All Eyes on You: Eye Care in Family Medicine

Erica Smith Ballard, OD, FAAO

Assistant Professor

University of Kentucky Department of Ophthalmology & Visual Sciences

Financial Disclosures

- none

Educational Need/Practice Gap

- Gap: Family medicine physicians are not comfortable, relatively speaking, treating and triaging eye complaints and may not be optimally managing these cases.
- Need: Additional training and education on ocular anatomy and pathology so appropriate triaging and treatment measures can be taken.

Learning Objectives

Upon completion of this activity, learners will be able to:

- Identify anatomical structures of the eye and adnexa.
- Distinguish causes of ocular complaints or symptoms.
- Recognize cases that need to be referred to an eye care provider or emergency department.
- Classify different causes of "red eye" that presents to a primary care/family medicine clinic.

Expected Outcome

- A stronger understanding of ocular anatomy and disease and increased capability in accurately triaging and treating common ocular ailments.

Think Of the Eyes!

- Vision care is one of the greatest unmet needs in the US
  - Disparities in care
    - Geography
    - Socioeconomic status
    - Racial disparities
  - Seniors
  - Children
    - 80% of classroom learning is through vision
- Acute eye care

But I'm Not an Eye Doctor…

- Systemic disease
- Patients are more likely to seek care from PCP, urgent care, or ED
  - Fear of losing vision
  - More than 1,744 ocular complaints in the ED daily
  - 1-5% of family medicine visits

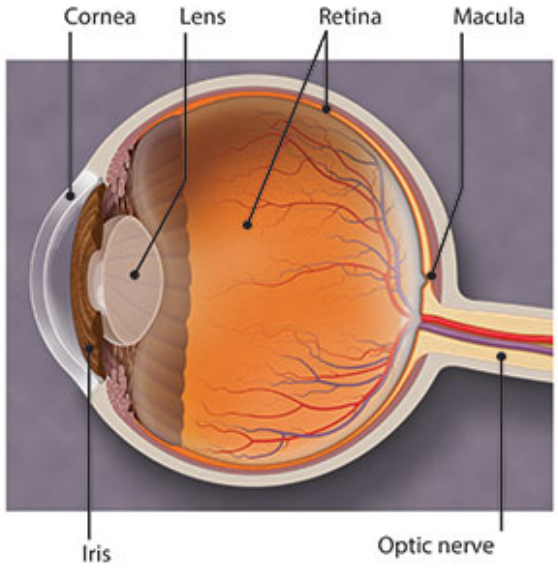
But I'm Not an Eye Doctor!

- No, you're not
- Less than 10 hours of ophthalmic education during residency
- Only 18% of US medical schools require ophthalmology education/clerkship
- No specific requirements for ophthalmic education from ACGME

A Crash Course

Eye doctors for a day

Anatomy of the Eye

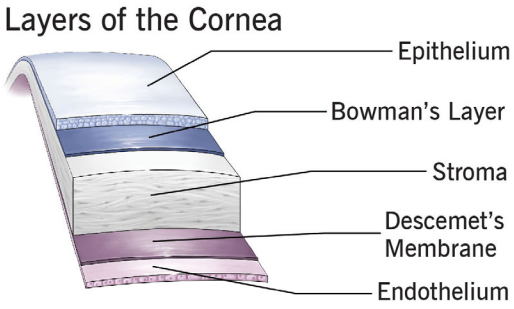


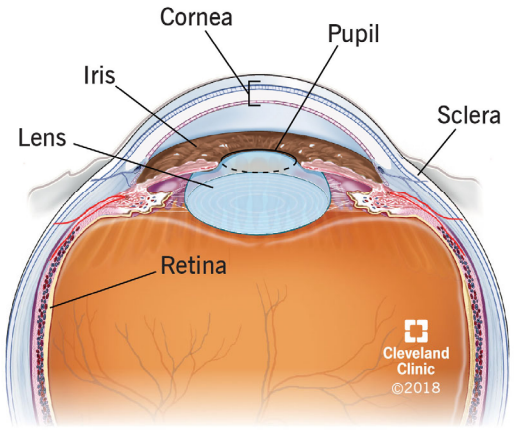
Source: American Academy of Ophthalmology

- 3 layers
  - Outer fibrous
  - Middle vascular
  - Inner nervous
- 3 compartments
  - Anterior chamber
  - Posterior chamber
  - vitreous
- 3 fluids
  - Aqueous humor
  - Vitreous humor
  - Blood

Cornea

- 5 (or 6) layers
- Avascular
- Optically clear
- Tear film?

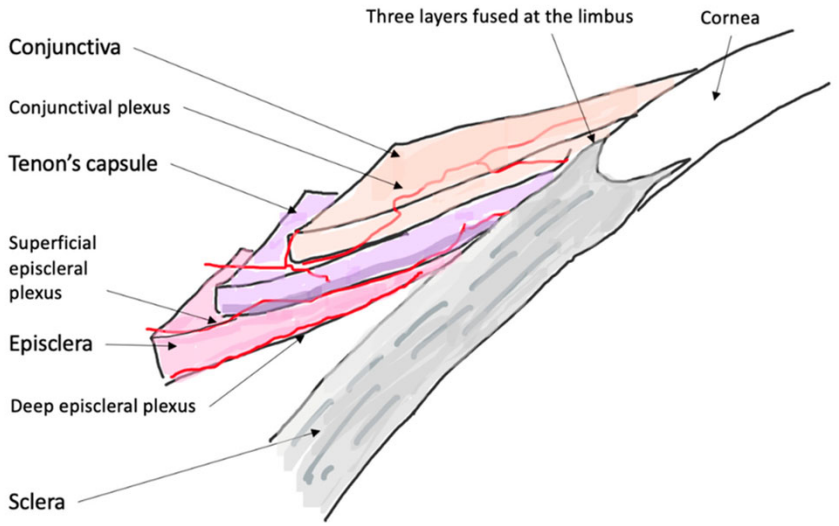




Source: Cleveland Clinic

Conjunctiva and Sclera

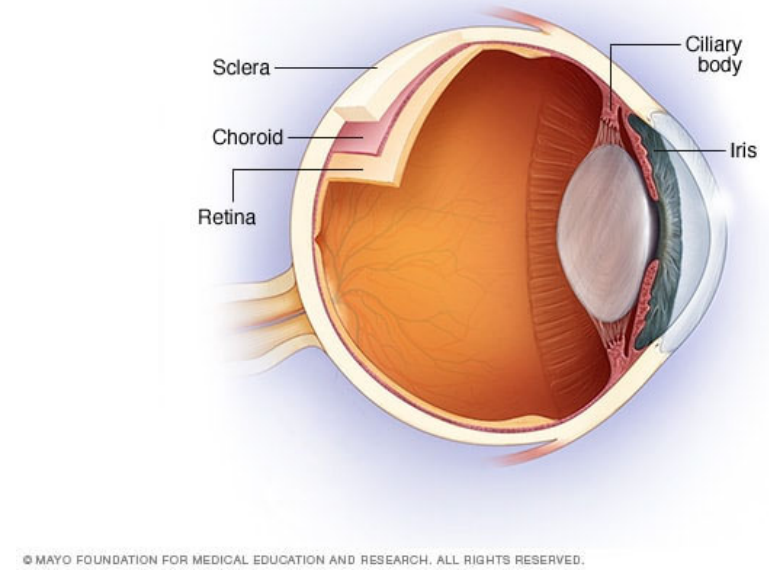
- Vascularized
- Multilayered
- Conjunctivitis, scleritis
  - And episcleritis



Source: *Journal of Clinical Medicine*

Lens and Uvea

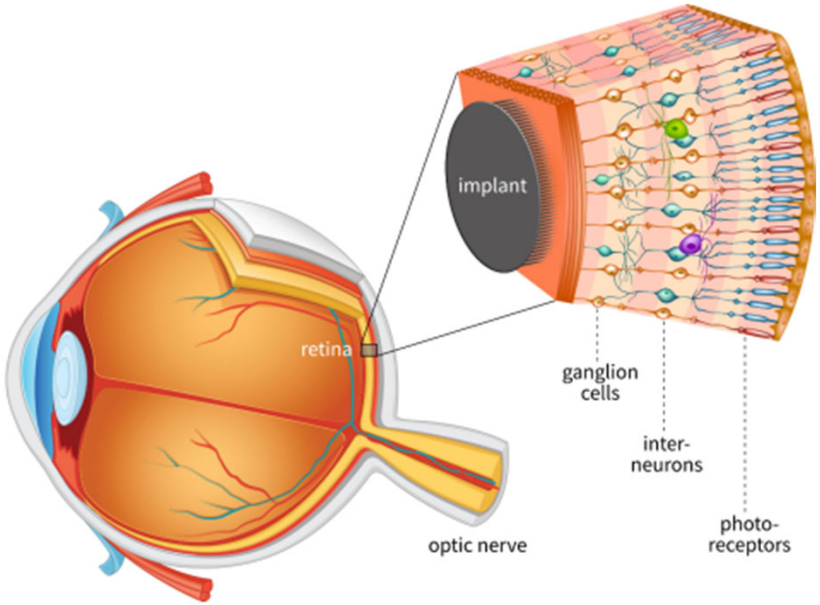
- Uvea - vascular
  - Iris
  - Ciliary body
  - Choroid
  - Uveitis
  - Trauma
- Lens - refractive
  - Cataract
  - Subluxation



Source: Mayo Clinic

Retina

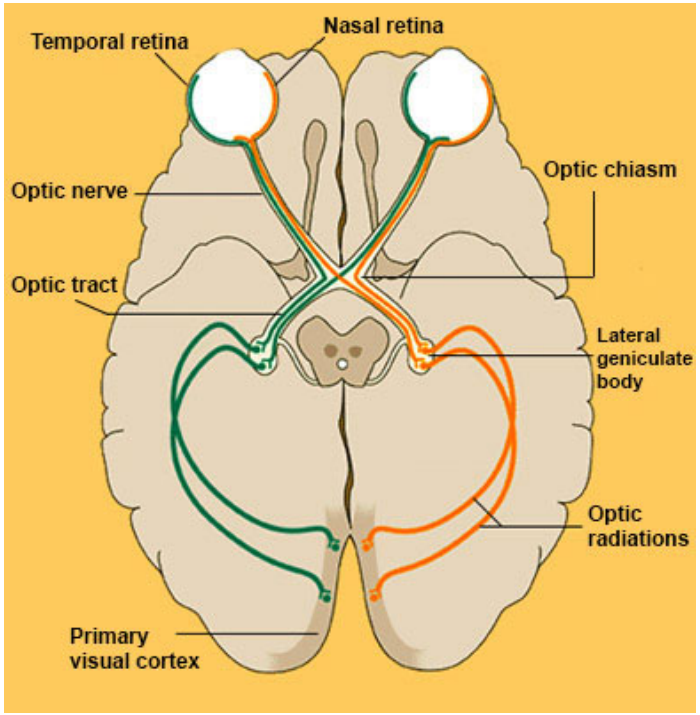
- 10 layers!
- Nervous
- Macula and fovea
- Retinal detachments
- Macular degeneration
- Diabetic retinopathy
- … and so many others



Source: Stanford Medicine

Optic Nerve

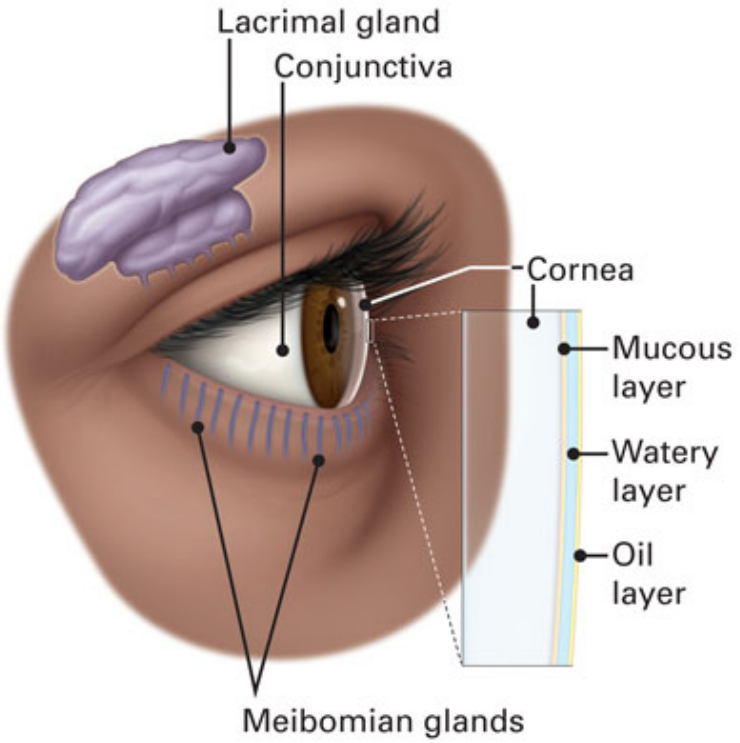
- Nervous
- Extends back into the brain
- Decussation
- Glaucoma
- Stroke
- Optic neuropathies
- Tumors



Source: Kellogg Eye Center

External Anatomy

- Eyelids
- Lacrimal system
- Tear film
- Extraocular muscles



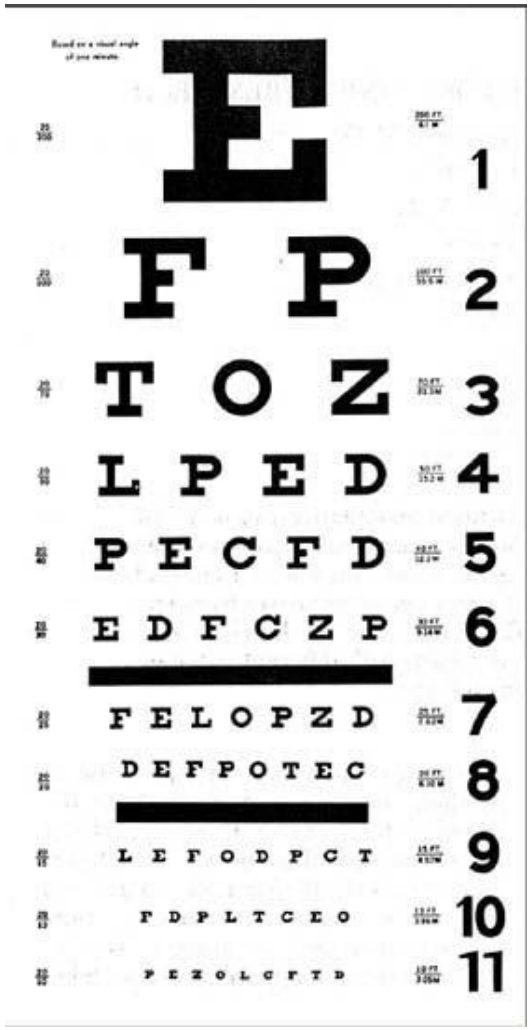
Source: American Academy of Ophthalmology

The Eye Exam

Yes, You Can!

The Basics

- History
- Visual acuity
- Visual fields
- Pupils
- Extraocular motilities
- External exam



The Extra Mile

- Portable slit lamp
  - Better views of ocular structures
  - Challenging to use
- Intraocular pressure
- Direct ophthalmoscopy

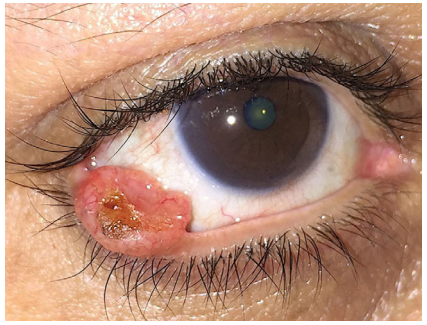
Common Complaints

And how to treat them

Anterior Segment

- Eyelid abnormalities
  - Stye/cellulitis
  - Ptosis
  - Lesions
- Red eyes
  - Conjunctivitis
  - Herpes Simplex
  - Uveitis
  - Dry eye syndrome

Source: American Association of Pediatric Ophthalmology and Strabismus



Source: American Journal of Case Reports

Hordeola and Cellulitis

- Bacterial infection at the base of eyelashes or inside the lid
- *Staphylococcus aureus*
- Chalazion?
- Warm compresses, digital massage
- +/- antibiotic treatment
  - Definitely with full cellulitis
  - Gram positive coverage
  - Oral vs topical?
- Recurrent?

Source: Harvard Health

Preseptal vs Orbital Cellulitis

Quiet eye, contained to anterior of septum, afebrile

Source: EyeWiki

Chemosis, diplopia/restricted motility, fever

Source: MedScape

Red Eyes

- Broad differential
- Infectious
  - Bacterial
  - Viral
  - Herpes – simplex and zoster
  - Corneal ulcer
- Inflammatory/autoimmune
  - Uveitis
  - Scleritis/episcleritis
  - Allergies
- Dry eye syndrome

Source: American Academy of Ophthalmology

Where To Start?

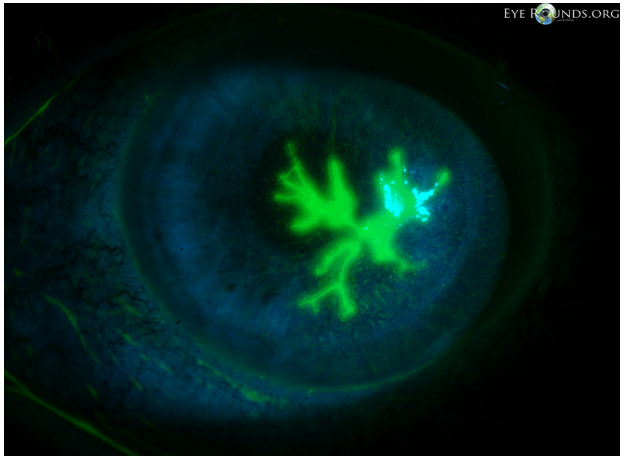
- History
  - Contact lens wear (and overwear)
  - Environmental factors
  - Known red eyes at home or school
  - Recent eye surgery
  - Colds, URI
- Visual acuity if possible
- Pupils
- Glove up
- Anterior segment exam

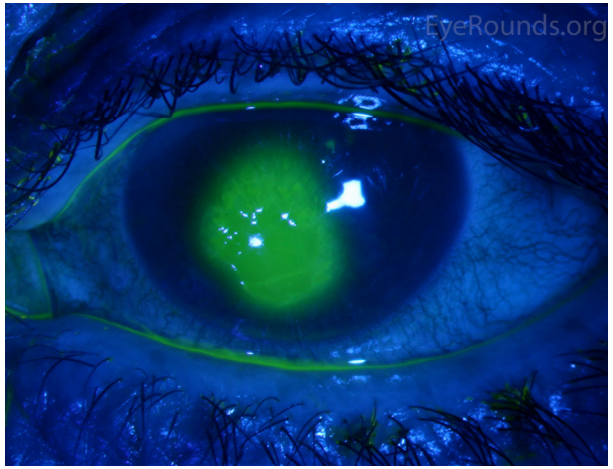
Dyeing To Know

- Sodium fluorescein
  - Highlights damaged tissue
  - Epithelial defects
  - Dendritic?
- Cobalt blue light

Fluorescein Staining

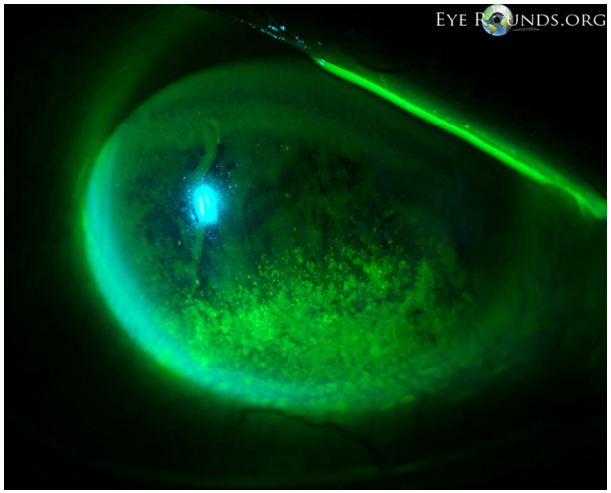
Fluorescein Staining Patterns





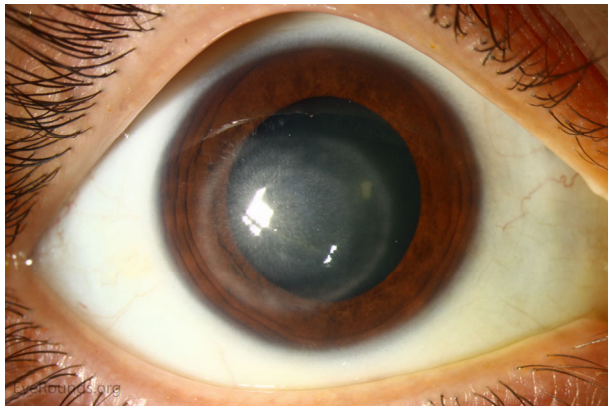
Source: University of Iowa Department of Ophthalmology and Visual Sciences

Fluorescein Staining Patterns



Herpes Simplex Keratitis

- Typically dendritic but can have other presentations as well
- Unilateral, can recur
- History of cold sores?
- Oral vs topical antivirals

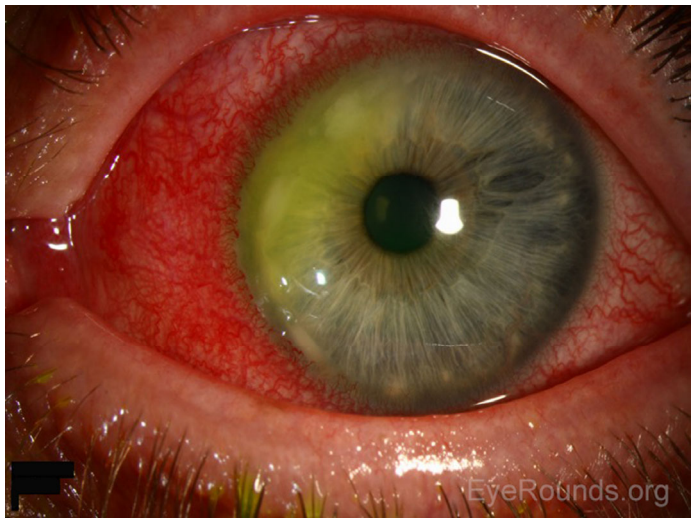


Corneal Abrasion

- Usually due to trauma, but can have other causes
- Consider cause of trauma
  - Mechanical vs organic
- Central and sight-threatening?
- Topical antibiotics
  - Ointment vs drops
- Bandage contact lenses?
- Do NOT prescribe anesthetic drops!

Corneal Ulcer

- Bacterial, viral, or fungal
- Contact lens use
- Unmanaged abrasions/trauma
- Dry eyes
- Pseudomonas
- Acanthamoeba
- Can lead to permanent vision loss/blindness
- Corneal transplant



Acanthamoeba Keratitis

Source: University of Iowa

Source: EyeWiki

Conjunctivitis

- "Pinkeye"
- Nonspecific symptoms
- Viral vs bacterial vs sterile
  - Viral most common in adults
  - Bacterial most common in kids
  - Allergic most frequent cause
- Secondary to systemic disease
- Need clearance for work/school – they're coming to you

Which Is Which?

Source: American Academy of Ophthalmology

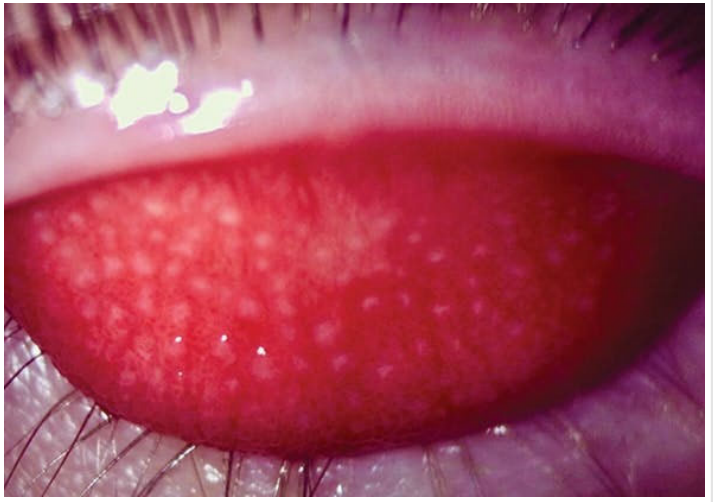
Which Is Which?

- Tissue changes
  - Papillae vs follicles
- Discharge
- Symptoms
- Systemic conditions and environment
- Cultures and antigen testing

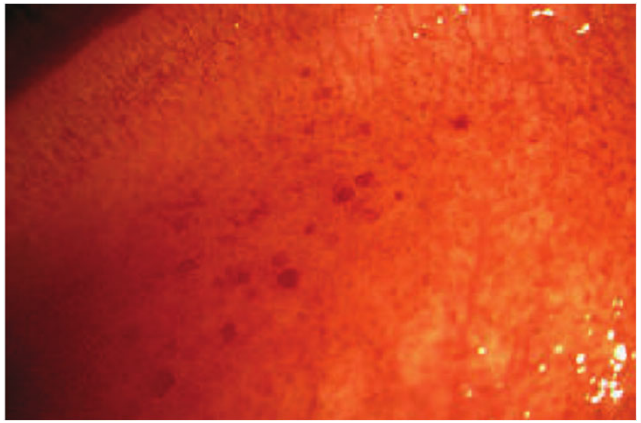
Conjunctival Changes

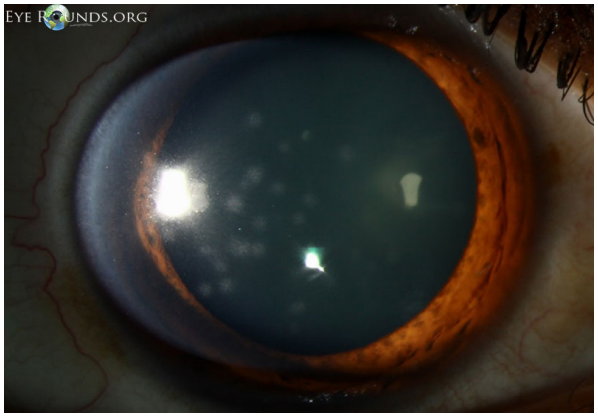
Follicles

Papillae



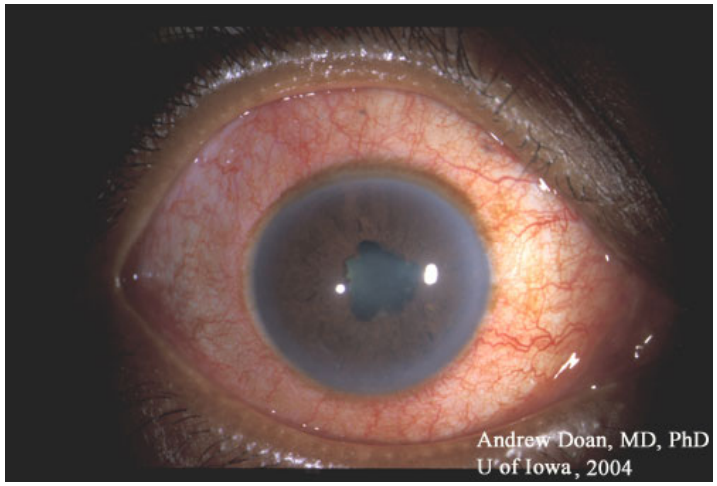
Epidemic Keratoconjunctivitis





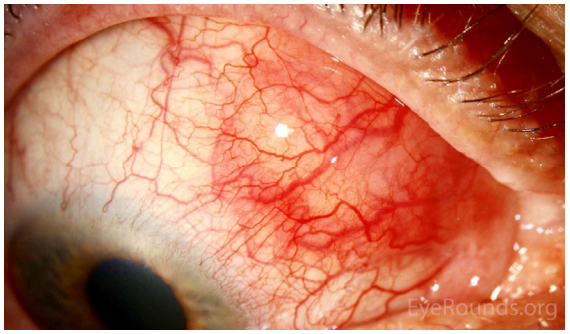
Uveitis

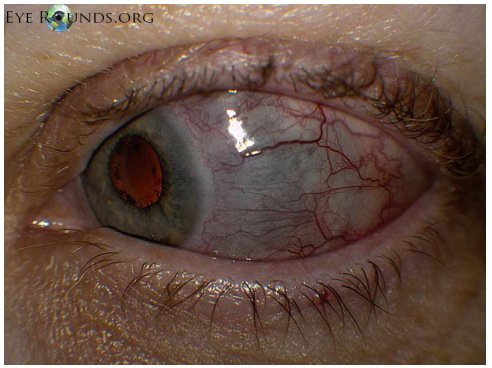
- Inflammation of iris or other parts of uvea
- Leukocytes in anterior or posterior chamber/vitreous
- Synechiae
- Often very painful, photophobic
- Systemic associations



Scleritis and Episcleritis

- Inflammation of deeper layers beneath conjunctiva
- Nodular vs diffuse vs sectoral
- Pain and color
- Systemic associations
- Oral treatments?





Bridge the Gap

- All of these should see an eye care provider at some point soon
- In the meantime, some treatment can be initiated
  - Topical fluoroquinolone
  - Topical ophthalmic ointment
  - Oral antiviral
  - Oral NSAIDs/steroids
  - Preservative-free artificial tears
- Avoid topical steroids

Ptosis

- Drooping eyelid
- Congenital vs acquired
  - Involutional
  - Neurological
  - Trauma
- Complete vs partial
- Diplopia, reduced motility
- Pupils
- Constant vs intermittent
  - Time of day
  - Rest

Source: North American Neuro Ophthalmology Society

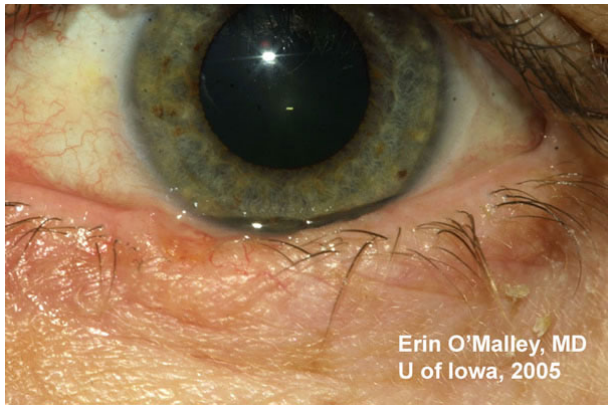
Ptosis Differential Diagnoses

- CN III palsy
- Myasthenia gravis
- Horner's syndrome
- Mass
- Mechanical/reactive
- Involutional – but you better make sure

Source: Review of Optometry

Suspicious Lesions

- Eyelid cancers most common neoplasms in ophthalmic practice
- Risk factors – age, male sex, Caucasian race, smoking
- Basal cell carcinoma
- Squamous cell carcinoma
- Sebaceous carcinoma



Deprez, Manuel and Uffer

Benign (84%)	
	Squamous cell papilloma (26%)
	Seborrheic keratosis (21%)
	Melanocytic nevus (20%)
	Hidrocystoma (8%)
	Xanthoma/xanthelasma (6%)
	(chalazia not included in study, #3340)
Malignant (16%)	
	Basal cell carcinoma (86%)
	Squamous cell carcinoma (7%)
	Sebaceous carcinoma (3%)

Systemic Conditions

- Vasculopathies – diabetes, hypertension, hyperlipidemia
  - Usually impacting the posterior segment
  - Fundus photographs?
- Stroke – pupils, visual fields, extraocular motilities
- Rheumatological/autoimmune
  - Should labs be ordered?
- Medications/toxicity
  - Hydroxychloroquine
  - Tamoxifen
  - Elahere
- Headaches

Vision Loss

- Sudden vs gradual
- Monocular vs binocular
- Transient vs constant
- Central vs peripheral
- Blur vs blackout/grayout
- Additional symptoms
  - Headache
  - Stroke symptoms
  - Flashes, floaters, curtain/veil

Which ED Should They See?

- Emergency Department
  - Orbital cellulitis
  - Sudden painless monocular vision loss
    - TIA
    - GCA
  - Severe trauma
    - Ruptured globe
    - Laceration through lid margin, nasolacrimal system, or canaliculus
- Eye Doctor
  - Trauma
  - Endophthalmitis/post-surgical complications
  - Suspected angle-closure glaucoma
  - Uveitis
  - Corneal ulcer
  - Acute vision loss
    - Flashes, floaters

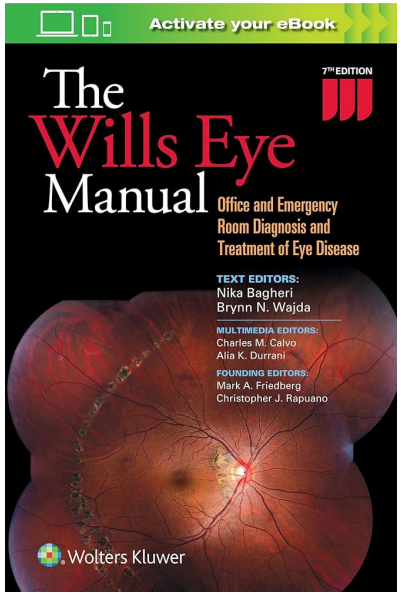
Winding Down

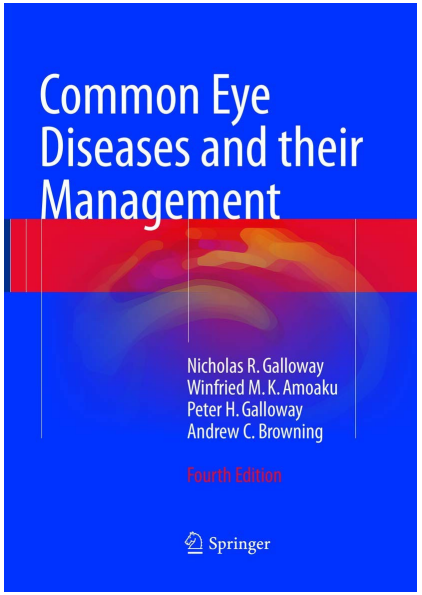
What will you do with all this information?

Conclusions

- Eyes are hard.
- Multidisciplinary approach
- Make friends with your local eye care providers
- Know what resources are available in your local emergency departments
- Utilize educational resources
- Don’t be afraid to ask questions
  - We are asking you questions too!

Resources





EyeRounds.org

References

- American Academy of Ophthalmology, EyeWiki
- Azari, A. A., & Barney, N. P. (2013). Conjunctivitis: a systematic review of diagnosis and treatment. *JAMA*, *310*(16), 1721–1729. https://doi.org/10.1001/jama.2013.280318
- Baş, Z., Sharpe, J., Yaghy, A., Zhang, Q., Shields, C. L., & Hyman, L. (2023). Prevalence of and Associated Factors for Eyelid Cancer in the American Academy of Ophthalmology IRIS® Registry (Intelligent Research in Sight). *Ophthalmology Science (Online)*, *3*(1), 100227-. https://doi.org/10.1016/j.xops.2022.100227
- CDC. (2025, March 27). *Acanthamoeba keratitis*. Centers for Disease Control and Prevention. https://www.cdc.gov/acanthamoeba/about/about-acanthamoeba-keratitis.html
- Deprez, M., & Uffer, S. (2009). Clinicopathological features of eyelid skin tumors. A retrospective study of 5504 cases and review of literature. *The American Journal of dermatopathology*, *31*(3), 256–262. https://doi.org/10.1097/DAD.0b013e3181961861
- Galloway, N. R., Amoaku, W. M. K., Galloway, P. H., & Browning, A. C. (2016). *Common Eye Diseases and their Management* (4th ed. 2016.). Springer International Publishing. https://doi.org/10.1007/978-3-319-32869-0
- Gelston, C. D., & Patnaik, J. L. (2019). Ophthalmology training and competency levels in caring for patients with ophthalmic complaints among United States internal medicine, emergency medicine, and family medicine residents. *Journal of Educational Evaluation for Health Professions*, *16*, 25–14. https://doi.org/10.3352/jeehp.2019.16.25
- Gerstenblith, A. T., Rabinowitz, M. P., Barahimi, B. I., Fecarotta, C. M., Friedberg, M. A., & Rapuano, C. J. (2012). *The Wills eye manual : office and emergency room diagnosis and treatment of eye disease* (Sixth edition.). Wolters Kluwer/Lippincott Williams & Wilkins.
- MAGAURAN, B. (2008). Conditions Requiring Emergency Ophthalmologic Consultation: Ophthalmologic Emergencies. *Emergency Medicine Clinics of North America*, *26*(1).
- McNamara, N. & Polse, K. (2019). Community Health Centers: A Model for Integrating Eye Care Services with the Practice of Primary Care Medicine. *Optometry and Vision Science, 96* (12), 905-909. doi: 10.1097/OPX.0000000000001458.
- Promelle, V. & Goëb, Vincent & Gueudry, Julie. (2021). Rheumatoid Arthritis Associated Episcleritis and Scleritis: An Update on Treatment Perspectives. Journal of Clinical Medicine. 10. 2118. 10.3390/jcm10102118.
- Rosses, A. P. O., Ben, Â. J., Souza, C. F. de, Skortika, A., Araújo, A. L. de, Carvalho, G. de, Locatelli, F., & Neumann, C. R. (2017). Diagnostic performance of retinal digital photography for diabetic retinopathy screening in primary care. *Family Practice*, *34*(5), 546–551. https://doi.org/10.1093/fampra/cmx020
- Tang, V. D., Safi, M., Mahavongtrakul, A., Mahmood, B., Ling, J., Kyrillos, R., Li, J., & Mannis, M. (2021). Ocular Anterior Segment Pathology in the Emergency Department: A 5-Year Study. *Eye & Contact Lens*, *47*(4), 203–207. https://doi.org/10.1097/ICL.0000000000000720
- Turbert, D., & Huffman, J. M. (2025, January 14). *What is a corneal ulcer (keratitis)?*. American Academy of Ophthalmology. https://www.aao.org/eye-health/diseases/corneal-ulcer
- University of Iowa Department of Ophthalmology

Thank You!

Erica Smith Ballard, OD, FAAO

erica.smith1@uky.edu