



# Assessment of referrals to the hospital eye service by optometrists and GPs in Bradford and Airedale

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## Abstract

**Purpose:** To investigate the content of referrals to a hospital eye department and describe differences between referring clinician (optometrist or GP) and referral formats.

**Methods:** A random sample of 433 new referrals to Bradford Royal Infirmary hospital eye service (HES) during 2007 and 2008 were retrospectively analysed.

**Results:** Three hundred and eleven referrals (72%) were from optometric practice and 122 (28%) from general practice. Optometric referrals were mainly for cataract and posterior capsular opacification (27%), glaucoma or suspect glaucoma (20%) and diabetic retinopathy (10%).

**Conclusions:** The proportion of referrals to the hospital eye service from optometrists appears to be increasing (1988: 39%, 1999: 48%, present study 72%). GPs mainly refer patients with anterior segment disorders, particularly lid lesions, based on direct observation and symptoms. Optometrists refer patients with a wide range of ocular diseases and include fundus observations and visual acuity measurements in their referrals. There is a need to inform optometrists of what content is required in a referral to the HES from GOS sight tests, at least for the common referral conditions such as age-related cataract and suspect open-angle glaucoma. Referral forms specifically designed for these commonly referred conditions are likely to improve referral quality.

## Introduction

This study investigated the content of referrals to the Bradford Royal Infirmary hospital eye service (HES) and describes differences between referring clinician (optometrist or general practitioner, GP) and referral formats. New patients attending the HES in the United Kingdom are referred there from optometric practice (39–57% of referrals) or by GPs (43–49% of referrals),<sup>1–3</sup> unless they have self-referred to Accident and Emergency clinics. The proportion of referrals from optometric practice appears to be increasing (1988: 39%,<sup>3</sup> 1999: 48%,<sup>2</sup>) and this study investigated whether this trend has continued.

The quality of referrals from optometrists,<sup>2–4</sup> particularly those for suspect glaucoma<sup>5–12</sup> have been analysed periodically over the last 30 years. Researchers have used

these reports to highlight inadequacies in the HES referral system that they subsequently attempted to improve<sup>13–16</sup> and it is therefore useful to continue this periodic review. In addition, very limited information is available that compares referrals, in terms of the types of condition referred, information provided or accuracy of tentative diagnoses, from optometrists and GPs. A very recent study by Pierscionek *et al.*<sup>1</sup> reported such information for referrals to a (non-hospital based) ophthalmology practice in Northern Ireland, but the results may not be typical of those found for the UK HES (this is discussed in detail in the discussion). The present study aimed to analyse referral information from a typical UK HES and highlight any differences with the NI study.

GP referral letters are usually computer generated and printed, whereas optometrist referrals can be written on a

General Ophthalmic Services (GOS) 18 form, a direct referral form, a shared care form or a typed or handwritten letter, and forms can differ depending on local schemes. In Bradford there is also an adapted GOS 18 form developed in collaboration with local ophthalmologists and aimed at improving optometric referral quality.<sup>17</sup> It differed in that there was no area for the GP to complete as local GP alliances informed the development team that this was no longer used. It also included a number of tick boxes for the most commonly referred pathologies, so the hospital clinician can see at first glance the reason for the referral. Despite some authors advocating the use of letter writing to refer effectively,<sup>18</sup> the GOS 18 form remains the most popular referral method (69–73% of referrals).<sup>2,5</sup>

The aims of the present study were to compare the content of referrals to a UK HES based on the referring clinician (optometrist or GP) and referral format; to investigate whether the proportion of referrals from optometrists is increasing and to attempt to find approaches that could improve referral quality.

## Method

Ethical approval was gained from the Bradford NHS Research Ethics Committee and the Bradford Hospitals NHS Foundation Trust Research Office. A random sample of 445 new referrals to Bradford Royal Infirmary ophthalmology department during 2007 and 2008 were retrospectively analysed. The presence of the following information was recorded from the referral: patient name and address, date, referrer name, referral format, referrer address, refraction, visual acuity, ophthalmoscopy, visual field assessment, tonometry, pupils, co-morbidity, slit lamp examination, symptoms, family history and any diagnosis given or alluded to [classified based on the International Classification of Diseases-10 (ICD-10), World Health Organisation]. If the referral was handwritten then the legibility of the referral was graded by one person (CD) as; fully legible, illegible in part but understandable overall, or not legible enough to understand the reason for referral.

Although there are many aspects of a good referral that are essential for all pathologies, the content will vary depending on the referral reason. For example, the Department of Health paper 'Action on Cataracts'<sup>19</sup> recommends that referrals should contain a confirmation of the presence of cataract that is affecting vision, an indication that the reduced vision was having a detrimental effect on the patient's lifestyle and an indication that the patient was willing to undergo surgery. However, the literature concerning glaucoma referrals agrees that the best referrals contain a triad of information including assess-

ments of visual fields, optic discs and intra-ocular pressures.<sup>5–12</sup> For this reason, referrals of certain categories of ocular disease were assessed using disease specific recommendations.

## Results

### Referring clinician

Twelve of the 445 referrals were excluded as the GP letter suggested that they originated from an optometric practice, but either the GP had not enclosed the optometrists' referral letter or it had been lost. Of the remaining 433 referrals, 311 (72%) originated from optometric practice and 122 (28%) were from general practice. Of the 311 referrals from optometric practice, 231 were from optometrists and 17 were from pre-registration graduates. It was not possible to identify whether 59 of the referrals from optometric practice were from Optometrists or pre-registration graduates, although they could not have been from Ophthalmic Medical Practitioners (OMPs) as none are registered with the local Primary Care Trust as performers. As the supervising optometrist takes legal responsibility for all referrals from a pre-registration graduate, all these referrals were combined as 'optometric referrals'. It was not possible to ascertain the type of clinician from 11 referrals, which were all Diabetic Retinal Screening Service (DRSS) referrals and were probably from DRSS technicians and therefore were not included in the GP/optometrist comparison.

### Referral format

All 114 referrals from GPs were typed and computer generated. The seven DRSS referrals from General Practice were on the relevant DRSS proforma. The format of the 311 referrals from optometric practice is shown in *Table 1*.

**Table 1.** The referral format of 311 referrals from optometrists to the hospital eye service in Bradford

Referral Format	n (%)
Old GOS18	124 (40)
New GOS18	115 (37)
DRSS form	33 (11)
Optometrist letter – typed	17 (5)
Cataract CHOICE	13 (4)
Optometrist letter – handwritten	4 (1)
Glaucoma monitoring scheme	3 (1)
Practice specific proforma	2 (1)

GOS18, General Ophthalmic Services 18 form; DRSS, Diabetic Retinal Screening Service.

## Legibility

All GP referrals were fully legible as they were all typed and either securely transmitted electronically or faxed. Of the 311 referrals from Optometric practice, 29 had an illegible referrer name and 26 had no referrer name present. Of the 275 handwritten referrals from Optometric practice, 202 (73%) were fully legible, 71 were illegible in part but with the general meaning intact (26%), and two were fully illegible. Both the frequency of presence and the degree of illegibility were similar for the different types of form used (old or new GOS18 or individual letter).

## Referral diagnoses

The ranges of primary diagnoses given in referrals from optometric and general practice are given in *Tables 2 and 3* respectively using categories from the ICD-10 of the World Health Organisation.

## Ophthalmoscopy

Five of 114 GP letters (4%) commented on the fundus. Two of them cited direct ophthalmoscopy as the method used whereas the remaining three did not comment on the technique used. Two hundred and ninety-one of 311 optometric referrals (94%) commented on the fundus. In most cases the technique used was unspecified (179,

**Table 2.** Primary diagnoses given in referrals from optometric practice ( $n = 311$ ) and classified using the International Classification of Diseases (ICD) 10th revision

Diagnosis in referral	<i>n</i> (%)
Disorders of lens	84 (27) <sup>a</sup>
Primary open angle glaucoma suspect	61 (20)
Diabetic retinopathy	32 (10)
Age related macular degeneration	23 (7)
Visual disturbances and other disorders of eye and adnexa	20 (6)
Other disorders of retina	17 (5)
Disorders of the cornea	14 (5)
Disorders of eyelid, lacrimal system and orbit	12 (4)
Disorders of vitreous body and globe	11 (4)
Retinal vascular occlusions	10 (3)
Disorders of muscles, binocular movement/vision, amblyopia, accommodation and refraction	8 (3)
Retinal detachments and breaks	7 (2)
Disorders of optic nerve and visual pathway	3 (1)
Disorders of conjunctiva	3 (1)
Angle closure, secondary and other glaucoma	2 (1)
Disorders of choroid	2 (1)
No diagnosis given in referral	2 (1)

<sup>a</sup>Includes 13 referrals for posterior capsular opacification and 1 for lens subluxation.

**Table 3.** Primary diagnoses given in referrals from GPs in general practice ( $n = 114$ ) and classified using the International Classification of Diseases (ICD) 10th revision

Diagnosis in referral	<i>n</i> (%)
Disorders of eyelid, lacrimal system and orbit	52 (46)
Visual disturbances and other disorders of eye and adnexa	21 (18)
Disorders of lens	12 (11)
Disorders of conjunctiva	10 (9)
Disorders of muscles, binocular movement/vision, amblyopia, accommodation and refraction	7 (6)
Age related macular degeneration	4 (4)
Disorders of the cornea	2 (2)
Disorders of vitreous, globe, sclera, optic nerve, visual pathway, iris, ciliary body, retinal breaks and other disorders of retina	6 (5)

58%), but the following techniques were reported: Dilated indirect ophthalmoscopy (53, 17%), direct ophthalmoscopy (34, 11%), retinal photography only (22, 7%) and undilated indirect ophthalmoscopy (3, 1%).

## Visual acuity (VA)

GPs included VA results in nine referrals (8%,  $n = 114$ ) and VAs were included in 299 referrals from optometric practice (96%  $n = 311$ ).

## Lids and lacrimal disorder referral quality

Fifty-two referrals for lids and lacrimal disorders were from General Practice, and 12 were from Optometric practice. GP referrals mainly provided symptoms ( $n = 49$ , 94%), with VA provided in two cases (4%) and no reports of any examination beyond direct observation. Topical drugs were prescribed in eight cases (15%). Optometric referrals typically provided VA results (12, 100%) and symptoms (11, 92%) and often indicated that a slit-lamp examination had been performed (9, 75%), but did not report prescribing drugs.

## Cataract referral quality

There were 12 referrals from GPs, although two had been previously diagnosed with early cataract by ophthalmologists. GP referral letters for cataract usually included information about the effect on the patient's lifestyle (11, 92%), occasionally that they were willing to have surgery (4, 33%), but rarely a description of the cataract (1, 8%) or fundus (1, 8%) and no reports contained VA or refractive error information. One of the 12 referrals (8%) could be said to have completely followed the Department of Health 'Action on Cataracts'<sup>19</sup> recommendations for referrals, yet 9 of the 12 referrals (75%) led to cataract surgery.

**Table 4.** Contents of 61 cataract referrals from optometrists to the hospital eye service by referral format

Referrer/format	Lens report (%)	Visual acuity (%)	Affecting lifestyle (%)	Fundal report (%)	Refractive error (%)	Resulted in surgery (%)
Cataract CHOICE ( <i>n</i> = 8) <sup>a</sup>	8 (100)	8 (100)	8 (100)	8 (100)	8 (100)	8 (100)
Old GOS18 ( <i>n</i> = 32)	32 (100)	31 (97)	21 (66)	31 (97)	30 (94)	23 (72)
New GOS18 ( <i>n</i> = 16)	16 (100)	16 (100)	5 (31)	15 (94)	14 (88)	10 (63)
Optometrist letter ( <i>n</i> = 5)	5 (100)	5 (100)	5 (100)	5 (100)	5 (100)	4 (80)

<sup>a</sup>In 6 cases, an older cataract CHOICE form, which included data obtained by phone by a patient care co-ordinator was used and these data are not presented. Three other referrals were submitted on Diabetic Retinal Screening Service (2) or Glaucoma Monitoring Service (1) forms. GOS18, General Ophthalmic Services 18 form.

There were 61 referrals for cataract from optometrists (*Table 4*). Optometrist referral letters usually included information about the cataract (61, 100%), VA (60, 98%), refractive error (57, 93%) and fundus (59, 97%), but less often information about the effect on the patient's lifestyle (39, 64%) or willingness for surgery (30, 49%). Thirty of the 61 referrals (49%) followed completely the Action on Cataracts recommendations and 45 of the 61 referrals (74%) led to cataract surgery.

#### Glaucoma referral quality

No new referrals were made by GPs for suspect glaucoma. Two glaucoma referrals from GPs were excluded as the patients had been previously diagnosed with glaucoma, but had been lost to recall by the hospital. The two patients already on the Glaucoma Monitoring Enhanced Service were excluded as they had also been previously diagnosed. There were 61 referrals from Optometric practice, of which 47 (77%) gave the recommended triad of assessment for suspected primary open-angle glaucoma of disc assessment with IOP and visual field measurement, 12 (20%) gave disc assessment with tonometry readings and two (3%) gave IOP measurements only. Non-contact tonometry was reported in 33 cases (54%) and contact tonometry in eight cases (13%), with the remainder being unspecified. Of the 31 patients with defective visual fields, three had obviously had visual fields repeated. A positive family history was reported in 13 cases (21%). It should be noted that all these referrals occurred prior to the National Institute for Health and Clinical Excellence (or NICE) guidelines on referral of patients with suspect primary open-angle glaucoma or ocular hypertension (April 2009).

## Discussion

#### Referring clinician

Compared to studies in the 1980s and 1990s, the proportion of referrals to the HES from optometrists is increasing (1988: 39%,<sup>3</sup> 1999: 48%,<sup>2</sup> present study 72%). There is no obvious reason to suspect that referrals to the HES in the

Bradford and Airedale region would be different to other parts of England, but they will probably differ from Scotland and Wales due to the enhanced GOS contracts agreed there. The reasons behind this increase are unknown and require further investigation (are patients choosing to attend optometric practice rather than their GP with ocular problems? Are GPs sending more patients to optometrists rather than directly to secondary care? Are optometrists referring relatively more of their patients?). The recent study from Pierscionek *et al.*<sup>1</sup> described data from a non-HES ophthalmology practice in Northern Ireland and may be atypical as discussed below. Even so, they report optometric referrals at 57%.

The majority of the 114 referrals from GPs (*Table 3*) were for symptomatic disorders of eyelid, lacrimal system and orbit (*n* = 52, 46%), of which 20 were lid cysts or lesions, 17 were symptoms of a lid/lacrimal disorder and six were entropion/ectropion or trichiasis. Other ocular abnormalities diagnosed were either symptom-based (such as 'poor' or 'distorted' vision, *n* = 21, 18%), cataract (*n* = 12, 11%) and conjunctival diseases (*n* = 10, 9%). In the majority of cases, the referral letters suggest that GPs diagnosed anterior segment diseases on the basis of direct observation (i.e. without slit-lamp or ophthalmoscopy) and symptoms, with rare provision of visual acuity data (*n* = 9, 8%) or mention of the use of a direct ophthalmoscope (*n* = 5, 4%). This summary differs from the view provided by Pierscionek *et al.*<sup>1</sup> who reported referrals from GPs and optometrists to a non-HES ophthalmology clinic in Northern Ireland (NI). For example, we found no referrals for suspect glaucoma originating from GPs, which is similar to the majority of the literature with reported values from 0% to 10%.<sup>6,8-11</sup> However, Pierscionek *et al.*<sup>1</sup> reported that 31% of glaucoma referrals in their study originated from GPs. In the current study there were 12 referrals where the GP indicated optometric practice as being the origin, but the original optometrists' referral was not included in the GPs' correspondence. This problem was also identified by Pooley and Frost<sup>2</sup> and could be an explanation for the disparity between the data from the NI study and the rest of the literature. i.e. perhaps some of the

glaucoma referrals from GPs in the NI study were originally referred by optometrists. Alternatively, the NI study could have included referrals from a GP with a special interest in ophthalmology, and therefore with access to visual field analysers and tonometers and with significant experience of disc assessment. However, one would have expected this information to have been provided in the report and it was not. The NI study also seems atypical in that the third most common cause for referral by GPs was retinal problems ( $n = 28$ , 12%, as there is no separate category, it is assumed to include age related macular degeneration; AMD) and 19 were reported to have provided a correct diagnosis. In the present study, six patients (5%) were referred for retinal problems by GPs (four for AMD and two for detachment/breaks and other disorders of the retina). Three of these patients had previously been diagnosed with AMD (one by their optometrist who had provided an Amsler chart for home monitoring and two by the HES who had subsequently discharged the patients), two were referred on the basis of symptoms only ('flashes and floaters' with a diagnosis of posterior vitreous detachment (PVD), and 'reduced vision' with a suggested diagnosis of AMD) and one was referred for a retinal detachment with PVD based on symptoms and ophthalmoscopy, for whom the HES subsequently diagnosed as cataract only.

Optometric referrals (see *Table 2*) were principally for disorders of the lens (27%), glaucoma or suspect glaucoma (20%) and diabetic retinopathy (10%). These referral patterns have been described before<sup>1,2,4</sup> and do not appear to have changed substantially. The optometric cataract referrals were all grouped together, but should perhaps have been divided into two groups: one set of referrals arising from a GOS 'sight test' as funded by the NHS and a smaller group from a CHOICE direct referral pathway where additional funding was provided to accredited optometrists by the local Primary Care Trust (PCT) for performing a dilated fundus examination, discussing cataract surgery with the patient and completing a cataract referral form. This is a form of referral refinement requiring a higher level of referral quality and uses a cataract-specific proforma. Perhaps not surprisingly, 100% of the eight referrals via the CHOICE pathway (the service was introduced during 2008, which could be a cause of the low numbers) provided the information indicated by the Action on Cataracts recommendations and all eight underwent surgery. Referrals arising from GOS tests were more variable. GOS referral letters virtually always included information about the cataract, VA, refractive error and fundus (all above 88%), but less often information about the effect on the patient's lifestyle (26/48, 54%) or willingness for surgery (23/48, 48%). One reason for this is that some optometrists clearly did not view a discussion of the need for surgery as part of the

remit of the GOS sight test. Indeed, one GOS referral for cataract included the following: 'Please arrange referral to ophthalmology to discuss the pros and cons of cataract surgery'. This latter approach is in agreement with the obligations of the GOS contract, but is clearly not followed by those optometrists who reported whether the patient was willing to undergo surgery. There is a need for all optometrists to be clear about what their requirements are for cataract referral as part of a GOS sight test.

The recommended information provided in a referral for suspect glaucoma includes an optic disc assessment and measurements of intra ocular pressure and visual fields in both eyes<sup>6,8,9,11,15,20,21</sup> and ideally, abnormal intra ocular pressures and visual field assessments should be repeated to avoid unnecessary false positive referrals.<sup>7,9,13,15,20</sup> Information regarding all three glaucoma assessments was provided in 47 of 61 optometric referrals (77%), with 12 referrals including just tonometry and disc assessment (20%) and two (3%) with just tonometry readings. Visual field measurements were repeated for 3 of 31 defective fields (10%) and 15% of referrals included contact tonometry readings, although it was not clear whether these were initial or repeated measurements. Once again, there is therefore a need for all optometrists to be clear about what their requirements are for referrals of patients with suspect glaucoma or ocular hypertension (OHT) as part of a GOS sight test.

In this regard, it is pertinent to highlight that a referral refinement service has recently been piloted in the Bradford area between 1 February 2009 and 31 July 2009.<sup>22</sup> This service funded repeat measurement of IOP by applanation and threshold visual field assessment for patients that would have otherwise been referred for OHT or suspect primary open angle glaucoma. The pilot reduced unnecessary referrals to secondary care and has since been rolled out over the rest of the PCT.

### Referral format

The majority of optometric referrals were made using GOS 18 forms, with 40% being made using the original GOS 18 and 37% with the newer locally adapted GOS 18. There appeared to be no difference in the information provided within the different formats and the locally adapted GOS 18 form showed no marked improvements in the information provided over the old GOS 18 (e.g., *Table 4*). The adapted form remained one that was attempting to be useful for all types of referral and it may be that improvements (such as those provided by the disease specific CHOICE forms, see *Table 4*) will only come about following the introduction of disease specific referral forms for the very common referrals of cataract and suspected glaucoma or ocular hypertension, with a generic GOS 18 being used for other referrals. Fully

illegible forms are not a major problem, however over a quarter of handwritten referrals were illegible in part, which may cause delay or inaccuracy when the referral reaches the HES. It is not clear if reduced legibility was due to poor handwriting or poor quality due to scanning, faxing or self-carbonating copies. This represents an improvement over 1999 findings which reported that only 33% of optometric referrals were read without difficulty.<sup>2</sup> Word processing would naturally improve legibility and all GP referrals were fully legible as they were computer generated. A surprisingly small proportion of optometric referrals were made using a word-processed letter (5%). The number of optometric practices using electronic patient records in this area is unknown, but as more practices switch to a paperless system perhaps a nationally adopted electronic referral template (or series of templates for different referral types as discussed above) could gradually replace the ageing GOS 18.

## Conclusion

The proportion of patients attending a HES department that have been referred by an optometrist rather than a GP is increasing. Optometrists refer patients with a wide range of ocular diseases and in most cases include fundus observations and visual acuity measurements in their referrals. GPs mainly refer patients with anterior segment disorders, particularly lid lesions, based on direct observation and symptoms. GP referral letters include all relevant non-clinical information and are all perfectly legible, whereas illegibility and missing clinical information remain problems in optometric referrals. This could be minimised by word-processed referrals, and in the future, direct electronic referral. There is variability in the provision of information in optometric referral letters to the HES for the common conditions of cataract and suspect primary open-angle glaucoma or OHT and there is a need to determine and disseminate what exactly should be provided as part of a GOS sight test. The introduction of disease-specific referral forms for suspect glaucoma and cataract, rather than the standard GOS 18 referral form, could also help to improve referral quality and is strongly recommended.

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