

Refining Vision Surgery for a Sharper Focus

HOW CUSTOM LASIK WORKS

COMMON VISION PROBLEMS

PAST METHODS

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CUSTOM LASIK

The newest technology in Lasik surgery, commonly called custom Lasik, provides additional accuracy and personalization to the eye correction procedure. WaveScan technology creates a "fingerprint" of the patient's vision, precise enough to capture subtle anomalies in each eye. A guided laser can cut a thinner, more uniform flap, while a corrective laser with variable size beams can reshape the cornea with increased accuracy, keeping on target even as the eye moves. But as with all corrective surgeries, complications can arise.

Sources: Dr. Joseph A. Eviator, Dr. Christopher T. Coad, Chelsea Eye and Cosmetic Surgery Associates; CustomVue; IntraLase Corp.



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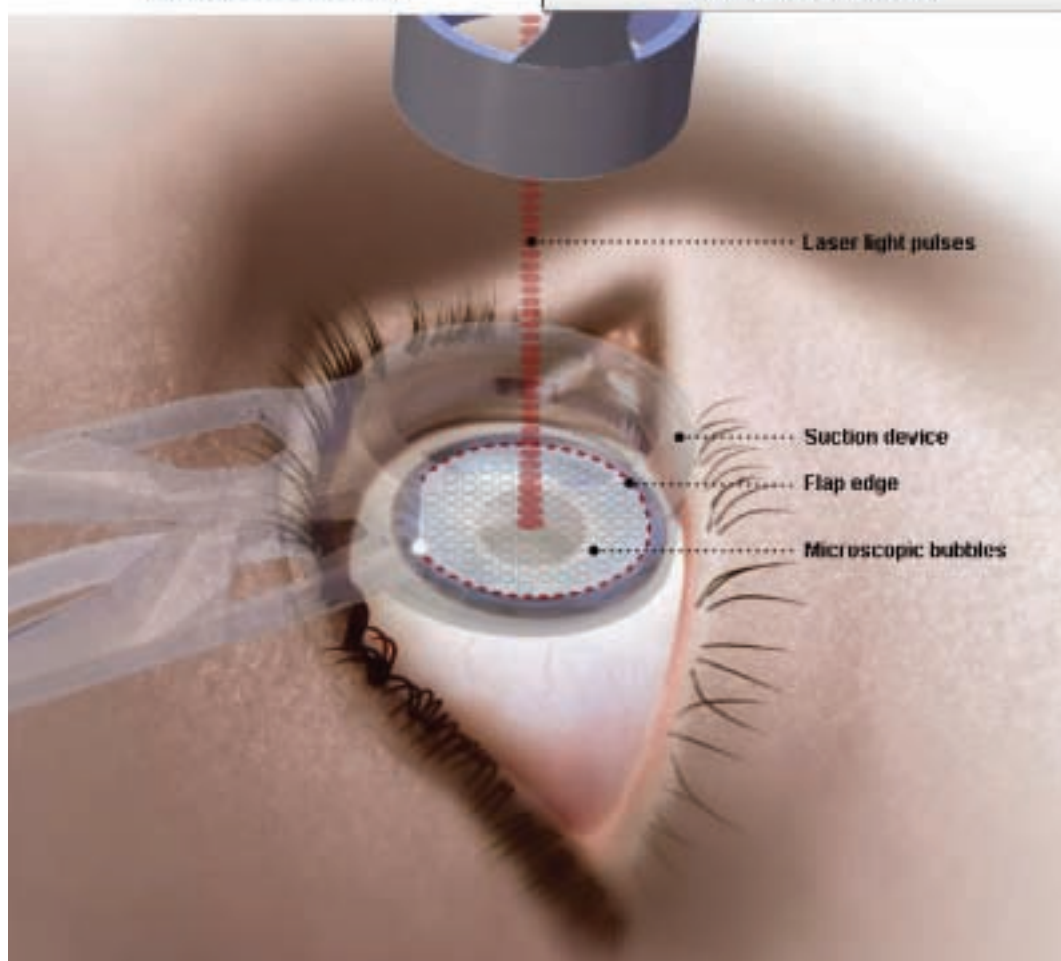
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CUTTING

The eye is immobilized using a suction device, which also temporarily flattens the cornea. Tiny laser pulses create a uniform layer of bubbles beneath the surface. The laser then cuts an incomplete circle at the edge.



Laser light pulses

Suction device

Flap edge

Microscopic bubbles

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OPENING

The surgeon lifts the lasered tissue. The flap is cut much thinner than with a metal blade, and the thickness is customized for each patient. In rare cases, complications can arise in cutting, lifting or replacing the flap.



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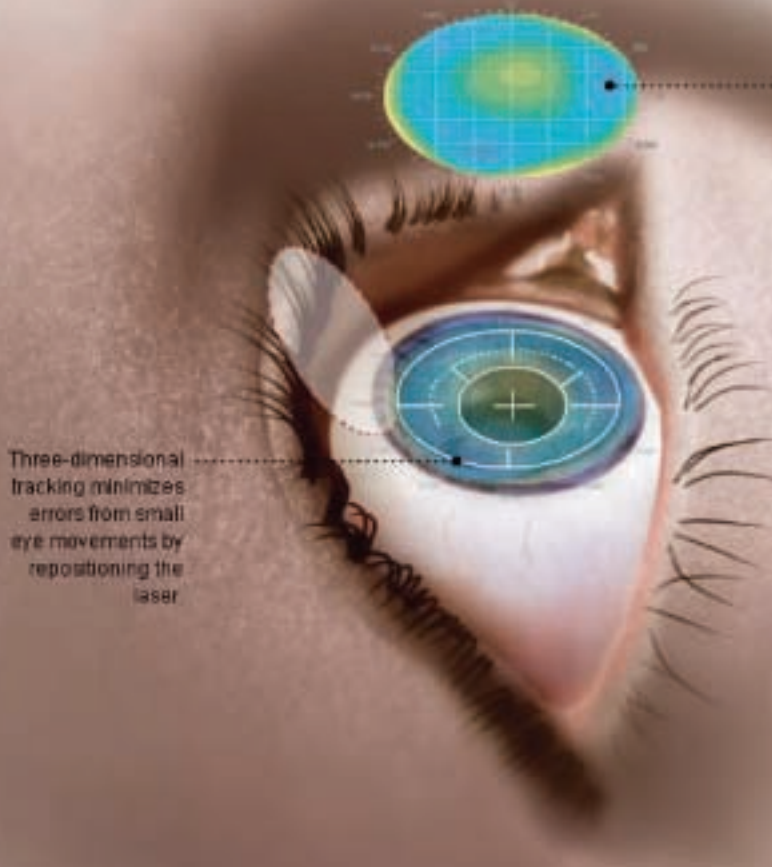
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CUSTOMIZING

An optical map that shows how light travels through the patient's cornea, lens and retina is loaded into the laser and locked onto the eye.

Three-dimensional tracking minimizes errors from small eye movements by repositioning the laser



Optical map

To create the optical map, light reflected back from the eye is compared to the entering light. Blue areas show the slowest light reflection.

IDEAL



Light exits as flat sheets

DEFORMED



Light exits as irregular waves

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CORRECTING

A laser reshapes the surface of the cornea by vaporizing microscopic amounts of tissue. The laser can vary its size, allowing for more accurate tissue removal. After the surgery, the flap is closed. Infection and inflammation occasionally occur during healing.



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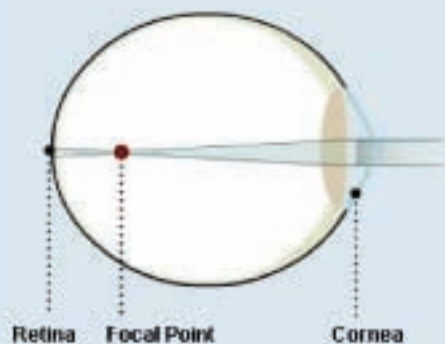
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By reshaping the cornea, Lasik surgery can correct the eye's ability to focus light onto the retina.

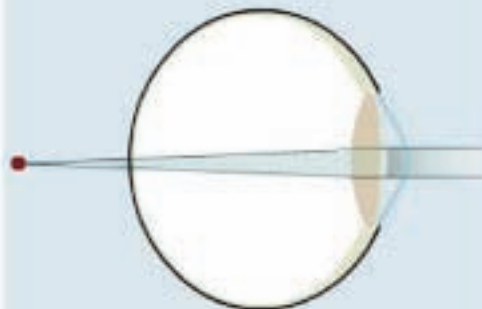
Nearsightedness

The eye is too long or the cornea is too curved. Light focuses in front of the retina.



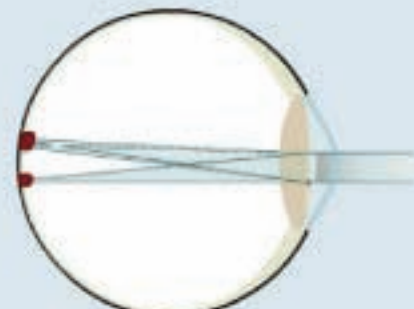
Farsightedness

The eye is too short or the cornea is too flat. Light focuses past the retina.



Astigmatism

The eye or the cornea is shaped irregularly. Light focuses on the retina at multiple points.



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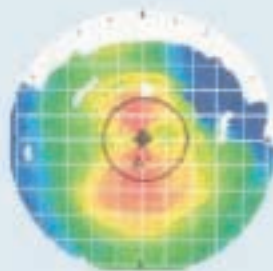
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Contour mapping

A map representing the elevation of the cornea is used to guide the procedure.



Drawback

Does not take into account the entire optical system.

CORNEAL IMAGES

Metal blade

A motorized blade guided on a track is used to cut the flap.



Drawback

Thickness of flap is hard to predict, potentially leading to complications.

No flap (PRK)

The corrective laser is applied directly to the surface of the cornea.



Drawback

More painful procedure. Longer recovery time, since wound is open.

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