Overview of Glaucoma
Webinar Q&A responses by Claire Gaskell

1. **Are we any closer to finding a cure to glaucoma? Have there been any technological advancements in this field of study?**
   Glaucoma is a progressive condition and there is unfortunately not a cure at present. We have many treatment options such as drops, laser and surgery that have advanced over the years. Treatment cannot reverse the damage that has already occurred and instead aims to slow down the progression.

2. **Do you think a review on who is eligible for a GOS 1 funded sight test needs to happen for other risk factor groups (and not just those with family history)?**
   Please see Q15

3. **Does it matter how myopic? or just high myopic pxs?**
   Various studies have found a link between increasing myopia and primary open angle glaucoma. Patients with high myopia over 6D are at increased risk. The elongation of the eye in addition to tilting and torsion can mean that the optic nerve is more susceptible to damage in these patients.

4. **How do you check pigment dispersion?**
   Pigment dispersion syndrome is a condition that causes pigment to be shed from the iris which is then deposited on the corneal endothelium and in the trabecular meshwork (drain). This can subsequently cause the IOP to become elevated. These patients may have pigmented deposits on the corneal endothelium and iris transillumination defects that occur in a spoke like pattern.

5. **How do you measure the C:D ratio?**
   The C:D ratio is a measure of the of the size of the cup in comparison to the size of the optic disc. This is generally measured vertically. The cup margins are found by assessing colour changes and blood vessel positions.

6. **How effective is using anterior OCT compared to gonioscopy & pachymetry?**
   Anterior eye OCT is a useful tool which is increasingly being used. Gonioscopy is still the Gold standard when assessing the drainage angle and recommended by NICE guidelines in assessment of new patients in the Hospital. However, in scenarios such as when we are unable to perform gonioscopy for example on an anxious patient anterior eye imaging can be very useful.

7. **Please can you explain abbreviations used NRR and CMO?**
   Neural retinal rim: The tissue between the border of the cup and the disc
   Cystoid macular odeoma: A condition where macular cysts develop, this can occur in some patients after cataract surgery

8. **In Open angle Glaucoma, although the drainage is not blocked, what caused IOP to go high in general to be Open AG?**
   This is still not completely understood, the raised intraocular pressure is thought to occur as a result of an increased resistance in the drainage of fluid

9. **Is glaucoma linked with dry eye?**
   Glaucoma is not directly linked to dry eye however the eyedrops that we can prescribe to lower pressure for glaucoma can cause dry eyes in some patients. In these patients we may prescribe preservative free eye drops or lubricating eye drops

10. **What is pseudoexfoliation?**
    Pseudoexfoliation is a condition in which flaky dandruff like material from the lens capsule accumulates on the edge of the pupil and lens. This material can deposit in the drain, reducing outflow and then causing elevated IOP.

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11. **What is the youngest patient you have treated?**
Glaucoma occurs more frequently in patients with increasing age. Some patients may develop glaucoma at a younger age, perhaps if there is a strong family history, myopia or a secondary element such as pigment dispersion or steroid use. Congenital glaucoma is a rare condition that some patients are born with.

12. **Why is glaucomaage related?**
Likely as the optic nerve becomes more delicate and susceptible to damage from IOP with increasing age

13. **Why is it that a person's prescription can increase their risk of glaucoma?**
A patient who is myopic is more likely to develop primary open angle glaucoma. These patients may have optic nerves that are more susceptible to damage due to the elongation of the eye.

A patient who is hypermetric is more likely to develop angle closure. They are more likely to develop this condition as they have a shorter, smaller eye and the drain may be narrower and more crowded as a result

14. **With regard to family history - would you expect subsequent family members with glaucoma to have the same type?**
If you have a family history of narrow angle glaucoma you would be more likely to develop angle closure glaucoma. Patients with a family history of Primary open angle glaucoma are at increased risk of developing open angle glaucoma

15. **Would someone with Raynaud's or migraines etc be entitled to yearly sight tests, like someone with family history of glaucoma?**
A decision can be made on each individual case on the frequency of eye examinations. Risk factors such as high blood pressure, diabetes, Raynauds, migraines, thin corneal thickness are all taken into consideration

16. **You mention using I-Care when Goldmann not possible. Do you consider I-Care equal or even more accurate than Perkins or just nicer for the Px?**
Contact tonometry is the Gold standard as recommended by NICE guidelines. However, in instances when we are unable to use applanation tonometry such as in patients with learning disabilities or with anxiety I-Care is a good alternative

17. **As a CLO, what should we be looking for?**
Patients that have been diagnosed with glaucoma may be on multiple eyedrops. An awareness of the potential side effects that drops is beneficial. Pressure lowering eyedrops can cause some redness. Some patients may develop dry eyes as a result of the drops and may not tolerate contact lenses or require preservative free or additional lubricating eye drops.

18. **What are the most overlooked presenting signs/symptoms?**
Please see Q17

19. **If someone develops glaucoma early i.e., 30s with good management can you preserve their VFs or will they end up like that final VF diagram you showed?**
The disease and rate of progression can vary patient to patient. Some patients may stabilise with drops, others may require laser or surgery.

20. **Is it more common to have glaucoma in both eyes rather than one?**
Glaucoma is generally a bilateral condition

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21. **Is glaucoma stable or increasing across the population generally given the trend groups are the same demographics by age.**
    As we have an aging population, we have increasing number of patients being diagnosed with glaucoma each year.

22. **How difficult is to diagnose low tension glaucoma**
    These patients have a normal IOP, damaged optic nerve and corresponding visual field defect. They may also have risk factors such as myopia, family history, thin corneal thickness, Raynauds and migraines.

23. **Can reading or looking at anything in closer proximity for a long time, alter eye pressure to trigger an acute closed angle attack?**
    Acute angle closure can occur in the evenings, patients may notice halos around lights, eye pain and brow ache.

24. **Does glaucoma affect a specific age range? Or can it occur at / from any age?**
    Primary open angle glaucoma affects around 2% of the population over 40 years. This increases with age, with 3% of people aged over 60 years and 8% over the age of 80 years will develop primary open angle glaucoma SIGN 2015

25. **Does lifestyle e.g., to much close work affect likelihood off glaucoma development?**
    No glaucoma is generally an inherited condition.

26. **For cases of the types of glaucoma that tend to be Asymptomatic and you wouldn't necessarily do a field test for them what is the best way of picking up on these types of glaucoma? Anything other than advising advanced examinations like OCT?**
    Visual fields, in addition to IOP and careful optic disc assessment are great screening tools for glaucoma, in particular for patients with a family history of glaucoma. OCT and disc photos can be useful to use as a comparison tool over the years to detect changes.

27. **how much more likely is an asymptomatic myope to develop glaucoma?**
    Studies suggest that patients with moderate to high myopia may be 2-3 times more likely to develop glaucoma.

28. **How soon must suspected closed angle glaucoma get seen at the hospital?**
    Acute angle closure is an emergency and patients should be sent to the hospital urgently that day

29. **How young can someone develop glaucoma?**
    Please see Q11

30. **If a person has a history of iritis which has resulted in pigment in the anterior chamber, are they more at risk of developing glaucoma?**
    Patients with iritis may develop a raised intraocular pressure and secondary glaucoma. Patients with iritis may be taking steroid eyedrops and a proportion of these patients may develop a raised IOP secondary to the drops.

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31. **If patient has deep cupping of discs noticed in 20's are they more at risk of glaucoma in later life?**
    Some patients can have larger optic discs with physiologically cupped optic discs, they are not at increased risk of developing glaucoma. These patients can be monitored closed for change.

32. **If someone has pigment dispersion, will they definitely get glaucoma**
    Not all patients with pigment dispersion develop raised IOP, it is however important to monitor these patients. Around 30% of patients with pigment dispersion syndrome develop secondary glaucoma

33. **If there are high numbers of false negatives on the field plot how many times should you get the patient to repeat the test?**
    It would be reasonable to repeat the visual field once or twice. There may be instances when the patient may be unable to perform a reliable visual field such as in patients with dementia or with difficulty concentrating.

34. **Do keretaconics have a higher risk of getting glaucoma?**
    Patients with keratoconus have thinning of their central corneal thickness which is a known risk factor for glaucoma progression

35. **Is obesity an added factor or not?**
    Patients that are morbidly obese can develop increased IOP

36. **What method do you use to measure Angle, and record it? Do you routinely carry out Iridotomies on very shallow angles if IOPs regularly measure 25mm or above?**
    Drainage angles can be quickly measured using Van Hericks technique which assesses the peripheral drainage angle. Gonioscopy is also performed on new patients and in patient with narrow angles. PI's are performed in patients with a diagnosis of primary angle closure, in patients with an increased IOP and in which the drainage angle is at risk of closure. In some scenarios a lens extraction can also be performed. EAGLE study

37. **Would you also do OCT to give you an idea of the angle as it is non-invasive?**
    Van Hericks technique is a good non-invasive method of measuring the peripheral drainage angle. Anterior eye imaging may be of use when Gonioscopy is unable to be performed.

38. **What percentage of people with FHG go onto develop glaucoma themselves?**
    You are between 2-4 times more likely to develop glaucoma if you have a direct family history of the disease

39. **At what stage after diagnosis is treatment offered?**
    At diagnosis of primary open angle glaucoma a patient may be offered drops, laser or surgery

40. **How do you manage patients refusing treatment?**
    A Discussion of the long-term prognosis and implications on driving and quality of life in patients with glaucoma. Explanation that glaucoma is a progressive and non-reversible condition

41. **Does gonioscopy hurt or just uncomfortable?**
    Patients may feel a little pressure one the eye and find this a little uncomfortable

42. **Is partial iridectomy still used to treat glaucoma?**
    Patients may have laser PI performed for narrow drainage angles, surgical PI's may be performed during glaucoma surgery and in acute closed angle glaucoma

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43. **Is there any advice we can give a patient suffering from acute ACG to reduce the amount of pain or discomfort whilst on route to A&E?**
A patient may take oral pain relief such as paracetamol

44. **With ARMD we advise on certain foods or supplements to help. Are there any foods or supplements to help prevent/help with Glaucoma?**
For patients with NTG although there is little evidence at present if they are keen to try alternatives we could suggest Coenzyme Q10 and Gingko Biloba in addition to using their eyedrops.

45. **If a px didn't want drops, could they opt for surgery straight away?**
The different management options are discussed, if a patient is unable to tolerate or instill eye drops we may consider SLT.

46. **What's the alternative for if a patient is allergic to the glaucoma treatment?**
If patients are allergic to eye drops, we may try an alternative drop or a preservative free eye drop. If the patient is allergic to multiple eyedrops we may suggest SLT laser.

47. **Is there a pressure threshold for an immediate/emergency referral rather than routine?**
Glaucoma is a chronic slowly progressing condition that can be seen routinely in the hospital. In patients with pressures over 30mmHg they may be seen as a soon referral.

48. **If a patient is suitable for surgery, with the cost saving per patient to the NHS for SLT, why would the hospital not suggest this as a possible first option to the patient, given a high success rate?**
Please see Q7 & 42

49. **Under what circumstances can we as DO's refer, especially if we don't have an Optom working with us?**
Please see Q51

50. **Would a DO be allowed to write a referral letter for Px to take to the hospital?**
Please see Q51

51. **You mentioned you do receive referrals from Dispensing Opticians too. In what scenario would you expect to receive a DO referral with no Optom involvement?**
If a patient presented with acute angle closure symptoms, and there was no Optometrist, it would be appropriate for the Dispensing Optician to urgently refer the patient to the Hospital

52. **If a DO refers a patient they suspect has glaucoma. Should they perform visual field test and attempt to take pressures. If they are able. Before referring?**
NICE guidelines suggest that Contact tonometry and visual fields should be performed for glaucoma referrals. In a scenario where a patient has suspected acute angle closure a visual field test may not be performed

53. **Acute angle - how is it treated?**
Patients may be given eyedrops and tablets to reduce the IOP. They may have PI laser and lens extraction to open up the drainage angle

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54. **How common would you say AACG is? I feel like I get several px with some outward symptoms which appear as AACG but it is not (I'm a D.O.), especially if px is describing over the phone which happens a lot more now!**
2 patients out of 100,000/year develop acute angle closure

55. **How quickly does acute angle closure come on?**
This can develop over hours

56. **If AAGlaucoma onset happens when a person is in say a remote area, what is the recommended action to be taken?**
Good question. A patient who has been referred to the hospital with narrow drainage angles may have a prophylactic laser peripheral iridotomy to prevent them developing acute angle closure

57. **Should px's with sleep apnoea be recalled every year?**
Sleep apnoea is a risk factor for developing NTG, when deciding upon review periods we need to consider other risk factors such as family history of glaucoma, myopia, disc appearance, IOP, corneal thickness before making a decision for each individual case

58. **Where can I get preservative free glaucoma drops?**
Preservative free glaucoma drops can be prescribed by the hospital. These are prescribed in patients that have a known allergy to the preservative or who are unable to tolerate preserved eyedrops.

59. **How do the drops change eye colour?**
Please see question 60

60. **Why do glaucoma drops change your eye colour?**
Prostaglandin analogues can change eye colour as these drops cause the iris to release more pigment. They can also cause increased eyelash length, pigment under the eyes, and loss of orbital fat making the eyes appear more sunken

61. **How do you deal with patients that return regular for check-ups but aren't using the drops as directed so the glaucoma is progressing?**
Please see Q40

62. **If a patient has pressures under 21mmHg would they be given pressure lowering drops? Even if it is a low pressure generally?**
Yes, even in patients with normal tension glaucoma, eyedrops can be prescribed to reduce the IOP.

63. **If the px is a contact lens wearer what is the best regime if they are prescribed drops to treat glaucoma? E.g., When to instil drops relative to when lenses are inserted?**
These patients may be prescribed preservative free eyedrops. Eyedrops should be instilled after contact lenses are removed or 30 minutes prior to lenses being inserted in the morning

64. **In normal glaucoma (without symptoms) is the pressure brought down with the use of drops?**
In Primary open angle glaucoma we can prescribe drops to bring down the IOP to slow the progression of the disease

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65. **Does OH tick the GOS box for "Risk of Glau"?**
Patients risk of developing glaucoma should be assessed on an individual basis when deciding how often to review. Patients with ocular hypertension (OHT) or with a direct family history are at an increased risk of developing glaucoma. The following are risk factors that in addition to the above can further increase a patients risk of developing glaucoma, thin central corneal thickness, myopia, Raynauds, migraines, high blood pressure and diabetes.

66. **What is the preferred eye drop prescribed? how do you decide which to start with?**
NICE guidelines would suggest that we would prescribe a prostaglandin analogue such as latanoprost firstline. This is generally well tolerated and effective at lowering the IOP

67. **How do the drops work?**
Drops have two modes of action- to reduce the amount of fluid being produced or to increase the amount of fluid that is drained

68. **Can the 'informed Px' request laser SLT be considered?**
Please see Q72

69. **Are there any side effects to laser?**
Patients can experience some dryness and redness for the first few days. A small percentage can develop a pressure spike LIGHT study

70. **Is Laser a private option at present to treat Glaucoma?**
Please see Q72

71. **Your slide stated Laser SLT treatment showed good success in Px getting to drop free and value for NHS, why is this not a preferred treatment?**
Please see Q72

72. **Why not do laser as a first option?**
SLT is being used increasingly more, the results from LiGHT study were very promising and in the future we may be performing SLT firstline

73. **Is the laser treatment to open the angle?**
SLT selective laser trabeculetomy is a laser used to target the trabecular meshwork (drain) which causes a reaction to reduce IOP
PI Peripheral Iridectomy is used closed angle, a hole is made in the iris to allow the fluid to drain and. This may be performed in patients with narrow drainage angles to prevent them from developing acute angle closure in the future

74. **Are (steroid) injections a regularly used treatment for glaucoma? If so, how serious does the diagnosis have to be?**
Steroid injections are not used to treat glaucoma, steroid injections may be used to treat patients with cystoid macular oedema secondary to a vein occlusion

75. **What do you do if you have told a patient to advise DVLA regarding their vision and they tell you that they will not do so?**
Please see information College Optometrist Website 'If you think a patient is unfit to drive'

76. **If you suspect the patient may not contact the DVLA, would you?**
Please see Q75

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77. Do you only have to tell DVLA if there is a bilateral defect?

Patients are required to inform the DVLA if they have Glaucoma with a visual field defect in both eyes

78. Is there no need to inform DVLA when field defect is only in one eye?

Please see Q77

79. Simulation vs. Fields results are inaccurate (upside down)?

'Glaucoma can cause a variety of visual field defects, some examples of these would be superior arcuate, inferior paracentral and superior altitudinal.

The first visual field plot shows a normal patient with blind spot which is demonstrated in the simulation.

The second example shows an inferior paracentral defect. This would result from damage to the superior optic nerve. The simulation demonstrates the loss of the inferior field.
The third example shows a superior arcuate defect that would result from damage to the inferior optic nerve and superior loss is shown in the simulation

The final example shows advanced visual field defect and corresponding advanced loss in the simulation.'