

## Slit Lamp Examination

Original Article Contributed by: Sullivan Smoak, BA

All Contributors: G. Conner Nix, MD

Faculty Editor: Dr. Natalie Kerr, MD

The slit lamp biomicroscope is one of the most useful tools for standard ophthalmic examination. The device consists of a binocular microscope and a light source, both attached to separate arms that rotate about a common axis. The two arms work in synchrony, as the light source can be manipulated to change the angle of illumination, thickness of the light beam, color of the light, and degree of illumination to assess for pathology during different parts of the exam.<sup>1</sup> While it can take time to master the slit lamp examination, the components of the exam can be broken down into simple parts. The general flow proceeds from outside to inside, and typically follows this format (common abbreviations used in documentation are listed in parentheses):

### **External Exam (EXT):**

Assess for abnormalities, such as asymmetry of the lid position (such as ptosis or retraction), placement of the globe in the orbit (such as proptosis or enophthalmos), masses, discolorations, or skin lesions.

### **Lids, Lashes, and Lacrimal System (LLL):**

Evaluate for any lesions, signs of blepharitis at the eyelid margin, or eye lash abnormalities (such as missing lashes or extra rows of eyelashes). Consider everting the lids to examine for foreign bodies, membranes, or inflammatory reaction (if indicated).

### **Conjunctivae and Sclerae (C/S):**

Assess the color of the sclerae for injection and icterus. Assess the conjunctiva for injection (dilation of the blood vessels), hemorrhage, unusual morphology (such as segmented vessels or arteriolization of veins) or chemosis. In trauma, lacerations of the conjunctiva and/or sclera may be visualized.

### **Cornea (K):**

Evaluate the corneal epithelium for any surface irregularities. This task is may be aided by the use of fluorescein dye and the cobalt blue light filter on the slit lamp. Assess the stroma for any opacities. Examine the endothelium for any guttata (bumps), lesions, or disruptions. The most common technique used to evaluate the different layers of the cornea is direct illumination with a narrow beam of light angled from the side.<sup>1</sup>

### **Anterior Chamber (AC):**

Evaluate the depth of the chamber. It may be shallow in the setting of angle closure glaucoma and other disease states such as globe perforation. This can be done by illuminating the iris with a lateral light source and looking for a shadow present on the medial iris, which would indicate a shallow angle. Assessment for cell and flare should also be performed by shortening the height of the beam and using direct focal illumination. The presence of protein flare often looks like

smoke in the aqueous, while individual cells can be visualized when present and look like specks of dust in the light beam. Either of these findings should raise concern for inflammation or intraocular bleeding.

**Iris (I):**

Evaluate the pupil and ensure that it is round. Assess the iris for any transillumination defects by narrowing the beam aperture to be the same or smaller size than the patient's undilated pupil (retroillumination). Next, direct the beam through the pupil to obtain a red reflex off of the retina and evaluate the degree of light shining back through the iris. During this part of the exam, the iris should also be assessed for lesions and neovascularization.

**Lens (L):**

If the patient is phakic (has their natural lens), assess the lens for opacities (i.e. cataract) and, if present, determine which layer of the lens is affected (nuclear, cortical, or subcapsular). If pseudophakic (patient has had a prior cataract surgery and lens implant), assess for proper lens position and opacities of the lens capsule. Retroillumination can also be used for detecting opacities in the lens or capsule.

**Vitreous (V):**

Examine deeper in the eye behind the lens in the vitreous cavity. You can assess for cells – white cells indicate inflammation or infection, while pigmented cells may indicate hemorrhage from a retinal source.

**Fundus:**

The slit lamp can also be used to examine the posterior fundus in detail when an auxiliary lens is placed in front of the patient's eye to provide further magnification. This is useful in the evaluation of the macula, vessels, and optic nerve; however, the peripheral retina is usually examined using the indirect ophthalmoscope in a dilated eye. When examining the macula, it is important to note the light reflex off of the fovea and to evaluate for drusen, edema, or exudate. When examining the vessels, one should evaluate for signs of arteriovenous nicking, as well as note any signs of vessel aneurysm or hemorrhage. Examination of the optic nerve includes determining the cup:disc ratio and whether there is any nerve margin thinning or pallor.

- 1) Martin R. Cornea and anterior eye assessment with slit lamp biomicroscopy, specular microscopy, confocal microscopy, and ultrasound biomicroscopy. *Indian J Ophthalmol.* 2018;66(2):195-201. doi:10.4103/ijo.IJO\_649\_17