

OPHTHALMOLOGY

Go bladeless: 3 advantages of this high- tech option

Removing cataracts is a common surgical procedure that has been made more precise and predictable with the introduction of laser technology to replace conventional cutting instruments.



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What are cataracts?

A cataract occurs when the clear lens of the eye turns cloudy, stopping light from entering it and causing impaired vision. The condition affects more than 80% of Singaporeans aged 60 and above, which is why cataract surgery is one of the most common eye procedures performed in this country.

Treatment options

Conventional treatment surgically removes the cloudy lens, which is then replaced with an implant. The surgeon makes an incision on the cornea with blade, and uses forceps to create an opening in the front of the lens capsule in order to gain access to the lens. The cataract is emulsified with high-frequency ultrasonic energy, then removed through a fine tube before an intraocular lens (IOL) is inserted.

A newer, more revolutionary method that removes cataracts is bladeless surgery known as femtosecond laser-assisted cataract surgery (FLACS). This uses femtosecond laser technology for the various steps in cataract surgery: the cornea cuts, opening in the front of the lens capsule and cutting up the lens. An optical coherence tomography (OCT) system first maps the eye in 3D. The computer-guided femtosecond laser creates a perfectly centred, circular opening in the front of the lens capsule and breaks the lens into pieces before making the cornea incisions to precise, pre-programmed cuts with specified location, depth and length. These steps are finished in less than a minute with an image guidance system that provides real-time high-resolution 3D images of the eye. The surgery is completed in the operating theatre with ultrasonic energy to break up and remove the lens before implantation of an artificial lens.

Why go bladeless?

Bladeless surgery offers more advantages and benefits than conventional surgery.

- 1 More architecturally round and centred openings created**
Femtosecond lasers emit optical pulses of extremely short duration (one-quadrillionth of second). This allows tissue to be cut more precisely with negligible heat. The femtosecond laser consistently makes a perfectly centred, optimally sized, circular opening in the front of the lens capsule. This is important to keep the IOL well-positioned and stable for better visual outcomes.
- 2 Less energy required for lens phacoemulsification**
Laser reduces the amount of ultrasound energy used during phacoemulsification, lessening the risk of injury and complications. This is particularly important in denser or more challenging cataracts.
- 3 More precise cornea cuts**
The femtosecond laser increases control, accuracy and allows customisation of the cornea incisions such as additional small cuts to correct astigmatism. It allows for more predictable outcomes.

Bladeless cataract surgery is suitable for most people except those with cornea disease, glaucoma, poorly dilating pupils or those who cannot tolerate the suction used to stabilise the eye. [🔗](#)