Clinical Pearls
A Quick Guide to Crystalens® AO
Accommodating Lens

See better. Live better.
Crystalens AO is the premium IOL that provides unsurpassed vision quality across a more natural range. As the first and only FDA-approved accommodating IOL, Crystalens AO complements an active lifestyle with richness, crispness, and clarity.

This publication is provided as a resource to help you achieve optimum outcomes with Crystalens AO. A handy miniguide entitled “Pocket Pearls” is also included in a pocket in the inside-back cover.

**Patient Selection and Consideration**

**Indications**
- The Crystalens® accommodating lens is intended for primary implantation in the capsular bag of the eye for the visual correction of aphakia following the removal of a cataractous lens in adult patients with and without presbyopia.
- The Crystalens provides approximately one diopter of monocular accommodation, which provides quality vision over a more natural range.

**The Ideal Patient**
Crystalens AO is most appropriate for active patients who demand more from their vision. For such patients, Crystalens AO offers a more natural range of vision, making Crystalens AO ideal for:
- Low-contrast situations like night driving or viewing a movie or concert, versus a multifocal
- High-quality distance and midrange vision for certain sports or activities, using a computer, etc
- Functional near vision

In addition, Crystalens AO enables your patients to minimize the neuroadaptation, halos, and glare that may be associated with multifocals.

**Physical Attributes**
- Good ocular health
- Active lifestyle
- Realistic expectations
- Potential for good visual acuity (VA) in each eye
- Does the patient have corneal astigmatism?
  - Plan for treatment if over 0.75 D
  - Limbal-relaxing incisions can be performed during IOL implantation
  - Refractive enhancements can be done post-op (any necessary YAG capsulotomy should be completed prior to any refractive surgery)
  - VA outcomes may be enhanced by bilateral implantation
**Step 1. Pre-op Pearls**

**Pre-op Measurements**
- Use optical biometry and/or manual keratometry to obtain keratometric readings before any eyedrops, applanation, or corneal manipulation
- Use optical biometry and/or immersion ultrasonography to measure axial length
- Make sure AL and K readings correlate with oldest known refraction

**Pearls for Accurate Biometry**

**Things to consider before you start:**
- Measure K readings on an untouched clear cornea (no drops, applanations, etc).
- Take note of any dry eye or other ocular pathology that may affect the corneal surface and fixation.
- For contact lens wearers, ensure that contact lens use has been discontinued long enough to provide corneal stability. Take 2 readings, one week apart, showing stable measurements before accepting the measurement for IOL calculations.

**Keratometry**

**Manual**
- Make sure the keratometer is calibrated
- Focus the eyepiece before taking any measurements
- Take at least 3 readings per eye to ensure accuracy and consistency of measurements
- Have the patient blink frequently between measurements to avoid drying the cornea
- If the patient has dry eye, artificial tears may help you obtain more reliable measurements

**Optical Biometry**
- Run instrument calibration according to the manufacturer’s recommendation
- If the patient has dry eye, artificial tears may help you obtain more reliable measurements

**Axial Length Measurement**

**Immersion**
- Calibrate instrument according to the manufacturer’s recommendation.
- Make sure your machine is set properly.
  - Phakic, pseudophakic, etc
  - Gates and gain
- Patient fixation and probe alignment are important. When all 5 spikes (cornea, anterior lens surface, posterior lens surface, retina, and sclera) are high and steeply rising, you are most likely on the visual axis. Posterior to the sclera spike, you should see multiple spikes that drop off in height (orbital fat).
- If the scleral spike is missing and very few small spikes are observed posterior to the retinal spike, you are most likely measuring into the optic nerve.

**Optical Biometry**
- Make sure your machine is set properly
  - Phakic, pseudophakic, etc
- The patient should look directly at the fixation light
- You can maneuver the central focusing spot within the measurement reticule to obtain the best signal curve display
- You can defocus (in or out), if needed, to improve the display
**Lens Power Calculations**
- Use the SRK-T formula for eyes with axial lengths of 22.01 mm or longer
  - Recommended starting A-constant for Crystalens AO is 119.1
- Use the Holladay II formula for eyes with axial lengths of 22.0 mm or shorter
- The Holladay II formula is suggested for eyes with K readings flatter than 42.00 D or steeper than 47.00 D, independent of axial length
  - The manufacturer’s recommended starting ACD for Crystalens AO is 5.61

**Crystalens Nomogram for Short Eyes**

<table>
<thead>
<tr>
<th>Axial Length</th>
<th>Formula</th>
<th>Target to Achieve</th>
</tr>
</thead>
<tbody>
<tr>
<td>21.0 mm or less</td>
<td>Holladay II</td>
<td>+0.25 Plano -0.25</td>
</tr>
<tr>
<td>21.01 to 22.0 mm</td>
<td>Holladay II</td>
<td>-0.25 -0.50</td>
</tr>
</tbody>
</table>

**Targeting**
For Crystalens AO:
- Distance eye: Select a lens that predicts between plano and -0.25
- Near eye: Select a lens that targets between -0.25 and -0.50

Note: The lens power selection may have to be adjusted based on the refractive outcome of the first eye.

**For All Measurements**
- Reproducibility and accuracy are critical
  - Keratometry: Repeated measurements should be within 0.12 D in each meridian
  - Immersion: SD should be within 0.09 mm
- Do not hesitate to have a second examiner confirm measurements

**Putting It All Together**

**Keratometry**
- If there is a difference of > 0.50 D between OD/OS, does it correlate with the oldest known refraction?

**Axial Length**
- If there is a difference of > 0.3 mm between OD/OS, does it correlate with the oldest known refraction?

**Step 2. Surgical Pearls**

**Surgery Recommendations**
- Create a symmetrical capsulorhexis measuring 5.5 to 6.0 mm
- Polishing of the anterior and posterior capsule
- Crystalsert® injector requires a 2.85-mm opening
- When injecting, verify round leading right haptic
- Rotate lens at least 90 degrees
- Eye should be left at high normal pressure
- Ensure watertight wound and paracentesis (if needed, perform Seidel test)

**Step 3. Post-op Pearls**
- Measure day-1 post-op uncorrected distance visual acuity (UDVA); measuring uncorrected intermediate visual acuity (UIVA) and uncorrected near visual acuity (UNVA) is optional. On days 7 to 14 post-op, check UDVA, UIVA, and UNVA.
- Measure distance-corrected near VA
- Measure binocular acuities at all ranges after the second eye has been implanted to assess visual function
- Verify refractive findings with a cycloplegic refraction if VAs and refraction do not correlate or if near VA is not J3 or better
- Confirm on slit-lamp examination the vault (posterior, neutral, or anterior) and centration of Crystalens AO
- It is recommended to keep patients on anti-inflammatories for a minimum of 4 weeks
**Post-op Evaluations**

**Things to Consider**

- In the initial post-op period, the accommodative change between distance and near may be slow.
- Evaluate all distance measurements before doing intermediate and near measurements.

**Suggested Techniques for Post-op Evaluations**

- Measure the UDVA, giving the patient time to blink and focus.
- Determine the starting point for your maximum plus refraction.
  - Ensure that the UDVA and the target outcome correlate (refer to chart on page 10).
  - Autorefractors tend to over-minus—DO NOT use this sphere as your starting point.
  - K readings will indicate the approximate amount of corneal cylinder and the axis.
  - If performing retinoscopy, ensure that the patient is fixating on a letter on the chart and not on the retinoscope.
  - Use this information to determine your starting point in the phoropter.

- Tell the patient that the chart might appear blurred and see how far down the chart he or she can read.
- Isolate the line that is 2 lines above the lowest line that the patient can read. Slowly add plus sphere power until the line is fully blurred. It may take 1.50 to 2.00 D of additional plus sphere to accomplish this.
- Isolate the 20/25 line. Tell the patient it will be blurred. Slowly add minus until the patient can read it. Next, isolate the 20/20 line and add minus sphere in small steps. Only give minus if the patient can read more letters. Do not use the “which is better?” technique. By relying on letters read, you are making this a more objective test.
- Refine the cylinder axis and power with the Jackson Cross Cylinder.
  - Maintain spherical equivalent by adjusting 0.25 D of sphere for every 0.50 D of cylinder change.

- Have the patient read the smallest line possible.
- At this point, the patient has to “earn” any more minus. If he or she can read more letters, or if it is “definitely clearer,” then add minus. If he or she cannot see more letters, or if it is “darker and smaller,” then DO NOT add additional minus.
- Generally, you have reached your endpoint if adding a little plus makes the image blurred, and if adding minus makes it stay the same or darker. No matter how much the patient might like more minus, you have to stop unless it truly helps him or her see better. Do not hesitate to repeat fogging if you think it is necessary. Doing it now is faster and easier than coming back after the next set of steps. (You can add +1.00 D sphere, change the smallest line, and slowly reduce power by 0.25-D steps to see if you have the same endpoint.)
- Measure UIVA at 28" to 32" and then UNVA at 16", again giving the patient time to blink and focus.

**Corrected VA Assessments and Add Power**

- Measure all ranges of vision (distance, intermediate, and near) as above, but through the distance correction.
- With the near card at 16", slowly add plus over the distance correction in 0.25-D steps until the patient can read J1. If the add is more than +1.50 D, you may have over-minused the sphere.

**Things to Reconsider**

- Do the uncorrected VA results (all ranges) correlate with the refraction?
- If you think the patient may be over-minused and you cannot relax his or her accommodation, recheck the UDVA. If the vision has decreased since the start of the examination, ask the patient to relax and refocus at a distance target.

**Cycloplegic Refraction**

- If your patient is not reading J3 or better through the distance correction, you should do a cycloplegic refraction to rule out subtle hyperopia/over-minus/accommodative spasm.
- This is a very important step in assessing the true maximum plus refraction in an accommodating Crystalens AO patient.
- After following the steps above, give the patient 1 drop of cyclopentolate 1%. Wait 5 minutes and give a second drop. Wait 30 minutes. (The patient may dilate before he or she is actually cyclopleged.)
- Refine the refraction. Measure distance VA only.
**Target and Outcome Chart**

<table>
<thead>
<tr>
<th>Distance</th>
<th>Intermediate</th>
<th>Near</th>
<th>Spherical Equivalent</th>
</tr>
</thead>
<tbody>
<tr>
<td>20/60</td>
<td>20/20</td>
<td>J1+</td>
<td>-1.25</td>
</tr>
<tr>
<td>20/50</td>
<td>20/20</td>
<td>J1+</td>
<td>-1.00</td>
</tr>
<tr>
<td>20/40</td>
<td>20/20</td>
<td>J1+</td>
<td>-0.75</td>
</tr>
<tr>
<td>20/30</td>
<td>20/20</td>
<td>J1</td>
<td>-0.50</td>
</tr>
<tr>
<td>20/25</td>
<td>20/20</td>
<td>J2+</td>
<td>-0.25</td>
</tr>
<tr>
<td>20/20</td>
<td>20/20</td>
<td>J3</td>
<td>0.00</td>
</tr>
<tr>
<td>20/15-20</td>
<td>20/20</td>
<td>J3</td>
<td>+0.25</td>
</tr>
<tr>
<td>20/20-30</td>
<td>20/25</td>
<td>J5</td>
<td>+0.50</td>
</tr>
</tbody>
</table>

Note: If the results are different from the intended DVA or NVA, measure the patient’s actual refraction.

**SPECIFICATIONS**

*Product Specifications for Crystalens AO:*

- **Optic Diopter:** 5.0 mm
- **Shape:** Biconvex
- **Material:** Biosil

<table>
<thead>
<tr>
<th>Model</th>
<th>Recommended Starting A-Constant</th>
<th>Recommended Starting ACD</th>
<th>Overall Diameter</th>
<th>Diopter Power</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crystalens A0 AT50AO</td>
<td>119.1</td>
<td>5.61 mm</td>
<td>11.5 mm</td>
<td>+17 D to +33 D in 0.50-D steps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+18 D to +22 D in 0.25-D steps</td>
</tr>
<tr>
<td>Crystalens A0 AT52AO</td>
<td>119.1</td>
<td>5.61 mm</td>
<td>12.0 mm</td>
<td>+4 D to +9 D in 1.0-D steps</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td>+10 D to +24 D in 0.50-D steps</td>
</tr>
</tbody>
</table>
CALL FOR OUR QUICK-START KIT
For customer service, call:
1-800-338-2020, 5:00 AM to 5:00 PM (PT)
For clinical support or assistance with IOL calculations, call:
1-888-393-6642, 6:00 AM to 7:00 PM (ET)
For DataLink/SurgiVision, go to:
https://svc.surgivision.net/sdl/iol/aspx/login.aspx


Crystalens® AO
Accommodating Posterior Chamber Intraocular Lens

BRIEF STATEMENT

Rx only.
Indications for Use: The Crystalens® is intended for primary implantation in the capsular bag of the eye for the visual correction of aphakia secondary to the removal of a cataractous lens in adult patients with and without presbyopia. The Crystalens® provides approximately one diopter of monocular accommodation which allows for near, intermediate, and distance vision without spectacles.

Warnings: Careful preoperative evaluation and sound clinical judgment should be used by the surgeon to decide the risk/benefit ratio before implanting a lens in a patient. Some adverse events which have been associated with the implantation of intraocular lenses are: hypopyon, intraocular infection, acute corneal decompensation, and secondary surgical intervention.

Precautions: Do not resterilize; do not store over 45°C.

ATTENTION: Refer to the Physician Labeling for complete prescribing information.

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