

Clinical Pearls

A Quick Guide To Crystalens®



Crystalens® 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.

This resource is intended for use by physicians and other healthcare professionals involved in patient care. It is not intended and should not be construed as medical advice, nor is it intended to replace sound clinical judgment in the delivery of healthcare services. All medical and clinical data contained or made available in this resource is intended to supplement the knowledge of physicians and other healthcare professionals involved in patient care. The absence of a warning for a given procedure, technique or suggestion contained in this resource should not be construed to indicate that such procedure, technique or suggestion is safe, appropriate or effective in any given patient.

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Patient Selection And Consideration

Indications

- Crystalens is indicated for the visual correction of aphakia in adult patients with cataracts
- It provides improved near, intermediate, and distance vision with a reduced dependence on glasses

The Ideal Patient

Physical Attributes

- Good ocular health
- Potential for good visual acuity in each eye
- Does the patient have corneal astigmatism?
 - Plan for treatment if over 0.75 D
 - Limbal relaxing incisions can be done during IOL implantation
 - Refractive enhancements can be done three months post-op (Any necessary YAG capsulotomy should be done prior to any refractive surgery)
 - Visual acuity outcomes will be enhanced by bilateral implantation

Psychological Attributes

- Type A- (or less)
- Realistic expectations



Pre-Op Suggestions

Pre-Op Measurements

- Use the IOL Master and/or manual keratometry to obtain keratometric readings before any eye drops, applanation, or corneal manipulation
 - For contact lens wearers, contact lenses must be removed long enough to allow the cornea to return to a stable state
- Use the IOL Master and/or immersion ultrasonography to measure axial length
- Make sure As and Ks correlate with oldest known refraction

Lens Power Calculations And Targeting

Crystalens Nomogram

Model	Axial Length	Formula	Target To Achieve		
			Plano	-0.25	-0.50
HD & Five-O	21.0 mm or Less	Holladay II	-0.50	-0.75	-1.00
HD & Five-O	21.01 mm to 22.0 mm	Holladay II	-0.25	-0.50	-0.75
HD & Five-O	22.01 mm and Greater	SRK-T	Plano	-0.25	-0.50
HD & Five-O	22.01 mm & Greater and Ks between 42.00-47.00	SRK-T	Plano	-0.25	-0.50
HD & Five-O	22.01 mm & Greater and Ks <42.00 & >47.00	Holladay II	Plano	-0.25	-0.50

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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 ocular pathology that may affect the corneal surface and fixation
- For contact lens wearers, ensure that the lenses have been removed long enough and the corneas are stable
 - Take two readings one week apart showing stable measurements before accepting the measurement for IOL calculations
- If the patient is pseudophakic and axial length is being verified postoperatively, ensure that the velocity is set for the IOL material

Keratometry

Manual

- Make sure the keratometer is calibrated on a regular basis
- Focus the ocular before taking any measurements
- Take as many measurements as you need — at least three — to get a good solid average
- Have the patient blink frequently between measurements to avoid drying the cornea
- If the patient has dry eye, artificial tears may help obtain more reliable measurements

IOL Master

- Alignment is important; make sure all six measuring points are visible and between the two auxiliary circles
- The six measuring points must be in focus
- Have the patient blink a few times and open wide before pressing the button
- If the patient has dry eye, artificial tears may help obtain more reliable measurements

Axial Length Measurement

Immersion

- Make sure your machine is set properly
 - Phakic, pseudophakic, etc.
 - Gates and gain
- Patient fixation is important. When all five 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 scleral 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

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Surgical And Post-Op Pearls

Surgery Recommendations

Lens Power Calculations

- The SRK-T formula will be used for eyes with axial lengths measuring 22.01 mm or longer
 - A constant for all Crystalens models is 119.0
- The Holladay II formula will be used for eyes with axial lengths measuring 22.0 mm or shorter
- The Holladay II is suggested for eyes with Ks flatter than 42.00 D or steeper than 47.00 D independent of axial length
 - Manufacturer's ACD for all Crystalens models is 5.55

Targeting

- Non-dominant eye; select a lens that will result in -0.25 post-op*
- Dominant eye; select a lens that predicts an outcome of plano post-op*

*For the Five-O™, use -0.50 for the non-dominant eye and target between plano and -0.25 for the dominant eye.

Surgical And Post-Op

- Create a symmetrical capsulorhexis measuring 5.5 mm to 6.0 mm
- Ensure that both plates and all four haptics are secure in the capsule
- Ensure that the Crystalens maintains a posterior position and is well centered
- Post-op Day 1, and Days 10 to 14: perform testing listed on the DataLink form and submit or enter findings
 - Measure distance corrected near visual acuity (VA)
 - Measure VAs OU at all ranges after second eye to assess visual function
 - Verify refractive findings with a cycloplegic refraction when VAs and refraction do not correlate or if near visual acuity is not J3 or better
- It is important to keep post-op patients on a regular regimen of steroids and NSAIDs after surgery

IOL Master

- Make sure your machine is set properly
 - Phakic, pseudophakic, etc.
- The patient should center on the red 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
- Signal to Noise Ratio (SNR) should be above 2.0

For All Measurements

- Reproducibility and accuracy are absolute requirements
 - Keratometry: repeated measurements within 0.12 D in each meridian
 - Immersion: SD should be within 0.09 mm
 - IOL Master: at least 4/20 measurements must be within 0.02 mm, with good signal curve display and SNR >2.0
- Do not hesitate to have a second examiner confirm your measurements

6 Putting It All Together

Keratometry

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

Axial Length

- The axial length must correlate with the oldest known refraction
- If there is a difference of >0.3 mm between OD/OS, does it correlate with the oldest known refraction?

Post-Op Evaluations

Things To Consider

- In the initial post-op period, the accommodative change between distance and near may be slow
- Because Crystalens patients can accommodate, you should refract them as you would a young myope — which is very different from your normal post-op routine
- Before the exam, most patients are sitting in the waiting room reading — which means they are probably accommodating
- Evaluate all distance measurements before doing intermediate and near

Suggested Techniques For Post-Op Evaluations

- Measure the uncorrected distance visual acuity (UCDVA), giving the patient time to blink and focus
- Determine the starting point for your maximum plus refraction
 - Ensure that the UCDVA and the target outcome correlate (Refer to chart on page 10)
 - Auto-refractors tend to over-minus. DO NOT use this sphere as your starting point
 - K readings will indicate the approximate amount of 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 it might appear blurred and see how far down the chart they can read
- Isolate the line that is two 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 D 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 they can read more letters, or if it is “definitely clearer,” they get it. If they cannot see more letters, or if it is “darker and smaller,” they DO NOT get additional minus
- Generally, you have reached your endpoint if adding a little plus makes the image blurred, and if you add minus, it stays the same or darker. No matter how much they might *like* more minus, you have to stop unless it truly helps them see better. Do not hesitate to repeat fogging if you think it is necessary. It is faster and easier to do it now, rather 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 uncorrected intermediate visual acuity (UCIVA) at 28" to 32" and then uncorrected near visual acuity (UCNVA) 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 Re-Consider

- Do the uncorrected visions (all ranges) correlate with the refraction?
- If you think the patient may be over-minused and you can't “undo” it, recheck the UCDVA. If the vision has decreased since the start of the exam, 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 must 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 patient
- After following the steps above, give the patient Cyclogyl® 1%, 1 drop q5min x2. Wait a full 30 minutes. (The patient may dilate before they are actually cyclopleged)
- Refine the refraction. Measure distance VA only

Suggested Targeting

Distance	Intermediate	Near	Spherical Equivalent
20/40	20/20	J1	-0.75
20/30	20/20	J2+	-0.50
20/25	20/20	J2	-0.25
20/15	20/20	J3+	0.00

SPECIFICATIONS

Crystalens IOL

Available Powers:

Crystalens HD™

10 to 33 D in 0.50-D steps

Crystalens Five-O

4 to 9 D in 1-D steps

10 to 16 D in 0.50-D steps

16.25 to 26.75 D in 0.25-D steps

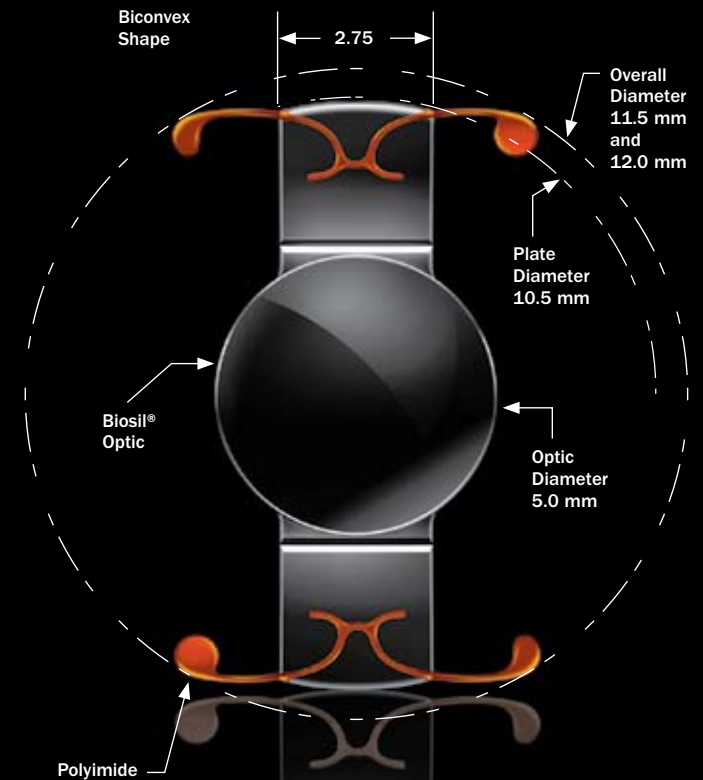
27 to 33 D in 0.50-D steps

Product Specifications:

Diameter:	5.0 mm
Shape:	Biconvex
Material:	Biosil®
A Constant:	119.0
Refractive Index:	1.428
ACD:	5.55 mm
Overall Length:	AT52SE – 4.00 to 16.75 D – 12.0 mm HD520 – 10.00 to 16.5 D – 12.0 mm AT50SE – 17.0 to 33.0 D – 11.5 mm HD500 – 17.0 to 33.0 D – 11.5 mm

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