



## **Laser vision correction** Understanding your options





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# Understanding your vision

## Understanding your vision

Blurry, unfocused vision can be caused by the shape of the surface of your eye, called the cornea. A perfectly curved cornea focuses light directly on the back of your eye, called the retina. This creates clear vision.

Modern eye tests can accurately diagnose the exact curvature of your cornea, and laser vision correction options are now available for almost every type of cornea shape.



### Normal vision:

A perfectly curved cornea focuses light directly on the back of your eye, called the retina. This creates clear vision.



### Myopia:

Myopia, or nearsightedness, is caused by a cornea that is too curved, causing light rays to focus in front of the retina instead of on the retina. This causes distant objects, such as street signs or people across a room, to appear blurry. Near vision objects, such as reading a book or using a computer, will still be mostly clear and focused without glasses or contacts.



### Hyperopia:

Hyperopia, or farsightedness, is caused by a cornea that is too flat, causing light rays to focus behind the retina instead of on the retina. This causes near vision objects, such as books and computer screens, to appear blurry. Distant vision objects and tasks will still look mostly clear and focused without glasses and contacts.



### Astigmatism:

Astigmatism is caused by a cornea that is shaped more like a football, instead of round like a basketball. This condition creates many variations of blurry, hazy vision for both near vision and distant vision. Almost all people have some degree of astigmatism, and it often combines with myopia or hyperopia to further blur vision.

# Laser vision correction

## What is laser vision correction?

Laser vision correction is the name for the set of eye procedures that uses a laser to reshape your cornea in order to create clearer vision. There are three major laser vision correction treatments available in the U.S. today:

**PRK:** Photorefractive keratectomy

**LASIK:** Laser-assisted in situ keratomileusis

**SMILE:** Small incision lenticule extraction

### Photorefractive keratectomy

In this procedure, the thin outer layer of the cornea is first gently removed. Then an advanced excimer laser is used to reshape the underlying cornea area. The result is a cornea that more accurately focuses light on the retina. A bandage contact lens is placed over the eye until the epithelium grows back.

- Longer recovery time with some recovery discomfort
- Similar vision results as LASIK and SMILE
- Minimal surgical risks

### Laser-assisted in situ keratomileusis

In this procedure a precise flap is created on the surface of the cornea. Then an advanced excimer laser is used to reshape the underlying cornea area. The result is a cornea that more accurately focuses light on the retina.

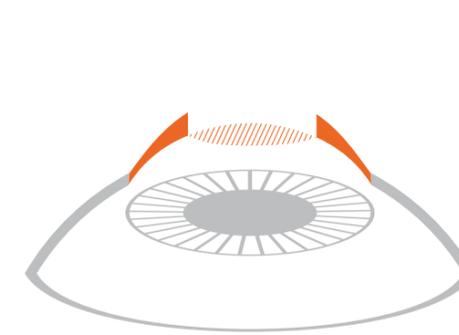
Today, doctors are able to create the LASIK flap in two ways. The first is using a handheld surgical device called a microkeratome. The second is using a fast and highly precise laser called a femtosecond laser.

- Thin flap
- Short recovery time with little recovery discomfort
- Similar vision results to PRK and SMILE
- Minimal surgical risks

### Small incision lenticule extraction

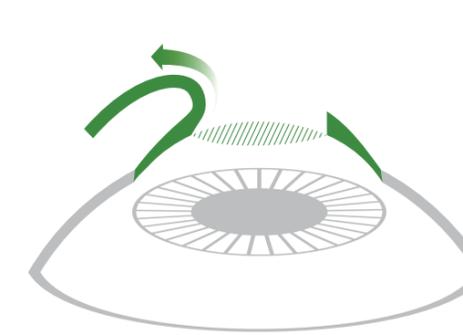
SMILE is the latest in laser vision correction for myopia (nearsightedness), providing LASIK-like visual outcomes in a minimally invasive procedure. In this procedure, a laser is used to create a thin, contact lens-shaped layer just beneath the surface of the eye and then a small opening through which that layer is removed, correcting your vision.

- Minimally invasive
- Short recovery time with potentially the least recovery discomfort
- Similar vision results to LASIK and PRK
- Gentle, comfortable patient experience
- Minimized surgical and dry eye risk



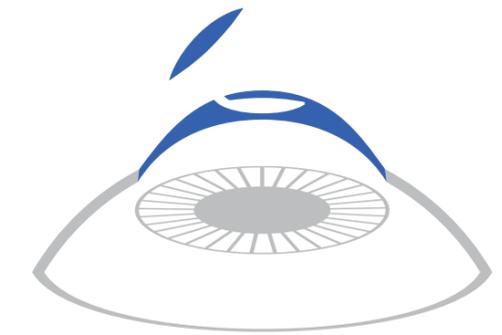
### PRK

Because PRK gently removes the top surface of the cornea, a bandage contact lens is placed over the eye until the epithelium grows back. Patients often experience discomfort during their recovery period while the cornea heals. This is temporary and does not affect long-term visual results.



### LASIK

LASIK patients may experience transient dry eye syndrome after treatment due to the size, shape, and location of the flap. However, LASIK patients often experience less discomfort than PRK patients during their recovery period.



### SMILE

Because SMILE does not involve removing the surface of the cornea or creating a flap, discomfort and dry eye symptoms may be reduced compared with LASIK and PRK.

# Treatment comparison

	PRK	LASIK	SMILE
<b>Method</b>	Surface ablation surgery	Flap surgery	Minimally invasive surgery
<b>Description</b>	Thin outer corneal layer (epithelium) is removed with an alcohol solution or a special brush, and underlying tissue is reshaped with an excimer laser. A bandage contact lens is placed over the eye until the epithelium grows back.	Traditional LASIK: a flap, a hinged piece of corneal tissue, is created in the outer corneal layer with a handheld surgical device, folded back, and the underlying tissue is sculpted with a laser (tissue ablation).  Advanced Femto-LASIK: a femtosecond laser is used to create a precise and predictable flap.	A laser is used to create a thin, contact lens-shaped layer just beneath the surface of the eye and then a small opening through which that layer is removed, correcting your vision.
<b>Things to consider</b>	<ul style="list-style-type: none"> <li>Great treatment option for patients with thin corneas</li> <li>Requires no flap, reducing risks of post-surgical complications and infection</li> <li>Extended recovery period (three to seven days) with some discomfort</li> <li>Some technology sounds and odors during surgery</li> </ul>	<ul style="list-style-type: none"> <li>Great treatment option for patients with healthy corneas</li> <li>Immediate vision enhancement results</li> <li>Quicker recovery period (4 to 12 hours) with low discomfort</li> <li>Some technology sounds and odors during surgery</li> </ul>	<ul style="list-style-type: none"> <li>Great treatment option for patients with healthy corneas, dry eye tendency and/or active lifestyles</li> <li>Minimally invasive surgery, with only a small opening</li> <li>Comfortable surgery experience with no sound or odor</li> <li>Quicker recovery period (4-12 hours) with minimal discomfort</li> </ul>

## SMILE by the numbers

0

Odor or noise during a SMILE procedure

1\*

Number of days before you can return to work after SMILE

7\*

Number of days for a full recovery after SMILE

30

Approximate number of seconds the laser is active during your SMILE procedure

170

Years of optic excellence from ZEISS, the creators of SMILE

1,000+

Number of doctors performing SMILE worldwide

750,000+

Number of SMILE procedures already performed worldwide

\*These numbers represent the average patient experience following a SMILE procedure. Numbers as of April 2017.

## Frequently asked questions

### Which one is better, SMILE or LASIK?

This is one of the most common questions we hear, and many patients want to know which procedure is “better.” The fact is that both LASIK and SMILE are proven, consistent procedures, and most patients will be very happy with either procedure. Generally speaking, SMILE is the less invasive laser vision correction option and has a smaller risk of post-surgical infection or transient dry eye syndrome. LASIK offers an ever so slightly quicker post-procedure visual recovery time. Based on your eye structure and lifestyle goals, your surgeon can recommend the right procedure for you!

### Does SMILE cost more than LASIK?

While SMILE and LASIK use different laser technologies to re-create the clarity of your vision, the costs of the two procedures are often very similar. These costs account for the skill and experience of your surgeon, the costs and fees of acquiring and using the laser technologies, and the costs of the support staff and surgical follow-up.

### Will SMILE hurt?

SMILE is one of the gentler vision correction procedures available. Patients consistently tell us it was very comfortable. Some patients do say they feel a tiny amount of pressure around their eye for a few seconds during the procedure, but are quick to clarify that it didn't hurt at all!

### How soon will I be able to return to work after SMILE?

Patients often return to most of their daily activities, including going back to work, the day after their SMILE procedure. While LASIK patients are asked to avoid wearing makeup for one to two weeks after their LASIK procedure, SMILE patients can begin wearing makeup the next day. Patients can generally resume all daily activities four to seven days after their procedure.

### Why haven't I heard of SMILE before?

While SMILE is a new, FDA-approved procedure in the United States, it has been performed worldwide for many years. In fact, more than 1,000 doctors around the world have performed the procedure, and more than 750,000 eyes have benefited from clearer vision thanks to SMILE.

### Why don't more practices offer SMILE?

We don't know! Along with LASIK and PRK, SMILE is a necessary and valuable part of a complete laser vision correction program. SMILE isn't the right procedure for everybody, but we believe that your doctor should have access to every possible technology to ensure they can offer you the best procedure. If a doctor isn't able to offer LASIK, PRK and SMILE, can you be sure you're getting the best procedure for your eye and lifestyle?



### Is SMILE safe?

Yes. SMILE is a proven and consistent laser vision correction procedure that has created better vision for hundreds of patients. As with any surgical procedure, there are possible risks and side effects. After a thorough eye exam and consultation, your surgeon will discuss your options with you and help you make the right decision for your vision.

### How many SMILE procedures have been done?

SMILE is the fastest-growing laser vision correction option in the world. Worldwide, hundreds of thousands of SMILE procedures have been performed by more than 1,000 surgeons.

### Is it FDA-approved?

Yes. The FDA approved SMILE for the United States in September 2016 after rigorous trials and testing showed it to be a consistent, effective way to improve vision and reduce dependence on glasses and contacts.

### Will the results of my SMILE last forever?

Yes and no. Your SMILE procedure is permanent, but as with every part of your body, your eyes will continue to age and your vision will be affected as you get older. SMILE cannot prevent cataracts and presbyopia, but most SMILE patients enjoy many years of clearer vision without glasses and contacts.

### Can SMILE fix my astigmatism?

Not yet. In the United States, SMILE is not yet approved to treat astigmatism.

### Will I require reading glasses after SMILE?

Most patients who receive SMILE tell us that they use their glasses and contacts very little, or not at all! The goal of SMILE is to reduce or eliminate your dependence on glasses. Based on the anatomy of your eye, your surgeon will be able to tell you more about the results you can expect from SMILE.



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ReLEx SMILE



**Carl Zeiss Meditec AG**

Goeschwitzer Strasse 51–52

07745 Jena

Germany

[www.meditec.zeiss.com](http://www.meditec.zeiss.com)



**Carl Zeiss Meditec, Inc.**

5160 Hacienda Drive

Dublin, CA 94568

USA

[www.zeiss.com/med](http://www.zeiss.com/med)

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