# Transforming Glaucoma Therapy with the First 1 ns SLT Laser

*The reduction of elevated intraocular pressure (IOP) is vital for the prevention of ocular damage in patients with glaucoma. Topical eye drops typically serve as the first-line treatment of choice, but when pharmacological intervention fails to produce a satisfactory drop in IOP or delivers unsatisfactory side effects, selective laser trabeculoplasty(SLT) is usually employed.*

*Existing literature shows that SLT has similar safety and efficacy to pharmacological therapy.[1] And, as it has fewer side effects and less cumulative expense than long-term pharmacological management, there is a strong argument to be made in favour of SLT as an effective first-line glaucoma treatment. Nonetheless, use of the treatment in this capacity remains limited due to concernsaboutits duration of action and repeatability. With this in mind, new-generation SLT lasers, such as the OptoSLTnano (Optotekd.o.o, Slovenia), are now addressing this issue and are primed to trigger a paradigm shift in glaucoma therapy*

Figure 1: OptoSLT nano

## The Benefit ofthe new laser technology

The OptoSLTnano is the first 1 ns SLT device on the market and has been designed with sophisticated dual set up. This allows seamless incorporation into any practice as a complete stand-alone device with lifting mechanism and slit lamp or added as an upgrade to existing slit lamp on the market.Standard SLT utilizes a low energy Q-switched, frequency-doubled neodymium doped yttrium aluminium garnet (Nd:YAG) laser with a wavelength of 532 nm and a short pulse duration of 3-5 ns. By using short laser pulses of a specific wavelength, SLT specifically targets pigmented trabecular meshwork cells while avoiding the widespread thermal damage associated with non-discriminatory lasers (argon laser trabeculoplasty [ALT]). This low-energy irradiation leads to IOP reduction by stimulating the removal of damaged cells by macrophages and increasing trabecular meshworkporosity, which in turn restores normal aqueous outflow through the drainage angle.

With diode pumped solid state laser technology inside, the OptoSLTnano device offers additional features for the SLT application, such as better pulse stability at higher repetition rates, whichresults in quicker and safer treatment option. Furthermore, the OptoSLTNano utilizes a more stable and efficient diode–pumped solid-state laser technology, which further boosts the speed of the SLT treatmentand at the same time does not compromizeits safety.
The device's energy levels range from 0.2 to 2.0 mJ and its red diode 635 nm aiming beam with superior sharpness of the beam profile ensures precise focusing for highly predictive and effective treatment. With the new laser technology inside the OptoSLTnanoachieves a very high pulse to pulse stability of ±2.5% - a level exceeding that of other existing laser technologies. And this increased stability improves pulse energy repeatability, therefore permitting faster SLT procedures (up to 5 Hz) and optimizing its safety.

## Clinical Use

While the exact clinical use of SLT varies somewhat from physician to physician, its commonest uses includeimprovement of IOP control for patients on medication(s), reduction of medication dependence for patients with controlled IOP, and improvement of IOP control in glaucoma patients with poor complianceto pharmacological therapy – perhaps due to intolerable side effects or poor memory.

The procedure with OptoSLTnanoitself is straightforward, lasting only a couple of mins.. With the OptoSLTnano, an initial treatment energy of 0.8 mJ can be used during the procedure, which is best commenced at the inferior angle – as it is usually the most openarea and easiest to clearly visualize. As angle pigmentation is greater nasally and temporally compared with inferiorly and superiorly, higher energy levels are needed for treatment in these areas. Physicians who have used the OptoSLTnano report that around 110 shots are needed to treat the full 360 degrees of each eye.

While SLT delivers noticeable IOP reduction, especially where other strategies fail, it is important to manage patient expectations accordingly. An important point of note is that the treatment results are not permanent, and last for an average period of 2 to 2.5 years, with an upper limit of 5 years reported by some patients. However, given that SLT performed with the OptoSLTnano can be safely and effectively repeated, patients can be managed long term with retreatment every 2 years.

## Conclusion

The low energy and pigment-cell specific nature of SLT makes it a safe and effective first or second line solution for IOP reduction in glaucoma patients. Anecdotal evidence suggests that despite numerous studies demonstrating the stand out benefits of the procedure, concerns about the repeatability of SLT have limited its uptake within the field of ophthalmology. The OptoSLTnano was developed to address this concern, while improving safety outcomes – a task achieved via the device's ultra-short laser pulse duration of just 1 ns and pulse-to-pulse stability feature. Given the maximized safety profile, procedure repeatability and speed, it is clear that glaucoma specialists have much to gain from the adoption of the use of the OptoSLTnano in clinical practice. The attention must now turn to educating ophthalmic physicians on the true potential of this device to ensure glaucoma patients receive the most effective and cost efficient treatment option available to them.

## References


1. Katz LJ et al: SLT vs Medical Therapy as Initial Treatment of Glaucoma: A Prospective, Randomized Trial. J. Glaucoma 2011 May