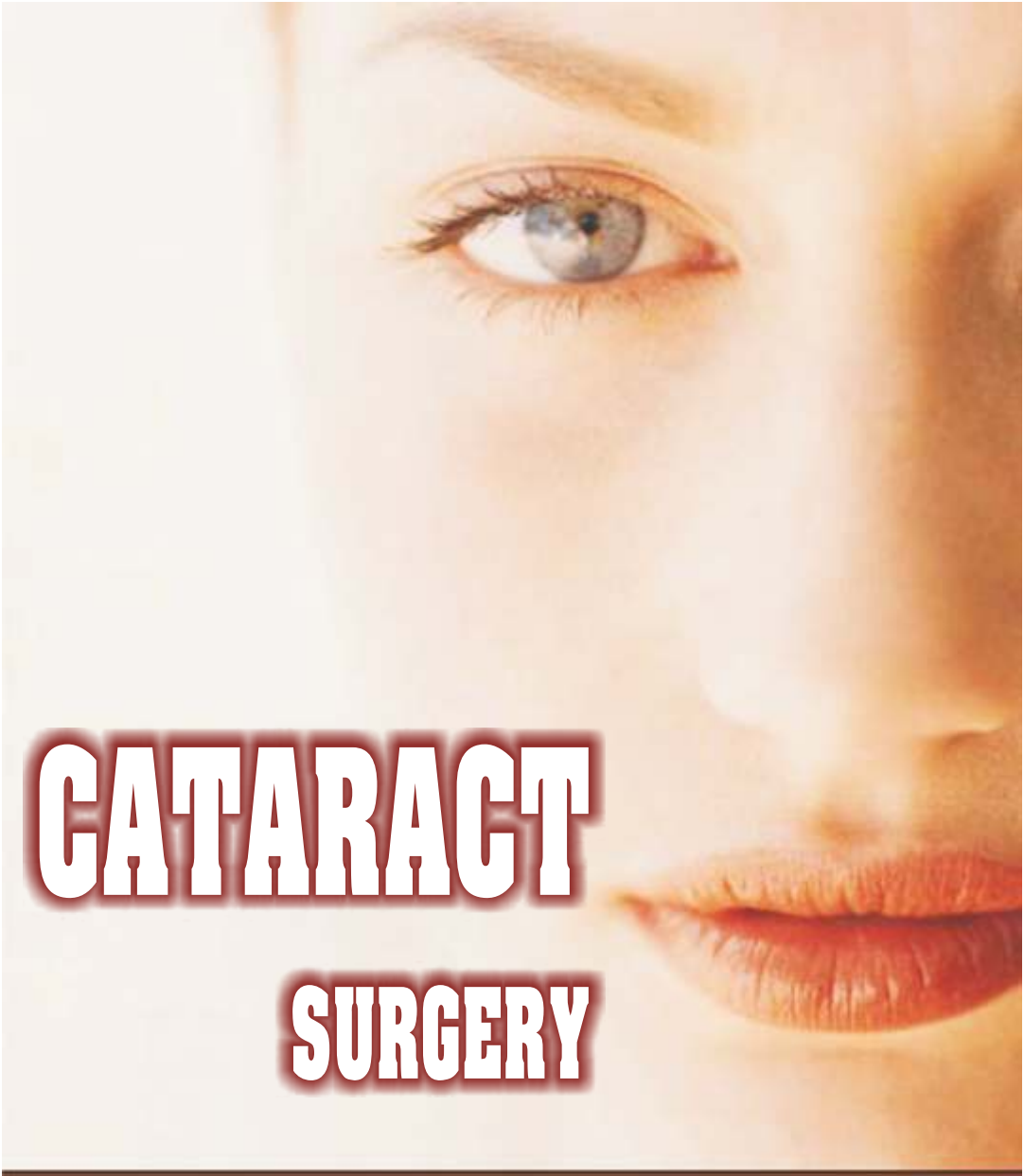
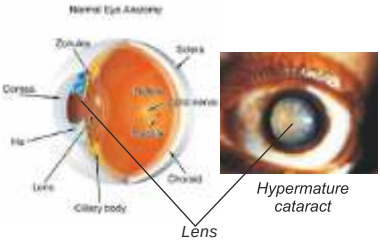


CATARACT SURGERY

This booklet is for people with cataract and their families and friends. It provides information about different types of cataracts and their problems.

This booklet answers questions about the causes and symptoms of the disorder and discusses diagnosis and types of treatment, and the latest techniques for cataract removal.



Hypermature cataract

Vision through a clear eye

Vision through a cataract

Normal view

View through a cataract

Clear veiw & View thro cataract

Visual acuity test

- **What is a cataract?**

  A cataract is a clouding of the lens in the eye that affects vision. Most cataracts are related to aging. Cataracts are very common in older people. By age 60, more than half of all Indian patients have either developed a cataract or have had cataract surgery.

  A cataract can occur in one or both eyes. It cannot spread from one eye to the other.
- **What is the lens?**

  The lens is a clear part of the eye that helps to focus light, or an image, on the retina. The retina is the light-sensitive tissue at the back of the eye. In a normal eye, light passes through the transparent lens to the retina. Once it reaches the retina, light is changed into electrical signals that are sent via the optic nerve to the brain. The lens must be clear for the retina to receive a sharp image. If the lens is cloudy from a cataract, the image you see will be blurred.
- **What are the symptoms of a cataract?**

  The most common symptoms of a cataract are:
- Cloudy or blurry vision, decreased reading vision.
- Colors seem faded.
- Glare, Headlights, lamps, or sunlight may appear too bright.
- A halo may appear around lights.
- Poor night vision.
- Double vision or multiple images in one eye. (This symptom may clear as the cataract gets larger.)
- Frequent prescription changes in your eyeglasses or contact lenses.
- **Are there other types of cataract?**
- Yes. Although most cataracts are related to aging, there are other types of cataracts.
- Secondary cataract: Cataracts can form after surgery for other eye problems, such as glaucoma. Cataracts also can develop in people who have other health problems, such as diabetes. Cataracts are sometimes linked to steroid use.
- Traumatic cataract: Cataracts can develop after an eye injury, sometimes years later.
- Congenital cataract: Some babies are born with cataracts or develop them in childhood, often in both eyes. These cataracts may be so small that they do not affect vision. If they do, the lenses may need to be removed.
- Radiation cataract: Cataracts can develop after exposure to some types of radiation.

- **How is a cataract detected and fully evaluated ?**

  Cataract is detected through a comprehensive eye examination that includes:
- **Visual acuity test:** This eye chart test measures how well you see at various distances and prescribes the correct spectacles after checking the details with an Auto Refractor.
- **Slit Lamp Biomicroscope evaluation:** Using a high powered microscope the eye is examined in detail and the cataract is evaluated, with its density and any complicating circumstances.
- **Retinal Examination:** Drops are placed in your eyes to widen, or dilate, the pupils. Subsequently with a indirect ophthalmoscope which enlarges the retinal image, your retina and optic nerves are assessed for signs of damage and

other eye problems.

- **Tonometry:** The doctor will test your eye pressure with an airpuff pneumotonometer. Alternatively an instrument that measures the pressure called an Applanation tonometer can be placed on the clear cornea after applying numbing drops.
- **Contrast Sensitivity testing:** Utilizing special charts with a grating system the doctor can tell how far the cataract has developed and even the speed of development and when he would expect the cataract would be ready for removal.
- **Ultrasound B Scan Sonography:** If the cataract is very dense it is not possible to know what is the status of the retina. In this circumstance the doctor will use a B Scan device which uses ultrasound to image the retina. Unfortunately, it can only tell if the retina is in place , but not if it functions or if there is any pathology like macular degeneration.
- **Specular Microscopy:** And finally the cells on the inner side of the cornea are assessed to be sure that they would not be affected by the energy used to remove the cataract. If they are weak, then a special protective viscous liquid is used during cataract surgery.
- **A Scan Sonography:** This is done to evaluate the exact power of the implant which, when placed in your eye will bring the resultant power to a range of +/- 1.5D.

A common question often by patients is why even with the most sophisticated biometry units, still the power of the eye, following surgery does not go down to zero. The reason is simple. The implant is fitted in the eye, behind the pupil, into soft tissue. A difference of 1mm in the accuracy of the fitting leaves a result of almost +/- 3.00. Thus the accuracy of a third of a millimeter is the maximum one can expect. In addition some astigmatism is expected as the healing process of an eye is an unknown factor and cannot be exactly predicted. Hence a little astigmatism which normally decreases with time is also expected.

Are there different types of cataract surgery?

There are four types of cataract surgeries. Your doctor can explain the differences and help determine which is better for you.

A cataract is essentially an opaque lens which consists of a thin capsule outside and fat nucleus (like the kernel of a fruit) inside surrounded by soft cortex.

Intracapsular Cataract Surgery: Here the nucleus is removed with the capsule. This was a way of doing a cataract almost 35 years ago. To do it, half the eye was cut open, to almost 180 degrees. Still done rarely, but only if the lens is dislocated.

Extracapsular surgery : Your doctor makes a longer incision on the side of the cornea and removes the cloudy core of the lens in one piece. The rest of the lens is removed by suction.

Phacoemulsification, or phaco: A small incision is made on the side of the cornea, the clear, dome-shaped surface that covers the front of the eye. Your doctor inserts a tiny probe into the eye. This device emits ultrasound waves that soften and break up the lens so that it can be removed by suction. Most cataract surgeries today are done by phacoemulsification. The technique of Phacoemulsification was pioneered in India by Dr. Keiki R. Mehta in 1986 which is why he is called the "Father of Indian Phacoemulsification". Dr. Keiki Mehta has operated live at different venues in India and even in Europe.

Slit lamp biomicroscope

Indirect ophthalmoscope

Automated Refractometer

Air puff Pneumo tonometer

Contrast charts

Ultrasound B Scan

Computerised Specular Microscope (First in Mumbai)

A Scan Immersion Biometer

High Powered Swiss Operating microscope

The latest Cataract machine The "Infiniti" with the surgeon

No-stitch, Self Sealing Incision Surgery

Traditional Incisio | One Stitch Incisior | Clear Cornea Self Sealing Incision

Ultrasound technology (phacoemulsification or "phaco") is often used to remove a cataract.

Dr. Keiki R. Mehta performing AquaLase

With "phaco", the probe is inserted through a small 1/8 opening (instead of a relatively wide incision) created with a specific self sealing technique.

The new techniques place the incision into the cornea (clear part of the eye that covers the iris or colored portion of the eye) just next to the sclera (white part of the eye).

Success Rates

It is estimated that you have a 97-98% chance of an excellent surgical result and a 1% chance of achieving no improvement and/or worse vision.

Microphako: Microphaco is an advancement of the normal phaco technique where by the incision size is reduced still further to only 1.2 mm. the advantage being the recovery is far faster and that the person may rejoin his normal duties from the very next day onwards. The disadvantage of the procedure is that it is only amenable to soft cataracts and that the implant costs much more. There are no multifocals available for these very fine incisions and microphaco is done only in special circumstances.

Infiniti AquaLase Cataract Surgery: A new technique whereby the cataract is dissolved using only high energy microbursts of warmed water in the eye. It is very safe as it cannot damage the tissue in the eye, however restricted to softer cataracts. AquaLase is available since 2004 for the first time in India at The Mehta International Eye Institute.

The First Infiniti system with AquaLase was bought by Mehta International Eye Institute. Dr. Keiki Mehta has specially been trained in USA for AquaLase.

Why Infiniti is the most advanced, latest instrument for Cataract surgery? What does it do?

The Infiniti Cataract removal system: A revolutionary new surgical device for safer, cataract surgery, it puts unprecedented precision, perfection and performance to and virtual total safety in cataract surgery.

This system utilizes a revolutionary new device termed the Aqualaser Liquifactor. AquaLase® Liquefaction Device is part of the Infiniti™ Vision System, the world's first tri-model cataract removal surgical instrument.

This single instrument now allows surgeons to choose from three different methods to remove a cataract. These are:

1. Advanced ultrasound phacoemulsification alone with, the ability to use micropulses or hyperpulses.
2. The combination of ultrasound and oscillation energy provided by the NeoSonix® headpiece.
3. New AquaLase® liquefaction device which, utilizes a micro fluid, high energy pulses, of only five milliseconds, which gently and with great safety, dissolves the cataract.

The Infiniti system uses a sensitive intelligent high-end computer interface with digital control, pressure sensors monitoring in real time, enhancing safety.

The greatest advantage of the new machine, of course with AquaLaser liquifactor device is that it dramatically reduces the potential for complication thanks to its innovative soft, fluid pulses. This new advancement in lens removal technology is a quantum leap forward and significantly improves results following cataract surgery.

What happens before surgery?

You will be asked to eat a light, oil free breakfast prior coming to the operating room. You can have water or tea once or twice in the morning, but do not overdo it. If you are diabetic, your sugar will be rechecked just prior the surgery with the fast, one prick, method.

Have a head bath a day earlier, wash your face and eyes thoroughly the morning of the surgery. Naturally no eye makeup or kajal/surma. No bindu or Kumkum.

What happens during surgery?

At the operating facility, drops will be put into your eye to dilate the pupil. The area around your eye will be washed and cleansed with antibiotic solution.

The operation, Phaco or AquaLase usually lasts about 7-10 minutes, and is virtually painless. Many people choose to stay awake during surgery. Others may opt to be put to sleep for a short time. If you are awake, you will have an anesthetic solution to numb the nerves in and around your eye.

After the operation, a protective sterile clean plastic shield or glasses will be placed over your eye. You will rest for a while. Your medical team will watch for any problems, such as pain or any bleeding. Most people who have cataract surgery can go home two hours following surgery. You will need someone to accompany you or drive you home.

What happens after surgery?

Itching and mild discomforts are normal after cataract surgery. Some fluid discharge especially on the first day, is also common. Your eye may be sensitive to light and touch. You may see objects coloured on the first day. After two to four days, moderate discomfort should disappear.

No water must be applied inside the eye for 10 days though you can have a head bath with eyes closed after 4 days.

When you are home, try not to bend from the waist to pick up objects on the floor. Do not lift any heavy objects. You can walk, climb stairs, cook; but for 10 days do light household chores.

In most cases, healing will be complete within four weeks. Your doctor will schedule exams to check on your progress.

For three months after surgery, your doctor will ask you to use eyedrops to help healing and decrease the risk of infection. You will need to wear an eye shield or eyeglasses to help protect your eye. Avoid rubbing or pressing on your eye.

What type of IOL should I implant in the eye.

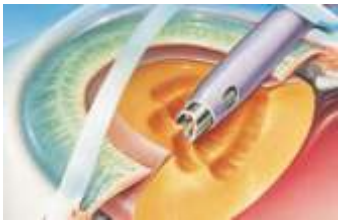
Intraocular lenses, commonly called IOLs, may be one of the most important ophthalmic developments in the past 30 years. These tiny prescription lenses are placed inside the eye during cataract extraction, replacing the eye's natural lens (called a cataract when it becomes clouded). Prior to the development of IOLs, cataract patients were forced to wear thick "soda-water bottle" glasses or contact lenses after the surgery. They were essentially blind without their glasses.

Today, patients receiving IOLs often enjoy the best vision of their lives. Thanks to sophisticated formulas used to calculate the corrective prescription power of the lens, the IOL not only replaces the need for thick glasses, but it can also correct the eye's existing refractive error.

There are two basic types of IOLs : foldable and hard.

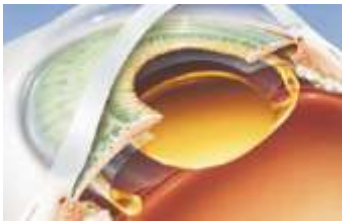
The "**INFINITI**" Cataract Machine
(First in India)

Sterile protective glasses
Will be given following The surgery



Phaco removal of cataract

Foldable IOL being implanted

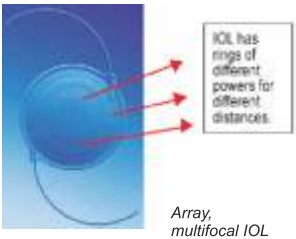


Foldable IOL in the eye.

Acrysof "Natural" foldable IOL

Iris clip IOL

Multifocal IOL's



Array, multifocal IOL

Acrytec multifocal IOL

HumanOptic Accommodative IOL

Foldable lenses are made of silicone or acrylic and can be rolled up and placed inside a tiny tube. The tube is inserted through a very small incision – less than 2.5 mm in length. Once inside the eye, the IOL gently unfolds. Hard plastic lenses are appropriate in certain circumstances determined by the surgeon. Since they cannot be folded, they are placed through a slightly larger incision.

- The first intraocular implant in regular practice was implanted in Bombay by Dr. Keiki R. Mehta in 1972. He is also the developer of the worlds first soft intraocular implant in 1978. He has recently developed the worlds first actively accommodative IOL's called 'Clamshell' for which trials are proceeding.

Should I implant a Multifocal implant in my eye. What are the advantages and disadvantages?

The human lens accommodates, i.e. sees for far and near by changing the shape of the human lens. When it becomes thicker the power increases for near and when it thins out, one can see distance. However a plastic implant cannot do so. In an effort to return a modicum of accommodation to the patient, Multifocal lenses have been devised.

There are two types of Multifocal implants. Fixed and Variable. Fixed implants use different rings of power, alternating for distance and near on the same implant. Thus simultaneous vision is available for both distance and near. However the side effect of these implants is that glare around light especially in dark places and at night is inevitable. It also means that driving at night may prove difficult as haloes will be seen around the lights. The second problem is that part of the distance vision is used for near which leads to a fall in contrast.

Thus though the vision in a bright light situation is perfect, at dusk or poor light situations vision will be a little 'soft'. If you do not drive at night and are not overtly dependent of reading glasses or need to read the whole day then Multifocal may be your answer to have reasonably good vision for both distance and near.

Multifocals are ideal for business people dealing with customers across the table needing eye contact. They are excellent for housewives. They are easily fitted in children who have cataracts, as a child adapts to multifocals very fast and is not bothered by light reflections.

What are the newer variable focal Multifocal implants?

These are actively mobile implants which move forwards for near and settle back for distance. Most important of all they give a moderate clear vision without glare, however for reading fine print you may still need to use glasses. These lenses can best be defined as "cocktail" lenses. Great for some reading for short duration but not for continuous reading. No glare and flare is seen in these lenses, and one can drive at night reasonably comfortably, though they are comparatively costly.

When will my vision be normal again?

You can return quickly to many everyday activities, but your vision may be blurry. The healing eye needs time to adjust so that it can focus properly with the other eye, especially if the other eye has a cataract. Ask your doctor when you can resume driving.

If you received an IOL, you may notice that colors are very bright. Within a few months after receiving an IOL, you will

become used to improved color vision. Also, when your eye heals, you may need new glasses or contact lenses.

What are the risks of cataract surgery?

As with any surgery, cataract surgery poses risks, such as infection and bleeding. Before cataract surgery, your doctor may ask you to temporarily stop taking certain medications that increase the risk of bleeding during surgery.

After surgery, you must keep your eye clean, wash your hands before touching your eye, and use the prescribed medications to help minimize the risk of infection. Serious infection can result in loss of vision.

Cataract surgery may slightly increases your risk of retinal detachment. Other eye disorders, such as high myopia (nearsightedness), can further increase your risk of retinal detachment after cataract surgery. One sign of a retinal detachment is a sudden increase in flashes or floaters.

Floaters are little “cobwebs” or specks that seem to float about in your field of vision. If you notice a sudden increase in floaters or flashes, see the doctor immediately.

What is an After-Cataract?

During cataract surgery a clear capsule surrounding the cataract is left in place to support the lens implant. In some cases this capsule may turn cloudy months or years after surgery creating, what is called as, an after-cataract. An after-cataract can develop months or years later. Unlike a cataract, an after-cataract is treated with a laser. In a technique called YAG laser capsulotomy, your doctor uses a laser beam to make a tiny hole in the lens to let light pass through. This is a painless outpatient procedure.

LASIK After Cataract Removal

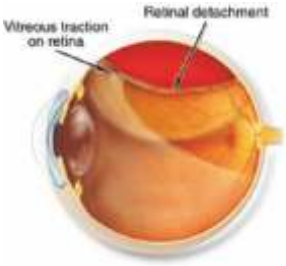
"LASIK" is an acronym for Laser in-situ Keratomileusis, which simply means, "to shape the cornea from within using a laser." Its "cool" or non-thermal light beam corrects vision by reshaping the cornea (outer window of the eye) so that light rays focus more precisely on the retina, thereby eliminating or reducing refractive errors and the need for glasses or contacts.

Since the LASIK procedure is **performed on the surface** of the cornea, (see diagram, below) and with cataract surgery, the lens implant is placed through the pupil, **behind the colored iris**, neither area is negatively affected by the other surgery.

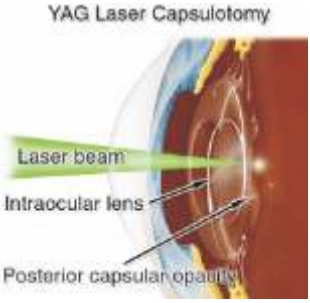
If you had cataract surgery, say 5 years ago, and you require LASIK to improve your myopia (nearsightedness), hyperopia (farsightedness) or astigmatism, the LASIK procedure would reshape the front of your cornea and would not adversely affect the positive results achieved with your prior cataract removal and lens implant surgery.

What if I have other eye conditions and need cataract surgery?

Many people who need cataract surgery also have other eye conditions, such as age-related macular degeneration or glaucoma. Having another eye problem is only important as far as it affects the final visual outcome following the cataract surgery. For example if you have a central retinal degeneration, the only improvement likely following cataract is to enhance the side vision and improve clarity but the number of lines in the chart you can see will remain the same. It differs from patient to patient.



Retinal Detachment



Yag Laser Capsulotomy

The Schwind AMARIS LASIK Laser.

The new pendular microkeratome

One has to merely look at the red light while the laser works

Know 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 AdvanceCongresses** 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 Instituto 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

THE MEHTA INTERNATIONAL EYE INSTITUTE :

Sea Side Bldg, 147 Shahid Bhagat Singh Road,
Next to Colaba Bus station Colaba, Mumbai - 400 005.

Tel: 022- 2215 1303 / 2215 0082 / 2215 1676 • Fax: 022- 2215 0433

Mobile : 98210 18214 / 9820031041

E-Mail: drkeiki@mehtaeyeinstitute.com

www.mehtaeyeinstitute.com / www.supervisionlaser.com

ISO - 9001 - 2008 Certified Institute

Asia's Most Advanced Eye Center