

## OPHTHALMOLOGY

# Cataract treatment sans blades

With cataracts affecting more than 80% of Singaporeans over 60, it's time to understand just what it is, how it is treated and why bladeless laser surgery can offer better outcomes for the patient.



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### Cataract demystified

This is a condition where the clear lens of the eye becomes cloudy. This prevents light rays from entering the eye, impairing vision. The patient begins to see as if through a cloudy filter, and the cloudiness depends on the severity of the condition.

Cataract can be caused by factors such as long-term use of medications like steroids, prolonged exposure to ultra-violet light, injury and ageing. Diabetes is also a risk factor.

### The conventional approach

This involves surgically removing the cloudy lens and replacing it with an implant known as an intraocular lens (IOL). The eye surgeon makes a small incision on the cornea, creating an opening to reach the lens. An instrument is inserted through this opening, and, using high frequency ultrasonic energy, softens or emulsifies the affected lens, which is aspirated out through the fine tube. This process is called phacoemulsification. The lens capsule (the elastic bag where the natural lens used to be) is left behind, ready to receive a replacement lens implant. The surgery does not require stitches and is performed under local anaesthetic.

### What kind of lens implant?

During cataract surgery, new and different types of IOLs can be inserted to correct the various types of refractive errors. The most common type is placed behind the iris within the lens capsule. The IOL acts just like the natural lens to focus light onto the back of the eye (the light-sensitive retina). Conventionally, monofocal IOLs provided a set focal point, usually for distance



vision. So cataract surgery patients, while being able to see clearly within a range, will require glasses for reading. The surgeon may sometimes insert an IOL in one eye for near vision and an IOL in the other eye for distance vision.

Multifocal IOLs are a newer type of lens that treats multiple focal points and reduces or eliminates the need for spectacles or contact lenses post-surgery. These lenses can provide a range. Some IOLs can also correct astigmatism and minimise the need for distance vision glasses after surgery. The eye surgeon will determine the most appropriate option.

### Bladeless laser surgery

This approach uses femtosecond laser technology which replaces or assists use of a hand-held surgical tool for the various steps in cataract surgery; the cornea cuts, opening in the front of the lens and cutting up the lens. An image-guided system first 'maps' the eye in 3D. This helps the surgeon perform the procedure with unparalleled accuracy. Femtosecond lasers emit optical pulses of extremely short duration (one-quadrillionth

of a second) which allow tissue to be cut more precisely with negligible heat. The computer-guided femtosecond laser makes the cornea incisions to a pre-programmed, precise round shape. The laser is also able to create an opening in front of the lens and break the lens into pieces. The dissolved cataract is removed with phacoemulsification. This is done with an image-guidance system with real-time 3D and high-resolution images of the eye.

### Benefits of going bladeless

The circular opening created by the femtosecond laser is more perfectly round and centred, which is very important in keeping the IOL well-positioned and stable. Laser reduces the amount of ultrasound energy used during phacoemulsification, reducing the risk of injury and complications. The system also increases accuracy and allows customisation. Most people are suited for bladeless cataract surgery, but patients with challenges include those with cornea disease, glaucoma or eyes which cannot tolerate the suction used to stabilise the eye before the laser. [👉](#)