GLAUCOMA SERVICE HANDBOOK

York Teaching Hospitals NHS Foundation Trust

Revised Marchˢ~~May~~ 202~~3~~1 for HD~~H~~FT

~~June 2020 – For Revision June 2022~~For Revision March 2024

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Co-section Mr Joshua Pilling
Revised May 2021 for use at Harrogate hospital with permission V Anakwenze, Miss J Liput, Mr J Pilling

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WELCOME

A warm welcome to the Glaucoma firm at Harrogate. This handbook has been written by the York glaucoma team and has been adapted for use at Harrogate hospital. This guide will make it easier for you to undertake clinical duties in your new position.

Lastly, it will be a reference for our ever-expanding eye team who operate outside our Glaucoma subspecialty.

Whilst we will aim to update this handbook regularly, please do not hesitate to inform us of any changes you feel this handbook would benefit from.
All the best and enjoy your placement with us.

Staff Contact

Name	Role	Mobile
Joanna Liput	Consultant	07979355957
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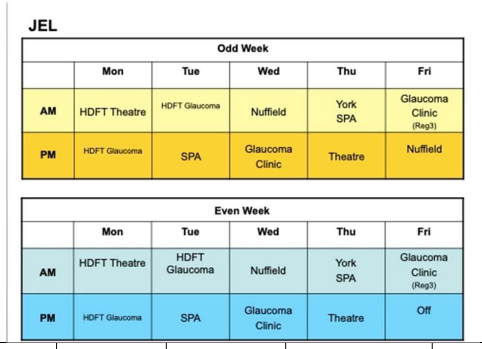
Timetables

JEL



	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
AM	theatre	clinic	Nuffield	Theatre 1 in 2 SPA 1 in 2	Clinic 1in 4	Theatre 1in 4
PM	clinic	laser		Virtual		Nuffield theatre 1 in 4

JP

	Monday	**Tuesday**	**Wednesday**	**Thursday**	**Friday**
AM	Ripon glaucoma	Virtual glaucoma	Theatre	Glaucoma clinic	Glaucoma clinic
PM	Ripon glaucoma	SPA	Off	SPA	General clinic

TB

Variable rota – please check staff intranet

Clinics

- 0800 |1300 Theatre WR
- 0845|Clinics start
- 1230 |Clinics finish
- 1330 |Clinic Starts
- 1700 |Clinic ends

Virtual Reporting Clinics

- Clinics currently being run in Harrogate
- RAG – Green/ AMBER patients only

Optometry Led Glaucoma Screening (OLGS)

- New referrals / Internal patients

Glaucoma Service Development

Yorkshire Glaucoma Symposium - YGS

Chair: Joanna Liput

Organised annually, usually 1st Tuesday of ~~September~~October. This event is recognized in the regional teaching rota.

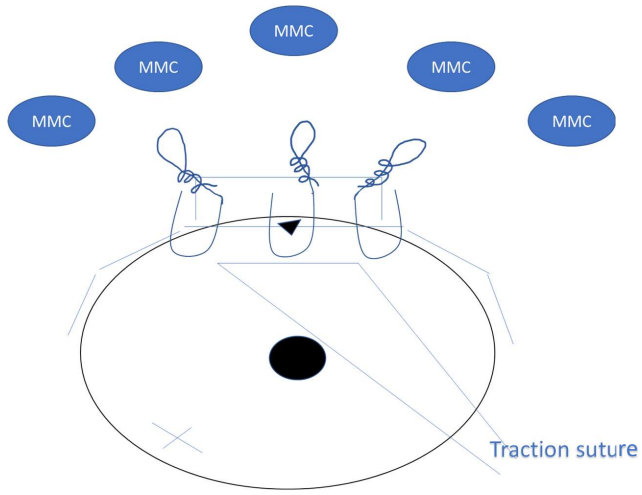
Research

- **LIGHT – RCT SLT vs Latanoprost**
  PI for York side – JEL- study closed
- **TAGS – RCT trab vs meds in advanced glaucoma**
  PI for York side – JEL – study closed
- **QoL Glaucoma**
  PI for York side – JEL
- **ATHENA**
  PI for York side - PYA

Commented [A1]: PI for York and Harrogate side

Commented [A2]: Irrelevant to HDFT, to be erased

Enhanced Trabeculectomy



1. P+D and surgical speculum
2. **Iopidine 1% plus Pilocarpine 2% Preop (JL – this is given in anaesthetic room)**
3. JEL Subtenon injection with 2% lidocaine to use for hydrodyssection as local anaesthetic
   JP subtenon
   TB Peribulbar anaesthesia
4. **7-0 silk** corneal traction suture (W817 Ethicon)
5. Superior conjunctival dissection
   - Start with **Vannas and Hoskins** in the middle.
   - Peritomy: scissors flat, change to **springs and Moorfields / Fechtner Forceps. .** Enter blades closed and open, enter shelf and cut (blunt dissection).
   - Dissect 10 mm posteriorly either side of SR.
6. Diathermy
7. Check the concentration of MMC, Patients hospital number and the expiry date!!! Standard concentration is 0.4 mg/ml; dilute to 0.2mg/ml in every primary trabeculectomy on Caucasian patient
   - 0.4 mg/ml MMC placed in gallipot
   - To make 0.2mg/ml add 1m BSS to the MMC gallipot
   - Cut corneal shield into 2 pledgets
   - The surgeon will take one by one using disposable Moorfields forceps and put them underneath the sub tenons space counting the total inserted; Use Fechner forceps to hold the conjunctiva as less trauma
   - When the first sponge is under the sub tenon's space the timer should start and set to 3 minutes
   - Count out the sponges as removed by the surgeon
   - 20 ml of BSS to wash out scleral pocket
   - Remaining MMC, sponges, any disposable instruments placed on the cytotoxic trolley should be disposed into cytotoxic container with purple top
8. Scleral Flap
   - **Measure 4x2mm**
   - Horizontal flap dissection with **15-degree blade/diamond knife to the** 'grey transition zone'. Hold fragment vertically and use the tip to cut.
   - 45° **crescent blade (yellow)** to dissect the plane in a circular motion – enter at 45 degree to establish plane and the flat against sclera. move the blade, don't cut anteriorly, take your time. Ensure the eye in pointing down and good fixation. Keep the hill of the blade flat on the globe.
   - Side cuts with Vannas, razor fragment(DB) or Diamond, cut short of being anterior i.e. cut incision start 1 mm from the limbus to promote posterior flow
9. AC maintainer (JL/JP/TB)
   - MVR Blade
   - AC maintainer goes in bevel up then down once in the AC. The bottle height is 33 cm above patients' head for a normal flow. Fixate inferiorly
10. Sclerostomy and PI

Commented [PA3]: r

- **2.4 mm keratome**
- Corneal incision: Enter **vertically**, **anterior, horizontal middle 1/3rd**.
- Use a **101 punch** Khaw punch (keeping it vertical as you punch). Ask for I/C lidocaine if uncomfortable
- PI (using **Colibri** to pick up iris and **Ongs** to cut, Scissors in Right hand for Right eye; Left hand for Left eye), check for pigment afterwards.
- Massage the eye with back of **spear** to encourage iris back.

11. Releasable sutures
    - 1 x releasable, one fixed suture with **10-0 nylon**. Filtration checked. AC maintainer bottle hight reduced to shoulder level of the surgeon. Filtration under flap should stop, eye should become very soft. If filtration still present, adjustable suture placed on posterior lip of the flap. Highly likely to be required in eyes with high risk for hypotony.
    - IT IS ALWAYS EASIER TO REMOVE THE SUTURE IN THE CLINIC RATHER THAN TAKE THE PATIENT BACK TO THEATRE FOR REVISION!
12. Conjunctival closure
    - Usually 3 sutures
        - Rotate sutures
13. AC maintainer removed and Paracentesis hydrated
14. Remove traction suture.
15. Wounds checked for leak with **fluorescein 2%.**
    - Occasionally 10-0 vicryl required (W7102 from Ethicon for small buttonhole in conjunctiva)
16. S/Conj Cefuroxime and Dexamethasone, **g. Atropine 1%,**
17. Shield and dressing applied

Commented [PA4]: I use 2% fluorescein

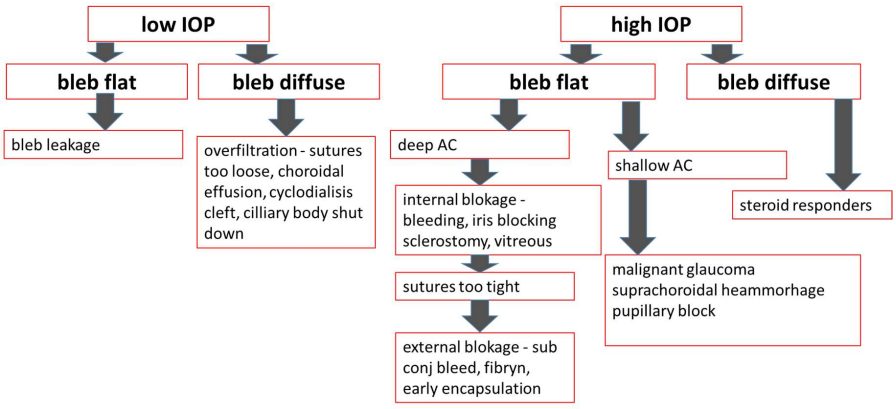
Post op Management

g. chloramphenicol 0.5% pres free QDS for 2/52
g. dexamethasone 0.1% pres free x6 for 2/52 then taper down to QDS and continue up to 3/12. After 3 /12 taper down one drop per week and stop. Do not stop in African-Caribbean, carry on OD on regular prescription

Stop glaucoma treatment to the operated eye

Follow Up

- 1/7 post-op
- Every week for the 1st month
- Every 2/52 for the 2nd month
- Once in the 3rd month



Trabeculectomy post-operative complications

Early Post-Operative

Flat AC

- Make sure it is not aqueous misdirection. Make sure that they are already on atropine 1% BD
- Immediately inform Consultant Colleague

Over drainage

- Contact lens technique. This involves placing an oversized bandage contact lens (BCL) 17-24mm
- Will overlap the cornea / sclera, covering the bleb and compressing it, allowing the ciliary body to recover from the insult of surgery and start producing aqueous
- Consider Bleb Revision

Bleb Leak

- Seidel test – 2% on all early post op cases
- Antibiotic where +ve Ofloxacin (another Quinolone)
- Aqueous suppression: Cosopt BD / Azarga BD
- BCL - inform Consultant Colleague before considering

Choroidal Effusion

- No evidence of over drainage or conjunctival buttonhole
- Can self-resolve
- May require drainage if kissing

Underdrainage

- Assess for excess healing (Increased vascularisation, low bleb, IOP creep
- Mx
    - Treat with Increased topical steroids
    - 5 FU injections
    - Releasing sutures from the flap
    - Ocular massage

Late Post-Operative

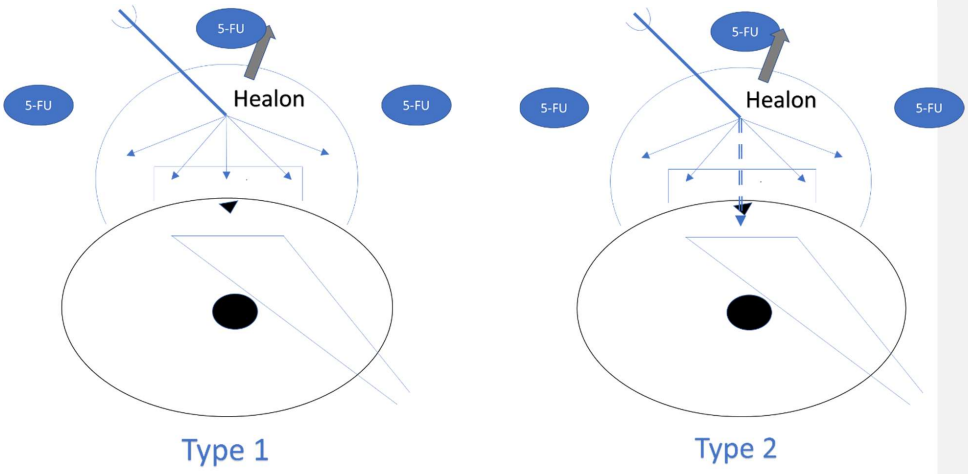
Late Bleb Leak

- As per early bleb leak
- Bleb revision
    - Autologous blood
    - Fibrin Glue

Blebitis

- Is a serious potentially blinding condition. Any Post Trabeculectomy patient who presents with a red eye should be considered for the immediate use of a fourth-generation fluroquinolone
- REMEMBER LEAKING BLEB –BLEBITIS→ CAN LEAD TO ENDOPHTHALMITIS

Bleb Needling



Variation of Needling classification

-Type 1 – under Tenons – usually in clinic

- Type 2 – under the flap – in theatre, topical anaesthetic

- Type 3 – under the flap and into AC – in theatre, sub conj anaesthetic, AC maintainer

Preoperatively

- Measure IOP
- Identify the flap + ostium
- Decide whether type 1 (subconjunctival) or type 2 (sub flap) is required.

Bleb Needling in clinic < 3/12 months

1. Indication: Type 1 needling
2. Method

    a. Topical anaesthesia and consider phenylephrine to prevent bleeding if bleb hyperaemic.
    b. Povidone Iodine 5% minims to the conjunctival sac

    c. **0.2mls of 5-FU (2.5 mg/0.1 ml) in an insulin syringe**. If there is thick tenons then you need to decant into another insulin syringe so that the needle is sharp.
    d. **Micro-perforations** (no sweeping movements) of 5-FU in the subconjunctival plane above the bleb.
    e. Use local anaesthetic soaked cotton bud to tamponade needle entry.
    f. Drop of Chloramphenicol at the close
    g. You can use viscotears at the end for relief.

Bleb Needling in theatre >3/12 months

1. Indication: Type 1 / 2 needling
2. Method
    a. Use topical oxy/proxy/tetracaine, if uncomfortable give 3mls of sub tenons LA (Lignocaine 2% : Bupivicaine 0.25%) 50/50 mix.
    b. Antimetabolite is filled in an insulin syringe with 29G needle to bend.
    c. Enter from the superior fornix hooding the conjunctiva forwards with Hoskins
    d. Needling of scar tissue (in out movements) (TYPE 1). Multiple perforations and cut with side of needle. Look for a response and monitor the AC.
    e. If there's none then enter AC sub flap (TYPE 2)
    f. If the AC shallows, consider BSS in AC via the side port and watch. Use Healon if necessary with Air/SF6 20% gas.
    g. Healon is then given subconjunctivally either side of flap and at 12 0'clock position. Look for if any scar tissue and needle appropriately.

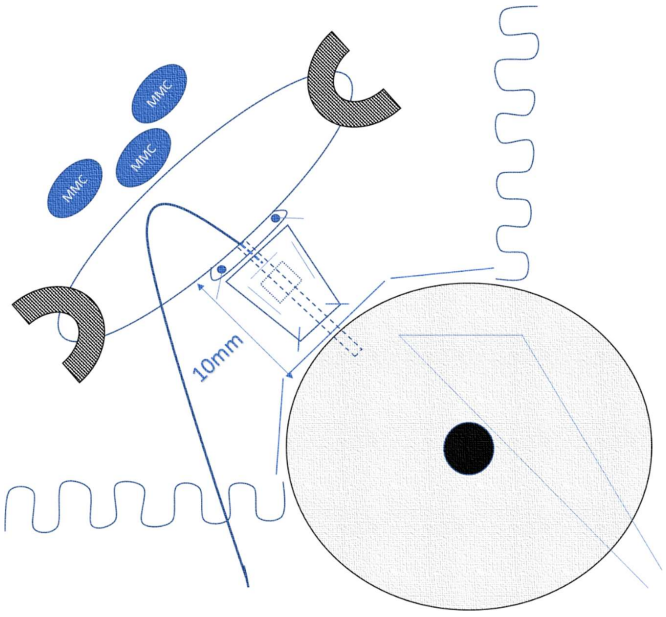
h. 5FU is injected; 0.1 mls is given on either side and superior to flap. (0.3 mls total).
i. Subconjunctival cefuroxime and betnesol is given to inferior conjunctiva

Post-operative Management

g. chloramphenicol 0.5% preservative free QDS for 2/52
g. dexamethasone 0.1% preservative free x6 for 2/52 then taper down to QDS and continue up to 3/12. After 3 /12 taper down one drop per week and stop. Do not stop in Afro Caribbean, carry on OD on regular prescription
g. Atopine 1% BD for 1/52
Stop glaucoma treatment to the operated eye

F/U as per post-op trabeculectomy. Consider aggressive 5-FU management in the early post-operative period.

Glaucoma Drainage Device



Baerveldt Tube

1. Determine location of plate, assess conjunctiva integrity: ST/SN/ IN/IT
2. Topical adrenaline 1:10,000 with squint hook onto superior (or inferior) conjunctiva
3. Marking
    a. Mark 12 o'clock 9 o'clock (supratemporal placement) with marker pen – splaying slightly
4. Conjunctival reflection and Tenons dissection
    a. Next place a 7-0 silk corneal traction suture
    b. Vannus and Hoskins for initial peritomy at limbus, then Westcott's and Hoskins. Make lateral releasing conjunctival incisions with Westcott's
    c. HPMC and corneal shield.
    d. Reflect conjunctiva with long conjunctival clamp and use a squint hook for further dissection and to hook muscles – exposing its length
5. MMC application
    a. Next apply the three-disc sponges soaked in **0.4mg/ml MMC** for 3 minutes and wash thoroughly. Sponges should be placed closer to conjunctiva (as this is the site for fibrosis). Wash with 20ml BSS and change to corneal shield.
6. Plate insertion
    a. Place supramid suture into the plate at this stage. Place plate roughly in desired location and make inferior fornix tunnel with springs and Moorfields and place the curved part onto bare sclera.

    b. Insert the plate into the desired position and check that there is 10mm from limbus to ridge of plate.
    c. Suture orientation is parallel to limbus. 3/1/1 tie down lock and tie down again with indentation; or use a slip knot. Need to expose the whole length of muscle and pull it forwards.
7. Perform Paracentesis
8. Insert tube
    a. Place eye in primary position. The ideal tube location is parallel to the iris, and distant from the cornea.
    b. Cut tube to the level of the traction suture.
    c. Locate landmarks to make a tunnel : limbus, iris root, enter 1 to 2 mm behind iris root
    d. Razor fragment/15 degree for the incision tunnel
        i. 70% scleral depth till you start seeing the bluish hue as in Trab, horizontally the width of the needle,
        ii. Blue needle, bend 45 deg- 90 degree more posterior to bevel
    e. Enter with needle parallel to sclera and once you get pass the iris root, change curvature to enter the AC. You need to change the curvature to ensure tube doesn't rub against cornea. **Ensure counter traction by using Hoskins to grab traction suture or Tenons adjacent to the tunnel insertion**
    f. Insert with McPhersons in the right hand and Hoskins in the left hand
    g. Face tube tip downwards to engage the tunnel, ensure the back of the tube is straight and push with McPhersons.
    h. You can use a Rycroft to get tube into the correct depth plane.
    i. Check that it is watertight and if not apply two 9-0 nylon to para-tube leak, +/- tenons and inert into leaking pockets

9. Place 9-0 nylon box / cross or fixed stitch to secure tube in place.
10. Consider if a Sherwood slit / blow valve is required.
    a. Use yellow 30G needle, parallel to the tube.

   b. Indication: Patient is on Diamox and there is no para-tube leak; if there is a leakage don't do the blow valves.
   c. NB* Do not use if tissue glue if blow valve is used.
11. Patch graft to protect the tube
12. DB; Double layered Trapezium with 8 mm Height and 6 mm at limbus and 8 mm at plate. The smaller part of tutoplast is towards sclera. 10/0 Nylon suture to 2 ends towards sclera 3/1/1 throws and buried mattress on non-parallel sides of tutoplast)
13. Conjunctival closure
    a. X2 slit knots (10/0 Nylon) for the conjunctival edges, X2 mattress sutures at limbus, 8/0 Vicryl continuous locking sutures to fornix.
14. Apply neat Fluorescein to check for leakage.
15. Finish with g. atropine 1%, g. benoxinate 0.5%, subconj cefuroxime 125mg/betnesol 4mg,

Postoperative management pearls

1. G Dexamethasone 0.1% presfree 6x daily, g.chloramphenicol 0.5% pres free QDS
2. Continue glaucoma drops until tube about to open and stop drops before this event at around 5-6 weeks. Sometimes patients may need diamox from the first day postop.
3. **Don't pull the supramid before 3 months.**
   a. Wait for IOP to get high 20's with or without drops before pulling the supramid and control with Acetazolamide in the meantime
   b. If IOP rises after removal of the supramid you can give prostaglandins, but aqueous suppressants are better.

Post-operative Management

g. chloramphenicol 0.5% pres free QDS for 2/52
g. dexamethasone 0.1% x pres free x 6 for 2/52 then taper down to QDS and continue up to 3/12. After 3 /12 taper down one drop per week and stop. Do not stop in African-Caribbean, carry on OD on regular prescription
g. Atopine 1% BD for 1/52
*CONTINUE glaucoma treatment to the operated eye**

Commented [PA5]: I just use predforte 2 hourly for 2/12

Follow Up

- 1/7 post-op
- 1st week
- 4th Week
- 6th to 8th Week
- 12th week

Phaco post Trabeculectomy

- temporal approach with careful corneal placement of side port to reduce ballooning of conjunctiva

- 5-FU, 0.2mls (50 mg/ml) subconjunctival is injected superior to bleb at the end of surgery and given at 1 week and 1 month.

- Postoperative steroids are given initially x 6 daily in the form of g.dexamethasone 0.1% and tapered over the course of 2 – 3 months

- Diamox 250mg SR bd PO x 2 days and continue all glaucoma medication**. Don't give Diamox if trab or tube works**. Use vision blue to check if filtration through the bleb is still present

- Review patient at week one

Minimally Invasive Glaucoma Surgery

Istent

Indications

The iStent® Trabecular Micro-Bypass Stent is indicated for the reduction of intraocular pressure (IOP) in adult patients with mild to moderate open-angle glaucoma currently treated with ocular hypotensive medication. Suitable patients may also be intolerant to conventional eye drops.

Steps

1. If undertaken as part of cataract surgery remove Viscoelastic at end of IOL insertion
2. ~~Use Miochol ;~~ Insert VED into the AC, widening view of Angle
3. Place VED into onto the eye and tilt the head away from you and microscope towards you (Change level of operating chair)
4. Check angle with Gonio Prism
5. Check IStent prior to insertion, insert into the eye using main wound as a pivot. Place lens on the eye (Swan Jacobs) as you move past the pupil
6. Look for the site of insertion , just behind the pigmented Trabecular Meshwork ™ . A reflux of blood within Schlemm canal is a good marker for positioning.
7. Engage the TM , click and release then pull away
8. Insert Second istent 2 clock hours away from initial stent
9. Inject healon to tamponade bleeding ad washout with BSS
10. Intracameral cefuroxime and Subconj dexamethasone at the close

Commented [VA6]: I don't recall us doing this at HDFT? I suppose I might consider if access isn't very good, but probably more likely just wouldn't implant. Don't use it routinely.
I don't give subconj dex either….

Commented [A7]: I don't use it. I guess it was in training phase for other consultants in York

Post-operative Management

*If only istent inserted give g.maxidex~~trol~~ Q~~T~~DS for 1 month

CONTINUE glaucoma treatment to the operated eye

Follow Up

- 1st week
- 4th Week
- 12th week

PRESERFLOW

The **PRESERFLO™ MicroShunt** is a 'minimally' invasive glaucoma drainage device. It is a small tube about 8mm in length

~~I~~ndications

PRESERFLO Microshunt is indicated for the **management of refractory glaucoma's cases of primary open-angle glaucoma that are unresponsive to maximum tolerated medical therapy**.

Post-operative Management

g. chloramphenicol 0.5% ~~preservative free~~ QDS for 2/52
g. dexamethasone 0.1% ~~preservative free~~ x6 for 4/52
~~NO ATROPINE~~

Follow Up

- Day 1 review
- 1st week
- 2nd week
- 4th Week
- 12th week

Laser

YAG Laser Iridotomy guidelines

Indications

1. Angle closure with pupillary block—may be acute or sub-acute; chronic; primary or secondary.
2. Prophylaxis: occludable narrow angles (including fellow eye in angle closure). 180 degrees of iridotrabecular contact

Before the Procedure

Check work up and Gonioscopy findings (prior to drop instillation). Check vision and IOP

Consent: explain what the procedure does, why you are treating both eyes, and possible complications, including failure of treatment or need for retreatment, bleeding, inflammation, corneal burns, and visual effects (e.g., photopsia, monocular diplopia).

1. Apply drops (20 minutes prior): G Pilocarpine 2% & G Iopidine 1%
2. Consider: Is argon laser pre-treatment necessary? (See next section)
3. Topical anaesthetic (e.g., proxymetacaine, oxybupivicaine).
4. Separate (COVID-19 Guidance g.Iodine)

Technical parameters:

Site:	Between 11 and 1 o'clock position (silicone oil pupil block is an exception where inferior PI (Ando PI) required. Consider temporal Peripheral iridotomy
	Avoid 12 o'clock (bubbles may obscure view)
	Site ¾ distance between iris margin and limbus
	Aim for an iris crypt
Size:	≥200µ (enlarge by applying shots nasal/temporal edge)
Number:	Avoid multiple iridotomies
Power:	As a guide: Blue irides 4-8mJ, Brown irides 7-10mJ
	Avoid multiple shot settings (risk of lens injury)
	Total energy should not exceed **60mJ**

Commented [PJ(8]: Never seen this as a problem. I'd do at 12 if there was in iris crypt.

Commented [A9]: Agree with Josh

Problems: Haemorrhage/pigment obscuring view/corneal clouding – stop and re-book

Difficulty penetrating stroma – consider argon pre-treatment chipping technique or skin on drum technique

High Laser energy – bring back for further laser session and consider above

After procedure: g. Iopidine 1%

Check IOP 1 hour after treatment

Prescribe g dexamethasone 0.1% hourly for 1 day, then QDS for 1 week

If significant IOP spike present give 500 mg stat Diamox

Check IOP after 60 min

If high IOP persistent inform the Glaucoma Consultant

Ensure that post treatment gonioscopy is/will be carried out at follow-up at 2-3 weeks

Record Procedure in clinical notes and LASER BOOK

Covid 19 guidance – Consider topical lubricant for 1-month QDS

Commented [PJ(10]: Seems odd – delete??

Commented [A10R2]: Delete please

As per MREH guidelines

Argon pre-treatment technique: Useful for heavily pigmented / thick irides

Step1:	OPTION 1: Apply 3-5 'slow cook' burns in an overlapping fashion, to **flatten** and **photocoagulate** the site (suggest 500µ x 100mW x 0.5 s)
	OPTION 2: Apply 4-6 'slow cook' burns circumferentially, to **stretch** the site (the 'drumhead' technique) (suggest 200µ x 100 mW x 0.2s)
Step2:	Apply 10-20 'short and sharp' burns, to **thin** the stroma (suggest 50µ x 1 W x 0.05s) (Note: step 2 is not always necessary)
Step3:	Apply YAG to **perforate** the centre of the treated area (use a low power:2-4 mJ)

Argon Laser Peripheral Iridoplasty

Indications

1. Plateau Iris Configuration
2. Post PI in Acute Primary Angle Closure & acute phacomorphic angle closure – if angle does not open post PI and IOP is still high
3. As an adjunct to facilitate Laser Trabeculoplasty
4. Double vision post PI (go peripheral to the PI) - segmentally

Before the Procedure

Check Gonioscopy findings (prior to drop installation). Check vision and IOP

Consent: explain what the procedure does, why you are treating both eyes, and possible complications, including failure of treatment or need for retreatment, bleeding, inflammation, corneal burns, and visual effects (e.g., photopsia, monocular diplopia).

1. Apply drops (20 minutes prior): G Pilocarpine 2% & G Iopidine 1%
2. Topical anaesthetic (e.g., proxymetacaine, oxybupivicaine).

Technical parameters:

Site:	Abrahams Iridotomy Lens
	Go as peripheral as possible.
Number:	24 burns 1-2 spots apart, spread equally amongst the four quadrants
Settings	Low setting: 500ms x 500microns x 140mW High setting: 1500ms x 150mW x 500 microns Aim for just iris stromal contraction

Problems: Haemorrhage corneal clouding – Avoid radial iris vessels - stop and re-book

Bubble formation, iris charring, pigment release, popping – reduce energy

After procedure: G Iopidine 0.5/1% if not given pre-treatment

Check IOP 1 hour after treatment

Prescribe g dexamethasone 0.1% hourly for 1 day, then QDS for 1 week

Ensure that post treatment gonioscopy is/will be carried out

Arrange follow-up in 2-3 weeks

Record Procedure in clinical notes and LASER BOOK

*Covid 19 guidance – Consider topical lubricant for 1-month QDS

Selective laser trabeculoplasty

SLT, the laser is a frequency-doubled (532-nm) Q-switched Nd:YAG. The laser settings are fixed except for the power. Spot size is 400-microns and pulse duration is 0.3 ns. SLT has largely replaced the destructive procedure of ALT and has recently been used successfully as first line therapy in the LiGHT trial. The laser machine in Harrogate is Duo. This means it has YAG and SLT settings. Ensure that you are on the correct setting (the clue is the SLT laser spot is single spot and is larger than YAG laser beam which is double spots).

Indications

Primary treatment for newly diagnosed open angle glaucoma inclusive of PXF or PDS, or as an adjunct to medication,

As an alternative for patients who are poorly compliant or have problems obtaining or are intolerant to glaucoma medications,

As an end-stage treatment to avoid surgery in patients who are already on multiple medications

Before the procedure

Consent: Explain what the procedure does and possible complications, including failure (short and long term), inflammation, transient raised IOP.

1. Apply drops (20 minutes prior): G Pilocarpine 2% & G Iopidine 1%
2. Topical anaesthetic (e.g., proxymetacaine, oxybupivicaine).

Technical Parameters:

Site	Focus on the trabecular meshwork, not the aiming beam
	Taking care not to hit the Peripheral Iris
	When bubbles seen, reduce power down until bubbles only just no longer seen.
Setting	spot size pre-set at 400µm
Power	Start at 0.6mj and titrate up by 0.1mj.
	Heavily pigmented (PDS/PXF) – start at 0.4-0.6mj to avoid IOP spike afterwards.
	After completing a quadrant, increase power again until bubbles seen and back down to ensure energy level correct for a changing angle appearance.
Number	Treat 360° (25 burns per quadrant = **100 burns in 360°)**

After procedure: G Iopidine 1%

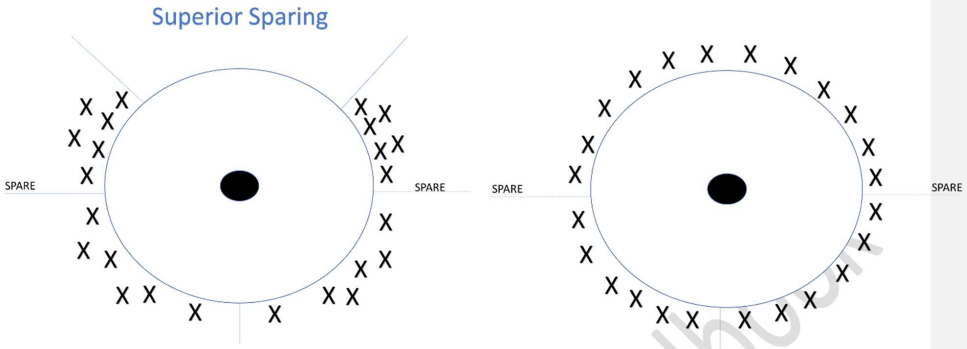
Check IOP 1 hour after treatment

Arrange follow-up in 6-8 weeks

Record Procedure in clinical notes and LASER BOOK

Covid 19 guidance – Consider topical lubricant for 1-month QDS

External Cyclodiode (transscleral cyclophotocoagulation) ~~(available at YDH only)~~



Indications

Non exhaustive scenarios include:-

Refractory Glaucoma i.e. in the setting of Uncontrolled glaucoma in the presence of conjunctival scarring from previous surgery

Neovascular Glaucoma

Elevated IOP with poor visual potential

Procedure

- Sub tenon LA (Lignocaine 2% : Bupivicaine 0.25%) 50/50 mix total 3mls. Taking care not to balloon conjunctiva. Sweep away any conjunctiva that has ballooned, away from treatment area
- Use gloves
- Put the speculum in.
- Pad, Shield, sub conjunctival betnesol and Chloramphenicol 1% at the close

Technical Parameters:

Site	Just behind ciliary body (x4) and x2 behind the row of 4.
	Positioning guide by retro-illumination
	Parallel to the visual axis
	Avoid 3 and 9 o'clock position +/- area of tube/trabeculectomy or potential trabeculectomy
Setting & Power	400ms x 1250 -1350mW x 1 pulse – slow coagulation technique
	2000ms x 2000mW x 1 pulse
Number	12~~2~~4

Nottingham technique Prof Vernon – 2000ms x 2000mJ x 14 shots (270 degrees), use less than 60J energy in total. 90 degrees rotation of spots placement when repeat

1. Settings (titrate according to effect required, slow coagulation more effective but more inflammatory)
2. There should be no hard pops, soft pops are ok as this is CB reaction.

After procedure: g.Dexamethasone 0.1% x 6 daily for 2 weeks

Consider g.vexol/g. lotemax QDS for steroid responders

(DB) Occ. Chloramphenicol 1% qds for 5 days

See at week 1 and month 1

- .

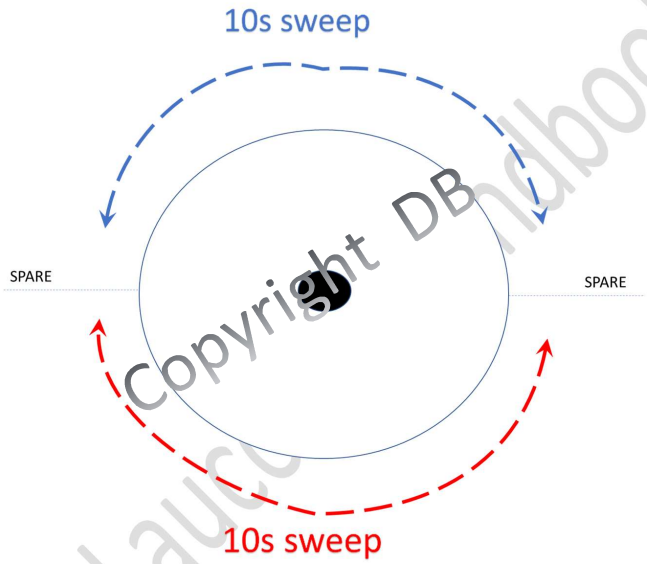
Commented [A11]: I give dexa QDS for 28/7, no antibiotic drops

If HDFT patient is referred to York, then all FUs are in HDFT

Micropulse diode Laser ~~((available at YDH only)~~

Commented [A12]: Available at Scarborough hospital only. Referrals should be addressed to Mr Van Der Hoek

Traditional methods of External Cyclodiode burn the ciliary body. **MicroPulse® P3 (pars plana) "Cyclophotocoagulation"**; however, it uses a slow application of laser energy that is "chopped" into micropulses (or, bursts). Each pulse heats up but does not burn or cause eye tissue destruction. In between each pulse is a pause. It delivers noncontinuous 810-nm laser treatment to the proposed site of action, melanin within the pigmented pars plana/ ciliary body epithelium



Indication

- As per External Cyclodiode
- Concerns regarding effect on visual acuity / corneal decompensation for where external Cyclodiode considered

Procedure

- Sub tenon LA (Lignocaine 2% : Bupivicaine 0.25%) 50/50 mix total 3mls. Taking care not to balloon conjunctiva. Sweep away any conjunctiva that has ballooned, away from treatment area
- Use gloves
- Put the speculum in.
- Ask patient to look down / use squint hook, when applying to superior 180 degrees and vice versa when treating inferior 180 degrees
- Pad, Shield, sub conjunctival betnesol and Chloramphenicol 1% at the close

Technical Parameters:

Site	**Positioning guide by retro illumination – treating posterior to ciliary body**
	Perpendicular positioning to globe
	Avoid 3 and 9 o'clock positions
Setting & Power	2000mW at 31.3% duty cycle
Time	**80-90 Seconds total per hemisphere**
Number	1 cycle Superior & 1 cycle inferiorly

After procedure: g.Dexamethasone 0.1% x 6 daily for 2 weeks

Consider vexol/lotemax QDS for steroid responders

Chloramphenicol 1% qds for 5 days

See at week 1 and month 1

Phaco + Endocyclophotocoagulation (ECP) ((available at YDH only)

Indications

ECP has been shown to be effective glaucoma types including primary open-angle, angle-closure, pigmentary, neovascular and other refractory glaucoma's. Its use is recognised as a treatment in patients with mild to moderate and medically controlled glaucoma's with good vision potential.

The procedure is undertaken following successful insertion of the intraocular lens

Technical Parameters:

Site	**Ciliary body**
	Reaction involves shrinkage and whitening
	Avoid Iris touch with probe (pro inflammatory)
	Stop when shrinkage occurs moving onto adjacent area
Setting & Power	200mW
Area	270 (minimum)-360 degree

After procedure:

g.Dexamethasone 0.1% x 2 hourly for 2 weeks then QDS for one month

g.Chloramphenicol 0.5% qds for 14 days

See at week 1 and month 1

Stop Glaucoma Medications

Glaucoma Clinic Guidelines (May 2020)

First Visit

New patients attending the glaucoma clinic, unless transferred from elsewhere, will have been through the Glaucoma Secondary Screening clinic. They may have been started on Latanoprost or offered SLT treatment by protocol. Any new patients who need review (ocular hypertensives outside discharge criteria, glaucoma suspects or confirmed glaucoma) should have the glaucoma summary form filled out and filed in front of the visual fields. Note that filling out the summary form can take the place of much of the history section of the first visit.

• Gonioscope all patients who make it through the screening clinic.

• Patients with unreliable visual fields at their screening clinic visit should have had a second visual field by the time of the first visit.

• Do not attempt any further follow-up on patients with visual field artefact and no other pathological findings.

If people with OHT or suspected COAG have had no changes in parameters for IOP, visual fields and optic nerve head and are not recommended to receive medication, they are discharged from the glaucoma care pathway ~~after 3-5 years~~ (depending on the perceived risk of conversion to glaucoma)~~, or sooner if confirmed normal~~

Glaucoma Suspects

These patients can be transferred after the first visit to the Green Glaucoma Clinic- Virtual Clinic for monitoring.

Ocular Hypertension

Central corneal thickness (CCT) is measured in the screening clinic. If not recorded, do so on the summary sheet. Use the measure to assess risk, to discharge patients at low risk and closely monitor those at high risk (see OHTT results for guidance). See

ww.nice.org.uk › guidance › evidence › full-guideline~~ pdf 4660991389~~

Familiarise yourself with the NICE guidelines re management of OHT. Discuss cases appropriate for discharge with consultants. DO NOT be a slave to these guidelines, especially re first line treatment with a B blocker and treatment of low risk OHT. Read the EGS guidelines, which are a first-rate textbook on glaucoma management.

https://www.eugs.org/eng/guidelines.asp

Protocol for referring patients with OHT back to their optometrist

Patients who can be discharged according to NICE and who do not need follow up in the Eye Department for any other reason should be discharged back to their Optometrist. The GP and optometrist should be informed of this discharge.

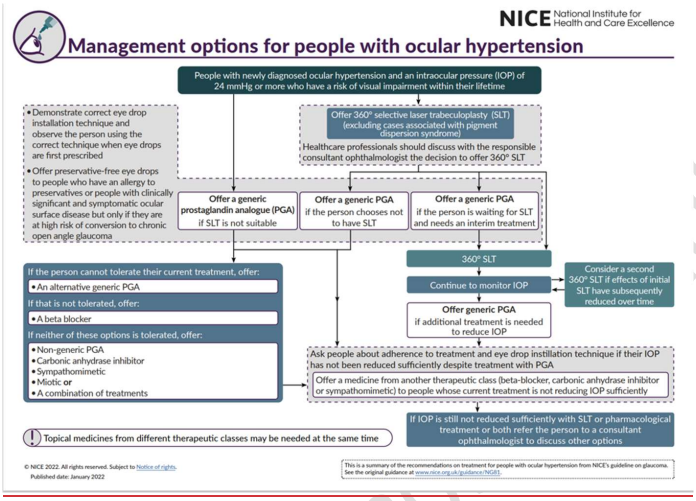
Glaucoma Treatment

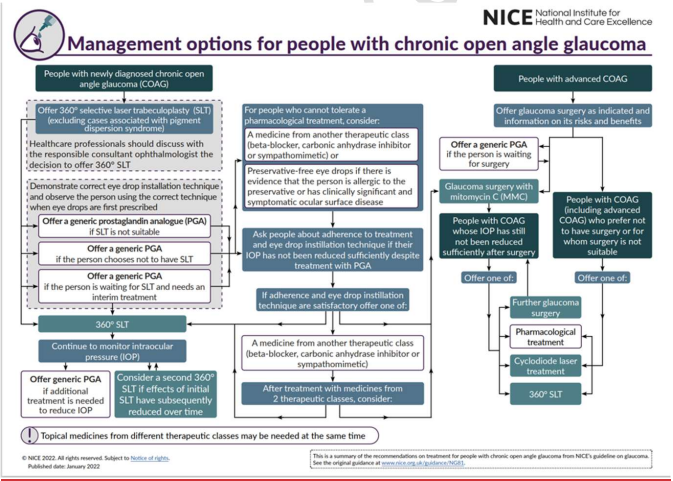
The aim of most glaucoma treatment is to lower intra-ocular pressure. A modest lowering of intra-ocular pressure is appropriate in early glaucoma but and advanced glaucoma may require substantial lowering of pressure. Familiarise yourself with the European Glaucoma Society guidelines. As an example, in early glaucoma in an eighty-year-old patient without other risk factors, aim for a 20% reduction in pressure or consider no treatment at all. In advanced glaucoma in a patient in his fifties

with myopia, aim for at least a 40% reduction in intra-ocular pressure. Trials of treatment need to be assessed swiftly to allow early progression to surgery if required.

Normal Tension Glaucoma

Current advice is to follow the Normal Tension Glaucoma Study Group publications and treat normal tension glaucoma if there is visual field loss near fixation or if there is documented progression of visual field loss. If treatment is indicated a 30% reduction in intra-ocular pressure is aimed for.



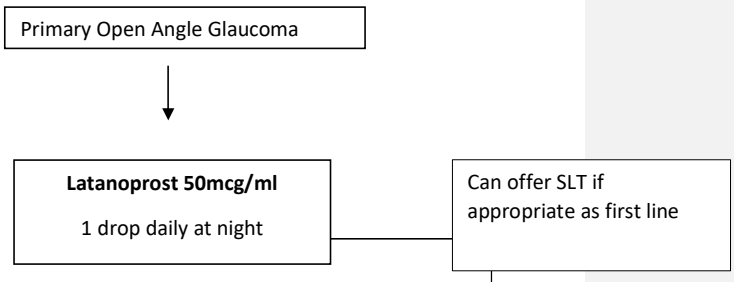


Medical Treatment

Current pharmacological first line treatment is PGE - Latanoprost. Alternative first line treatment is Selective Laser Trabeculoplasty (SLT). Bimatoprost 0.1 mg/ml or a B blocker can be considered if the patient prefers pharmacological rather than laser treatment. Common second line treatments include

Brinzolamide or combination therapy to reduce drop burden ie Ganfort (Bimatoprost /Timolol) Brinzolamide/Timolol.

Medical Treatment of Primary Open Angle Glaucoma



poor response to generic, prescribe branded PGE

Commented [A13]: We don't use travoprost any more Lumigan is 2nd line PGE

1-3/12

Travoprost 40mcg/ml

or Bimatoprost 100mcg/ml

1 drop daily at night

Beta Blockers not contraindicated

Beta-blockers contraindicated

Second line

Bimatoprost 0.03% with Timolol 0.5% (Ganfort)

Travoprost 40 mcg/ml with Timolol 0.5% (Duotrav)

1 drop daily at night

Brinzolamide (Azopt) 10 mg/ml
1 drop BD

Commented [A14]: No travoprost, please replace with Lumigan

No duotrav any more, please replace with ganfort

1-3/12 Third line

Brinzolamide (Azopt) **10 mg/ml** 1 drop BD

OR

Dorzolamide 2% with Timolol 0.5% (Azarga) 1 drop BD

OR

Brimonidine 0.2% (Alphagan) 1 drop BD

OR

0.2% Brimonidine with 0.5% Timolol (Combigan) 1 drop BD

Brimonidine 0.2% (Alphagan) 1 drop BD

OR

Brimonidine 0.2% + Brinzolamide 10mg/ml (Simbrinza) 1 drop BD

Preservative free drops	**Combination drops**
Levobunolol/Timolol/Betaxolol	Cosopt
Saflutan	Azarga
Bimatoprost UD 0.03%	Ganfort
Trusopt	Xalacom
Cosopt	Combigan
Monopost	
	Simbrinza
Travatan (BAK free)	

Commented [A15]: Lumigan UD

Commented [A16]: Ganfort UD

Please complete a glaucoma summary chart (on green paper) for glaucoma patients to be filed at the front of the Ophthalmology Clinical Notes.

Visual Fields

Initially aim for reliable visual field performances and note any agreement or discrepancies between the optic disc and individual field. If reliable visual fields are achieved annual fields are usually appropriate.

• In patients with loss near fixation or rapid progression six monthly or four monthly visual fields may be appropriate.

• Patients with advanced visual field loss and central islands of vision benefit from follow-up with 10-degree visual fields and specify this in the notes.

• Patients with normal visual fields are best followed up by careful disc examination and these patients are often best in the monitoring clinic.

• Consider booking visual fields prior to the glaucoma clinic appointment, as there is only a limited visual field capacity on the morning of the glaucoma clinic.

• Book patients for fields on the same day if they are coming from a distance or if they are disabled.

• Make yourself familiar with RAG system to stratify risk of glaucoma.

Glaucoma Green Clinic – Virtual Monitoring Clinic

Transfer any patients with no change in treatment for one year (or on no treatment) and with stable visual fields and intra-ocular pressure within the target range to the glaucoma-monitoring clinic. Also transfer glaucoma suspects and ocular hypertensives outside discharge criteria. Please inform these patients that a doctor will not routinely see them, but the information covered at their visit will be later assessed and they will receive a letter with feedback from the visit. At the virtual monitoring clinic visual fields and intra-ocular pressure will be recorded together with OCT - RNFL and macula ganglion cell layer and optic disc examination. Usually the monitoring clinic would be an annual visit.

Do not transfer patients with poor disc views, poor dilation, or poor/no field reliability. These patients are mainly elderly and are better served by a yearly appointment in clinic, probably without fields, in the glaucoma clinic.

Amber Glaucoma clinic

There are several optometrists who see booked patients in the Amber glaucoma clinic. Suitable patients are low/medium risk glaucoma patients who are not suitable for photographic monitoring and 6 to 12-month reviews or suffer from another ocular comorbidity. You can specify on clinic outcomes who should see the patient next time.

Red Glaucoma Clinic

High risk glaucoma patients are seen in consultant or consultant lead clinic only. Please do not book Red Glaucoma Patients into virtual Clinics.

Listing for Glaucoma Surgery

Please discuss patients for listing with a consultant or senior doctor in clinic. Consent all patients in clinic and make sure you know who is ordering any anti-metabolites (usually the secretary supplies the order form for the consultant to sign). Please provide relevant Patient Information Leaflet

Post-operative Care

Please ensure that following glaucoma surgery, adequately experienced staff see patients. This usually means the registrar (under supervision), consultants or Staff Grade doctors working in Glaucoma Team. It is particularly important that steroid doses, adjustable sutures, and antimetabolites are used at the right time and place following surgery and it is important that failing glaucoma surgery is identified at an early stage.

Procedure for Anti-metabolites in Theatre and Out-patients

5- Fluorouracil

This is used at a concentration of 50mg per ml and is used in outpatients or during surgery as a subconjunctival injection. 0.2mls usually used for bleb needling

Pharmacy supplies this in a 1ml syringe ready for use. It is available off the shelf in pharmacy and has a long storage life. Use the anti-metabolite request form which can be sent with a patient or staff member to pharmacy. Current hospital rules prohibit patients carrying anti-metabolites back from pharmacy – send a staff member to pick up when labelled and ready (takes 30 mins).

Commented [PJ(17]: We're using 7.5mg in 0.3ml (whatever that works out at!)

Commented [A18]: 7.5mg/0.3ml is concentration that I used to use in Nottingham and what I have been using as consultant

If you perform needling procedure in the clinic, make sure you check patient's details, expiry date, concentration. After finishing procedure, please dispose 5FU syringe in cytotoxic container with purple lid

Mitomycin-C

This is applied topically or subconjunctivally in theatre (occasionally in opd). The usual concentration is 0.2mg per ml. It has a short shelf life and is ordered in by pharmacy who need several days' notice.

It is a theatre staff responsibility to ensure that the MMC is there at the start of each list, and there are handling protocols in theatre

GLAUCOMA VIRTUAL CLINIC GUDIELINES ~~MAY 2020~~ August 2021

A virtual clinic is one in which the face-to-face clinician consultation is removed. In a glaucoma asynchronous virtual clinic, technicians gather quantifiable data for clinicians to make value decisions. In this type of model, clinicians can review considerably more patient data than in traditional clinics.

This document aims to define the standard operating program (SOP) of the glaucoma virtual clinic at Harrogate based on York Teaching Hospital Eye Service.

Recommended test procedures and processes (for technicians and nurses)

- Visual acuity testing : to be performed at each visit and recorded ~~in the proforma~~on medisight. Current visual acuity to be compared with visual acuity at previous hospital visit. If ~~significantly~~ reduced~~, ask about duration, onset, associated symptoms such as pain, check for RAPD and colour vision, OCT macula to be performed and,~~ by 2 lines or more, flag as urgent virtual review. ~~doctor on call to be requested to review the patient on the same day.~~

- Record Driving status

- Record current glaucoma medication and, compliance

- Record any current visual/ocular symptoms~~, any local/systemic side effects of anti-glaucoma drops. (Is patient happy with the drops?) If ocular side effects, prescribe lubricants (hyloforte PRN) to reduce ocular discomfort/consult doctor on call.~~

- Threshold automated visual fields: to be performed on every visit. (If not done, document the reason for not doing it).

- Intraocular pressure (IOP): to be measured with ORA. IOP (One single measurement with WS>7.5 should be considered as reliable). Repeat IOP measurement if WS <7.5. If WS>7.5 cannot be reached after 3 consecutive measurements, please measure IOP with Goldmann applanation tonometer~~-~~).

Raised IOP at data collection appointment

If IOP >30 mmHg AND painful or 40mmHg and over~~, patient must be reviewed same day by the~~ patient to be seen same day by URC or on-call doctor.

If IOP over 30mmHg and comfortable – book to JP Friday AM glaucoma clinic (spaces to be left for urgent patients). If no JP clinic running in the same week, discuss with JL, JP, TB or on call doctor.

- Central corneal thickness (CCT): to be measured at least once, if not previously recorded.

- ~~Dilation, fundus photos,~~ OCT ~~discs~~ RNFL, macular and ganglion cell layer: to be performed on each visit and uploaded to medisight. (If not done, document the reason of not doing it).

Patient Suitability for glaucoma virtual clinic (for doctors)

Suitability is at the discretion of their referring clinician.

Following patients are considered suitable for glaucoma virtual clinics.

1) Ocular hypertension (OHT)

2) Suspected open angle glaucoma

3) ~~Early or moderate primary open angle glaucoma in the worse eye~~Stable primary open angle glaucoma

4) Bilateral pseudophakia and a primary diagnosis of early or moderate primary angle closure glaucoma in the worse eye

Minimum requirements before referring to virtual clinics

- Gonioscopy
- Dilated ophthalmoscopy
- CCT
- Previously attended the face to face (F2F) glaucoma new patient or glaucoma screening clinic.
  - Ganglion cell layer
  - Disc imaging

Following are the patients deemed unsuitable for glaucoma virtual clinics:

1) Quality of data collected is of insufficient reliability (e.g. unable to perform visual fields, poor disc imaging, etc)

2) Patients with co-existing ocular comorbidities (e.g. uveitis, age-related macular degeneration, neovascular glaucoma and other secondary causes of glaucoma) who require monitoring of their condition.

Reviewers

Vision, IOP, Visual field, disc imaging should be reviewed to determine if IOP control is optimal/suboptimal and if clinical status is stable/unstable.

If IOP control is optimal and clinically the status of OHT/Glaucoma is stable, patient should continue to be monitored in glaucoma virtual clinic.

Patients with no signs of conversion to glaucoma and who have low risk of conversion to glaucoma may subsequently be discharged from the service. They should be advised to continue with annual/biennial routine community sight tests.

The decision for a F2F clinician review at the time of discharge is optional and remains at the discretion of the referring reviewer.

If IOP control is suboptimal or if OHT/glaucoma seems unstable (progressive changes noted on visual fields/disc imaging or visual field/optic disc mismatch), appointment to be booked in F2F clinic for IOP assessment, dilated fundus evaluation and to discuss further management options.

Medisight updated.

RAG Conditions

- **Green/ Amber/ Red Glaucoma clinic – FOLLOW UP**
- **Glaucoma Laser clinic**

PTs suitable to be discharged must be discussed with the consultant

Please discharge with disc photo

GREEN GLAUCOMA CLINIC **FU 12/12/-24/12**

- SUITABLE TO BE SEEN IN VIRTUAL CLINIC (virtual review based on IOP, VF, OCT of optic nerve; ~~every 3rd visit to be seen by clinician in OPD~~)

- Glaucoma suspects
- Treated and non-treated OHT
- Pre-perimetric glaucoma
- Early glaucoma with unilateral mild VF loss (< -6 dB)

AMBER GLAUCOMA CLINIC **FU 6/12-9/12**

- Narrow angles
- Glaucoma with MODERATE VF loss < -12 dB, stable VF
- NTG with well controlled IOP and stable VF, without paracentral scotoma
- PDS, PXF glaucoma
- CACG with well controlled IOP and stable VF
- > 1-year post surgery (trabeculectomy, diode, valve)
- Afro Caribbean patients
- Disc haemorrhage

RED GLAUCOMA CLINIC **FU 3-4/12**

- Glaucoma with advanced VF loss > -12 Db
- High presenting IOP - recently diagnosed
- NTG with paracentral scotoma
- Juvenile glaucoma
- One eye glaucoma patients
- Patients with uncontrolled IOP
- Patients with possible evidence of glaucoma progression
- Patients post recent Acute Angle Closure Attack
- Patients with family hx of blindness due to glaucoma
- Uveitic glaucoma
- Post-surgical patients <1 year

Emergency Management of Glaucoma Conditions

Protocol for Acute Angle Closure Management

Immediate treatment

- Systemic treatment to start immediately Acetazolamide IV 500mg (Baseline U&Es) – **Caution use in Sickle Cell patients**
- Acetazolamide 250mg QDS orally (first dose immediately) Potassium supplementation if necessary
- Consider Analgesia, anti-emetic and rehydration as appropriate
- Lie the patient in a supine position.

Topical treatment to affected eye to start immediately

- G. Pilocarpine 2% QDS
- **G.Cosopt (20 mg/ml dorzolamide + 5 mg/ml timolol) / Azarga (10 mg brinzolamide and 5 mg timolol)** ~~/~~
- *G. Timolol 0.25% BD (if CAI contraindicated)*
- G. Pred Forte 1% QDS

To non-affected eye

- No drops assuming pressure OK and angle open – Consider prophylactic Yag PI same day

After one hour

Recheck pressure – if no reduction, give 20% IV mannitol 1-2g per kg over 45 minutes – Caution use in Diabetic patients

After a further 2 hours

Recheck pressure if no improvement consult senior colleague. Consider Argon Laser Peripheral Iridoplasty if good enough view in effected eye to reduce appositional closure

Consider Peripheral Iridotomy in the acute setting for patients if corneal view good enough, however discuss with senior colleague.

Follow up

Discharge home with

g.Pilocarpine 1% QDS

g.Pred Forte 1% QDS

+/- Ocular antihypertensive medication (topical and Oral) dependent on success of Peripheral Iridotomy

Commented [VA19]: **Our HDH proforma is 500mg IV and 500mg PO STAT (SEE SEPARATE DOCUMENT)**
- G.Timolol 0.5% stat.
- G.Apraclonidine 1% stat.
- G.Predforte 1% stat.

HDFT protocol sounds better to me

Discuss with Glaucoma team for referral

Management of blebitis

Bleb related infections have the potential to be catastrophic.

Leaking bleb -> blebitis -> Endophthalmitis

Referral:

Post trabeculectomy patients with a red, painful eye need to be assumed to have endophthalmitis until proven otherwise. These should be seen on the same day as a matter of urgency

History:

Some important factors to consider….

Has the patient had recent surgery? Are there previous notes and records available – is the previous bleb morphology known? Has this been a high risk bleb e.g. Cystic/leaking bleb in the past?

Examination:

Is there a leak? Always check Seidel test with 2% fluorescein.

Bleb leak is the highest risk factor for developing blebitis.

Check for AC activity and vitreous inflammation

Treatment:

If there is significant AC activity (e.g. hypopyon, fibrin) – treat as endophthalmitis. See separate guidelines.

(If in doubt – treat as endophthalmitis)

Swab any discharge/infiltrate for M, C and S.

Topical antibiotic: Hourly levofloxacin

Oral antibiotic: Ciprofloxacin 750mg twice daily. Allergy: discuss with microbiology

Follow up:

Daily review.

Discuss with glaucoma consultant. Likely the patient will require revision of ischaemic/leaking bleb.

Uveitic glaucoma

Most patients present initially through the uveitis service before developing a secondary glaucoma. However, occasionally patients with uveitic glaucoma will present acutely with pressure related complications.

Most importantly, early involvement of the medical ophthalmology team is key. They will guide on disease activity control and immunosuppression.

Management of iris bombe

If the patient develops 360-degree posterior synechiae then this can result in iris bombe, causing secondary angle closure.

Treatment:

- Be sure to exclude other causes of angle closure, e.g. pupillary block.
- Topical mydriatic agents +/- subconjunctival mydricaine (check not contraindicated)
- If this fails to release synechiae then the patient will likely require Laser / Surgical iridectomy. Contact on call consultant/glaucoma team.

Top tips from a Glaucoma TSC (HARROGATE / YORK HOSPITALS)

Commented [A20]: I guess this can be removed from HDFT book

The glaucoma TSC in Harrogate/ York gives a great opportunity to develop surgical and clinical skills in the sub-speciality. Below are some of the aspects that I have found particularly beneficial:

1. Operating with multiple consultants allows you to learn different techniques and subtle nuances as well as picking up different hints and tips to develop surgery. This has allowed me to develop my own preferences, for example with trabeculectomy conjunctival closure, use of AC maintainer, preferred instruments.
   Tip: If planning to use a technique/approach learned with a different consultant, discuss this in advance with consultant supervising surgery. All the consultants are supportive of developing techniques, but this prevents any surprises!
   Tip: When listing patients for surgery with anti-metabolites, make sure a cytotoxic prescription is completed and left in the notes. Also email Judith Cutts (glaucoma secretary) with details of patient and procedure – she will then request MMC/5FU.

~~2.~~ MIGs. Plenty of opportunity to learn MIGs procedures. Mostly endocyclodiode and istent.
Tip: Contact Glaukos rep early to organise Istent online training and dry lab. ~~(Rich Norman rnorman@glaukos.com)~~

~~3.~~2. Post op reviews. This is probably the most valuable part of surgical glaucoma training. Some blebs work perfectly from day one, most will need some level of input. There is a great opportunity to hone the skills of post op bleb management – suture removal, suture lysis, needling, revision.
Tip: See as many post op patients as you can and ensure you follow them through the whole post op journey (not just day 1). Best done in tandem with consultant (PYA Wednesday am, JEL Friday am, DB Alternate Wednesday AM /Thursday AM)

~~4.~~3. Make the most of the uveitis service. Uveitis and glaucoma go hand in hand. Having a regional uveitis service in the unit provides a lot of complex glaucoma patients.
Tip: Learn from the uveitis team. Chance to develop skills in management of uveitis by working closely with medical ophthalmology and seeing patients jointly. Often, a modified approach is required compared with POAG patients.

~~5.~~4. Research. Lots of opportunities coming up to get involved in research. ~~- e.g. Athena trial~~
~~**Tip:** Speak with Alison (research nurse) early and~~ Eensure that you have everything needed to join research e.g. GCP training.

~~6.~~5. Teaching. Monday ~~morning~~lunch time sessions in Harrogate, ~~–~~ Wednesday and Thursday lunch time in co-operation with York - plenty of chances to present/teach at journal club/teaching. Regional trabeculectomy and tube dry lab (previously organised by Thea pharmaceuticals) presents a good opportunity to practise on artificial eyes with glaucoma consultant supervision.