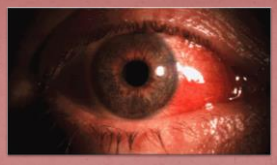


The Red Eye

John West, M.D.
Katie West, 4th year Optometry Student

Speakers

- **John West, M.S., M.D.**
  - McCook Clinic, P.C.
    - McCook, Nebraska
  - University of Nebraska Medical Center (Omaha, NE) Volunteer Faculty-Family Medicine Preceptor
  - UNMC College of Medicine – M.D. (1990)
  - UNMC Graduate College – M.S. (Pharmacology 1986)
- **Katie West**
  - 4th year Optometry Student
    - Northeastern State University Oklahoma College of Optometry
  - Bachelors of Science in Biology (2014)
    - Nebraska Wesleyan University

Major Contributor

- John Dorsch, M.D.
  - KU School of Medicine (Wichita, KS)
  - Family & Community Medicine Department
  - Associate Professor

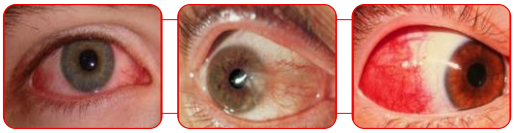
Learning Objectives

To obtain the expertise to:

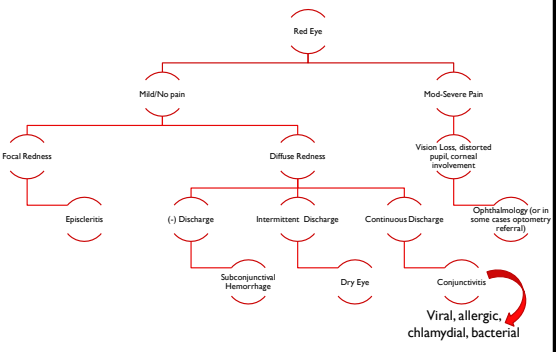
1. **Recognize the common causes** of red eye conditions
2. **Adequately treat** the common causes of red eye conditions
3. **Recognize and refer** patients with red eye conditions that have higher-stakes diagnoses

HPI – Approach to the Patient with **Red** Eye

1. Unilateral or bilateral?
2. Intense eye **pain**?
3. **Foreign body** sensation?
4. **Contact lens** wear?
5. **Discharge**? Type?
6. **Itch**?
7. Eyelid **edema**?
8. Do the eyelids have **lumps**?
9. Do the eyes **burn**?
10. **Photophobia**?
11. Loss of **vision**?
12. Using ocular **medications**?
    - Topical or oral



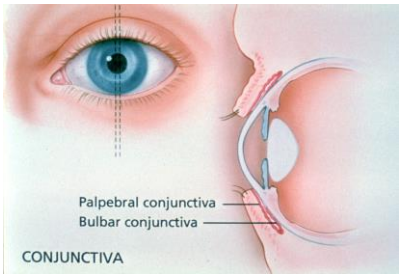
Common	Less Common/Less Serious	Less Common/More Serious
Conjunctivitis: (bacterial, viral, allergic)	Episcleritis	Viral Keratitis
Subconjunctival hemorrhage	Pingueculum	Uveitis
Corneal abrasion	Pterygium	Scleritis
Blepharitis		Angle Closure Glaucoma
Hordeolum (stye)		Chemical Burn



http://www.aafp.org/afp/2010/0115/p137.html

1. Conjunctivitis

Conjunctiva Anatomy

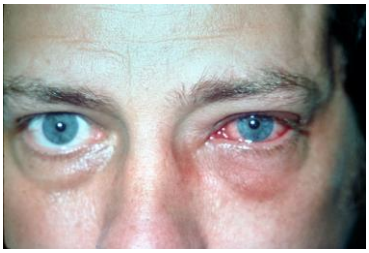


Conjunctivitis

Type	Course	Characteristics	Discharge
Bacterial	Starts in one eye, often spreads to other eye	AM eyelid adherence	Purulent
Allergic	Accompanies allergic rhinitis; bilateral	Itchy eyes	Mucus, Stringy
Viral	Usually bilateral	Very red eyes	Watery

Bacterial Conjunctivitis

- Often unilateral
- Usually purulent discharge



Bacterial Conjunctivitis

- Topical Antibiotics prescribed for 5 – 10 days

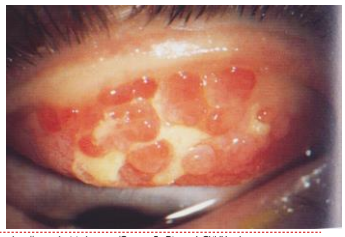
Bacitracin (Ak-Tracin, Bacticin) ointment	**Neomycin/polymyxin B/gramicidin** (Neosporin) ophthalmic solution
Ciproloxacin (Ciloxan) 0.3% ophthalmic solution	**Ofloxacin** (Ocuflox) 0.3% ophthalmic solution
Gatifloxacin (Zymar) 0.3% ophthalmic solution	**Polymyxin B & trimethoprim** (Polytrim) ophthalmic solution
Gentamicin (Gentak, Getasol) 0.3% ophthalmic solution or ointment	**Sulfacetamide** (Isopto Cetamide, Ocusulf-10, Sodium Sulamyd, Sulf-10, AK-Sulf) 10% ophthalmic solution, ointment
Levofloxacin (Quixin) 0.5% ophthalmic solution	**Tobramycin** (AK-Tob, Tobrex) 0.3% ophthalmic solution - Comes in steroid combo drop **(Tobradex)**
Moxifloxacin (Vigamox) 0.5% ophthalmic solution	

Chlamydial & Gonococcal Conjunctivitis

- *Copious/severe* purulent discharge***
- Chlamydial Conjunctivitis Treatment
  - **Azithromycin 1 g p.o. single dose**
  - Alt: Doxycycline (Vibramycin) 100 mg p.o. BID X 7-10 days
  - Add-on: Erythromycin (Ery-Tab) ung BID-TID to help suppress ocular manifestations
    - Not FDA approved for this indication
  - Treat partners
- Gonococcal Conjunctivitis Treatment
  - **Ceftriaxone 1 gram IM in single dose followed by 2-3 weeks of oral Ab therapy**
    - Fluoroquinolones q1-2h
  - **Topical Antibiotic Therapy:**
    - gentamicin, erythromycin or bacitracin every 2 hours x 2days, then 5x daily until resolved
  - **Ideally daily follow-up for ocular symptoms*****

Allergic Conjunctivitis

- Usually in both eyes
- Often accompanies allergic rhinitis
- Itchy eyes
- Mucoid discharge
- Cobble-stoning



http://www.physicianbyte.com/CommonEyeDiseasesInChildHood.aspx

Allergic Conjunctivitis Treatment

H1 Antagonists

- Emedastine (Emadine)
- Naphazoline/pheriramine (Naphcon-A, Opcon-A, Visine-A)
- **Ketotifen (Alaway, Zaditor)**

Mast Cell Stabilizers (chronic allergies)

- Cromolyn (Crolom)
- Lodoxamide (Alomide)
- Olopatadine 0.1% (Pataday)

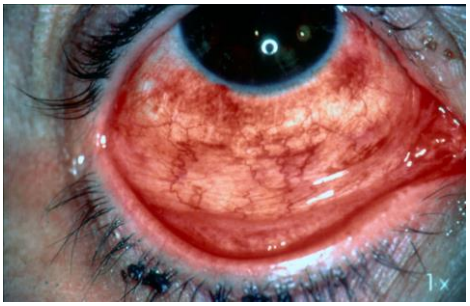
Combination

- Azelastine (Optivar)
- Epinastine (Elestat)
  - H1 & H2 antagonist
- Nedrocomil (Alocril)
- Olopatadine 0.1% (Patanol)

NSAID's / Steroids

- Ketorolac (Aclar) - NSAID
- Diclofenac (Voltaren) - NSAID
- Loteprednol (Alrex, Lotemax) - Steroid

Viral Conjunctivitis

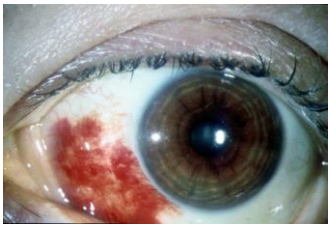


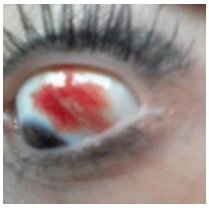
Viral Conjunctivitis

- Usually starts in one eye and frequently spreads to other eye
- Profuse watery discharge
- Diffuse conjunctival injection
- Often seen in epidemics

- Behavioral Treatment – may not affect duration of symptoms
  - Cold compress
  - Scrupulous hygiene
  - Avoidance of direct contact with others

Subconjunctival Hemorrhage



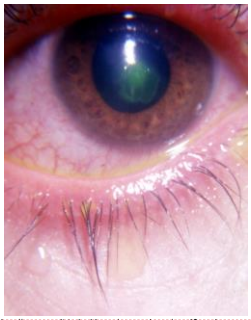


Subconjunctival Hemorrhage

- No pain or visual changes
  - If pain or visual acuity decrease are present - refer
- Should resolve in 2 – 3 weeks
- Potential Causes:
  - Spontaneous
  - Trauma
  - Hypertension
  - Bleeding disorders
  - Increased intrathoracic pressure (Valsalva)
    - Straining
    - Coughing
    - Retching

Corneal Abrasion

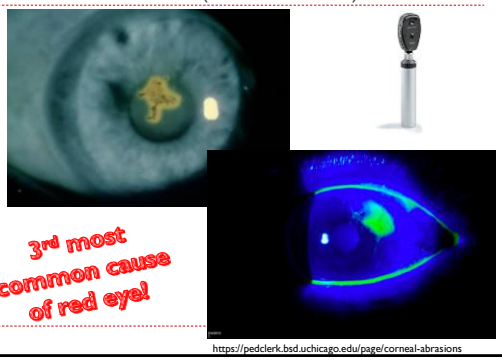
- Causes
  - Trauma
  - Welding Burn
  - Contact Lens Overwear
- Symptoms
  - Tearing
  - Pain
  - Photophobia
- Factors
  - Size
  - Location



http://www.emedicinehealth.com/contact_lenses/page13_ent.htm

Fluorescein stain

Corneal abrasion (Cobalt Blue)



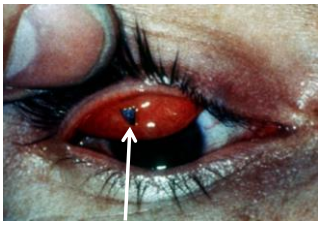
3rd most common cause of red eye!

https://pedclerk.bsd.uchicago.edu/page/corneal-abrasions

Corneal Abrasion Treatment

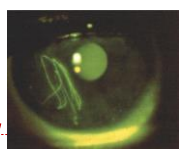
- **Antibiotic drops/ointment**
- Consider NSAID topical (Ketoralac)
- No evidence that patching is beneficial (may be harmful)
- Re-examine patient the following day
  - If central visual axis and/or ≥4mm in size
- Refer if corneal abrasion is not healing

Foreign Bodies

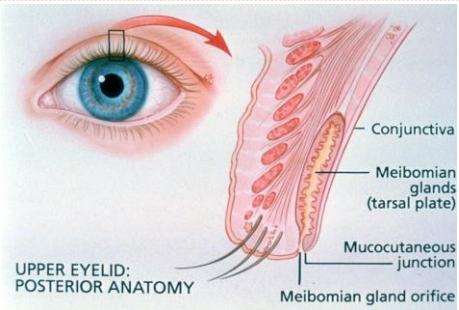


Upper eyelid FB

Corneal surface FB



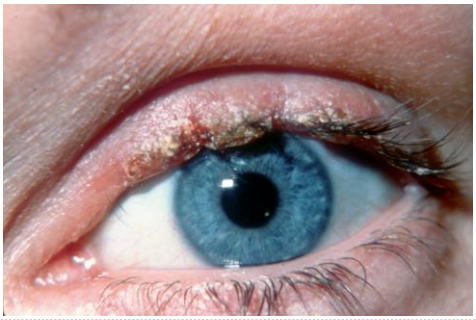
Anatomy of the Eyelid



Blepharitis

- Bacterial (Staphyloccal)
  - Site: Accessory glands of eyelids
  - Clinical findings:
    - Erythema & eyelid induration
    - Crusting, discharge, & loss of eyelashes
- Fungal (Seborrheic)
  - Site: Meibomian glands
  - Clinical findings:
    - More chronic scaling

Staphyloccal Blepharitis



Staphyloccal Blepharitis

- Treatments:
  - Warm, moist packs
  - Johnson & Johnson Baby shampoo
  - Erythromycin ointment HS

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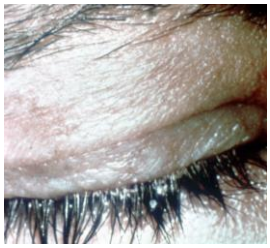
Seborrheic Blepharitis

Seborrheic Blepharitis

- Treatments:
  - Warm compresses
  - Baby shampoo scrubs
  - Oral tetracycline for resistant cases



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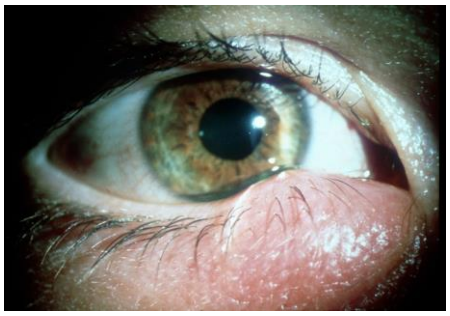
Hordeolum/Stye

- Diagnostic Symptoms
  - Acute Eyelid Redness
  - External (most common) or Internal Eyelid
  - Pyogenic (usually Staph)
  - Eyelid infection or abscess
  - Edema (localized to posterior tarsal conjunctival surface)

Hordeolum/Stye

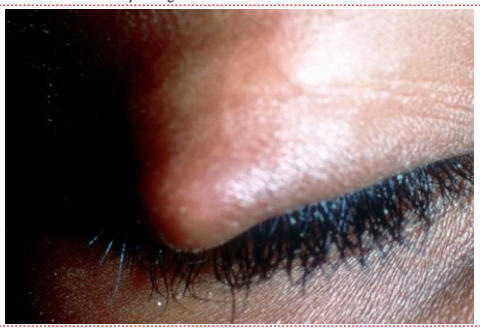


Hordeolum/Stye

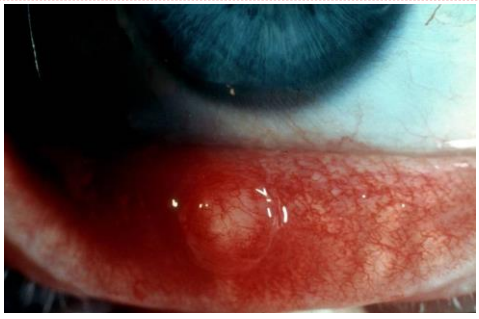
Hordeolum/Stye

- Hordeolum Treatment
  - Hot, moist compresses (5-10 minutes TID)
  - Omega-3 Fatty Acids (Fish Oil capsules)
  - If no resolution consider incision with fine-tipped scalpel blade.
  - If associated cellulitis at eyelid then add oral antibiotics
  - Dicloxacillin or Erythromycin 250 mg QID

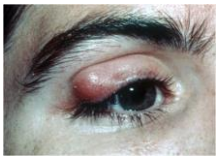
Hordeolum/Stye



Hordeolum/Stye



Chalazion

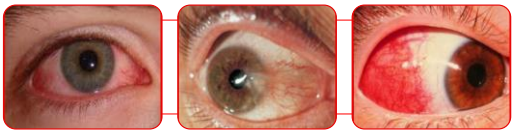


Chalazion

- Diagnostic Symptoms
  - Subacute and Non-infectious.
  - Pain (+/-)
  - Meibomian Gland occlusion or Eyelid Cyst
  - Points away from eyelid margin
  - Redness of eyelid
  - Edema localized to posterior tarsal conjunctival surface.
  - Progresses to a small nodule in eyelid center.

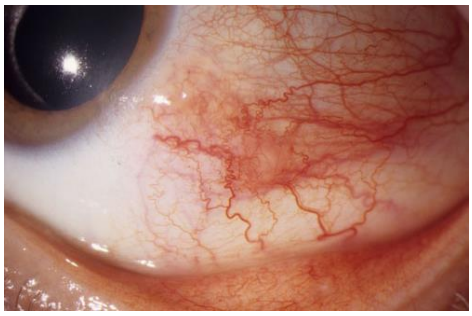
Chalazion

- Treatment
  - Hot compresses 5-10 minutes TID
  - If no resolution then:
  - Intrachalazion Corticosteroid therapy (Triamcinolone 25 mg/ml.)
  - Inject 0.05-0.2 ml into the chalazion
  - Incision and curettage



Common	Less Common/Less Serious	Less Common/More Serious
Conjunctivitis: (bacterial, viral, allergic)	Episcleritis	Viral Keratitis
Subconjunctival hemorrhage	Pingueculum	Uveitis
Corneal abrasion	Pterygium	Scleritis
Blepharitis		Angle Closure Glaucoma
Hordeolum (stye)		Chemical Burn

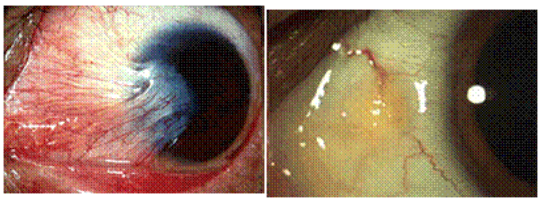
Episcleritis



Episcleritis

- Usually unilateral
- Episcleral vessel inflammation - autoimmune
- Rapid onset
- Redness confined to one sector
- Duration: 7 – 10 days
- No treatment necessary
  - NSAID drugs may be prescribed

Pterygium Pingueculum

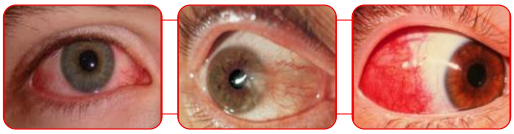


Pingueculum

- Characteristics
  - Yellowish patch/bump on the bulbar conjunctiva
  - Deposit of fat/protein
  - Non-cancerous
  - Redness with irritation or inflammation
  - May cause a foreign body sensation
  - Does not grow onto cornea or effect vision
  - Can become acutely inflammed

Pterygium

- Characteristics
  - Associated with chronic sun exposure (Surfer's Eye)
  - Fibrovascular conjunctival tissue
  - Triangular (Insect wing shape)
  - Non-cancerous
  - Starts peripherally and moved centrally onto cornea
  - Effect on vision only if approaches the visual axis
    - Can be referred for surgical removal



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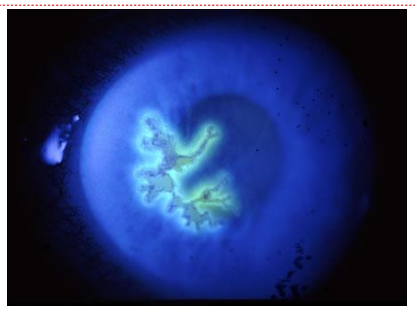
Viral Keratitis

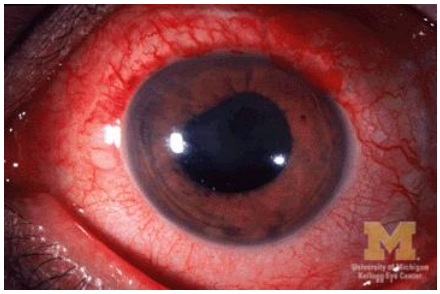


http://www.eyesurgeryinberkshire.co.uk/information_ko/ko_keratitis.html

Viral Keratitis

- Caused by corneal inflammation
- Moderate to intense pain
- Potentially impaired vision
- Also called Dendritic Keratitis
- Utilize Fluorescein staining for diagnosis
- Refer to Ophthamologist

(Anterior) Uveitis



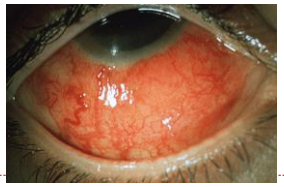
http://www.aao.org/theeyeshaveit/red-eye/anterior-uveitis.cfm

(Anterior) Uveitis

- Iris and ciliary muscle inflammation
- Caused by autoimmune disease or trauma
  - Also can be idiopathic
- Signs:
  - Ocular pain
  - Limbal/Ciliary flush
  - Irregularity of pupil (shape)
- Refer to Ophthalmologist/Optometrist

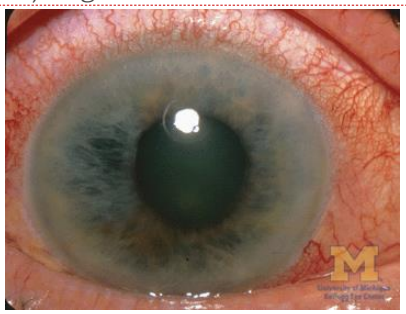
Scleritis

- Intense inflammation and **severe, deep eye pain**
- Associated with:
  - Rheumatoid arthritis
  - Inflammatory bowel disease
- Refer to Ophthalmologist



http://eyepathologist.com/disease.asp?IDNUM=310920

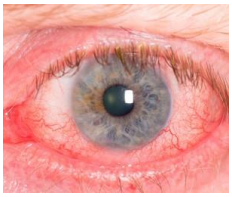
(Acute) Angle Closure Glaucoma



http://www.aao.org/theeyeshaveit/red-eye/angleclosure-glaucoma.cfm

(Acute) Angle Closure Glaucoma

- **Acute unilateral ocular pain**
- Other symptoms:
  - Vomiting
  - **Blurred vision**
  - Acute photophobia
  - Pupils unreactive to light
  - **Ciliary flush**
- Treatment:
  - Pilocarpine (Ispto Carpine)
  - Topical timolol (Timoptic)
  - Acetazolamide (Diamox)



http://vision.answers.com/eye-diseases/acute-glaucoma-and-red-eye

▶Immediate referral to Ophthalmologist

Chemical Burn/Injury

- Alkali
- Acidic
- Refer to Ophthalmologist
- "Dilution is the solution to pollution."

http://www.emergency-shower.org/combination-shower-eyewash/

Ophthalmologist Referral

- Traumatic injury to the eye
- Loss of vision
- Extreme eye pain not explained by pathology
- Keratitis
- Suspected uveitis or glaucoma
- Chemical injury (especially alkali)
- Corneal abrasion (persistent)

Current Therapy

- Do **not** use eye patches in patients with corneal abrasions.
- Do **not** use topical anesthetics for the eye outside a clinic/hospital setting, because corneal toxicity can occur.
- Patients with corneal abrasions should be **reexamined** the following day.
- Patients with corneal abrasions from extended-wear contact lens often become colonized with *Psudomonas aeruginosa* → treat with floroquinolone antibiotic

Case Study #1

A 12-year-old girl develops a painful lump of the left lower eyelid close to the eyelashes. No discharge is present in the eye. No blepharitis or conjunctivitis is present on exam. The best treatment of this condition is (Check all that apply):

- 1. Erythromycin ointment in the left eye at bedtime each night
- 2. Baby shampoo/Water scrubs of the eyelid 3-4 times per day
- 3. Warm, moist packs over the left eye for 20-30 minutes 4 times a day

Case Study #2

A 40-year-old man is seen in the office for a sensation "that something is in my eye" after working outside in a strong wind all day. He has tearing, photophobia, and significant pain in his right eye. Fluorescein examination reveals a corneal abrasion. No foreign bodies are found in the eye and the patient does not wear contact lenses.

- Among the treatment options listed below, which ***should not*** be used (check all that apply):
- 1. Prescribe a bottle of Proparacaine drops for the patient to take home to treat himself for continued pain.
- 2. Antibiotic drops or ointment to use in the affected eye.
- 3. Put a patch on the eye.
- 4. Repeat the exam in 24 hours to see if healing has occurred/is occurring.

Case Study #3

An 18-year-old female high school student comes to the office complaining of a red eye for the past 2 days. It feels "irritated, but not too painful." There is copious watery discharge. It seems to be spreading to the other eye. Otherwise she has no health complaints. Examination of both eyes demonstrates redness of the palpebral and bulbar conjunctivae. No other abnormal findings are present.

- Which statement is ***false***?
- A. This is most likely viral conjunctivitis.
- B. She should be treated with topical antibiotics.
- C. She should keep her hands clean and focus on not spreading the infection to others.
- D. She will likely take 7-10 days before this clears.
- E. The most common etiology is infection from one of the Adenovirus family.

Case Study #4

A 38-year-old woman comes to the office complaining of redness of her left eye. On examination she appears to have a subconjunctival hemorrhage in the left eye. She has no complaint of eye pain or loss of vision.

- You should ask about (Circle all that apply):
- 1. Has she had any trauma to the eye?
- 2. Has she had a bad cough recently?
- 3. Has she been vomiting recently?
- 4. Is she on any anticoagulants?

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