



I Spy With My Eyes! Ophthalmology Case Studies

AAPA Conference 2021

Nancy Reid, DHSc, PA-C, DFAAPA

Disclosures

- ▶ I no relevant commercial relationships to disclose.



Objectives

- ▶ At the conclusion of the presentation, the participant should be able to:
 - To discuss causes and treatment of amblyopia.
 - To discuss causes of leukocoria.
 - To discuss causes for malalignment disorders of the eye.

Case Study #1

▶ HPI

- A 7-month-old female is brought to the pediatrician by her parents who express concerns about what they believe is an inward turning left eye. The parents denies noticing any excessive tearing, squinting, or abnormal head tilts. They state that the baby tracks objects like faces and her favorite toys. There has been no history of trauma.



Case Study #1

▶ Past Medical History

- Born 4 weeks premature but is now in the 60% for weight and 75% for height.
- 2 week stay in NICU.
- Vaginal delivery without the use of forceps.

▶ Past Ocular History

- None

▶ Family Ocular History

- Father with small refractive error. Maternal history unremarkable.

Case Study #1

- ▶ Social History
 - Lives at home with parents.
- ▶ Medications
 - None
- ▶ Allergies
 - None
- ▶ Review of Systems
 - Unremarkable



Case Study #1

▶ Physical Exam

- Visual Acuity
 - OD– fixes and follows objects
 - OS– fixes and follows objects
- Inspection
 - Lids, lashes, conjunctiva, sclera, iris normal OU.
 - No facial hemiparesis.
- Pupils
 - OU– Equal, round, reactive to light.



Case Study #1

- ▶ Physical Exam (continued)
 - Extraocular Movements
 - Full movement OU. No nystagmus.
 - Intraocular Pressure
 - OD– soft by palpation
 - OS– soft by palpation
 - Fundoscopic exam
 - Red reflex is present OU.



Case Study #1

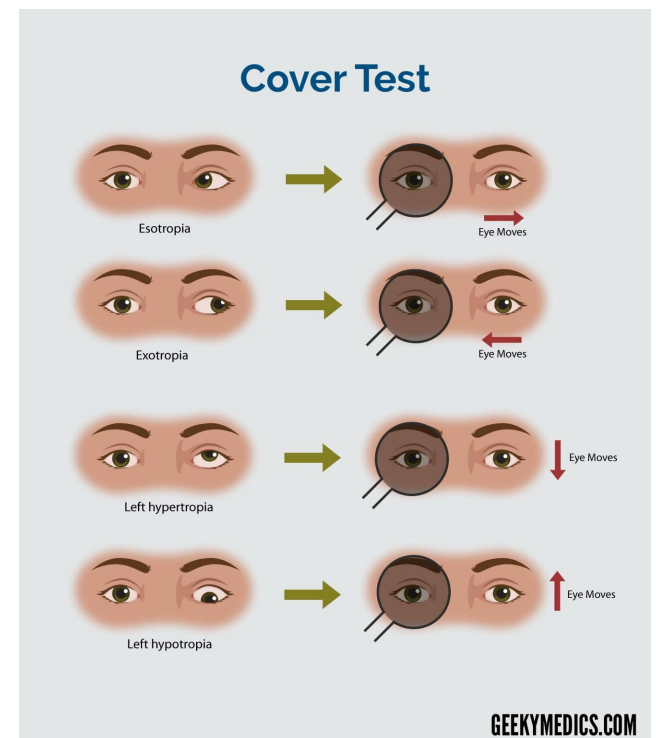
Break Out #1

What three additional physical exam techniques would you perform on this pediatric patient?



Case Study #1

- ▶ What three additional physical exam techniques would you perform on this pediatric patient?
 - Hirschberg corneal reflection test
 - Cover–uncover test
 - Cover–crossover test
 - (aka. Alternate cover)

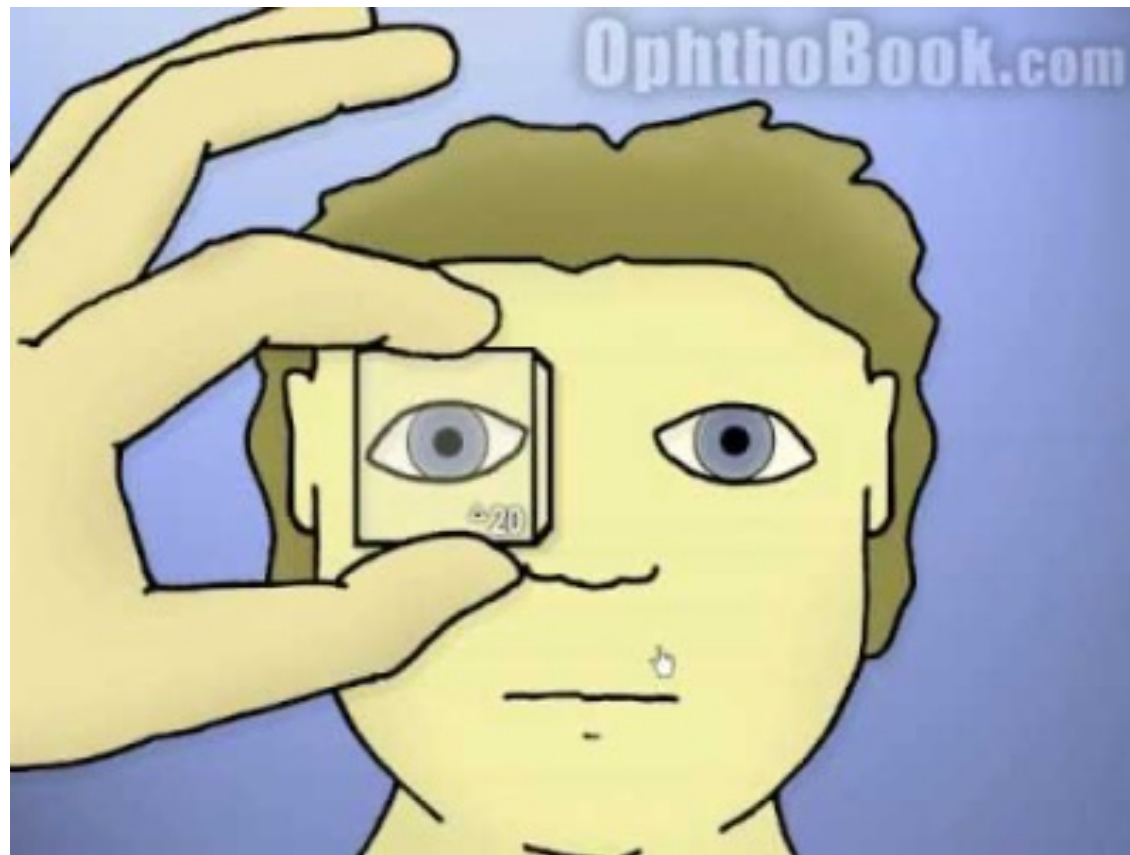


Case Study #1

- ▶ Physical Exam (continued)
 - Hirschberg corneal reflection test
 - Reflection of penlight is in the center of her right pupil and temporally to the center of the left pupil
 - Cover–uncover test
 - On covering the right eye, the left eye shifts outward and fixes intermittently to a toy straight ahead. When the right eye is uncovered, the left eye shifts back inward. When covering the left eye, the right eye remains straight looking at the target.
 - Cover–cross cover test (Alternate cover test)
 - Same results as cover–uncover test.

Case Study #1

- ▶ Physical Exam



Case Study #1

▶ Break Out #2

- ▶ Discuss a differential diagnosis for this patient.
- ▶ Determine the most likely diagnosis.

Differential Diagnosis

Most
Likely

*"I'm concerned it
could be this."*

Need to
Rule out

*"Based on the hx / risks,
we need to rule it out"*

Not likely

*"I thought about it, and
I'm not concerned."*

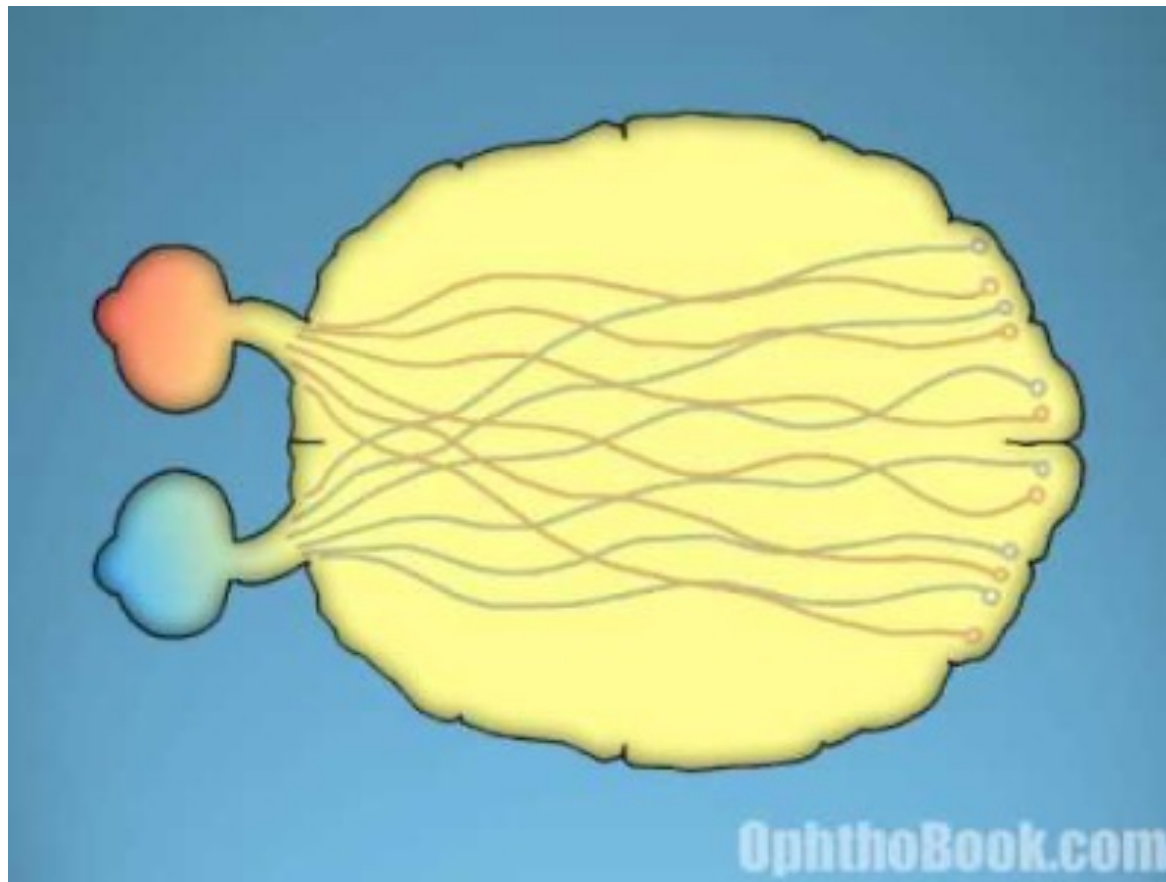


Case Study #1

- ▶ Discuss the differential diagnosis for this patient.
 - Infantile esotropia
 - Pseudostrabismus
 - Cranial nerve 6 palsy
 - Trauma
 - Brain tumor
 - Meningitis

Case Study #1

- ▶ Relation of strabismus and amblyopia.



Case Study #1

- ▶ Treatment of infantile esotropia
 - Address the amblyopia
 - Patch the stronger eye to development of the weaker eye.
 - Surgical alignment
 - Earlier surgery improves stereoscopic depth perception (stereopsis).
 - Frequent post-operative follow-up
 - Postoperative misalignment due to overcorrection.
 - Improvement of amblyopia.

Case Study #2

▶ HPI:

- A 62-year-old Caucasian female presents to her primary care provider complaining of painless decreases vision in her left eye. She initially notices glaring of headlight of oncoming cars while driving at night. She also noticed the need to wear sunglasses due to intolerance of bright lights. She suffers from presbyopia and uses reading glasses. She has not had an eye exam for a couple of years. She denies any recent history of eye trauma.

Case Study #2

- ▶ Past Ocular History
 - Presbyopia
- ▶ Past Family Ocular History
 - Mother suffers from macular degeneration. No ocular pathology on her father's side.
- ▶ Past Medical History
 - Type II Diabetes Mellitus
- ▶ Social History
 - Non-smoker, non-drinker
- ▶ Allergies
 - NKDA
- ▶ ROS
 - Otherwise, negative



Case Study #2

▶ Physical Exam

◦ Visual Acuity

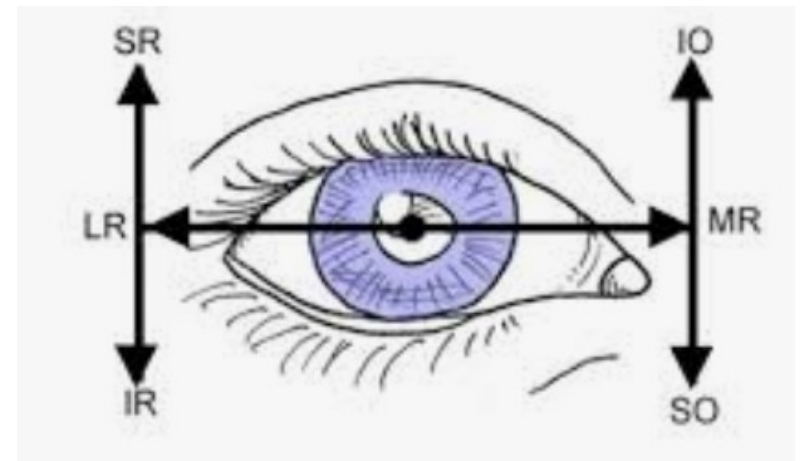
- Distant Vision
 - OD– 20/20
 - OS– 20/70
- Near Vision Uncorrected
 - OD– 20/40
 - OS– 20/70
- Near Vision Corrected
 - OD– 20/20
 - OS– 20/70



Case Study #2

▶ Physical Exam (continued)

- Inspection
 - Lashes, lids, sclera, and conjunctiva have no abnormalities.
- Intraocular Pressure
 - OD– soft by palpation
 - OS– soft by palpation
- Pupils
 - Equal, round and reactive to light.
- Extraocular Movements
 - Full OU. No nystagmus.
- Visual Fields
 - Full OU.



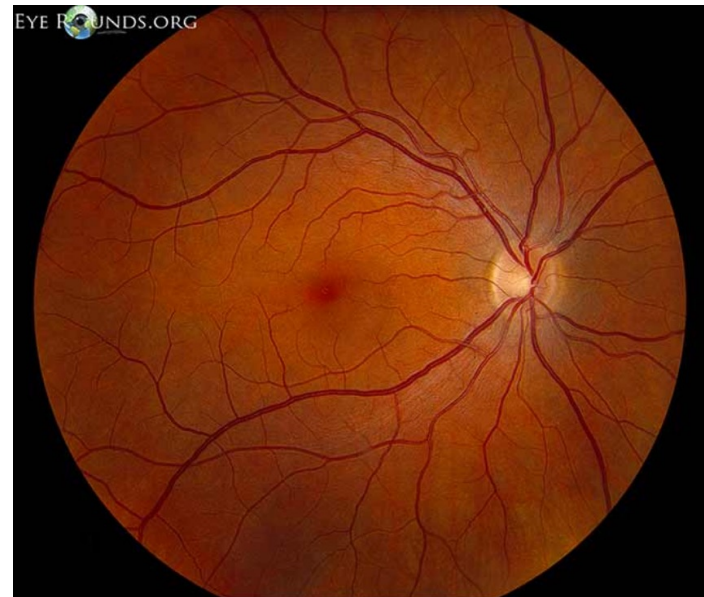
Case Study #2

- ▶ Physical Exam (Continued)
 - Ophthalmoscopic exam
 - Cornea
 - OD–Clear, no foreign body or ulcers
 - OS– Clear, no foreign body or ulcers
 - Lens
 - OD– clear
 - OS– slightly cloudy
 - Red Reflex
 - OD– present
 - OS– diminished



Case Study #2

- ▶ Physical Exam (Continued)
 - Ophthalmoscopic exam
 - Non-dilated fundus exam
 - OD- sharp optic disc margins, normal vessels, cup to disc ratio of .3
 - OS- Unable to visualize



EyeRounds.org

Case Study #2

Break Out #3

- ▶ Discuss a differential diagnosis for this patient.
- ▶ Determine the most likely diagnosis.

Differential Diagnosis

Most
Likely

*"I'm concerned it
could be this."*

Need to
Rule out

*"Based on the hx / risks,
we need to rule it out"*

Not likely

*"I thought about it, and
I'm not concerned."*



Case Study #2

- ▶ Discuss a differential diagnosis for this patient.
 - Glaucoma
 - Refractive error
 - Macular degeneration
 - Diabetic retinopathy
 - Optic atrophy
 - Retinitis pigmentosa
 - Senile cataract

Case Study #2

▶ Treatment

◦ Surgery

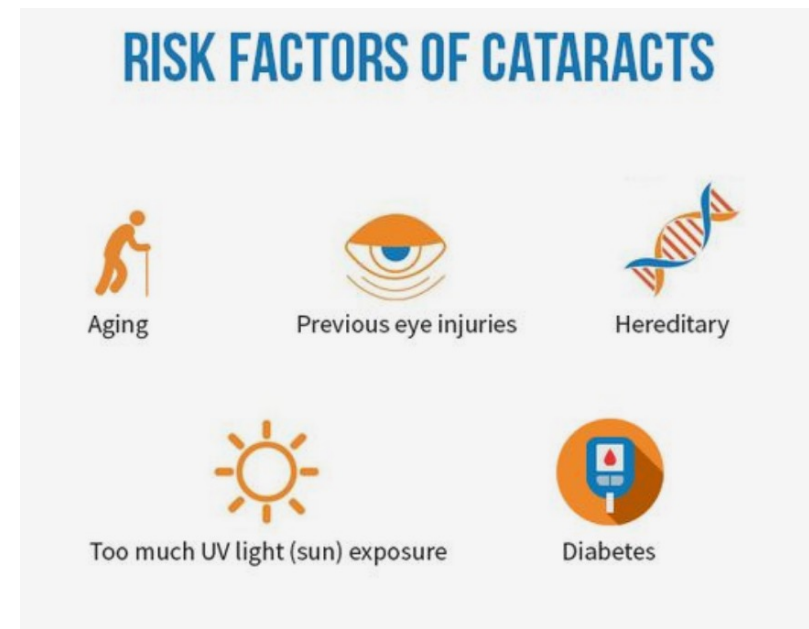
- Phacoemulsification
- Extracapsular surgery

▶ Prognosis

- The degree of visual impairment
- Type of cataract
- Timing of intervention
- Mode of intervention
- Quality of life
- Unilateral or bilateral involvement of the eye
- Presence of another systemic disease

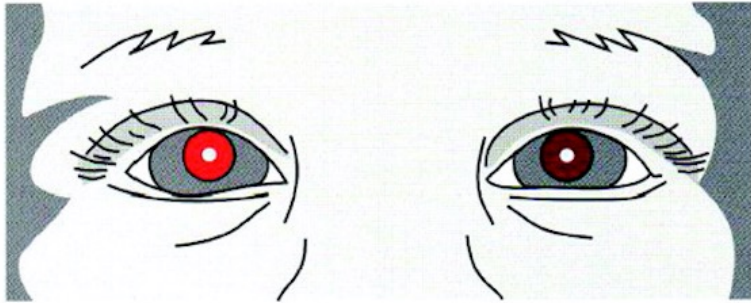
Case Study #2

- ▶ Risk Factors For Developing A Cataract
 - Increasing age
 - Diabetes
 - Excessive exposure to sunlight
 - Smoking
 - Obesity
 - High blood pressure
 - Previous eye surgery
 - Previous eye injury

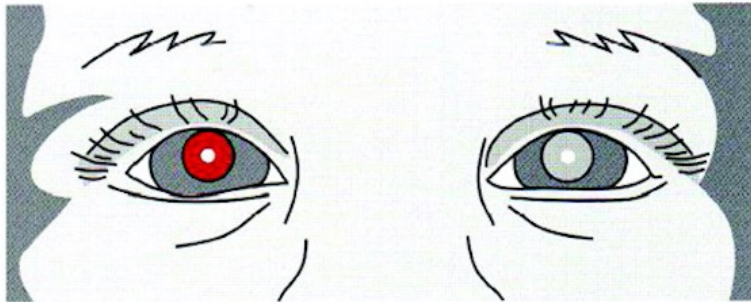


Cause of Abnormal Light Reflex

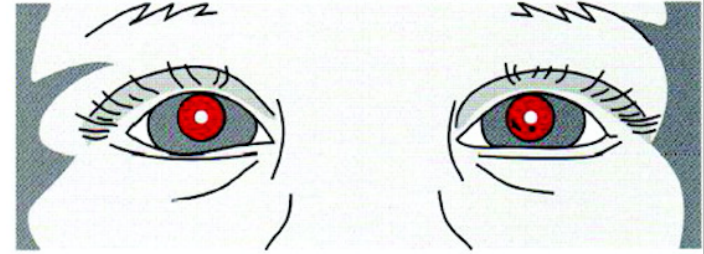
↓ **UNEQUAL REFRACTION**—One red reflection is brighter than the other.



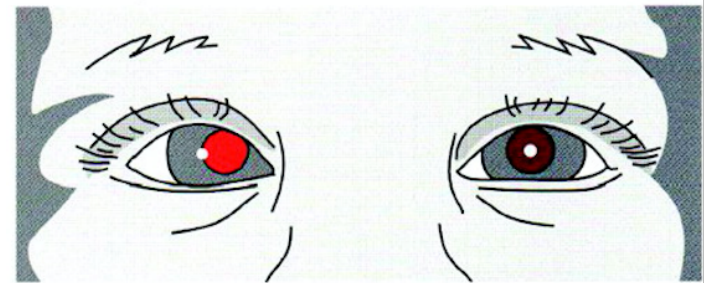
↓ **NO REFLEX (CATARACT)**—The presence of lens or other media opacities blocks the red reflection or diminishes it.



↓ **FOREIGN BODY/ABRASION (LEFT CORNEA)**—The red reflection from the pupil will back-light corneal defects or foreign bodies. Movement of the examiner's head in one direction will appear to move the corneal defects in the opposite direction. (Parallax)



↓ **STRABISMUS**—The red reflection is more intense from the deviated eye.



Copyright © 1991, Alfred G. Smith, MD, Miami, FL

Leukocoria as seen in retinoblastoma.



EyeRounds.org

Take Home Points

- ▶ Pediatric patients should have a Hirschberg corneal reflection test, cover–uncover test, and cover–cross cover test performed as part of routine screening.
- ▶ Amblyopia is an irreversible cause of blindness that results from undetected/untreated strabismus.
- ▶ Cataracts occur frequently with increasing age, may be a normal part of aging, and without intervention can progress to blindness.
- ▶ Abnormal red reflex generally signals eye pathology and can be a sign of life–threatening conditions in the pediatric population.

References

▶ Case Study #1 Infantile Esotropia

- American Academy of Pediatrics, Section on Ophthalmology, American Association for Pediatric Ophthalmology And Strabismus, et al. Red reflex examination in neonates, infants, and children. *Pediatrics* 2008; 122:1401.
- Archer SM, Sondhi N, Helveston EM. Strabismus in infancy. *Ophthalmology* 1989; 96:133.
- Williams C, Northstone K, Howard M, et al. Prevalence and risk factors for common vision problems in children: data from the ALSPAC study. *Br J Ophthalmol* 2008; 92:959.
- Birch EE, Fawcett S, Stager DR. Why does early surgical alignment improve stereoacuity outcomes in infantile esotropia? *J of Am Assoc for Ped Ophthalmol and Strabismus*. 2000; 4:10–14.
- O'Connor AR, Stephenson TJ, Johnson A, et al. Strabismus in children of birth weight less than 1701 g. *Arch Ophthalmol* 2002; 120:767.
- Donahue SP. Clinical practice. Pediatric strabismus. *N Engl J Med* 2007; 356:1040.
- Root T. Ophthalmology: Trophias vs Phorias [video]. YouTube. <https://www.youtube.com/watch?v=PRa7mPx2XVs&t=99s>. Published date Nov 7, 2010.
- Root T. Ophthalmology Lecture: Amblyopia [video]. <https://www.youtube.com/watch?v=0kHCHvFhzWc>. Published date Mar 10, 2009.

References

▶ Case Study #2 Senile Cataract

- Lee CM, Afshari NA. The global state of cataract blindness. *Curr Opin Ophthalmol.* 2017; 28:98.
- Asbell PA, Dualan I, Mindel J, et al. Age-related cataract. *Lancet.* 2005; 365:599.
- Kohli P, Arya SK, Raj A, et al. Changes in ocular surface status after phacoemulsification in patients with senile cataract. *Int Ophthalmol.* 2019; 39:1345–1353.
- West SK, Valmadrid CT. Epidemiology of risk factors for age-related cataract. *Surv Ophthalmol* 1995; 39:323.
- West SK, Duncan DD, Muñoz B, et al. Sunlight exposure and risk of lens opacities in a population-based study: the Salisbury Eye Evaluation project. *JAMA* 1998; 280:714.

Questions

