

The classification of glaucoma relies heavily upon knowledge of the anterior segment anatomy, particularly that of the anterior chamber angle. Gonioscopy refers to the techniques used for viewing the anterior chamber angle of the eye for evaluation, management and classification of normal and abnormal angle structures. The *anterior chamber* is commonly evaluated during slit lamp biomicroscopy, but the *chamber angle* is hidden from ordinary view because of total internal reflection of light rays emanating from the angle structures. (Fig. 1).

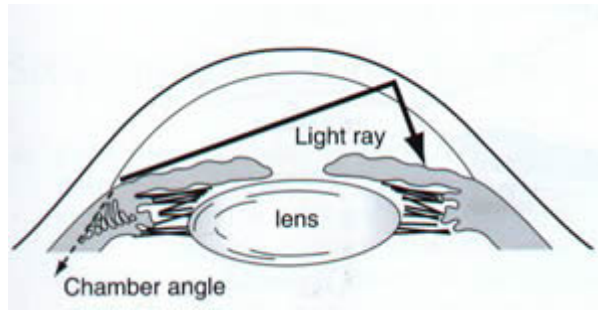


Figure 1: The normally hidden anterior chamber angle: The anterior chamber angle is not routinely seen during slit lamp biomicroscopy because light rays emanating from the chamber angle are refracted back into the eye (total internal reflection of light rays). During slit lamp examination, the anterior chamber may be described as 4+ deep, but without gonioscopy, the additional diagnostic clues of disease are forever hidden from ordinary view.

It requires additional effort, skill and patient co-operation to view the normally concealed chamber angle by either indirect (angle structures -- Fig. 2-- viewed through a mirror) or direct (angle structures -- Fig. 3 -- viewed directly) gonioscopic techniques. Without gonioscopy, it is impossible to classify the glaucoma properly.

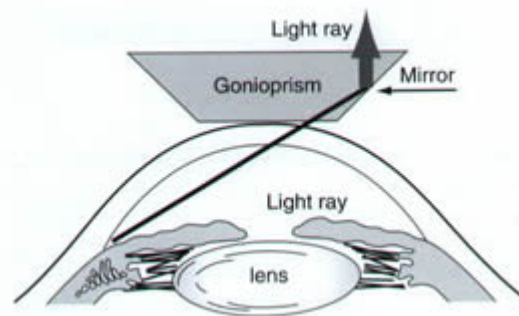


Figure 2: Indirect gonioscopy: A special contact lens overcomes the problem of total internal reflection of light rays from the chamber angle. The bending of light rays back into the chamber angle at the cornea-air interface is eliminated when a contact lens (gonioprism) is placed on the cornea. With this method of indirect gonioscopy, the light rays are reflected by a mirror in the gonioprism to the observer and focused with the slit

lamp biomicroscope. The Goldman and Zeiss lenses are examples of indirect goniolenses.

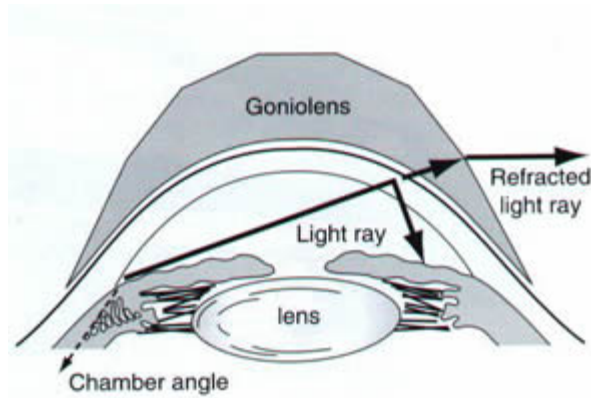


Figure 3: Direct gonioscopy: With direct gonioscopy, the goniolens allows chamber-angle light rays to be refracted directly through the cornea-contact lens interface and a hand-held gonioscope is required for magnification and illumination. The Koeppel lens is an example of a direct goniolens with antireflective coating, and is best with laser therapy (Fig. 4 and Table 1).

On a busy patient day, the Zeiss or equivalent gonioprism (Posner, Sussman) is the most convenient contact lens for rapidly evaluating any chamber angle, and the Goldman or equivalent gonioprism with antireflective coating is best for laser therapy (Fig. 4 and Table 1).



Figure 4: The two most common contact lenses for gonioscopy.

Table 1 (below): Contact Lenses Used for Gonioscopy

Contact Lens	Type	Advantage	Disadvantage
Koeppe	Direct	Convenient for examination under anesthesia (EUA), no angle distortion, able to view fundus, easiest for angle photography, excellent anatomic view, panoramic view.	Patient must be in supine position, laborious examination patient dislikes, examiner must change position, gonioscope or operating microscope required.
Barkan	Direct	Surgical goniolens with blunted side allows access for goiotomy, variable sizes.	Same as Koeppe.
Goldman 3-Mirror	Indirect	Excellent gonioprism for neophyte to learn anatomy, viscous bridge creates suction effect stabilizing eye for examination and laser therapy.	Goniogel required for best view which obscures patient's vision and may compromise further same-day diagnostic tests, corneal abrasion in compromised cornea, part of angle hidden in narrow-angled eyes, time consuming when necessary to evaluate both eyes, artificial narrowing of the angle.
Zeiss 4-Mirror	Indirect	Rapid evaluation without goniogel, no corneal compromise with goniogel, further same-day diagnostic tests not compromised, indentation or compression gonioscopy allows expert evaluation of narrow-angled eyes with hidden anatomy, patient friendly, slit lamp friendly with minimal movement to see 360°, option for compression to perform indentation gonioscopy.	Must first master Goldmann gonioprism, more hand-eye coordination necessary than for Goldmann gonioprism, Unger handle required, easy to apply excessive force causing corneal folds with poor view of angle.

