

## The LASIK Procedure A Complete Guide



aser in-situ keratomileusis, or LASIK, is a safe and effective treatment for a wide range of refractive (spectacle based) problems. It is the most frequently performed elective surgery all over the world.

hy is it so popular? **LASIK** is a quick and surprisingly painless procedure. For the majority of patients, the surgery significantly enhances vision and reduces the need for corrective eye-wear.

ASIK involves the use of a laser to permanently change the shape of the cornea, the clear covering of the front of the eye. In this manner the focusing system of the eye is re-shaped and polished, thus allowing the patient to see clearly, without the need for glasses or contact lenses.

ASIK being a surgical procedure conducted on a delicate part of the eye, it is

therefore crucial that potential candidates are well educated on the benefits and risks of the procedure. This booklet will educate you further along these lines.

Our experience of over 11,000 cases, over 15 years and an access to worldwide database of over 4 million cases on this technology allows us to accurately predict the visual results prior to surgery.

Though we now use the latest Super-Fast LASIK Laser, "the AMARIS" with the revolutionary Carriazo MK system, the most advanced system in the world, bar none; it is nonetheless a mistake to think that technology alone is responsible for the best outcomes. The skill, experience and judgment of the surgeon is at least as important as the technology. Attention to detail and the reproducibility of the procedure will greatly enhance the achievement of superior results.

## The AMARIS LASK Laser World's Finest & Latest

dvanced: The SCHWIND AMARIS is a superfast excimer laser with a 0.54 mm Super Gaussian profile at true 500 Hz repetition rate.

t is the first laser to have dual and automatic fluence adjustment (high and low fluence levels accordingly with the planned correction). The first laser with a 1050 Hz turbo eyetracker considering static and dynamic cyclotorsion and detection of both iris and limbus.

ultifunctional: Can perform "Aberration-Free" treatments, ocular wavefront treatments, corneal wavefront treatments

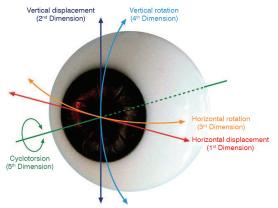
ccurate View: There is a high resolution stereoscopic microscope, slit focusing illumination integrated a slit lamp and dual operating systems.

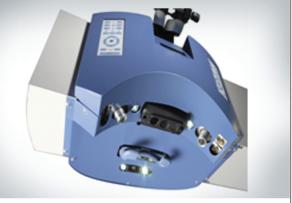
eliable: The particle aspiration system gives a totally stable climate around the eye that makes the system fully independent from the environmental conditions and air flow, a bugbear with all the older model lasers which simply use vacuum.

ntelligent: The Amaris uses three high powered computer with built-in features that make this machine very smart and user friendly, with software that is very advanced giving a perfect correction.

S afe: The knowledge, the experience and the results of thousands of cases with the SCHWIND-CAM software, are used and built into the SCHWIND AMARIS profiles. This means exceptional results even in very demanding difficult cases









# Schwind Amaris Excimer LASK Laser System

World's Finest & Latest



The SCHWIND AMARIS is a super fast excimer LASIK laser with a 0.54 mm Super Gaussian profile at true 500 Hz repetition rate. with dual fluence and a very advanced eye and embodies all the latest refinements for laser vision correction.

The Carriazo Pendular Microkerartome is the first 3rd Generation instrument which literally guarantees total safety with perfect results using a patented ultra sophisticated computer controlled system.

The **Keratron Scout Corneal Topographer** is a unique system for analysis and correction of irregularities in corneal shape.

The COAS Hartman Shack "OrcaWave is the highest resolution instrument for determination of optical imperfections in the human eye. Using it enables superlative visual results



## Your Vision is Our Mission

For further information
www.mehtaeyeinstitute.com
www.supervisionlaser.com
www.eye-tech-solutions.com

## What is OrcaWave Wavefront-guided LASIK I

It is a new technology that provides an advanced method for measuring optical distortions in the eye. Measuring and treating these distortions goes beyond nearsighted, farsighted, and astigmatism determinations that have been used for centuries. As a result, physicians can now customize the LASIK procedure according to each individual patient's unique vision correction needs.

The treatment is unique to each eye, just as a fingerprint is unique. OrcaWave Wavefront systems work by measuring how light is distorted as it passes into the eye and then is reflected back. This creates an optical map of the eye, highlighting individual imperfections.

## What can OrcaWave Wavefront do for you.

During the patient evaluation process, Wavefront evaluation provides comprehensive individual diagnostic information, not available using earlier technologies. Thus, before surgery even begins, the surgeon is better able to determine the appropriate course of treatment.

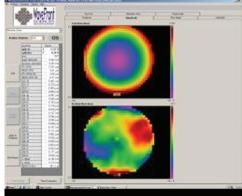
During treatment Wavefront allows the surgeon to tailor the laser beam settings, making the surgical procedure itself more precise. In this way, wavefront technology offers the patients sharper, crisper, better quality vision, as well as a reduction in night time vision difficulties such as halos and glare.

OrcaWave Wavefront Customised technology is an adjunct tool used to enhance an already safe and effective procedure still more and give superlative vision.

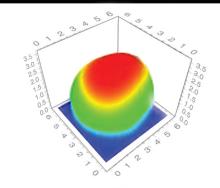
The improved quality of vision benefits of OrcaWave customized Wavefront procedures are an important advancement for patients with corneal irregulaities or abberations.



The Schwind ORK Abberometer



A Typical Abberometry Map



Abberations in a eye in 3D following the correction

www.mehtaeyeinstitute.com
www.supervisionlaser.com
www.eye-tech-solutions.com

## The Scheimpflug LASK guidance device

SCHWIND SIRIUS is the latest, brilliant, new computerized device instrument using the revolutionary 3 Dimensional, rotating Scheimpflug camera, combined with a computerized Placido disc developed to enhance and refine the results of Lasik, to achieve a new level of accuracy.

This new computerized device maps the front and back of the cornea with sensational, never before, achieved, accuracy. The device is contact-free, and does the readings in less than a second (700 milliseconds to be exact), instantly analyzing over a 100,000 points on the cornea, not only the front but even the back of the cornea giving a very detailed finite map of the cornea.





It delivers a heightened new level of sophisticated diagnostic information enabling a complete corneal, anterior chamber, right up to the human lens, combining with it's a corneal wavefront computation, which enables the Amaris laser via a data link to give a superlative, very accurate result.

This device, in addition to managing lasik very well is ideal for evaluation corneal problems like keratoconus, and corneal irregularities and even corneal grafts to enable very accurate and safe results.

## Calculations prior the LASK proceedure

- SCHWIND rotating Scheimpflug camera and a 3D topography device., the Sirius, with Placido disc automatically detecting the anterior segment by a rotating automatic measurement in less than a second enabling a new level of detailed diagnostic analysis of the entire cornea and anterior eye segment.
- The data is then collated with the corneal topography measurements to give a master computerized map which is then used to design a very special and specific treatment for each individual cornea
- THE MULTIFUNCTIONAL SHACK-HARTMANN ABERROMETER The "abberometer" which send waves through the eye to provide an very exact calculation of the actual power of the eye, the night adapted pupil size and generates a even more precise map of the aberrations that are affecting your vision. Once known the machine calculates exactly what is needed to give a clear visual abberation free result.





SHACK-HARTMANN ABERROMETER









Auto Keratorefractor

Slit Lamp Biomicroscope

Specular Microscope

- In order to decide whether you're a good candidate for LASIK, your eye doctor will examine your eyes to determine their health, what kind of vision correction you need, and how much laser ablation is required. Just as in a regular eye exam, he will use instruments such as: an auto keratorefractor (to determine your prescription and accurately assess your astigmatism); a Slit Lamp (to look into the back of the eye under high magnification); and a tonometer (to determine intraocular pressure if it's high, this may be an early sign of glaucoma).
- Your doctor will also look for signs of dry eye disease, if excessively dry they may need to be treated before LASIK can be performed.
- A corneal topographer is the next step. This device photographs your eye and creates a kind of "map" of your cornea. No one has a perfectly rounded cornea, and the topographer will display the corneal irregularities and the steepness or flatness that the surgeon must correct.
- Your corneal thickness will be evaluated as will the quality of your cells on the inner surface of the cornea using a "Specular Microscope". It tells how safe is it for you and how much correction can be done safely.
- Your doctor will also use a new "Wavefront" device, termed the "abberometer" which send waves through the eye to provide an even more precise map of the aberrations that are affecting your vision.
- Finally, the doctor will question you about any health problems you have or medications you take. Some health conditions will disqualify you altogether for LASIK, but others may just postpone the procedure until a later date.

Schwind AMARIS Excimer LASIK Laser System





**Corneal Topography** 

**Abberometer** 





- LASIK is an ambulatory procedure; you walk into the surgery center, have the procedure done and walk out. In fact, the actual surgery usually takes less than a minute, and you're awake the whole time.
- Most people don't feel any pain during LASIK surgery. Your eyes are first anesthetized with special drops.
- The doctor will have you lie down, then make sure your eye is positioned directly under the laser. (One eye at a time.) A kind of spring retainer is placed over your eye to keep your eyelids open normally, this is not uncomfortable.
- The next step is a stabilizing suction ring that keeps your eye steady for preparing the corneal flap.
- The ring is positioned and the new Pendular microkeratome will automatically make the flap in simply 6 seconds. You feel nothing except for a slight vibration.
- You will be asked to look at a target light for a short time while the doctor watches your eye through a microscope while the laser sends pulses of light to your cornea. The Schwind Laser is equipped with very fast eye tracker that follows your eye even if it moves
- The laser light pulses will then painlessly remove the tissue. You'll hear a steady buzzing sound as the laser is operating. It takes only 3 seconds per number. The surgeon has full control of the laser.
- After the procedure is finished, a plano contact lens is placed on the eye, usually removed the next day. You will rest for a little while before doing the second eye. Customarily both eyes done the same day.



The Schwind "Amaris" Excimer LASIK Laser



The New Pendular Microkeratome

## The Mehta International Eye Institute

Asia's most advanced Eve Center

www.mehtaeyeinstitute.com www.supervisionlaser.com





Actors and Actresses: Courtney Cox, Dennis Quaid Brooke Shields, Reese Witherspoon







Musicians: Melanie B, Spice Girl Elton John, Jessica Simpson

**Professional Athletes:** 







Tom Kite (golf) Wade Boggs (baseball), Vijay Singh (golf)

















- Dependence on spectacles or contact lenses can be reduced or eliminated by refractice surgery. It is possible to correct most cases of long and short sightedness and astigmatism. It is also possible to reduce dependence on reading glasses.
- People of all ages enjoy the benefits of refractive surgery.
- With LASIK surgery, most people's vision improves right away, but some find that their vision gradually improves even more over the next few days or even weeks.
- Most people achieve 6/6 or better vision with LASIK. Some may achieve only 6/9 depending on the original status of the eye. Usually you can expect the same level of vision your initial glasses gave you.
- Postoperative complications can include infection or night glare (starbursts or halos that are most noticeable when you're viewing lights at night, such as while you're driving). These typically occur only in high (>-8.00) or in astigmats. They usually diminish with time and are, later, hardly noticeable.
- Even if you see perfectly after laser eye surgery, you may still need reading glasses or bifocal contact lenses once you hit your 40s. This is because of a condition called presbyopia which begins to develop in most people when they're between the ages of 38 and 42. Your distance vision will probably remain crisp, but seeing up close will be more difficult.
- Rarely, people will experience improvement, then notice a gradual worsening of vision called "regression". If this happens, one more surgery (called an enhancement or "touch-up") will be necessary
- If you have less than perfect vision improvement may be possible following the enhancement LASIK procedure.

# Understanding Different LASIK Laser Procedures available at THE MEHTA INTERNATIONAL EYE INSTITUTE and SUPERVISION LASER CENTER

Mehta International Eye Institute and SuperVision Laser Center offers a variety of different LASIK applications. Newer advanced technologies offer increased opportunity for excellent vision, however their application is dependent on each individual patient and varies with the individual qualities of each patient's eyes (such as the spectacle prescription, pupil size, corneal thickness, keratometrically evaluated corneal curvature and higher-order aberrations).

Mehta International Eye Institute and SuperVision Laser Center offers the following innovative and advanced technologies.

We use the worlds most advanced Amaris Schwind Laser which is the gold standard for LASIK Lasers all over the world.

#### **Premium LASIK**

Premium LASIK is an economical but safe and effective method of treating near-sightedness, far-sightedness, and astigmatism and has had excellent and satisfying results.

The refractive power of the patient is directly fed into the Laser. The OrcaWave software in the computer then refines the input to provide the best Aberration free option to achieve an excellent result utilizing it extensive software library.

During the procedure, the laser resurfaces the cornea, basically replacing the natural curve of the eye with the new calculated curve needed to give sharp vision without glasses or contact lenses. Utilizing the new Amaris Laser, Premium laser will give good reproducible results. It is a good blend of economy with good results.

Premium LASIK results at MIEI are superior to treatments at many other LASIK centers, with 95% of our patients able to see the last line without recourse to glasses or contact lenses.

#### **Optimized LASIK**

Optimized LASIK at Mehta International Eye Institute and SuperVision Laser Center uses a specialized laser calculation or algorithm, inbuilt in the OrcoWave Lasik software called Optimization to retain the natural shape of the patient's cornea even after it is reshaped to correct the power or imperfections on the cornea.

During this procedure, the surgeon 'personalizes' the surgery to compensate for the natural shape, thickness, and prescription of each patient's eye.

#### What does 'Optimization' really do?

Optimization is the process of modifying a system to make it work more efficiently, executing the program more rapidly with a higher level of accuracy.

The procedure of LASIK surgery has the potential of creating visual aberrations by flattening the shape of a patient's central cornea. Production or continuance of these ocular aberrations can result in decreased quality and sharpness (or crispness) of vision and night vision problems, such as glare and haloes.

Optimization is the key to enhance the quality of vision as it uses a specialized computer algorhythm guided laser pattern in order to maintain the natural bell-shaped curve of your eye.

By retaining the natural shape of the cornea, Optimized LASIK has been shown to provide a better quality of vision than conventional LASIK and reduces the frequency of glare complications after surgery.

#### Benefits

- 1. Maintains natural physiologic corneal shape
- 2. Enhances quality of vision
- 3. Significantly reduced chance of night vision problems, such as glare and haloes

#### **Ultimate Waveform Lasik**

The most advanced technology in LASIK - True Wavefront guided Lasik

The best way to understand Wavefront technology is to imagine different faces of different people. No two faces are exactly identical (even in twins). Everyone's face is different in shape and form. Your eyes are different in an identical way. Every pair of eyes are different in shape, size, curvature, and optics. One type or pattern of laser would not be sufficient in fully correcting everyone's refractive

Wavefront technology is a way to individualize or customize laser treatment for each individual eye based on unique visual characteristics.

### What exactly is Wavefront Customization? How does it lead to SuperVision?

Near-sightedness, far-sightedness, and astigmatism, the three inputs in your spectacle data, are referred to as "lower order aberration." In addition to these, our eyes have complex "higher order aberrations" that are not correctable with glasses or contact lenses. These higher-order aberrations, are often linked to the visual glare and halos that cause night vision problems and can affect quality of vision.

Studies of the eye's Wavefront aberrations in a normal population have showed significant amounts of higher order aberrations (HOA) apart from conventional sphere and cylinder. This indicates that correcting HOA even in normal eyes can provide additional visual benefit over conventional correction methods such as spectacles and contacts. Not only was there significant visual benefit of correcting HOA in normal eyes under normal viewing (white light) condition but Contrast sensitivity, ideal for driving in twilight or seeing in dusk, was also improved. Literally, you develop vision better than you ever had, which is termed "SuperVision".

#### How is Ultimate Waveform LASIK carried out.

In Ultimate Waveform LASIK, higher order aberrations are first diagnosed and measured using a special instrument called Shack-Hartmann Wavefront analyzer. (Also termed Abberometer for short) which generates a Wavefront map. This Wavefront map is created by bouncing harmless light rays off the patient's retina. Results are then fed into a complex computation algorythm program, which calculates a enhanced ablation profile that not only attempts to retain the natural, physiologic shape of the cornea but also aims to remove any previous aberrations within a patient's eye.

The calculations also enhance the speed of the laser, thus shortening the surgery time providing greater patient comfort and increased reliability.

Ultimate Waveform LASIK also utilizes a specialized laser algorithm called Optimization is used to retain the natural physiologic shape of the patient's cornea. Thus the surgeon personalizes the surgery to adjust for the natural shape, thickness, and prescription of each patient's eye.

Ultimate LASIK combines the benefits of both Optimization and Wavefront and often provides the best opportunity for superior vision through customized treatment to cater to each patient's individual visual system.

Ultimate Waveform LASIK is the most advanced procedure currently available. It combines both Wavefront Customization and Optimization to provide the best possible results.

#### **Benefits**

- Significantly enhances the quality & crispness of vision
- Enhances peripheral (side) vision by automatically compensating for curvature changes sharpening the 180 degree zone of vision.
- 3. Night vision problems like glare and flare virtually eliminated even in the higher powers.

### How does the new SCHEIMPFLUG SCHWIND SIRIUS help in getting better vision.

This, latest, brilliant , new computerized device instrument using the revolutionary 3 Dimensional, rotating Scheimpflug camera, combined with a computerized Placido disc developed to enhance and refine the results of Lasik, to achieve a new level of accuracy.

This new computerized device maps the front and back of the cornea with sensational, never before, achieved, accuracy. The device is contact-free, and does the readings in less than a second (700 milliseconds to be exact), instantly analyzing over a 100,000 points on the cornea, not only the front but even the back of the cornea giving a very detailed finite map of the cornea.

common sense dictates that the higher and more sophisticated the plotting of the cornea, the more accurate will be the final results.

The Sirus delivers a heightened new level of sophisticated diagnostic information enabling a complete corneal, anterior chamber, right up to the human lens, combining with it's a corneal wavefront computation, which enables the Amaris laser via a data link to give a superlative, very accurate result.

This device, in addition to managing lasik very well is ideal for evaluation corneal problems like keratoconus, and corneal irregularities and even corneal grafts to enable very accurate and safe results



- 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
- $H.E.\ the\ Governor\ of\ Maharashtra\ Shri.\ S.\ C.\ Jamir\ in augurating\ the\ latest\ SuperLASIK\ laser\ "The\ Amaris".$
- Dr. Keiki R. Mehta receiving the award for Best Paper in Refractive Surgery at the biggest ophthalmological conference in the world the American Society of Cataract and Refractive Surgery (ASCRS) by Prof. John Marshall from UK who is the world's best researcher in Ophthalmology.
- Dr. Keiki R. Mehta with Prof. Takhchidi Khristo the Chief of the biggest and most famous Fyodorov Eye Institute in Russia.
- Dr. Keiki R. Mehta being felicitated by Hon. Dr. Vimaltai Mundada, the Health Minister for having received the Padmashree Award at the Bombay Ophthalmological Association.
- The very famous Prof. Albert Galand of Belgium and Prof. Warren Hill with Dr. Keiki R. Mehta
- Dr. Keiki R. Mehta with Prof. Boris Malyugin of the Fyodorov Eye Institute in Russia and Prof. Jerome Bovet of the ONO Eye Institute in Switzerland.
- Dr. Keiki R. Mehta at the European Society of Calaract and Refractive Surgery (ESCRS), Europe's biggest ophthalmological conference with Prof. Richard Packard - UK, Prof. Marie-Jose` Tassignon-Beligum, Prof. Jerome Bovet-Switzerland and Prof Marcelo Ventura-Brazil the biggest names in ophthalmology.
- Live Surgical Workshop at EyeAdvance 2008 with Prof. Ulrich Klemen-Austria, Dr. Gerald Schultz-USA, Prof. Biro Zsolf-Hungary, Dr. Keiki R. Mehla and Dr. Vincenzo Ferrara - Italy.
- 10. Dr. Keiki R. Mehta with Prof. Peter Kansas of the prestigious Kansas Eye Surgery Associates-USA.
- 11. Dr. Keiki R. Mehta lecturing at the European Society of Cataract and Refractive Surgery (ESCRS).
- Prof. Lucio Buratto-Italy and Dr. Keiki R. Mehta, at Video Cataratta, Europe's biggest LIVE Surgery Conference.
   Dr. Keiki R. Mehta at the ASCRS with Dr. Alan Crandall of the famed Institute of Utah-USA.
- 14. Prof. Emanuel Rosen-UK, chairman of the Publications Committee of the ESCRS with Dr. Keiki R. Mehta
- 15. Prof. Philippe Sourdille-France and Dr. Keiki R. Mehta at the ASCRS.

## 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.

■ 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



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

- 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 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 Exemplanery Surgical Skills and his outstanding Achievements and Research in Ophthalmology

#### THE MEHTA INTERNATIONAL EYE INSTITUTE



Sea Side Bldg, 147 Shahid Bhagat Singh Road, Near Colaba Bus Station, Colaba, Mumbai 400005. India Tel Nos: +91-22-22151303 / 22151676 / 22150082 Mobile: +91 - 9821018214 / 9820031041 Email: drkeiki@mehtaeyeinstitute.com



www.mehtaeyeinstitute.com / www.supervisionlaser.com

Asia's Most Advanced Eye Center