounts of water (see section on chemical burns)

History

-Trauma to the eye, foreign body, or chemical burn?
-Symptoms gradual or sudden?
-Red eye or discharge? Wake up with eyes matted shut?
-Vision loss?
-PMH- Contacts (VERY IMPORTANT TO ASK!)
-Glasses? Last time saw an optometrist/opthomologist?
-Hx of eye issues and full PMH, PSH, allergies, meds, etc.

Exam

-External eye exam- Compare eyes side by side- redness, sclera bleeding, conjunctival injection, lid droop,
-Extra-Ocular movements- trace the H, test accommodation
-Palpate the orbital area for any tenderness/swelling
-Opthalmoscope exam- check pupil reactivity, bleeding in sclera (subconjunctival hemorrhage), hyphema (blood in anterior chamber)
-Also check for any opaque spots on the cornea (corneal infiltrates/ulcers)- important for corneal abrasions in contact lens wearers

-Evert the eye lids- check for foreign bodies of upper and lower lids, can take moistened cotton swab and wipe inside of eyelids to be sure- foreign bodies can easily hide in the lids

Topical Anesthesai

-Trauma to the eye can be incredibly painful
-1-2 drops of tetracaine or proparacaine for pain control/facilitate exam
-Warn the patient that it will sting a little but will feel better- coach them
-Can't send patient home with it (will use too much and impair healing) but small study says dilute proparacaine is ok- needs further study

Fundoscopic exam

-Look for papilledema and changes suggestive of central retinal artery/vein occlusion (see section on CRAO/CRVO)
-Pan-opthalmoscope is much easier to use
-Check embasic.org for videos on how to do this exam effectively

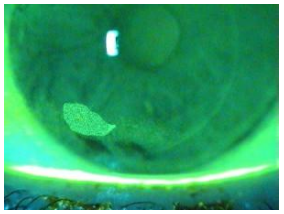
Slit lamp exam

-Takes a lot of practice- do it on every eye patient to get good at it
-Check embasic.org for videos on how to do this
-Turn off light and lock lamp into place after exam to prevent damage

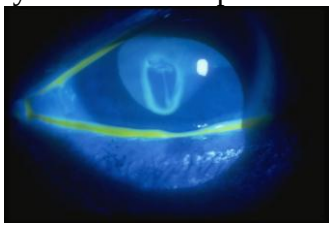
Flourescin exam

-Need flourescin strip, saline, wood's lamp
-Take patient's contacts out (flourescin will permanently stain them)
-Put strip just above patient's eye, put drop of saline onto strop and let it roll into patient's eye
-Darken room, turn on wood's lamp and examine for any dense, opaque uptake in corneal- will fluoresce = corneal abrasion
-Vertical corneal abrasions = probable upper eyelid foreign body
-Dendritic lesions (herpes simplex infection of eye)
-Sidell's sign- river of flourescin flowing- indicates open globe

PEARL- For routine flourescin exam, don't have to physically touch the patient's eye with flourescin strip- technically you should for sidell's sign but may see it without "painting" it on the eye- try doing it first without touching the eye, if negative then can touch the eye if trauma/suspicious


Corneal Abrsion


Dendritic lesion


Sidell's sign

Intra-ocular pressure (IOP)

-Done after you have ruled out an open globe- check a sidell's sign or defer exam if you are very suspicious of one
-Apply topical anesthesia first
-Calibrate tonopen (most common brand in US)- put cover on, press button, hold tip down, flip up quickly to the ceiling when it says "UP"
-Hold patient's eye open, hold tonopen perpendicular to center of pupil, tap lightly multiple times
-Will hear a soft, quick beep with each tap, keep tapping until you get a long, loud beep
-Check the measurement- normal IOP is 10-20

Final part of exam- do a head to toe exam- don't miss anything!

Common eye diagnoses with treatments

Corneal abrasions- caused by foreign body or blunt trauma to the eye, dense uptake on flouresecin exam
-Treatment- pain control and antibiotics (patching doesn't work)
-Pain control- tetracaine/proparacaine in ED only, discharge with Tylenol/motrin +/- oxycodone/hydrocodone (vicodin/percocet)
-Antibiotics

Contact lens wearer- have to cover pseudomonas and throw out current contacts, no wearing until they see optho in followup

-Polymixin/trimethoprim (polymixin)
-Ciprofloxacin (Ciloxan)
-Ofloxacin (Oculflox)
-Tobramycin (Tobrex)

PEARL- For contact lens wearers, make sure to check cornea for white spots = infiltrates = optho referral that same day

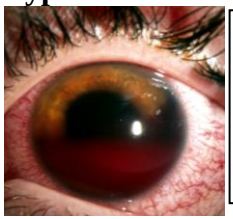
Non-contact lens wearers- can use erythromycin ointment instead (doesn't cover pseudomonas but cheap and easier to use in kids) or any of the above antibiotics

Subconjunctival hemorrhage- usually a benign diagnosis- patient freaked out when they or someone else notices blood in sclera- should be painless- usually something more serious if associated with pain
-Can be spontaneous or related to vomiting, coughing, child birth

If visual acuity and exam are normal, discharge with re-assurance that will re-sorb in a few weeks

If on warfarin (Coumadin)- check INR and treat PRN- if re-current, outpatient workup for bleeding disorder

Hyphema



Usually a result of trauma but can be spontaneous in those with sickle cell
Blood collects in anterior chamber
If hyphema + open globe- emergent optho consult
Head of bed to 30 degrees, eye drops as advised by optho

Usually admitted but some studies say outpatient management ok in select cases (about 5% will require surgery)

Extra-ocular muscle entrapment
-Usually a result of direct orbital trauma- pt complains of double vision
-May be able to see EOM deficit on exam
-CT orbits to make diagnosis
-Optho, ENT, or Oral Maxillofacial Surgery consults or transfer as appropriate (institution and call schedule dependent)

Retrobulbar hematoma
-EXTREME ocular emergency
-Suspect this if orbit is tense and/or large difference in IOP in setting of trauma
-If not rapidly decompressed, can lead to vision loss
-See section on lateral canthotomy below

Chemical burns
-Important- what patient got in their eye (alkalais worse than acids)
-With few exceptions- need copious irrigation with water/saline until pH is normal (6.5-7.5)
-Give topical anesthesia as well
-Can do this at sink or with bottle of water/saline or morgan lens
-Can also use a bag of saline attached to nasal cannula placed over nose
-Exceptions- elemental metals (sodium/potassium), dry lime, sulphuric acid (drain cleaners)- water will make worse- brush off chemical first
-If job related exposure- should have materials safety data sheet (MSDS) available or look this up online

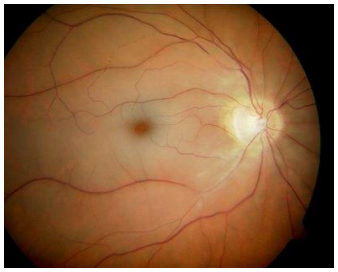
Foreign bodies- if any doubt as to foreign body (for example- working with metal grinder but nothing on external exam), get CT orbits, Ultrasound may be more sensitive but CT shows damage caused by FB

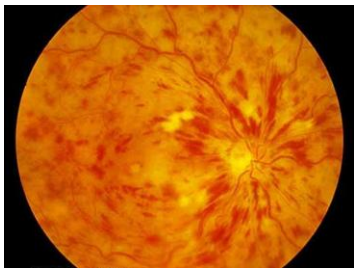
Conjunctivits
-Can be viral or bacterial
-Bacterial usually purulent discharge, viral watery d/c but lots of overlap
-Difficult to determine viral vs. bacterial- usually err on side of treatment
-Antibiotics- same as corneal abrasion including differences between contact lens wearers and non-wearers- throw out contacts as well
-Safe answer is to refer contact lens wearers for optho followup but probably overkill
-**Hyperacute conjunctivitis caused by gonorrhea**- can occur only 12 hour after exposure- copious purulent discharge that happens suddenly- needs admission for IV and topical antibiotics, observation for perforation

Herpes simplex infection
-Pain +/- vesicles in V2 distribution on face
-Dendritic lesions on flourescin exam (see above)
-Optho consultation for further management

Acute angle glaucoma
-Older patient with sudden eye pain and unilateral vision loss
-Usually when going into dark room, pupil dilates which blocks outflow of vitreous humor through canal of schlemm
-Diagnosis hinges on large difference in IOP between eyes
-Treatment- lower IOP
    -Timolol and pilocarpine eye drops
    -With optho input- prednisolone and acetazolamide IV
PEARL- don't use acetazolamide in patients with sickle cell

Central Retinal Artery Occlusion- acute clot in retinal artery
-Painless unilateral loss of vision with cherry red spot on macula or whitening of retina on fundoscopic exam
-Usually has risk for clot or emboli like a-fib
-Intermittent digital massage of eye to dislodge clot
-Lower IOP with timolol, pilocarpine, acetazolamide
-Rebreathe into paperbag to increase CO2 and lower IOP
-May need paracentesis of anterior chamber
-IV TPA has been used but not standard treatment


Central Retinal Artery Occlusion


Central Retinal Vein Occlusion

Central Retinal Vein Occlusion
-Sudden painless unilateral vision loss
-Same treatments to lower IOP
-Much more often surgical management

Retinal Detachment
-Spots and floaters in patient's vision
-Can use ultrasound for diagnosis but not highly sensitive
-If suspicious, consult opthomology

Lateral canthotomy

-If suspecting retrobulbar hematoma- cut first, ask questions later
-If you do in unnecessarily- not a big deal- usually heals on its own, if you don't do it and patient needed it- permanent vision loss

-Numb up lateral canthal area with lidocaine with epi, procedural sedation PRN but preferred without- want to ask patient if vision better

-Clamp lateral orbit with hemostat for 30-60 seconds to devascularize
-Cut laterally with scissors (iris scissors if you have it, otherwise any scissors from laceration tray should work)
-Then cut superior and inferior tendon, check patient's eye and IOP to see if it worked
-If it didn't work, re-cut and be more aggressive- most common area is not actually snipping the tendons

Links

Slit lamp exam- 24 minutes but excellent and great videos of actual exams- worth watching the whole thing

https://www.youtube.com/watch?v=w9wMJ6job_0

Fundoscopic exam- kinda cheesy but effective

https://www.youtube.com/watch?v=wPzCA9k8GRQ
Pan-opthalmoscope- https://www.youtube.com/watch?v=a9rhPWqV_ac

Ocular ultrasound- from the ultrasound podcast
http://www.ultrasoundpodcast.com/2012/04/episode-26-ocular-ultrasound-with-chris-fox/

Lateral Canthotomy on a cadaver

http://www.youtube.com/watch?v=cAYBGW3c95M

Contact- steve@embasic.org **Twitter- @embasic**