

# ***Keratoconus Treatment With The Latest, Most Advanced Avedro KXL Laser System From USA***



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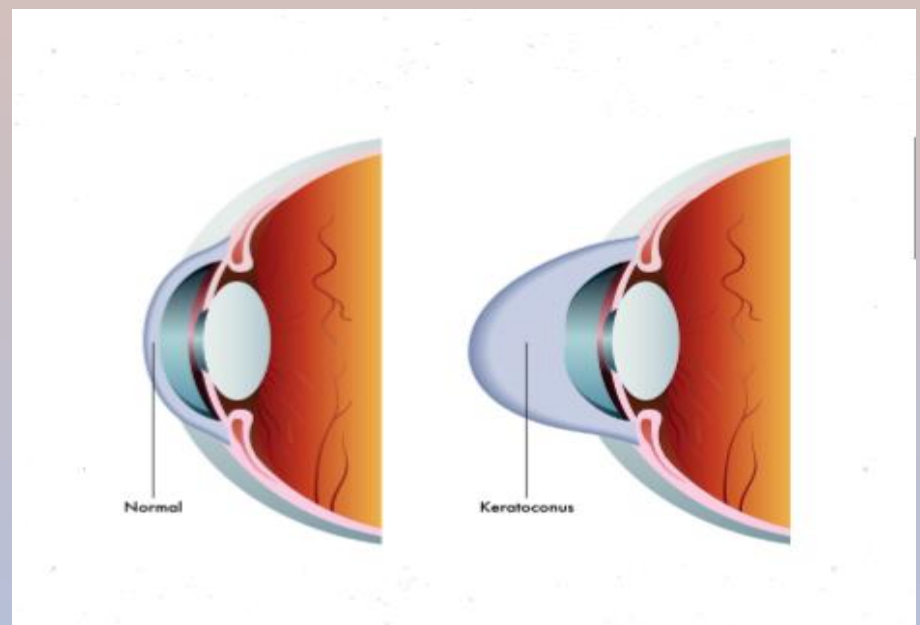
# What Is Keratoconus



- Normally your cornea, the clear outer lens or "windshield" of the eye, has a dome shape, like a ball. Sometimes the structure isn't strong enough to hold its round shape and it bulges outward, like a cone. This is called Keratoconus.
- Tiny fibers of protein in your eye called collagen help hold your cornea in place. When these fibers get weak, they can't hold their shape. Your cornea gets more and more cone-like.
- It happens when you don't have enough protective antioxidants in your cornea. Its cells produce harmful by products, the same way a car puts out exhaust. Normally, antioxidants get rid of them and protect the collagen fibers. But if levels are low, the collagen weakens.
- **What Causes KERATOCONUS**
- **Family History:** If someone in your family has this condition, you have a greater chance of getting it yourself. If you have it, be sure to get your children's eyes checked for signs starting around age 10.
- **Age:** It usually starts when you're a teenager. But it might show up earlier in childhood or not until you're 30. It can also affect people 40 and older, but that's less common.
- **Inflammation:** Inflammation from things like allergies or asthma, or atopic eye disease can break down the tissue of the cornea.
- **Eye rubbing:** Rubbing your eyes hard over time can break down the cornea. It can also make keratoconus progress faster if you already have it.

# What Are the Symptoms?

- Keratoconus changes your vision in many ways:
- As the cornea changes shape from a ball to a cone, the smooth surface becomes wavy. This is called irregular astigmatism
- As the front expands, your vision becomes more near-sighted. That means you can see objects clearly only when they're up close. Anything too far away looks like a blur.
- An eye doctor may spot the signs during an eye exam. You should also mention symptoms like:
  - Double vision when looking with just one eye
  - Objects both near and far that look blurry
  - Bright lights that appear to have haloes around them
  - Light streaks
  - Triple ghost images
  - Blurry vision that makes it hard to drive



# All About The Cross Linking Treatment For Keratoconus

- How effective is collagen cross-linking?
- It is now widely agreed that corneal collagen cross-linking (CXL) is **the only effective treatment for keratoconus** because of its ability to halt the pathological progression of the disease. It has also been suggested that standard CXL may have an additional but unpredictable refractive effect. hence the new Avedro KXL System system helps in stabilizing the keratoconus even in severe cases
- In the most basic sense, corneal cross-linking is a treatment where riboflavin drops are applied to and absorbed by the cornea.
- An ultraviolet light treatment is then applied to the eye, causing a reaction within the corneal stroma to create bonds called cross-links.
- Those bonds stiffen and strengthen the cornea so it stops thinning, weakening and distorting.

BEFORE CXL : LESS CROSSLINKING  
= WEAKER CORNEA



AFTER CXL : MORE CROSSLINKING  
= STRONGER CORNEA



# More about Crosslinking

## • **Side effects of Cross linking**

- Feeling like something is in your eye (called “foreign body sensation”).
- Being sensitive to light.
- Having dry eye.
- Having hazy or blurry vision.
- Feeling eye discomfort or mild eye pain

## • **How long does cross-linking last?**

- How long does cross-linking treatment last? The cornea is completely rebuilt every **7–8 years**.
- The younger the patient is at the first cross-linking, the higher the likelihood that they will need a second treatment after seven or eight years.

## • **What can I expect after the procedure?**

- You should not rub your eyes for the first 1-2 weeks after the procedure.
- You may notice a sensitivity to light or a foreign body sensation as well as some discomfort in the treated eye.
- A minority of patients will actually experience significant pain for several days. You may take over the counter pain medications and your doctor may give you a prescription for a few days of prescription pain pills.
- In general, most patients are relatively comfortable within a few days.
- Antibiotic and steroid eye drops will be used for about a month.

# Avedro KXL System Corneal Cross-linking Device

- Avedro's KXL System is the only FDA approved cross-linking device:
  - - UVA Irradiation: 30 minutes at 3mW/cm<sup>2</sup>.
  - - Laser alignment for patient positioning.
  - - Wireless control for beam alignment in the X,Y and Z axes.
  - - Fully-integrated stable delivery platform.
  - - Touch screen operation.
  - - Self-calibration of UVA irradiation intensity.



# What is the new Accelerated system on the Avedro KXL system

- The KXL System achieves Accelerated Cross-Linking in minutes by increasing the UVA power and reducing the exposure time while maintaining the same total energy on the eye as standard cross-linking
- **How long does cross-linking treatment last?**  
The cornea is completely rebuilt every **7–8 years**. The younger the patient is at the first cross-linking, the higher the likelihood that they will need a second treatment after seven or eight years.

## Accelerated cross-linking with Avedro KXL System

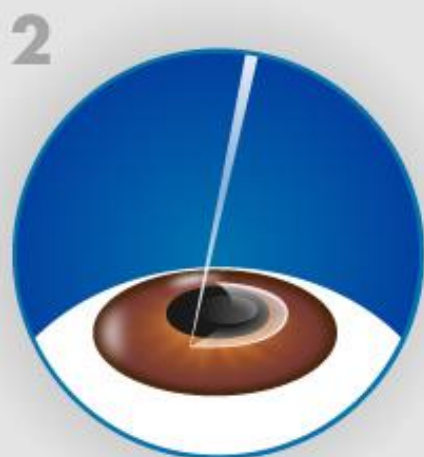
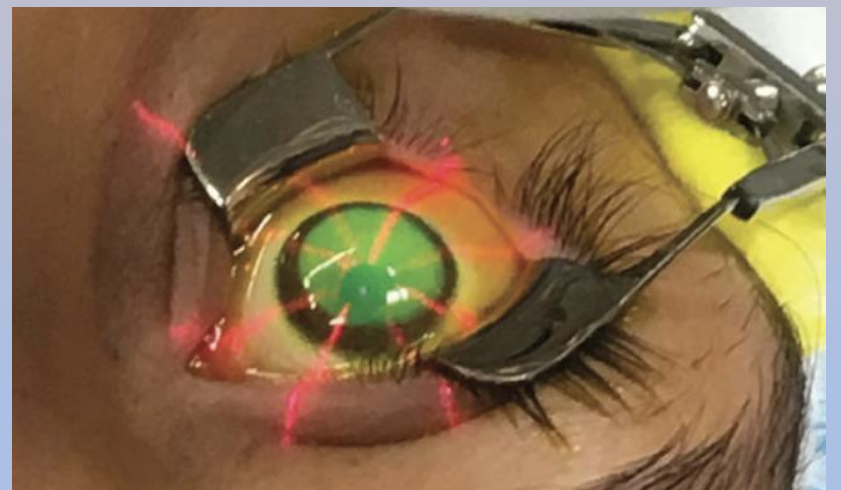
This procedure is much the same as standard epithelium-off CXL except it uses a higher powered UV light for a shorter period of time. Trans epithelial CXL UV light are applied thereby making the procedure painless.

By minimising the UV treatment time to only 3 minutes, patient comfort can be maximised and anxiety.

This procedure is ideal for small levels of keratoconus, in sensitive patients, and in young children.

# How does LASIK Xtra work?

- The procedure involves a combination of Ultraviolet A (UVA) light and riboflavin (vitamin B). The former is an invisible light ray normally provided by the sun and responsible for the body's tanning process.
- Using the new Avedro KXL system we are using corneal cross-linking in combination with LASIK. Called LASIK Xtra, through this procedure the cornea is stabilized at the same time they are receiving LASIK to help prevent the risk of ectasia.





# Benefits Of Lasik Xtra With The Avedro KXL System

- **Benefits of LASIK Xtra**  
By far the largest benefit from LASIK Xtra surgery is the fact it lengthens the effectiveness of the surgery. In other words there is less likelihood of follow-up laser eye surgery being required 10 or 20 years down the line.
- This is referred to as the “stabilizing effect” where the Xtra technique “locks-in a prescription following surgery.” In LASIK without the Xtra surgery, he said, the cornea often attempted to revert to its original shape resulting in the necessity for follow-up surgery some years later.
- Eye patients whose short or long-sightedness was so severe that it excluded them from the LASIK procedure, may now be able to benefit when LASIK Xtra is used. It provides not just long-term stability, but also “enhanced safety” for patients that he treated with LASIK.
- **How is Lasik Xtra done on the Avedro system**
- The patient first undergoes the original LASIK operation where an anaesthetic is applied to the eye and a flap cut into the cornea in one of two ways – either using a femtosecond laser or a microkeratome tool. The flap is lifted and the excimer laser reshapes the cornea to correct the way in which light reaches the eye. In doing so the patient’s short or long-sightedness is much improved.
- The next step, when the LASIK Xtra is included, involves riboflavin eye-drops being dropped onto the cornea. The eye drops are then allowed to soak for a couple of minutes after which the cornea is thin.

# About your surgeon

## •Prof. Dr. Keiki R. Mehta

•M.B.B.S., D.O.M.S., M.S.(Ophth), D.O. (Ireland)  
D.O. (London), F.R.S.H. (London), F.I.O.S.(U.S.A.)

•**Chief Surgical & Medical Director,  
Mehta International Eye Institute.**



Dr. Keiki R. Mehta, receiving the Padmashree Award by the President of India, Smt. Pratibha Patil for his exemplary surgical skills and his outstanding contribution to Ophthalmology

• **Prof. Dr. Keiki R. Mehta is India's foremost Consultant Ophthalmic Surgeon, and is The Surgical Chief & Medical Director of The Mehta International Eye Institute, Colaba, Mumbai, considered to be Asia's most advanced and foremost Ophthalmic Institute, and specializes in **Cataract, LASIK, Glaucoma, Squint, Lazy Eyes, Keratoconus, Retinal surgeries and treatment.** An outstanding researcher and clinician, he has extensive experience of Excimer Laser, PRK and LASIK techniques which **he has done on over 11000 patients over the last 15 years****

• **He has pioneered, in India, the commencement of Intraocular implants, Phacoemulsification Cataract surgery.**

• **He is the winner of 11 Gold Medals in India, having received virtually all the Honors possible, has been the President of the All India Ophthalmologists Association and President of the Intraocular Implant and Refractive Society among many others. Chairman and Organizing Secretary of the very successful Eye Advance Congresses for the last 12 years 1996- 2008. These have now reached an iconic status and are recognized worldwide**

• **The American implant Society awarded him its Appreciation Award, at San Francisco for pioneering Soft intraocular implants for the first time in the world. He has received Grand Honors Award from the National Eye Research Foundation, Chicago, USA, the only Indian to be ever awarded. Presented the prestigious Lim international Award from the Asia Pacific intraocular implant Association for outstanding work in Ophthalmology in the Asia Pacific Region, the only India to be presented this award. Awarded the Triple Ribbon Award of the American Society for Cataract and Refractive Surgery, USA, for Outstanding Research presentations in Ophthalmology. Presented the Outstanding Recognition Award by international Council of Cataract Surgeons for Outstanding Research & Development in Cataract Surgery, award presented at Barcelona, Spain**

• **He is the only Indian to be elected a Member of the Legion d' Honor of the Institute Barraquer, Barcelona, Spain**

• **Prof. Dr. Keiki Mehta is the only distinguished Indian Ophthalmic surgeon to be ever invited to Operate Live at Video Cataracta in Milan, Italy, where only the best of the best are invited, at Europe's biggest Live Surgery Conference**

• **Presented advanced research papers on Lasik internationally and won the Outstanding Presentation Award at San Diego, USA**

• **Prof. Dr. Keiki R. Mehta is considered India's foremost Ophthalmic surgeon, and has conducted Live Surgical workshops in every major city in India, and has trained thousands of doctors in intraocular implant surgery and Phacoemulsification and Laser refractive surgery including Lasik**

• **He is Honorary Visiting Professor at ONO Eye Hospital in Geneva, Switzerland and St. Luke's institute, Texas, USA**

• **He is the Consultant Ophthalmic Surgeon to the Governor of Maharashtra, to the Armed Forces, Government of India and to the Maharashtra Police.**

• **Awarded *PadmaShree* by the President of India in 2008 for his exemplary surgical skills and his outstanding achievements and research in Ophthalmology**



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