

# **Plymouth Optometrist Glaucoma Monitoring Scheme Audit Report 2015**

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## **INTRODUCTION**

Audit of the Plymouth Optometry Glaucoma Monitoring Scheme (POGCS) since its inception in 2008.

## **METHODS**

Devon Local Optical Committee (LOC) instigated a prospective audit of the Plymouth Optometrist Glaucoma Monitoring Scheme (POGCS), which was carried out by an independent Ophthalmologist with subspecialty interest in Glaucoma. The aim was to audit 5% of the patients in the scheme within 3 months of their last review by the scheme, with a view to assess the safety and compliance with the monitoring protocol. The ophthalmologist visited the 10 sites that participated in the POGCS. Goldman applanation tonometry, optic disc assessment, and review of visual fields and record keeping were carried out at these visits. A predetermined proforma was used for data capture. Data collected was entered onto and analysed on Excel.

## **RESULTS**

5.5% (n=184) of 3360 patients within the Plymouth Optometrist Glaucoma Scheme were audited between May 2015 to January 2016. The mean age was 72 years (SD 8.8) with equal distribution of male (n=88, 48% ) and female (n=97, 52%). The diagnoses were Ocular Hypertension (n=76, 41%), Primary Open Angle Glaucoma(POAG) n=58, 32%, Glaucoma Suspect (n=28, 15%), Normal Tension Glaucoma n=8, 4%), Primary Angle Closure (n=12, 7%), Secondary Glaucoma (n=2, 1%). The range of number of years within the scheme was 1-8 years with adequate representation of patients audited over the duration of the scheme. The scheme was found to be safe and effective: 94-96% of intraocular pressures were within target at review, 95-97% of visual fields were stable and 86-88% of discs were deemed stable. Unstable patients were appropriately referred back to the hospital glaucoma service. 93% of patients were reviewed at the intervals specified by the protocol with 85% investigations carried out as per protocol and 89% of records being legible.

## **CONCLUSIONS**

The POGCS was safe and compliance with monitoring protocol was good. Although not formally assessed in this audit, the general feedback from patients was good as they appreciated being seen locally and in a timely fashion.

## **RECOMMENDATIONS**

There were aspects of the scheme that could be improved to better serve the patients:

1. A universal patient records system across the practices, ideally an electronic patient record and pathway, which enable virtual monitoring.
2. All patient information and investigations results should be available at every review, and transfer of records should be facilitated when patients move between practices, should an electronic system not be adopted.
3. Better compliance with investigations schedule.
4. Automated visual field progression analysis which triggers a referral or reassessment when progressing
5. Standardised optic nerve head imaging, and revision of imaging frequency.
6. Better clinical governance in place to audit practices at regular predetermined intervals, which would be aided by electronic patients record.

## Introduction

Glaucoma is a common, potentially blinding, chronic condition that requires lifelong monitoring once diagnosed. It is responsible for approximately 10% of UK blindness registration. The prevalence of Primary open angle glaucoma (POAG), which is the most common form of glaucoma, is estimated at 2% in those older than 40 years of age, rising to 10% in the over 75 years in white Europeans<sup>3</sup>. The incidence of POAG is in the region of 0.5% to 0.6% per year<sup>6-7</sup>. Ocular hypertension (OHT) is major risk factors for development of POAG. The prevalence of OHT is around 3-5%<sup>3</sup>. POAG, OHT and POAG suspects make up the majority of glaucoma workload. As such glaucoma is a high volume and resource demanding disease and several schemes have been introduced in an attempt to decentralise care, e.g. referral refinement and shared care schemes.

## Methods

### The Plymouth Optometrist Glaucoma Scheme (POGCS) Audit

The POGCS started in 2008 in an attempt to reduce the number of glaucoma patients seen at the Royal Eye Infirmary (REI), Plymouth Hospitals NHS Trust, in a primary care based Glaucoma co-managed scheme. Stable glaucoma patients were transferred to the care of accredited optometrists near them and were typically seen within 6 months of referral for baseline assessments.

The inclusion criteria were Ocular Hypertension, Stable glaucoma and glaucoma suspects. Stable patients were defined as having no change in management of glaucoma for one year, absence of new symptoms attributable to progressive visual deterioration, intraocular pressure within target, stable disc appearance and visual field for one year.

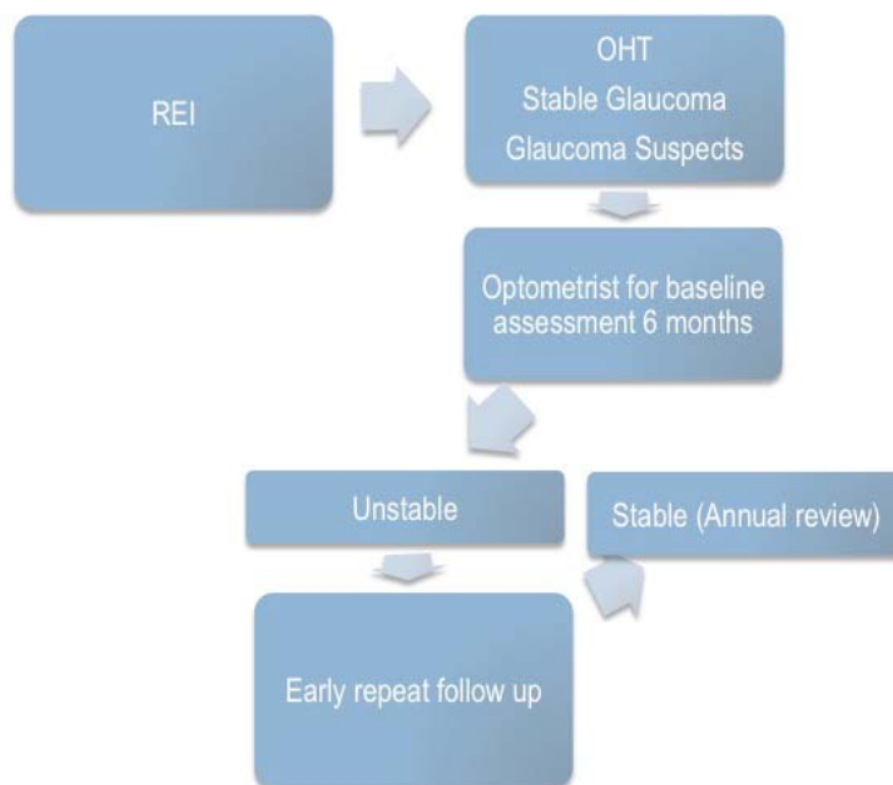
The exclusion criteria were unstable glaucoma, visual field constriction to less than 20 degrees from fixation on either field, or patients with significant other ocular pathology.

The discharge information provided by the REI included diagnosis, visual acuity, target intraocular pressures (IOP), last visual fields and a summary of glaucoma medication.

The practitioners in the POGCS underwent a local accreditation program overseen by the REI consultant ophthalmologist. It was a requirement for the participating practices to be equipped with Goldman or Perkins applanation tonometer, threshold computerised visual field machine, slit lamp biomicroscope and fundal lens and digital fundal camera.

The baseline assessments once accepted into the POGCS included history, slit lamp examination with Goldman applanation tonometry (Perkins applanation tonometry if Goldman was not possible for example secondary to mobility issues), stereo optic disc assessment with Volk lens, visual fields and digital disc

photograph. If they were stable, they remained in the scheme and were reviewed in a year's time. If they were unstable, the attending optometrist would initiate a referral back to the REI as a new referral. If there was suspicion as to the stability of any parameters, a repeat measure is instigated within 3 to 6 months. Each visit would generate an attendance form, which was returned to the Administrator and would trigger payment for the visit (Figure 1). At each follow up visit, the optometrist would check the intraocular pressure, perform disc assessment at the slit lamp and conduct a visual field test. Every sixth visit would trigger a repeat disc photograph.



**Figure 1 POGCS Flowchart**

This was the first audit of the scheme since its inception in 2008. The aim was to audit 5% of patients attending the scheme by an independent ophthalmologist in terms of the safety of the scheme and compliance with monitoring protocol.

The ophthalmologist visited the 10 sites that participated in the POCGS and reviewed patients who were seen within 3 months of their last review by the scheme. A predetermined proforma was completed for each patient seen (Figure 2). The patients records were reviewed at the visit, the diagnosis and treatment and past ocular history were noted, intraocular pressures were checked by Goldman applanation tonometry, visual fields were assessed for progression, optic nerves were examined with slit lamp biomicroscopy and compared to disc

photo. The review interval, clarity of documentation and intervals between performance of visual fields and fundus photography were also noted.

The data collected and analysed on Excel.



Plymouth Hospitals NHS Trust

NHS Northern, Eastern and Western Devon Clinical Commissioning Group

**Peninsula Optometrist Community Glaucoma Scheme**

Patient Attendance Record - Audit Form

To be completed by the practice

Patient name:	Date of Birth:	Date:
Practice:	Name of monitoring Optometrist:	Ophthalmologist: Miss Lei-Ai Lim
Target IOP (mmHg): L: R:	Date of last follow-up:	Date of digital photograph:

To be completed by Ophthalmologist

Right Eye		Left Eye	
Visual Field		Visual Field	
<input type="checkbox"/> Stable	<input type="checkbox"/> Unstable	<input type="checkbox"/> Stable	<input type="checkbox"/> Unstable
Comments			
Optic Nerve Head		Optic Nerve Head	
<input type="checkbox"/> Stable	<input type="checkbox"/> Unstable	<input type="checkbox"/> Stable	<input type="checkbox"/> Unstable
Comments			
IOP (Goldmann):	Time of applanation	IOP (Goldmann):	Time of applanation
mmHg		mmHg	
Is this patient? Stable <input type="checkbox"/> Unstable <input type="checkbox"/>		Reviewed at appropriate intervals <input type="checkbox"/>	
Signature <input type="text"/>		Timely referral <input type="checkbox"/>	
		Clear documentation <input type="checkbox"/>	
		VF and photo as per protocol <input type="checkbox"/>	

Additional comments overleaf

POGCS Audit, May 2015

Devon LOC

**Figure 2 POGCS Audit Proforma**



## Results

### Demographics

10 practices were audited between 13 May 2015 and 19 January 2016. 184 patients were reviewed, which constitutes 5.5% of 3360 patients currently enrolled in the POGCS. Table 1 shows a breakdown of the number of patients audited in each practice.

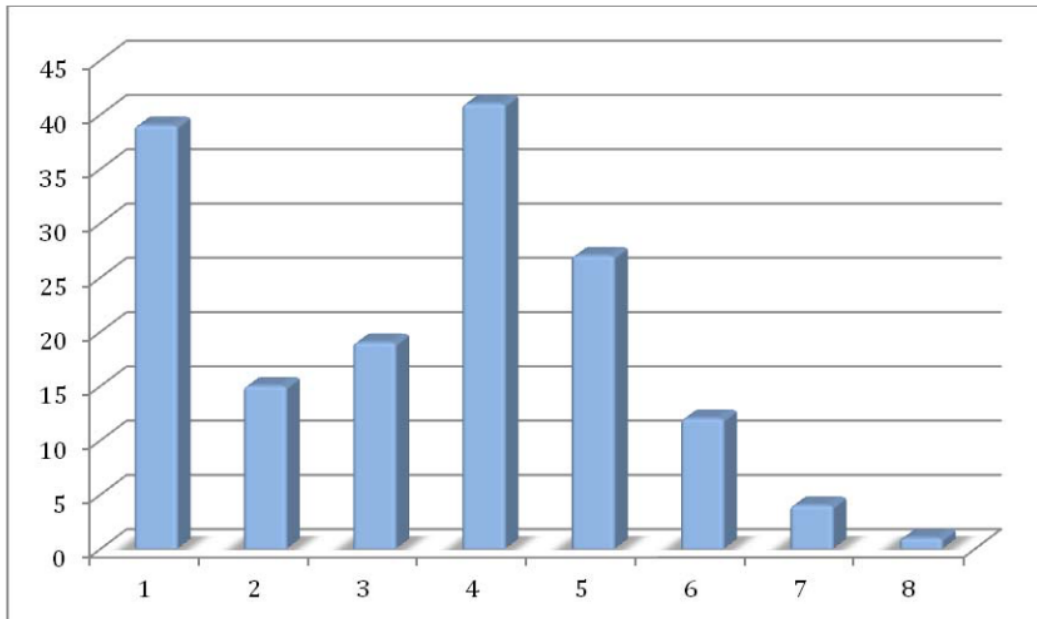
Practice	Number of Patients
Noakes Habermehl & Kerr Callington	26
Noakes Habermehl & Kerr Crownhill	20
Angus McPhie	13
Kingsbridge	7
Nigel Gainey	14
Boots Plymouth	10
Specsavers Plymouth	27
Newsome	13
Leonard A Gibson Plymstock	25
Andrew Keirl	30

**Table 1 Breakdown of number of patients audited at each practice**

The age range was 48-92 years with a mean of 72 years (SD 8.8). There was a slight female preponderance with 96 females (52%) and 88 males (48%).

Ocular Hypertension constituted the majority with 76 patients (41%), followed by 58 (32%) Chronic Open Angle Glaucoma (COAG), 28 (15%) Glaucoma suspects (GS), 12 (7%) primary angle closure, 8 (4%) Normal tension glaucoma (NTG) and 2 (1%) Secondary glaucoma. Of the secondary glaucoma patients, one had post traumatic angle recession and the other had pigment dispersion syndrome. Of the angle closures, 6 were primary angle closure suspects (PACS), 1 had primary angle closure (PAC) and 5 had primary angle closure glaucoma (PACG). 116 patients (63%) audited were on topical treatment for glaucoma, 19 (10%) had previous laser treatment, such as argon or selective laser trabeculoplasty or laser peripheral iridotomy. 13 patients (7%) had previous trabeculectomy. 55 patients (29%) were not on topical treatment; of these 29 were Ocular hypertensives, 23 Glaucoma suspects, 1 POAG and 2 NTGs. 8 of these 55 patients had previous laser: 4 had laser peripheral iridotomies and were primary angle closure suspects, 4 had argon/selective laser trabeculoplasties (3 OHT, 1 glaucoma suspect).

Graph 1 illustrates the number of patients audited at each year of attendance in the POGCS.



**Graph 1 Number of patients represented at each year of attendance in POGCS**

### **Safety/Stability Measures**

The standard measures for monitoring glaucoma includes a combination of optic nerve structure (disc imaging) and function (visual fields) and intraocular pressure. The latter is currently the only modifiable risk factor. These measures are presented here individually as well as in the context of the overall stability.

#### ***Were the Intraocular Pressures within Target?***

There were 184 left eyes and 182 right eyes. 2 patients were “only eye” patients, 1 lost an eye following trauma; the other lost the sight from previous central retinal vein occlusion. 4 patients were discharged from the REI without target intraocular pressures and were excluded from analysis. 94% of the left intraocular pressures were within target, and 96% of the right intraocular pressures (IOP) were within target throughout their follow up period (Table 2).

Of the 11 left eyes which exceeded the target IOP, 2 were appropriately referred back to the hospital glaucoma service by the attending optometrist, 5 were raised by 1-2mmHg at the audit visit but the remainder of parameters were thought to be stable. The remaining 4 were not classifiable due to lack of information at the audit visit to support or refute progression, for example, lack of baseline disc photo or visual fields. Of the 8 right eyes that exceeded the target IOP, 2 were referred back to the hospital glaucoma service, 5 were deemed stable and arrangements were made for earlier review to recheck intraocular pressure, and 1 had incomplete baseline information to aid judgment of stability (Table 3). For the patients with incomplete information, suggestion was made for earlier review.

	Left Eye	Right Eye
<b>Total Eyes</b>	<b>184</b>	<b>182 (2 only eyes)</b>
<b>No without Target IOP (excluded)</b>	<b>4</b>	<b>4</b>
<b>Number of eyes included</b>	<b>180</b>	<b>178</b>
<b>Number exceeding Target</b>	<b>11</b>	<b>8</b>
<b>Percentage</b>	<b>6%</b>	<b>4%</b>

**Table 2 Overall number exceeding Target Intraocular Pressure**

	Left Eye	Right Eye
<b>Total</b>	<b>11</b>	<b>8</b>
<b>Stable Overall</b>	<b>5</b>	<b>5</b>
<b>Unsure (lack of documentation)</b>	<b>4</b>	<b>1</b>
<b>Unstable (referred back to REI)</b>	<b>2</b>	<b>2</b>

**Table 3 Breakdown of IOPs exceeding target**

***Were the Visual Fields Stable?***

97.3% ( n= 179) of left sided visual fields and 95.6% of right sided visual fields were deemed to be stable. 7 cases in total were deemed unstable. 5 of these 7 cases were referred back to the hospital glaucoma service; one was scheduled for repeat visual fields in 3 months and one was advised referral by the ophthalmologist. The unclassifiable visual fields were unreliably performed, however, they were deemed to be stable overall (Table 4)



	Left Eye	Right Eye
Total Eyes	184	182
Stable	179(97.3%)	174 (95.6%)
Unstable	1	6
Unclassifiable	4 (2.1%)	2 (1%)
Percentage Unstable	0.5%	3.2%

**Table 4 Visual fields stability**

***Were the optic discs/nerves stable?***

The optic disc stability was judged by comparing the slit lamp appearance of the discs via non-contact fundus lens examination to disc photos. Most of the assessments were performed without dilation. Table 5 shows the breakdown of disc assessments. The eyes deemed “unclassifiable” were due to the non-availability of disc photo at the audit visit.

	LEFT EYE	RIGHT EYE
TOTAL	184	182
STABLE	159 (86%)	160 (88%)
UNSTABLE	2 (1%)	1 (0.5%)
UNCLASSIFIABLE	23 (12.5%)	21 (11.5%)

**Table 5 Optic Disc Stability**

### **Protocol Compliance**

#### ***Review frequency***

93% (n= 171) were reviewed as per protocol. Of the remaining 13 patients, 12 had incomplete documentation or investigations, 1 was lost to follow up for a few years then returned to the scheme.

#### ***Investigations***

85% (n=157) had their visual fields and disc photography performed as per protocol. Of the 27 who did not have all their investigations performed, 18 (67%) did not have their disc photographs performed, 9 (33%) did not have both disc photograph and visual fields performed as per protocol. The reason cited for 3 of these cases was that they were previously seen in another optometry practice within the POGCS, 1 was lost to follow up for a few years.

#### ***Patient Records***

Each of the 10 practices has their own record system with two main varieties: paper system with paper records and printed visual fields or scanned paper documents. The patient records were assessed for completeness and legibility, this excluded visual fields and disc photographs, which were assessed separately

above. The disc photographs were in a separate computer viewing system in all the practices. 89% (n=164) of the documents were complete and legible. Of the remaining 20 documents, 16 were incomplete (missing discharge documentation from the hospital or attendance forms), 2 were scanned but illegible and 2 patients had both missing attendance forms as well as illegible scanned documents.

## Discussion and Recommendations

The rising number of patients with glaucoma related pathologies as a result of an ageing population, increased optometric screening, and increased public awareness has led to increased demand for glaucoma services. Several coping strategies have been adopted nationally in order to supplement overburdened and under-resourced hospital glaucoma services. One such strategy involves the employment of a community shared care scheme, where community optometrists with training in glaucoma are employed. The study of one such scheme in Bristol has shown that it is safe, and is associated with high patient satisfaction<sup>1-2</sup>. A national survey of the various forms of shared care schemes in glaucoma in operation in the UK alluded to the wide diversity of shared care schemes, and the paucity of published audit data from shared care schemes and the worrying absence of regular audit of such schemes<sup>8</sup>.

The Royal College of Ophthalmologist and NICE have issued guidelines on the criteria for suitability of patients, optometric training, frequency of follow up, referral protocols, lines of communication, validation, audit and funding<sup>3-5</sup>. Future audits and scheme redesign should take into account the NICE Quality Standards<sup>4</sup>.

The POGCS was found to be safe and compliance with protocol was good. The range of number of years within the scheme was 1-8 years with adequate representation of patients audited over the duration of the scheme. 94-96% of intraocular pressures were within target at review, 95-97% of visual fields were stable and 86-88% of discs were deemed stable. Unstable patients were appropriately referred back to the hospital glaucoma service. 93% of patients were reviewed at the intervals specified by the protocol with 85% investigations carried out as per protocol and 89% of records being legible.

There were aspects of the scheme that could be improved to better serve the patients. The compliance with investigations schedules could be improved.

Primary angle closure glaucoma is associated with higher rates of blindness. The acute form of primary angle closure requires urgent treatment in the hospital setting. The chronic form share similar features with the more common primary open angle glaucoma, however, there are investigations and treatments that are specific to the management of primary angle closure. 7% of patients audited had primary angle closure (6 Primary angle closure suspects, 1 Primary angle closure, 5 Primary angle closure glaucoma). There were also isolated case of a patient who had only unilateral laser iridotomy, and patients with PACG who were still phakic. The skills and equipment for gonioscopy are not routinely available in the optometric setting, however every participating practice has a

slit lamp, and the clinical examination of the anterior segment by the Van Herrick test is part of the core competence of all optometrist. It is recommended that this should be included as part of the routine assessment of patients seen in the POGCS. Alternatively, the suitability of patients for the POGCS would need to be reviewed.

NICE Quality Standard 9 states that “ Healthcare professionals involved in the care of a person with COAG, suspected COAG or with OHT have appropriate documentation and records available at each clinical encounter in accordance with NICE guidance”. This includes clinical notes and results of investigations. These were not available in up to 11% of patients audited. The participants in the POGCS employs database specific to the practices and is varied across the different practices. Universal patients record across the practices, ideally an electronic patient record and pathway, which facilitates virtual monitoring and clinical governance, would be advisable. There will be cost and governance implications with implementation of such a system, which is outside the scope of this audit. Should an electronic system not be adopted, there needs to be a process in place, when patients transfer from one optometry practice to another to ensure transfer of patient records to enable continuity of monitoring.

For patients with OHT or COAG suspects who are not recommended to receive medication, NICE recommends assessing IOP, optic nerve head and visual fields at the following intervals: between 12 and 24 months if there is a low risk of conversion to COAG and between 6-12 months if there is a high risk of conversion to COAG. The POGCS currently has a pathway that specifies IOP check and visual field testing at each visit, and disc photography at baseline and only after 5 visits (at the 6<sup>th</sup> visit). There was a lack of consistency in the quality and type of photography performed, making some of the comparisons difficult. Subjective estimates of cup:disc ratio only detect large changes in cupping and are insufficient for monitoring structural changes. There are also issues with regards to intraobserver and inter-observer agreement in optic disc assessment<sup>9-10</sup>. Great caution should be exercised when combining photographic and clinical measurements in assessing structural progression. Serial optic disc photography is a more enduring method for this purpose. It is therefore recommended that the performance of disc photography is standardized and the frequency of imaging is revised.

Finally, it may be helpful to adopt an automated visual fields analysis with computer assisted progression analysis, with a trigger for referral following confirmed “event” analysis.

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