

## **Refinement:**

**Step 1: Preparing for Refinement** (1<sup>st</sup>, record the retinoscopy results and VA with that correction) Be sure that the patient is properly in place behind the phoropter.

**Step 2: Occlude the patient.**

- Occlude one eye.
- Provide a range of letters including the last line the patient was able to read.
- Ensure the patient can see the target.
- Instruct patient that as you offer different lenses, that the patient is to choose the option that provides the sharpest and clearest vision.

**Step 3: Refine the sphere power.**

- Always give plus lenses first
- Ask the patient, "Which makes your vision sharper and clearer?"
- Patient has to "earn" more minus power. If patient does not see more letters, or says that the more minus option is "smaller & darker" they have not "earned" the more minus option.

**Step 4: Put the Jackson Cross Cylinder in place.**

**Step 5: Adjust the Jackson cross Cylinder to assess the axis.**

- Straddle the cylinder axis with the JCC by turning the knurled ring of the lens parallel to the cylinder axis.

**Step 6: Refine the cylinder axis.**

- Offer two choices from which the patient must choose
- Follow the white dot. (go in the direction of the white dot)
- Ask the patient, "Which makes your vision sharper and clearer?"
- Move the axis dial by about 5-10° at a time.
- Continue the choice options until both options are equally blurry.

**Step 7: Adjust the Jackson Cross Cylinder to measure power.**

- Now rotate the JCC so that the axis of rotation is 45° away from the cylinder axis and the power (Noted as "P") is parallel to the cylinder axis.

**Step 8: Refine the cylinder power,**

- Offer the patient two choices by flipping the knurled ring. In one choice the red dots will align with the axis. With the opposite flip, the white dots will align with the axis.
- White dots indicate that more plus cylinder would be added. If the red dot is chosen, then plus cylinder power will be taken away.

**Step 9: Remove the Jackson Cross Cylinder**

- Continue offering choices without the JCC until both choices appear equally blurry. (The patient may say they look the "Same" or "No different")

**Step 10: Refine the sphere power.**

- After the cylinder power has been determined, you should go back to finalize the sphere power refinement.
- Always go in the plus direction first.
- OK to add more minus sphere power if the visual acuity improves with the lens change.
- GOAL: Find the best visual acuity using the most plus power (or least minus power).

**Step 11: Verify balance between two eyes by performing the Duochrome test.**

- Using at least 2 lines larger than the smallest the patient can read, move the red-green filter into place.
- Ask patient to chose “which letters are clearer, the letters in red or in green?” if the green letters are clearer, add 0.25D to the plus sphere power.
- If the red letters are clearer, subtract 0.25D of plus power.
- Repeat until the red and green sides appear to be equally blurry.
- Fogging technique(open the occluder in the phoropter and add +3.00 D to the fellow eye.
- Add enough to blur the patient’s vision. Slowly remove the extra plus power on click at a time.
- This result becomes your final refinement.

**Step 12: Document the results of the final refraction.** (Also record BCVA)