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***Retinoscope***

It is a device used to shine a beam of light directly into the eye to assess the refractive error and determine the type of eye prescription needed. This technique is especially useful in cases where a patient cannot undergo a subjective refraction because they are unable to judge or respond.

Retinoscopy is the use of a retinoscope to measure a patient's refractive error. Retinoscopy is an objective method of refraction in which the patient does not need to tell the practitioner how they see.



***There are two types of retinoscopes:***

1- ***Streak retinoscopes*** have a light source that produces a line or streak of light. The streak of light can be changed by moving the slide knob or sleeve. It can be:

• rotated to any axis position (by rotating the sleeve)

• made wider or narrower in width (by moving sleeve up or down)

• changed from convergent to divergent light (by moving the sleeve up or down). It is normally used in the ‘down’ position.

2- ***Spot retinoscopes*** have a light source that produces a spot of light. The spot of light can be changed by moving its slide knob. It can be:

• made larger or smaller in diameter (by moving the sleeve up or down)

• changed from convergent to divergent light (by moving the sleeve up or down).

The spot light of a spot retinoscope does not need to be rotated (like the streak retinoscope) to examine different axis directions.

The red reflex can be neutralized with plus and minus trial lenses:

* The Plus lenses neutralize a ‘with’ movement.
* Minus lenses neutralize an ‘against’ movement.







***Types of Retinoscopy***

There are two main types of retinoscopy, static and dynamic.

➢ ***Static retinoscopy*** requires the patient have relaxed accommodation which can be achieved by focusing on a distant object or through cycloplegic agents.

➢ ***Dynamic retinoscopy*** requires the patient have active accommodation by focusing on a near object and is useful to evaluate the effectiveness of accommodation.

Parts of retinoscope:

• Projection System: to illuminate the retina

–Light Source

–Condensing Lens

–Mirror

–Focusing Sleeve

–Current Source

•***Observation System:*** for examiner to see the retinal reflex from the patient

▪ ***Optical Head***

The optical head projects a slit beam of light from one side of the head and has an observer window on the other. The light originates from a bulb and passes through a condensing lens. This lens focuses rays from the light source onto a mirror, bending the light beam at a right angle to the axis of the handle so that it is properly projected from the instrument head.

***▪ Sleeve***

The sleeve lies below the optical head and controls both meridian (or streak rotation) and vergence (or streak focus). By sliding the sleeve up or down, the distance between the bulb and lens is changed to either converge or diverge the light streak. Different sleeve positions are utilized based on the type of retinoscopy technique used. Rotating the sleeve rotates the orientation of the streak around different meridians.

***▪ Plane mirror effect:*** apparent light source is behind the retinoscope, creating parallel light rays.

▪ Plane mirror and concave effect using retinoscope

Concave mirror effect: apparent light source is in front of the retinoscope, creating concave light rays

***▪ Handle***

The handle contains the battery which provides the current source

***Retinoscopy Technique:***

1. The retinoscope should be in plano mode with the sleeve down.

2: The patient should be instructed to fixate on an appropriate distance target. Both eye wells should be open.

3: While standing approximately 15 degrees temporal to the patient’s line of site in the right eye, the doctor should aim the streak of retinoscope light into the patient’s right eye. Gently sweep the beam back and forth across the pupil to determine the light reflex. Keep in mind, the reflex observed describes the power of the eye in the meridian perpendicular to the light beam.

4: Continue gently sweeping the light beam across the pupil while slowly rotating the beam 360 degrees. If the reflex is constant throughout, the patient has a spherical refractive error. If the reflex changes, astigmatism is likely present.

***Note*:** many practitioners will begin by scoping only the 180 and 90 meridians since the majority of astigmatic patients require cylinder correction in those meridians.

6: Neutralize the most minus/least plus meridian if astigmatism is present. If ‘with’ motion is observed, add plus lenses until ‘neutral’ is achieved; if ‘against’ motion is observed, add minus lenses until ‘neutral’ is achieved. The reflex is ‘neutral’ when the retinoscope reflex “blinks red” across the pupil.

***What is the red reflex?***

When we shine light from a retinoscope on the pupil of the eye. The light rays emitted from the retina are observed as a red retinal reflex in the patient's pupil.





***THANK YOU***