Slit Lamp Examination Techniques

Parisa Taravati, M.D.
Assistant Professor
Department of Ophthalmology
University of Washington

I. Parts of Slit Lamp
   A. Head rest
   B. Light source
   C. Oculars/biomicroscope

II. Alignment of Patient
   A. Adjust chair height so patient can comfortably lean forward into head rest
      i. Tip: patients with a large belly should scoot forward in the chair and rest feet on ground rather than foot rest to reach slit lamp comfortably
   B. Black mark on head rest should be aligned with the lateral canthus

III. Types of Illumination
   A. Wide Beam/Diffuse
      i. Good for looking at lids and lashes, as well as large areas of pathology (i.e. corneal abrasion)
      ii. Not good for determining depth of a lesion
   B. Direct Focal
      i. Light and microscope focused on same area
      ii. Microscope directly in front of patient, light is angled about 45 degrees away
      iii. Two types:
          1. Parallelepiped: most commonly used
             a. Slit beam width 1-2 mm, height 7-9 mm
             b. Good for viewing cornea and lens in 3-D
          2. Optical section
             a. Slit beam width as thin as possible, height 7-9 mm
             b. Good for determining depth of lesion, especially in cornea
C. Indirect Proximal
   i. Light is next to object of interest
   ii. Good for looking at fine lesions in corneal epithelium
   iii. Good for studying iris pathology

D. Specular Reflection
   i. Microscope and light are the same angle from the perpendicular but on opposite sides (total of about 60 degrees apart)
   ii. Good for evaluating corneal endothelium

E. Sclerotic Scatter
   i. Normally, the slit lamp is parfocal, meaning that the light and microscope are focused in the same place
   ii. With sclerotic scatter, the light is decentered and defocused from the microscope
   iii. A broad beam of light is focused on the limbus while microscope is focused on the cornea
   iv. Cornea illuminates, making corneal opacities more visible

F. Retroillumination
   i. Light and microscope lined up directly in front of patient, with light shining through pupil
   ii. Light should be smaller than the pupil
   iii. Will cause red reflex to be visible, and the light from the red reflex will shine through anterior chamber structures
   iv. Especially useful in identifying iris transillumination defects
   v. Also good for identifying lens opacities, such as posterior subcapsular cataract

IV. Evaluation of Anterior Chamber Depth
   A. Van Herick Grading System
      i. Slit beam is made thin and angled 60 degrees from the microscope
ii. The slit beam is moved slowly from the temporal sclera to the cornea, and the light beam will split into 2, one on the cornea, and the other on the iris.

iii. The space between these two beams of light is the anterior chamber.

iv. Thickness of cornea is compared to that of the anterior chamber.

v. If anterior chamber is \( \frac{1}{4} \) corneal thickness or less, then gonioscopy should be performed to decide if it is safe to dilate the patient.

B. Table for Van Herick Grading System

<table>
<thead>
<tr>
<th>Anterior Chamber Depth in Corneal Thickness</th>
<th>Grade of Angle</th>
</tr>
</thead>
<tbody>
<tr>
<td>&gt; Cornea</td>
<td>4</td>
</tr>
<tr>
<td>( \frac{3}{4} ) to ( \frac{1}{2} )</td>
<td>3</td>
</tr>
<tr>
<td>( \frac{1}{4} )</td>
<td>2</td>
</tr>
<tr>
<td>&lt;( \frac{1}{4} )</td>
<td>1</td>
</tr>
<tr>
<td>Slit</td>
<td>Dangerously narrow</td>
</tr>
</tbody>
</table>

V. Evaluation of Anterior Chamber Cell and Flare

A. Should be done before checking IOP by applanation
   
   i. Fluorescein causes flare

B. Should also be done before dilation
   
   i. Dilation increases cell

C. Slit beam should be decreased to 1 x 1 mm

D. Microscope should be centered and light angled to the side

E. Easiest to see cell and flare with room lights down

<table>
<thead>
<tr>
<th>Grade of Cell</th>
<th>Cells in Field (1x1 mm slit beam)</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>&lt;1</td>
</tr>
<tr>
<td>0.5+</td>
<td>1-5</td>
</tr>
<tr>
<td>1+</td>
<td>6-15</td>
</tr>
<tr>
<td>2+</td>
<td>16-25</td>
</tr>
<tr>
<td>3+</td>
<td>26-50</td>
</tr>
<tr>
<td>4+</td>
<td>&gt;50</td>
</tr>
<tr>
<td>Grade of Flare</td>
<td>Description</td>
</tr>
<tr>
<td>---------------</td>
<td>------------------------------------------</td>
</tr>
<tr>
<td>0</td>
<td>None</td>
</tr>
<tr>
<td>1+</td>
<td>Faint</td>
</tr>
<tr>
<td>2+</td>
<td>Moderate (iris and lens details clear)</td>
</tr>
<tr>
<td>3+</td>
<td>Marked (iris and lens details hazy)</td>
</tr>
<tr>
<td>4+</td>
<td>Intense (fibrin or plastic aqueous)</td>
</tr>
</tbody>
</table>

VI. Contact Lens Evaluation

A. Centration of lens

B. Movement of lens with blinking
   i. Measure amount of vertical movement with each blink
   ii. Easiest to measure with eye in upgaze while blinking

C. Deposits

D. Fluorescein staining patterns (can only be used with rigid gas permeable lenses)
   i. Example of lens that fits well
   ii. Example of lens that is too steep
   iii. Example of lens that is too flat