TRIAL FRAME & CROSS CYLINDER TECHNIQUE

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Different Types of Trial Frames

- When ordering the trial frame, think of the weight of the device on the patient’s face and ears.
Adjusting the frame to the patient

- Ear piece
- Nose
- IPD (InterPupillary Distance)
- Optical centers
- Pantoscopic Tilt
- Vertex distance
Metal vs. Plastic Frames

- Traditional frame
  - Very heavy
  - Has all the settings

- Lighter weight
  - Has most of the settings
  - May be more expensive than the traditional frame
Pediatric Trial Frames

- You need either a range of fixed IPD frames or an adjustable frame.

- Half eye frames are more comfortable for the patient but lack some important settings.
Adjustable Temples

- Set at neutral then adjust the ear height and pantoscopic tilt

Knob to set earpiece to set pantoscopic tilt

Ear piece Extension

Neutral Setting
Lenses parallel to face. No pantoscopic tilt

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Nose piece settings

- Align for comfort with earpieces
- Adjust for the bridge of the nose (*TILT*)
- Adjust so the optical centers are aligned with the eye vertically
Pantoscopic Tilt

Poor adjustment of the trial frame may result in excessive tilting of the lens and can cause an oblique astigmatism.

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IPD Setting (InterPupillary Distance)

- The adjustment made separately for each eye
- Align the optical center of lens to center of the patient’s pupil
- It is important that the patient’s pupil is in the center of the lens

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**Vertex Setting**
(vertex distance is the distance from the cornea to the back of the lens)

- When the lens is farther from the eye it induces **PLUS power** (more plus or less minus)
- When the lens is closer to the eye it induces **MINUS power** (less plus or more minus)
Placing lenses in the trial frame

DO NOT STACK LENSES IF POSSIBLE
Stacked lenses cause optical aberrations

Sphere goes in the rear cell
Closest to the eye.

Cylinder goes in the front cell

Place the additional spheres in the rear cell if necessary

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Changing Lenses
Head turn to allow eccentric fixation
THE CROSS CYLINDER
Make up of the Cross Cylinder

+1.00 Cyl. X 90° combined with a -1.00 Cyl. X 180°
Important Features

Minus - Power X 180°

RED dots are positioned for the MINUS POWER AXIS

Effective power here is +/- 0.50D for the +/-1D Cross Cylinder.

The handle is situated at 45° between the two principal meridians of power or the location of their axis.

POWERS, of the cross cylinder are always EQUAL and OPPOSITE.

i.e.: +/- 0.25, +/-0.50, +/-0.75, +/-1.00

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Plus + Power X 90°

WHITE dots are positioned for the PLUS POWER AXIS
What the Cross Cylinder Produces

- The Cross Cylinder verifies that the image is focused on the retina and there is no residual astigmatism left uncorrected.
The effective cross cylinder “interval”

- **When the cylinder axis or power is incorrect:**
  - *FLIPPING* the cross cylinder creates image distortion
  - The interval (or distance between the images) is shorter in one flip compared to the second flip

- **The endpoint of the test is when the intervals are equal between flips**
  - This is when the patient states the images are “EQUALLY BLURRED” or “the same”
The Interval Effect

This cross cylinder position *increases* the astigmatic interval and expands the circle of least confusion. This makes the symbols on the chart look worse to the patient during the cross cylinder technique.

This cross cylinder position *decreases* the astigmatic interval and contracts the circle of least confusion. This makes the symbols on the chart look clearer to the patient during the cross cylinder technique.
Cross Cylinder Features
Adjusting the Cylinder Power

- You add **plus cylinder** when the patient prefers the **WHITE** dots aligned with the PLUS cylinder axis.
- You subtract **plus cylinder** when the patient prefers the **RED** dots aligned with the PLUS cylinder axis.
- You subtract **minus cylinder** when the patient prefers the **WHITE** dots aligned with the MINUS cylinder axis.
- You add **minus cylinder** when the patient prefers the **RED** dots aligned with the MINUS cylinder axis.
Non Standard Cross Cylinders

- Markings are different from standard power and “straddling the axis” positions
  - +/-0.25 CC has powers noted by green (+) and red (-) hash marks with no dots
  - +/- 0.50 CC & +/-1.00 CC have white dots & handle at the straddle position, green & red hash marks for power/axis positions

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Trial Lens Sets

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TRIAL LENS SETS – WHICH ONE?

- Look for full lens in the frame
  - Wire frame
  - Cylinder axis clearly defined
  - Plus & Minus lenses differentiated
  - Good range of sphere powers
When to use a trail frame

- Low Vision patients
- Patients with high powered spherical correction
- Children who can’t be fit with phoropter
- Anatomical face and head situations
- *Macular patients* or any patient with central vision problem
  - Allows patient to turn head for best vision
- **CLINICAL TRIALS**
SUMMARY

- Correct and comfortable trial frame adjustment is important
- Know how to fit the trial frame comfortably on the patient by adjusting the nose and ear piece
- Be familiar with the use loose lenses and of the hand held cross cylinder