

NEODYMIUM-DOPED YTTRIUM ALUMINIUM GARNET (ND:YAG) LASER PERIPHERAL IRIDOTOMY

Laser peripheral iridotomy is a procedure to create a passage for aqueous humour to flow through the iris. It is typically performed prophylactically in patients with narrow (“occludable”) anterior angles to modestly reduce the risk of angle closure,¹ and well established in the treatment of pupil block during acute angle closure glaucoma, including the treatment of the fellow at-risk eye.² The opening of a channel in the peripheral iris permits a more direct route for aqueous humour to from the ciliary body to the trabecular meshwork, which reduces the pressure gradient across the iris, reducing anterior iris bowing and opening the anterior angle.³ The procedure is not without risk. As the iris is a vascularised tissue, there is risk of bleeding, and with the introduction of energy to the anterior eye, there is also the increased risk of cataract and other inflammatory complications.⁴ Appropriate patient selection is vital, as the number of peripheral iridotomies needed to be performed to prevent one angle closure event is approximately 44 (and over 120 to prevent any sight loss),⁵ while any adverse outcomes from the procedure may subject the patient to additional, and upon reflection, unnecessary, ophthalmological care and surgery. Careful consideration and discussion with the patient regarding the risks and benefits is essential in all cases.

Prior to performing the procedure in vivo, the optometrist must first demonstrate competence in the theoretical and procedural aspects of performing a peripheral iridotomy, to the satisfaction of their nominated ophthalmologist.

1. A piece of paper with a mock iris drawn on it (to scale) should be secured to the head rest of the laser unit.
2. The laser power should be titrated in a single spot in the periphery of the mock iris, until the required photo-disruptive effect is observed.
3. Once the power is determined, a mock iridotomy should be performed using the appropriate power, duration, repetition, etc. This mock iridotomy, under supervision, should be completed to the satisfaction of the nominated ophthalmologist.
4. A variety of iris, cornea, ocular co-morbidities, and simulated eyelid positions should be presented to ensure that an appropriate location and clinical technique is applied in each case, to the satisfaction of the nominated ophthalmologist.

5. The nominated ophthalmologist may use this opportunity relate theoretical knowledge of the procedure and anatomy to the clinical presentations.

Once the series of mock peripheral iridotomies have been completed to a level deemed satisfactory by the nominated ophthalmologist, the optometrist should directly observe the nominated ophthalmologist complete a **minimum of 20 iridotomies** to ensure that their knowledge can be applied to real-world examples. This stage requires completing a detailed *Laser surgeries logbook* (Appendix 3) that must be submitted for the Board's approval, before the optometrist may continue with the training.

6. These cases should be interactive and probe the optometrist's knowledge and clinical decision making during each case. Note that in considering the patient's best interests, this discussion may take place once the consultation has finished.
7. At a minimum, pre- and post-treatment binocular views should be obtained on the slit lamp. Ideally, the entire procedure would also be followed through a teaching tube or video capture.
8. Selection of the laser parameters and target areas should be discussed with the optometrist, in addition to cautionary features of the treatment and recognition of potentially difficult cases.
9. Particular attention should be made for cases where higher laser powers may be required, or unique or complex cases which may require consultation or referral to an ophthalmologist.
10. The optometrist is required to keep a record of each case (Appendix 3), including the clinical presentation, laser settings, surgical procedure, and patient outcomes.
11. Once at least twenty cases have been observed, the nominated ophthalmologist must co-sign the logbook with the optometrist to declare that all training has been completed to a standard to which they are satisfied.
12. The nominated ophthalmologist must also sign and date the *Laser surgery declaration* (Appendix 4). This includes a summary of all surgical procedures.
13. Before the optometrist can proceed to perform the procedure themselves, the *Laser surgeries logbook* (Appendix 3) must be submitted and approved by the Board. This provides an additional opportunity for discussion of any of the cases.

Once the Board has given approval of the training logbook for the observed procedures, the optometrist may proceed to conducting the procedure themselves, under direct supervision¹ of their nominated ophthalmologist.

¹ Direct supervision means both the nominated ophthalmologist and optometrist are present in the room during the procedure.

14. Patients must be made aware of the training nature of the procedure and give appropriate consent by signing an Agreement to Treatment (Consent) Forms prior to the practitioner undertaking the laser procedure.
15. The Consent Form should document the title and position of the practitioner being trained and that patients have been made aware that they are in training under direct supervision.
16. Feedback is given to the optometrist either during or immediately after the observed treatment.
17. A detailed log of the cases, including feedback from the nominated ophthalmologist, must be recorded in a *Laser surgeries logbook* (Appendix 3), similar the observation logs completed previously.
18. Additional questioning, such as more complex 'What-if?' type scenarios can be used to help the nominated ophthalmologist obtain the required level of confidence in the optometrist
19. After a **minimum** of 10 directly supervised surgeries, if the nominated ophthalmologist believes that the optometrist can independently, competently, and safely complete the procedure, this logbook should be signed off.
20. The nominated ophthalmologist must also sign and date the *Final supervisor sign-off and declaration* (Appendix 5).
21. The signed-off *Laser surgeries logbooks* (Appendix 3) and Final supervisor sign-off and declaration (Appendix 5) should be submitted to the Board (ODOB) and must be accepted by the Board before the practitioner is allowed to independently perform the surgery.
22. On-going approval from the Board is contingent on a suitable work environment, a satisfactory nominated ophthalmologist being available, and meeting the auditing requirements set out for continuing competency in each procedure.

References

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2. Lowe RF. Primary angle-closure glaucoma: A review 5 years after bilateral surgery. *Br J Ophthalmol*. 1973. doi:10.1136/bjo.57.7.457
3. Gazzard G, Friedman DS, Devereux JG, Chew P, Seah SKL. A prospective ultrasound biomicroscopy evaluation of changes in anterior segment morphology after laser iridotomy in Asian eyes. *Ophthalmology*. 2003. doi:10.1016/S0161-6420(02)01893-6
4. Radhakrishnan S, Chen PP, Junk AK, Nouri-Mahdavi K, Chen TC. Laser Peripheral Iridotomy in Primary Angle Closure: A Report by the American Academy of Ophthalmology. *Ophthalmology*. 2018. doi:10.1016/j.ophtha.2018.01.015
5. Gupta V, Dada T. Should we perform peripheral laser iridotomy in primary angle closure suspects: implications of the ZAP trial? *Ann Transl Med*. 2019. doi:10.21037/atm.2019.06.52