

## SLIT LAMP MICROSCOPY SKILL SESSION

The evaluation of all eye complaints begins with the history.

All patients with eye complaints should have their visual acuity checked.

Tetanus status

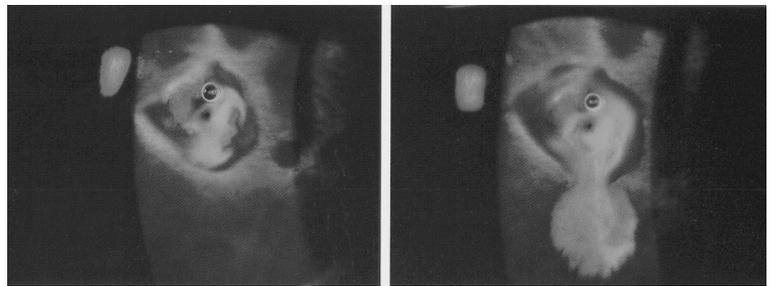
R/O

alkali/chemical burn - irrigate immediately

central retinal artery occlusion - massage, acetazolamide, timolol, (and paracentesis)

globe perforation (**Seidel Test/Sign\***)

The use of fluorescein in a case of a perforated corneal ulcer to demonstrate a positive Seidel Test. Aqueous humor leaking through the corneal opening quickly dilutes the applied fluorescein which is seen a moment later being washed down the surface of the cornea.  
*(from Martonyi et al, Fig 103.)*



Pharmacology

### Local anesthetics

amides

generic name

lidocaine

brand name

Xylocaine®

esters (If a patient is allergic to local anesthetics, it will probably be this class.)

procaine

Novocaine®

tetracaine

Tetracaine®, Pontocaine®

proparacaine (refrigerate)

Alcaine®, Opthane®

### Cycloplegics / mydriatics

generic name

tropicamide (ophthalmologist dilation)

brand name

Tropicacyl®, Mydracil®

duration

4 - 6 hours

cyclopentolate (for corneal abrasions)

Cyclogyl®, AK - Pentolate®

1 day

homatropine

Isopto Homatropine®

1 - 2 days

scopolamine

Isopto hyoscine®

1 - 2 days

atropine

Isopto Atropine®

1 - 2 weeks

Mydriatics are red-topped.

Meiotics, like pilocarpine for acute angle closure glaucoma, are green-topped.

Do not prescribe eye drops containing cycloplegics, topical anesthetics, or steroids.

Slit lamp technical points to remember.

Align (roughly) the eyes with the black line on the microscope.

**The patient's head must abut the headrest. This is the most likely source of error.**

Fluorescein staining

Use the cobalt blue lamp to check for corneal defects.

The cobalt blue lamp is similar to the 'black light' from your undergraduate days.

The red-free filter has a blue-green appearance.

**A patient who complains of a FB sensation has a corneal abrasion. This is very common.**

The light should be obliquely oriented, and 'wide open', **initially**. If a stained defect is not readily apparent, narrow the slit to detect a small defect.

Blinking will dilute the dye.

Focus on the cornea, not the iris. When the patient blinks, the fluorescein film layer is readily apparent.

White light

Flip the lid to r/o FB. **Have the patient look down** to relax the levator palpebrae muscle.

Have the patient look up and the lid will easily flip (spontaneously) into place.

**Penlight Screening Test for Acute Angle Closure Glaucoma**

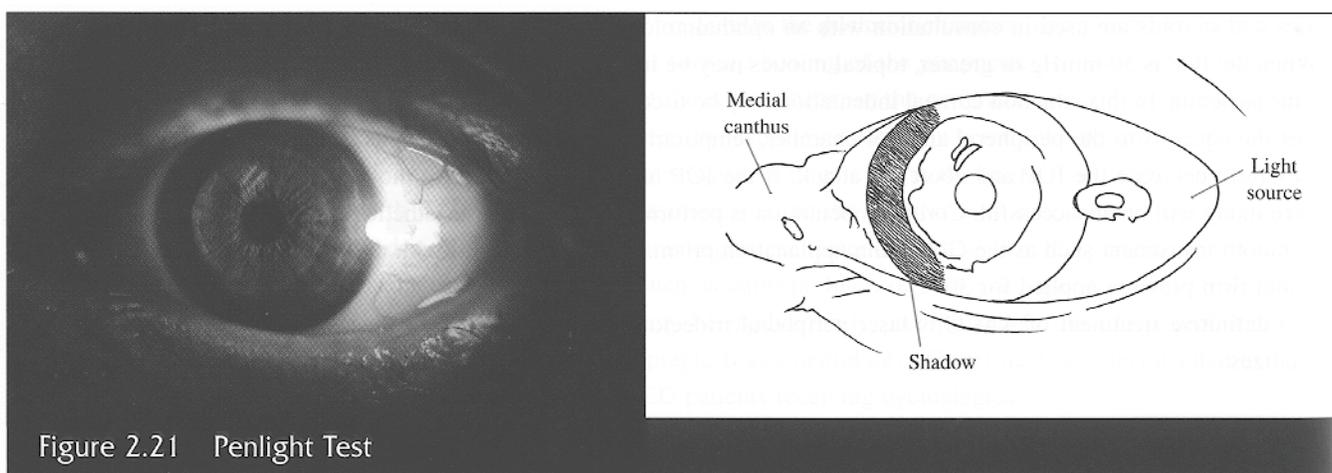


Figure 2.21 Penlight Test

A penlight, held laterally and directed nasally, projects a shadow on the nasal side of an iris with a shallow anterior chamber. This patient presented with acute angle closure glaucoma. (Courtesy of Alan B. Storrow, MD.)

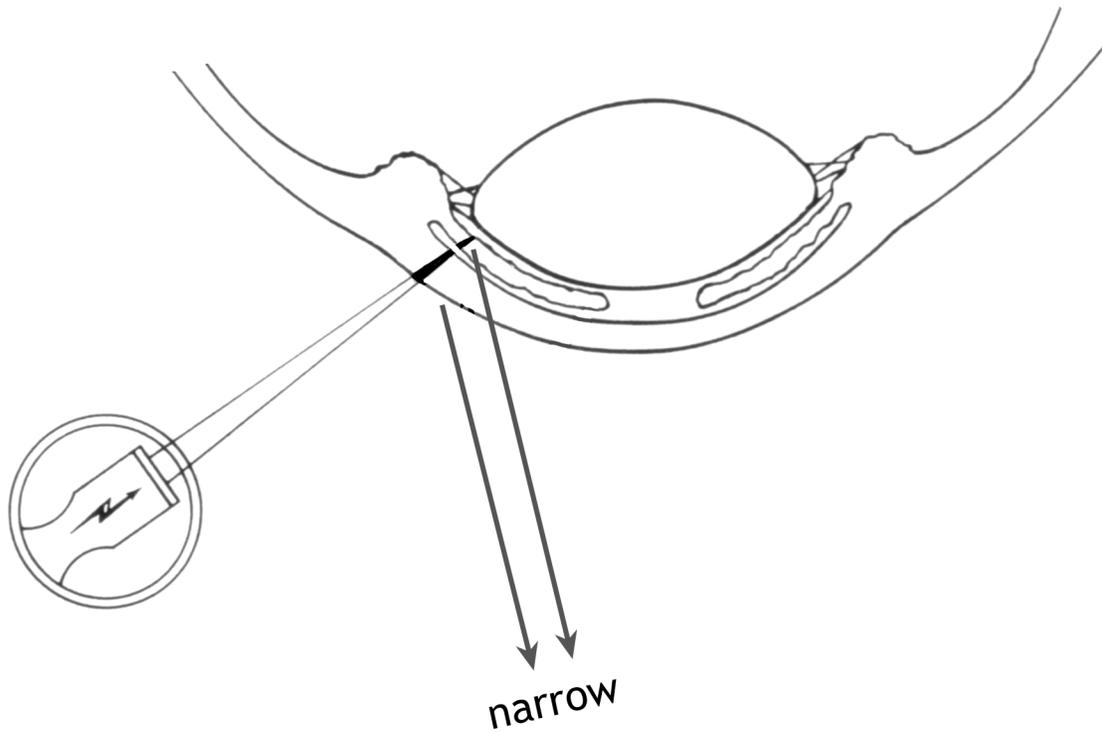
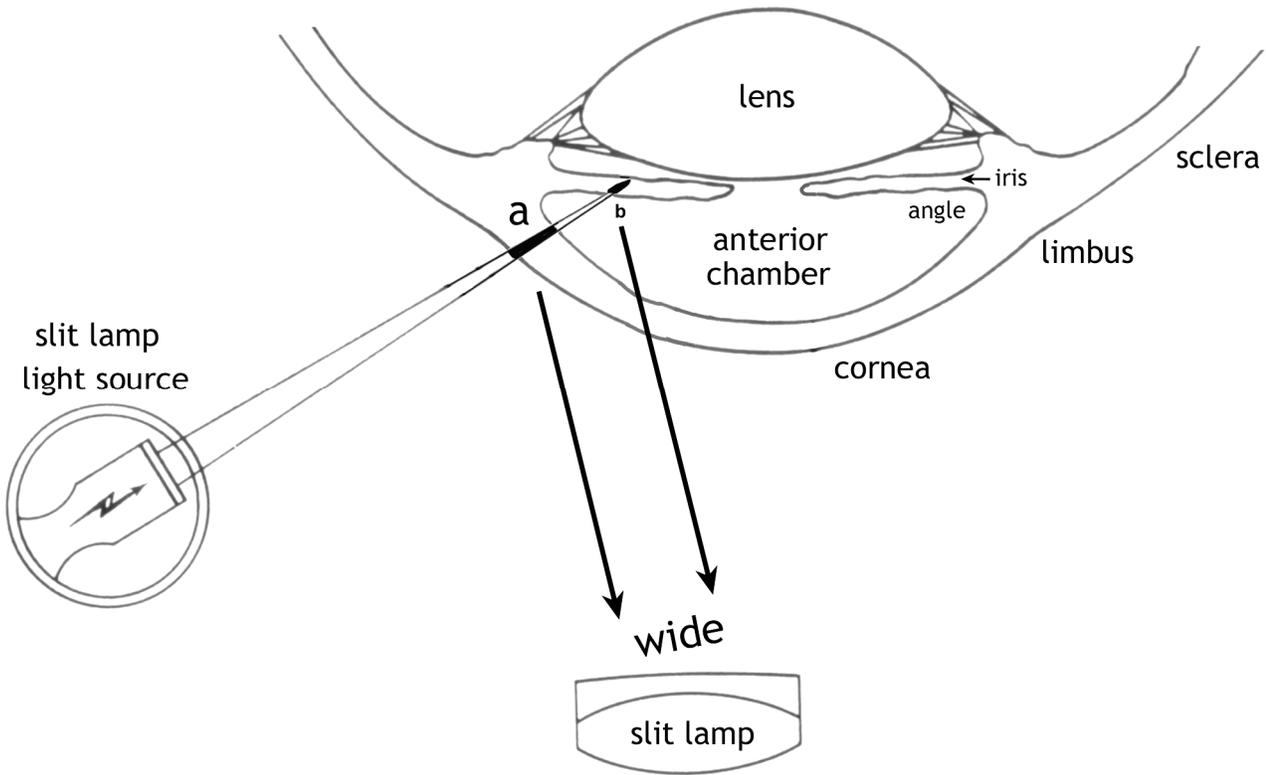
*From Knoop, Stack, and Storrow  
Fig 2.21*

The Anterior Chamber: Acute Angle Closure Glaucoma and Iritis (cell and flare)

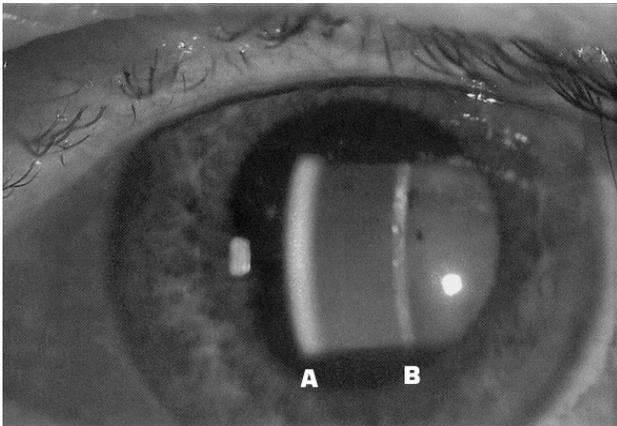
Slit lamp: Use a thin stripe, obliquely oriented, to check the depth of the anterior chamber.

Penlight: See picture on previous page.

*(The two figures below are modified from Martonyi et al.)*



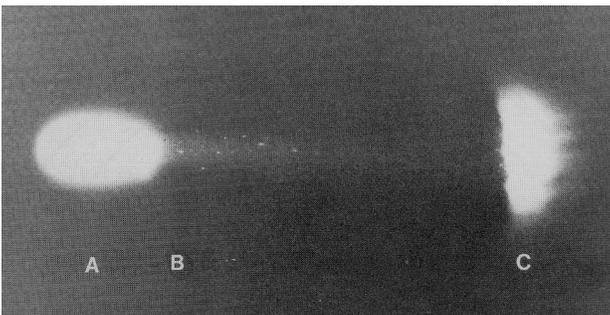
Cell and flare - Iritis appears as the 'beam of a car's headlight' when the slit lamp's light passes through the anterior chamber. Focus initially on the iris, then pull back on the joystick to focus within the anterior chamber.



A flare within the aqueous humour is the result of an abnormally high concentration of protein from the leaking intraocular blood vessels together with some local synthesis of immunoglobulin. It defines the slit-lamp beam within the anterior chamber rather like a car headlight cutting through a foggy night. A flare will usually be found in the presence of cells, although it often remains within the aqueous humour for some time after the cells have disappeared and is then an indication of persisting vascular damage rather than active inflammation.

*(Modified from Spalton et al, Fig 10-3.)*

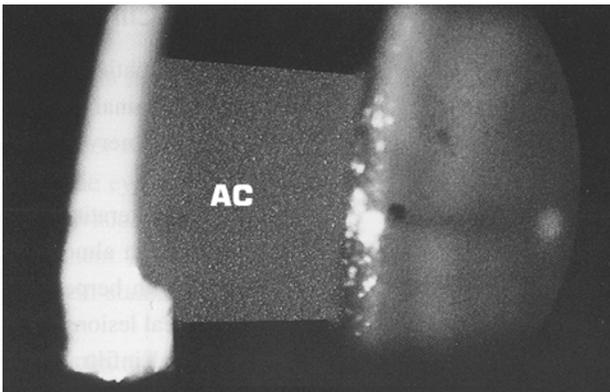
Flare is seen between the points A and B.



Aqueous cells and flare.

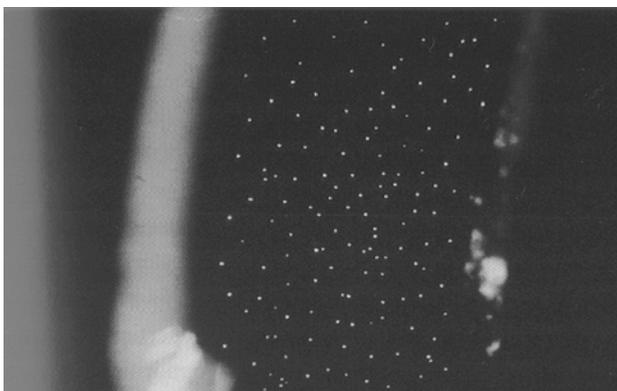
Flare is seen (subtly) between points B and C, more so at point B.

*(From Martonyi et al, Fig 36.)*



Flare is more easily seen here (AC - anterior chamber).

*(Modified from Knoop, Stack, and Storrow, Fig 2.25, who stole it from Spalton, Hitchings, and Hunter.)*



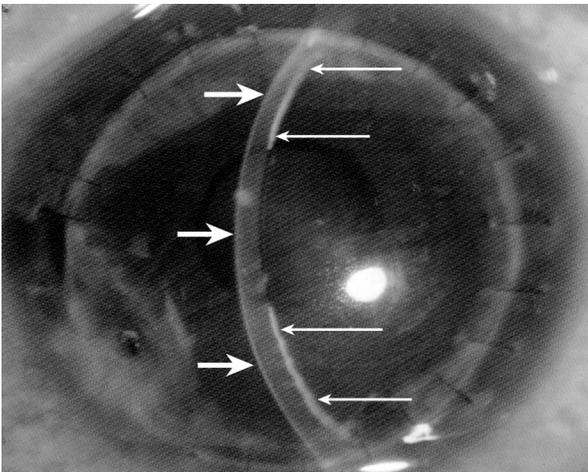
Cells in the anterior chamber are a sign of inflammation or bleeding and appear similar to particles of dust in a sunbeam. They are best seen with a narrow slip-lamp beam directed obliquely across the anterior chamber.

*(From Knoop, Stack, and Storrow, Fig 2.24. They stole this one too from Spalton, Hitchings, and Hunter.)*

References

- Berson FG. Basic Ophthalmology for Medical Students and Primary Care Residents  
Sixth edition. American Academy of Ophthalmology. 1994
- Brandreth RH. Clinical Slit Lamp Biomicroscopy 1978
- Cullom RD and Chang B. The Wills Eye Manual - Office and Emergency Room Diagnosis and Treatment of Eye Disease J.B. Lippincott Second edition 1994
- Knoop KJ, Stack LB, and Storrow AB. Atlas of Emergency Medicine  
First edition McGraw-Hill 1997
- Knoop KJ, Trott A. Ophthalmologic Procedures in the ED, AEM 1994-5  
Part 1: Immediate Sight-saving Procedures. 1(4) p 408  
Part 2: Routine Evaluation Procedures. 2(2) p 144  
Part 3: Slit Lamp Use and Foreign Bodies. 2(3) p 224
- Martonyi CL, Bahn CF, and Meyer RF. Clinical Slit Lamp Biomicroscopy and Photo Slit Lamp Biomicrography Time One Ink, Ltd. Second edition 1985
- Spalton DJ, Hitchings RA, and Hunter PA. Atlas of Clinical Ophthalmology  
Wolfe Publishing Second edition 1994

Appendix



There is essentially no separation between the cornea (short arrows) and the iris (long arrows). The anterior chamber is essentially absent. (adapted from Martonyi et al)

Diagram of the corneal parallelepiped

ABCD represents the anterior surface of the cornea.  
EFGH represents the posterior surface of the cornea.  
BDFH represents the cornea in cross-section.

