CLINICAL PRACTICE GUIDELINE: Emergency Department

# Laser Peripheral Iridotomy (LPI)

Disclaimer: This Clinical Practice Guideline ('CPG') was written for use in The Royal Victorian Eye and Ear Hospital Emergency Department. It should be used under the guidance of an Ophthalmology or ENT registrar. If clinical advice is required, please contact the Eye and Ear Admitting Officer for assistance: EYE: +61 3 9929 8033; ENT: +61 3 9929 8032. Links to internal Eye and Ear documents cannot be accessed from the website CPG.

See also: Laser safety learning material

## Acute Management:

**Indications For LPI:**

- Primary angle closure (PAC)
- Primary angle closure glaucoma (PACG)
- Fellow eye of PAC, PACG
- Narrow angle at risk for PAC
- Closure of previous LPI
- Uveitis causing complete posterior synechiae (iris bombe)

**Pre-Procedure Evaluation:**

Informed consent:

- Risks: haemorrhage, inflammation, ghost image, need for additional laser, elevated intraocular pressure (IOP), possible decrease or loss of vision
- Explain indications for laser and what to expect (contact lens, discomfort)
- Consent form signed: correct procedure, correct eye
- Measure and record: visual acuity, IOP.

Pre-treat eye to be lasered with:

- Pilocarpine 2% eye drops, 1 drop before procedure in order to constrict pupil and facilitate penetration.
- Brimonidine 0.2% eye drops, 1 drop (decreases post-operative pressure spike). Alternatively, can be given after laser.

**Procedure:**

- Refer to laser safety protocol (i.e. laser in use signs, etc.)
- Correct protective eye wear for observer (1064 nm)
- Topical anaesthetic (oxybuprocaine 0.4% minim or proxymetacaine 0.5% eye drop)
- Contact lens specific for LPI, coupling gel
- Position contact lens and laser to visualize superior iris and select area for LPI. Preferred position, base of iris crypt, 11:00 or 1:00 o'clock under lid to prevent ghost image. LPI needs to be as peripheral as possible.

**Suggested Laser Settings:**

**NOTE:** laser settings may vary with different machines, contact lenses, and variable iris thicknesses and pigmentation.

Blue to moderately brown irides:

YAG Laser:

- Total energy (millijoules (mJ)) = energy per pulse x number of pulses
- Total energy = 5-15 mJ
- Energy per pulse = 2-3 mJ (may need to increase to 4mJ)
- Pulses = 1-3
- **Common starting point:**
  - **2 to 3 mJ (single shot)**
  - **May need to increase pulse from 1 to 3, eg 3 mJ X 3 pulse = 9 mJ total energy**

- Endpoint for laser: penetration through iris pigment epithelium with gush of pigment and fluid through hole.

If haemorrhage: gentle pressure with contact lens against eye will control bleeding in most cases.

Dark Brown Irides

May need Argon laser to thin iris stroma prior to using YAG laser to complete procedure.

Argon Laser:

- Energy: 500-1000 milliwatts
- Pulse: 1 burst
- Spot size: 50 microns
- Duration: 0.05-0.1 second

Treat peripheral iris tissue in spot intended for LPI, until reach iris pigment epithelial layer.

Then complete penetration of pigment epithelial layer with YAG laser as above.

**Post-procedure Care:**

Consider Brimonidine 0.2% eye drops, 1 drop immediately after laser if not given prior

Check IOP 30-60 minutes after procedure. If there is a significant rise from baseline IOP, treat as indicated and recheck IOP 1 hour later.

Prednefrin forte® eye drops: 1 drop QID for 7 days

## Follow up:

1 week to assess patency of LPI, anterior chamber depth, intraocular pressure, inflammation, and repeat gonioscopy

Note:  high risk patients with advanced optic nerve cupping, visual field loss or pressure > 30 may need sooner follow up appointment.

## Discharge instructions:

Instruct patient to return if pain or decreased vision.

## Additional notes:

Give patient copy of Laser Peripheral Iridotomy Patient Information

**Evidence Table**

| Author(s) | Title | Source | Level of Evidence (I – VII) |
|---|---|---|---|
| | The Wills Eye Manual, 5th Edition, 2008 | | **VII** |
| | Moorfields Manual of Ophthalmology, 2008 | | **VII** |
| Tarek, M Shaarawy | Glaucoma, Volume 2, Surgical Management, 2009 | | **VII** |
| Don Julian de Silva, Gus Gazzard, Paul Foster, Br J | Laser iridotomy in dark irides, Ophthalmol 2007;91:222-225 | | **VII** |

**The Hierarchy of Evidence**

The Hierarchy of evidence is based on summaries from the National Health and Medical Research Council (2009), the Oxford Centre for Evidence-based Medicine Levels of Evidence (2011) and Melynk and Fineout-Overholt (2011).

I) Evidence obtained from a systematic review of all relevant randomised control trials.

II) Evidence obtained from at least one well designed randomised control trial.

III) Evidence obtained from well-designed controlled trials without randomisation.

IV) Evidence obtained from well-designed cohort studies, case control studies, interrupted time series with a control group, historically controlled studies, interrupted time series without a control group or with case series.

V) Evidence obtained from systematic reviews of descriptive and qualitative studies.

VI) Evidence obtained from single descriptive and qualitative studies.

VII) Expert opinion from clinician, authorities and/or reports of expert committees or based on physiology.

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