Refraction Action: Common Tips for Refracting

Refractometry Vs. Refraction

- Ophthalmic professionals perform Refractometry
  - Refractometry is the method for measuring the refractive index
- Ophthalmologist and Optometrist perform the Refraction.
  - The clinical determination of best optical correction
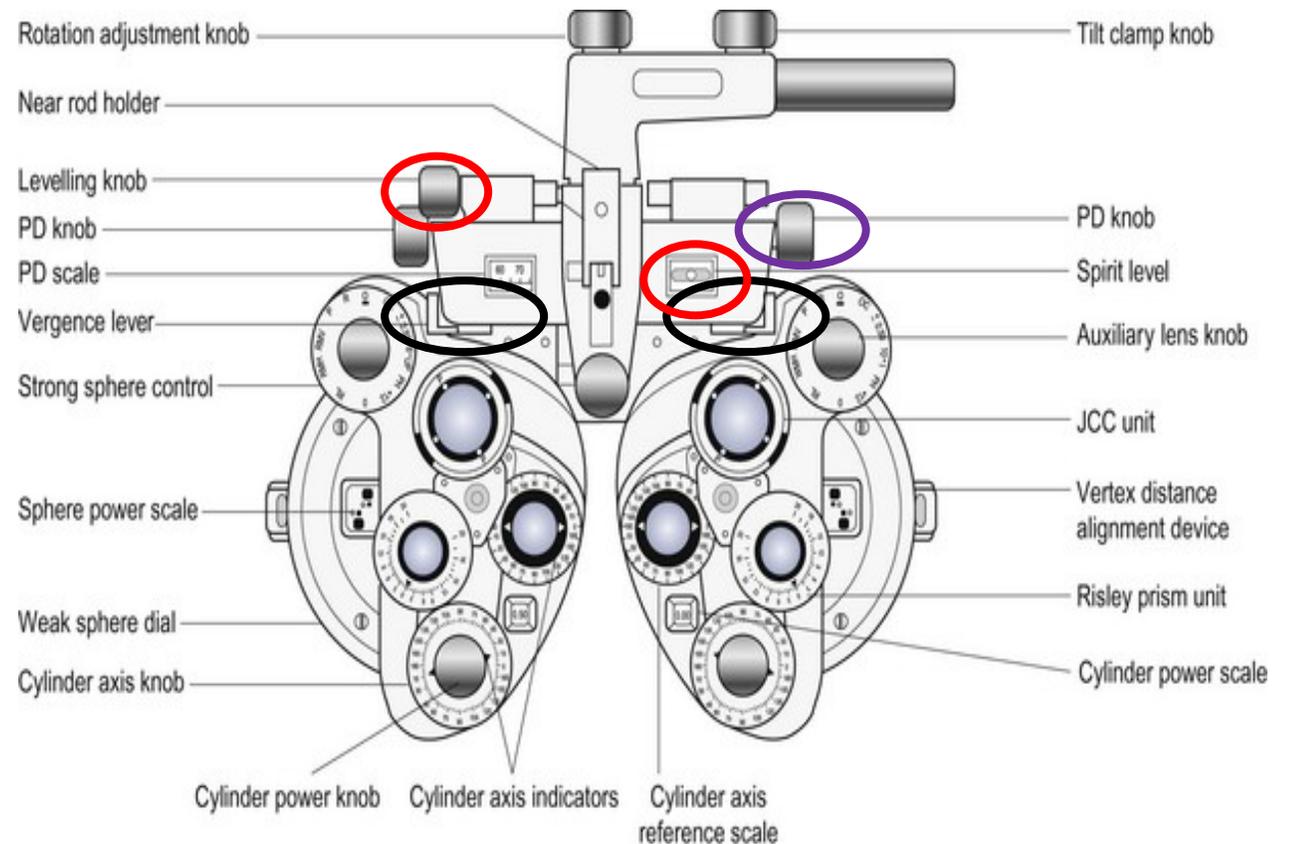
A-B-C's of Manifesting

- Give the patient directions
  - Identify which is clearer
  - If they look the same, that's a good answer
- Pay attention to what the patient is saying
  - Look for clearer and not bigger, look for sharper and not darker
- Encourage a response
  - Including – "they look the same"

How to Start

- Perform lensometry of the glasses that the patient brought to the visit

- Perform Autorefraction if the patient did not bring their glasses or does not wear glasses

- Perform retinoscopy then refine your results

Set Up

- Add the patient prescription (from AR, Lensometry or Retinoscopy)

- Set vertex distance (adjust forehead rest)

- Set pupillary distance

- Make sure the vergence lever is out for distance vision and in for near vision

- Balance the eyes in the phoropter using the leveling knob

Rotation adjustment knob

Near rod holder

Levelling knob

PD knob

PD scale

Vergence lever

Strong sphere control

Sphere power scale

Weak sphere dial

Cylinder axis knob

Tilt clamp knob

PD knob

Spirit level

Auxiliary lens knob

JCC unit

Vertex distance alignment device

Risley prism unit

Cylinder power scale

Cylinder power knob   Cylinder axis indicators   Cylinder axis reference scale

Phoropter Auxiliary Lens Knob

- O – Open

- O – Occlude

- + .50 – JCC diopters

- 6ΔU - Assess binocular vision

- PH – Pinhole

- +.12 – Assess binocular balance

- RL – Red lens

- RMH – Red Maddox Rod horizontal

- RMV – Red Maddox Rod vertical

- P – Polarizing lens

- R – Retinoscopy (working distance -1.50)

Steps to Refracting

- Explain the test to the patient

- Add the prescription determined from your starting point process

- Occlude one eye (start with right eye)

- Power – Axis – Power (PAP)
  - Spherical power – cylinder axis – cylinder power (refine sphere)

Beginning the Refraction - Sphere

- Offer sphere power in 0.50D steps
  - Start with plus – push plus
  - If no improvement move to minus

- Offer sphere power in minus at 0.50D steps

  - If patient wants minus, make them prove that they can see better

- Continue with spherical power until choices look the same, there is no longer an improvement, or patient can read the smallest line
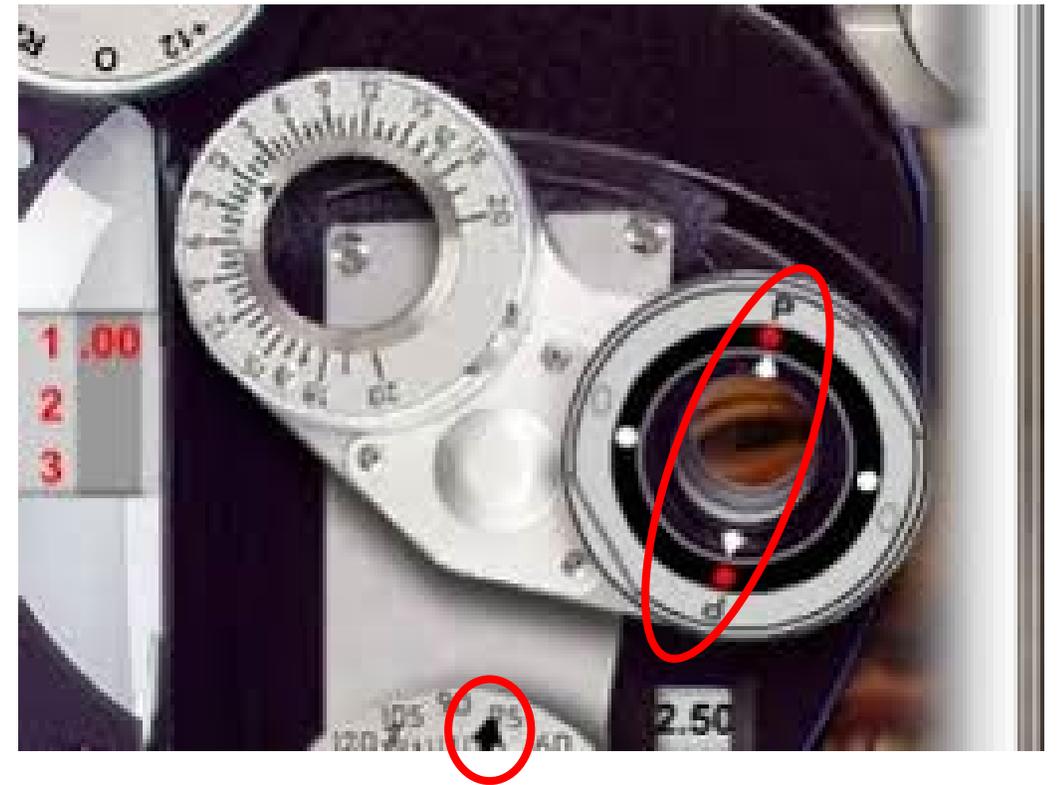
Beginning the Refraction – Cylinder Axis

- Refine the cylinder axis using the JCC

- Pull the JCC down and make sure the red and white dots straddle the axis

- Flip the lens of the JCC
  - Move towards the white dot

- For every 0.50D of cylinder power given, adjust the sphere power by 0.25D in the opposite direction
  - Adding (+0.50D): Add -0.25D sphere

https://www.aao.org/education/basic-skills/cross-cylinder-technique-adjusting-sphere

Beginning the Refraction – Cylinder Power

- Refine the cylinder power using the JCC

- Pull the JCC down and align the **P** with the axis

- Flip the lens of the JCC
  - If it lands on white – add cy

https://www.aao.org/education/basic-skills/cross-cylinder-technique-adjusting-sphere

Beginning the Refraction – Final Step

- Final refinement of the spherical power

Starting with Plano

- Offer sphere power (start with plus)
- Pull down the JCC
- Dial in 0.25D or 0.50D of cylinder and check all four meridians (straddle)
    - 45°, 90°, 135° and 180°
- Once a meridian has been determined, refine the axis
- If one is clearer, flip down the Jackson-Cross Cylinder, straddling the axis
    - Move in 15° increments initially, then come back towards original meridian in 5° increments
- Check the cylinder power by aligning the **P** with the axis
- Refine sphere with 0.25 D plus and minus increments

Determining Add Power

- Measure at 14-16 inches from the patient with both eyes open

- Based on the patient age, add the appropriate add power
  - Remove and add power if needed in 0.25D

- Determine the patients near acuity with the add power and document it in the chart

Age	Add
35	0.00
40	+0.50
45	+1.00
50	+1.50
55	+2.00
60	+2.50

Tips and Tricks

- Offer the patient the least amount of minus as possible (push plus)
- Young patient with strong accommodation with eat plus
  - Make the patient prove they can see better with the additional minus power

- Use red-green duochrome test or binocular balance tests to avoid over-minus power

- Patients that can read without glasses are usually myopic

- Patients with difficulty at distance and near are likely hyperopic with presbyopia