Glaucoma Referral Refinement Scheme

Fiona Spencer
(and the rest of the team!)
Manchester Royal Eye Hospital
Rationale for Optimising Service Development

- “Bow wave of doom”
  - Service pressure to see new patients
  - Deferred appointments for glaucoma follow-up
- “Snowball”
  - Longer in post more patients as chronic disease
- External pressures
  - LOC application to Eye Services Group to manage glaucoma
Options for responding to Eye Services Group?
What’s next?

• Need to look at what is likely to succeed locally
  – How many patients: size of problem
  – What stage of disease process/type of patient
  – Personnel available/ potential team
  – Clinic space available: Hospital or Community
  – Costs of set-up: Funding options
• Consider training required
• Protocols for referral
• Continuing education/professional development
• Sickness/leave cover: continuity
• Audit and assessment tools
Examine Existing Ideas

• Own experience
  – Nottingham model

• Other model
  – Held “Shared Care” meeting in Manchester
  – Assessed pros and cons of other models
Share your vision!

• Engage with stakeholders early
• Build team
  – David Henson
  – Rob Harper
  – Nick Jones
  – Ted Cadman
Referral Refinement Scheme

- Met with Local Optical Committee
- Enlisted support in MREH
- Designed training course
  - Evening lectures
  - Afternoon practicals & accreditation
- Direct referral form to MREH
- Selection Process
  - All local optometrists invited to introductory meeting
  - All invited to apply (1 per practice)
  - Had to practice within MHA
  - Had to attend whole training scheme
  - 17 completed but 15 accredited (2 counselled out following review of task sheets on disc assessment)
Referral Refinement Scheme

• Started in November 2000

• Objectives
  – reduce number of false positive glaucoma referrals to MREH
  – thereby reduce waiting times for other patients
  – Improve quality referral information to HES
  – Utilise Optometric expertise in community
Glaucoma Referral Pathways

Original Pathway

Community Optometrist

General Practitioner

Hospital Eye Service

Manchester Pathway

Community Optometrist

Accredited Community Optometrist

General Practitioner

Hospital Eye Service
Referral Criteria 1

- IOP alone if repeated > 26 mmHg (35 mmHg : urgent)
- Field alone if repeated (check no other causative pathology)
- Disc alone if absolute (Notch, abnormal NRR configuration, large cup for size of disc, disc hge merits closer inspection, asymmetry optic cup of 0.2 or greater)
- Documented change in optic disc
Referral Criteria 2

- Field and disc (NTG)
- IOP and disc (pre-perimetric glaucoma)
- Narrow angles (symptoms of subacute attacks VH grade 1)
- Secondary glaucoma signs and IOP > 22 mmHg (Treat PXF as POAG but recheck IOP at 12 months)
Patient Assessment

- History
- Anterior Segment Assessment
- Applanation Tonometry (Goldmann or Perkins)
- Disc Assessment
- Automated Visual Field Analysis (Dicon, Henson, Humphrey)

- (refraction)
Copy for Eye Hospital Referral

MANCHESTER GLAUCOMA REFERRAL REFINEMENT SCHEME

NHS NO.

PATIENT

Date of Birth 16/4/99
Surname
First Name
Address
Post Code
Phone No.

ASSESSOR

Name
Date of Assessment 29/7/04

GP Name & Address Dr. Smith, Willowbank, Church Lane

PRESCRIPTION DETAILS FROM CURRENT SIGHT TEST

Date: 23.7.04

PREVIOUS CORRECTED VISUAL ACUITY

Date: 11.12.99

R: 1/9
L: 1/9

RISK FACTORS:
Family History □ Diabetes □ Myopia □ Hypertensive □ Afro Carribean □

CURRENT OPHTHALMIC STATUS

RIGHT EYE
LEFT EYE

VISUAL FIELDS (enclose all copies)
Comment on reliability: Good / Bad

INTRA OCULAR PRESSURES mmHg
16 (23.7.04) 15 (23.7.04)

ANGLE (VAN HERRICK GRADE)

16

ANTERIOR CHAMBER

OBSERVATION eg. PSEUDOEXFOLIATION RUBEOSIS

YES / NO

OPTIC DISC

Please draw appearance and features in space provided.

DISC SIZE

L / M / S

C/D RATIO

0.75

CUP SHAPE

VO / HO / R

ISNT RULE BROKEN

YES / NO Location?

YES / NO Location?

YES / NO Location?

YES / NO Location?

YES / NO Location?

YES / NO Location?

ERI - PAPILLARY ATROPHY

DISC SIGNS

FOCAL NOTCH BOWED BACK

VASCULAR SIGNS

Bayonet / Nasalisation / Vessel Bearing etc.

STATUS OF EYE

ACTION TAKEN

By accredited Optometrist (GP copy for information only)

1. The above patient is a suspect glaucoma patient and requires an eye hospital appointment

2. The above patient is thought not to have glaucoma and should be reviewed by original referring optometrist in . . . . months

Signature of Accredited Optometrist

Signed

I agree / do not agree that any Ophthalmologist to whom I am referred for medical consultation and / or treatment may make information relevant to my eye condition and its treatment available to my Optometrist / Ophthalmic Medical Practitioner.

Signed

Date

29.7.04

MANCHESTER ROYAL EYE HOSPITAL
TWO HUNDRED YEARS OF EXCELLENCE
1814-2014
Success of Scheme

- Established good relationship with LOC
- Repeated training sessions every 12-18 months, some open to all LOC
- Further accreditation due to changing staff in 2005 and 2007 and renewed scheme in 2013
- Initial audit confirmed protocol reduced false positives as expected
Audit of Referral Forms

- All audit data entered into spread sheet
- In May 2003 MSc student (Irma Ricciardello) examined MREH records
  - (71%) available for analysis Nov 01-May 03
- 670 patients seen by RR Optometrists
- 396 referred (59%)
Optometrist Activity Initially

- No evidence of an increase or tail off of the number of cases going through the scheme
- Individuals saw 14-110 in time period
Patients
# Tests performed

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>Optometrist</th>
<th>Consultant*</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>Percent</td>
</tr>
<tr>
<td><strong>Visual Fields</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>both eyes</td>
<td>378</td>
<td>95.5</td>
</tr>
<tr>
<td>one eye</td>
<td>8</td>
<td>2</td>
</tr>
<tr>
<td>neither eye</td>
<td>10</td>
<td>2.5</td>
</tr>
<tr>
<td><strong>Optic Cup-to-disc Measurements</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>both eyes</td>
<td>382</td>
<td>96.5</td>
</tr>
<tr>
<td>one eye</td>
<td>10</td>
<td>2.5</td>
</tr>
<tr>
<td>neither eye</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td><strong>IOP</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>both eyes</td>
<td>393</td>
<td>99.2</td>
</tr>
<tr>
<td>one eye</td>
<td>3</td>
<td>0.8</td>
</tr>
<tr>
<td>neither eye</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Family History and risk factors</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>yes</td>
<td>106</td>
<td>27.8</td>
</tr>
<tr>
<td>no</td>
<td>290</td>
<td>73.2</td>
</tr>
</tbody>
</table>
IOP differences (RE)

Mean difference = -0.10
Standard Deviation = 4.2
CD Ratio Differences

Mean Difference -0.01

CD ratio Difference (Community - HES)
Patient Outcomes

- 24% POAG
- 8% NTG
- 6% OHT (treated)
- 4% ACG
- 2% PDS glaucoma
- 11% discharged
- 43% watch
- 2% others
<table>
<thead>
<tr>
<th>Single Referral criteria</th>
<th>Reviewed Cases (%)</th>
<th>False +ve Cases (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. IOP&gt;26 mmHg confirmed at a second visit IOP&gt;35 mmHg.</td>
<td>3 (1)</td>
<td>0</td>
</tr>
<tr>
<td>2. Unequivocal pathological cupping of ONH. Abnormal NRR configuration. Large cup-</td>
<td>73 (19)</td>
<td>10 (29)</td>
</tr>
<tr>
<td>overall disc size. Notched NRR&lt;0.2 asymmetry of C/D ratio.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Visual field defect compatible with diagnosis of glaucoma, confirmed at a second</td>
<td>12 (3)</td>
<td>1 (3)</td>
</tr>
<tr>
<td>visit</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Combined referral criteria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. IOP&gt;22 mmHg &amp; suspicious OD appearance or OD asymmetry.</td>
<td>75 (19)</td>
<td>2 (6)</td>
</tr>
<tr>
<td>2. Abnormal OD and VF (IOP not raised).</td>
<td>71 (18)</td>
<td>4 (12)</td>
</tr>
<tr>
<td>Additional referral criteria</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. OD change: C/D, rim appearance, haemorrhage.</td>
<td>42 (11)</td>
<td>7 (21)</td>
</tr>
<tr>
<td>2. Anterior segment signs of secondary glaucoma with IOP&gt;22 mmHg on two occasions.</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>3. Suspect NAG (subacute attacks/closable angle &amp; IOP&gt;22 mmHg).</td>
<td>4 (1)</td>
<td>0</td>
</tr>
<tr>
<td>Others</td>
<td>32 (8)</td>
<td>6 (18)</td>
</tr>
<tr>
<td>Total</td>
<td>396 (100)</td>
<td>30 (100)</td>
</tr>
</tbody>
</table>
Community refinement of glaucoma referrals

Abstract

Aim To describe a Manchester-based glaucoma referral refinement scheme designed to reduce the number of false-positive referrals to the hospital eye service. To report on the first year’s results of this scheme and its financial costs to the NHS.

Methods Patients with suspected glaucoma, instead of being referred to their GP and then on to the hospital eye service, were referred to a group of specially trained community optometrists working to an agreed set of (20–65%), i.e. there is little if any evidence of glaucoma. These false-positive referrals place unnecessary demands upon an already overstretched resource and contribute to the long waiting times between GP referral and outpatient department (OPD) appointments. The false referrals also incur considerable financial costs, both for the NHS itself and to the patient (travel, lost time at work). In addition, there may be psychological costs, with unnecessary anxiety in the referred patient, who is informed that they may have glaucoma and...
How did it fit with later policy?

- DoH Eye Services group initial report 2003
  - Community optometrists encouraged to conform to College guidelines for referral
  - HES to consider use optometrists to assist in glaucoma care services within HES
  - Community refinement of optometric referrals utilising optometrists wSI or OMPs

- NICE Guidelines 2009
  - Consider GAT for Referral refinement
Post NICE Guidelines

• AOP advise referral for IOP over 21 mmHg
• Large increase referrals nationally
• Delays in patient assessment in secondary care
• Future of GRRS locally?
• Joint College Guidance
  – from RCOphth and COptom
The effectiveness of schemes that refine referrals between primary and secondary care—the UK experience with glaucoma referrals: the Health Innovation & Education Cluster (HIEC) Glaucoma Pathways Project

## Results

- Overall FVDR was significantly higher for non-OSI than for OSI partic Manchester suggesting better concordance with secondary care.

### First-visit discharge rate by period

<table>
<thead>
<tr>
<th>Site</th>
<th>Pre NICE</th>
<th>Post NICE</th>
<th>Post JCG</th>
<th>Current practice</th>
<th>All periods</th>
</tr>
</thead>
<tbody>
<tr>
<td>Nottingham (non-OSI)</td>
<td>19.5</td>
<td>32.8</td>
<td>25.3</td>
<td>53.7</td>
<td>33.5</td>
</tr>
<tr>
<td>Huntingdon (non-OSI)</td>
<td>33.3</td>
<td>37.6</td>
<td>42.1</td>
<td>38.3</td>
<td>38.0</td>
</tr>
<tr>
<td><strong>Mean non-OSI</strong></td>
<td><strong>29.2</strong></td>
<td><strong>35.0</strong></td>
<td><strong>34.7</strong></td>
<td><strong>43.9</strong></td>
<td><strong>36.1</strong></td>
</tr>
<tr>
<td>Manchester (OSI)</td>
<td>4.9</td>
<td>6.5</td>
<td>16.9</td>
<td>3.0</td>
<td>8.9</td>
</tr>
<tr>
<td>Gloucestershire (OSI)</td>
<td>8.7</td>
<td>20.3</td>
<td>12.5</td>
<td>25.9</td>
<td>18.6</td>
</tr>
<tr>
<td><strong>Mean OSI</strong></td>
<td><strong>6.3</strong></td>
<td><strong>15.2</strong></td>
<td><strong>15.0</strong></td>
<td><strong>17.2</strong></td>
<td><strong>14.1</strong></td>
</tr>
<tr>
<td><strong>Mean overall</strong></td>
<td><strong>21.9</strong></td>
<td><strong>27.8</strong></td>
<td><strong>27.6</strong></td>
<td><strong>35.4</strong></td>
<td><strong>28.6</strong></td>
</tr>
</tbody>
</table>
False Negatives?

• Study to assess this ongoing
• Enhanced scheme evaluation project
  – Steering Group of 16
• Auspices of College of Optometrists
Aims: To identify % those ≥65 yrs that might be referred by community optometrists as OHT suspects in relation to AOP v joint Colleges guidance

Results: 85 of 1643 people (5.2%) tested with normal VA/VF had a GAT IOP >21mmHg in either or both eyes. Without CCT data, all 85 would be referred under the AOP algorithm, whereas 31 (1.9%) would be referred under the joint College algorithm. If CCT is used to influence referral, 13 (0.8%) people would be referred under the joint College algorithm.

Conclusion: If community optometrists use GAT and CCT, and follow the joint College guidelines for referral, referrals of OHT suspects to secondary care could be reduced to a fifth of those under the original AOP guidance.
Updated Scheme for GRRS locally

• Worked with CCGs to review scheme and update
• include pachymetry
• Electronic referral (Webstar)
Patient presents for GOS or private sight test

**Entry level optom without any accreditation**
- IOP>21mmHg
  - With or without glaucoma related optic nerve head or visual field abnormalities
  OR
- IOP<21mmHg
  - With glaucoma related abnormal fields/optic nerve head/other

**Goldmann tonometry accredited optom**
- As per Entry level optom without any accreditation
- Refer to GRR optom if confirmation of IOP
  - IOP >21 with Goldmann
  - Normal optic nerve head
  - Normal visual fields
  - IOP<21 with Goldmann
  - Abnormal optic nerve head/visual fields

**Manchester Glaucoma Referral Refinement optom**
- See following for referral criteria

**Hospital Eye Service**
### Manchester Glaucoma Referral Refinement Optom

#### Referral criteria

**Single criteria**

- IOP $>30\text{mmHg}$ confirmed at a second visit. If IOP $>35\text{mmHg}$ then no confirmatory measurement is necessary.

- Unequivocal pathological cupping at the optic nerve head. Abnormal neuroretinal rim configuration. Large cup, taking into account the overall size of the disc. Notched neuroretinal rim. The existence of a disc haemorrhage merits closer inspection for early nerve fibre loss. A $>0.2$ asymmetry of cup to disc ratio.

- Visual field loss consistent with a diagnosis of glaucoma, confirmed at a second visit. If explained by other disc or retinal pathology to be referred as such and not through scheme.

**Combined criteria**

- IOP, age and CCT criteria as per NICE treatment algorithm**

- IOP $>21\text{mmHg}$ plus an optic disc appearance suspicious of glaucoma or optic disc asymmetry.

- Abnormal optic disc and corresponding visual field defect (IOP not raised) (no need for confirmatory measures).

**Additional criteria**

- Optic disc change over time e.g. increase in cup size, change in the rim appearance, or the occurrence of a new haemorrhage.

- Anterior segment signs of secondary glaucoma (eg pseudoexfoliation) with IOPs $>21\text{mmHg}$ on two occasions.

- Suspected narrow-angle glaucoma (symptoms of sub-acute attacks or occludable angle and IOP $>21\text{mmHg}$).

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<table>
<thead>
<tr>
<th>CCT (micrometres)</th>
<th><strong>590</strong></th>
<th>555–590</th>
<th>&lt;555</th>
<th>Any</th>
</tr>
</thead>
<tbody>
<tr>
<td>IOP (mmHg)</td>
<td>&gt;21-25</td>
<td>&gt;25-29</td>
<td>&gt;25-29</td>
<td>&gt;21-25</td>
</tr>
<tr>
<td>Referral</td>
<td>No</td>
<td>No</td>
<td>No</td>
<td>Refer if &lt;60</td>
</tr>
</tbody>
</table>

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**Notes:**

- **:**
- **:**

New Training and Accreditation

• Lecture programme
• Mini-placement
  – OLGA optometrist (as necessary 2-4 sessions)
• Written assessment (MCQ)
• OSCE
  – GAT, ant segment/VH, CCT, disc assessment, VF
• College certificate accreditation equivalent
New glaucoma training programmes

• Glaucoma curriculum development group
  – Defined aims, learning outcomes, indicative content, and teaching, learning and assessment strategies

• Certificate Level
  – To prepare optometrists to participate in formal ‘referral refinement’ and OHT/ suspect COAG monitoring schemes.

• Higher Certificate Level
  – To prepare optometrists to participate in community or hospital-based schemes involving the diagnosis of OHT and preliminary diagnosis of COAG.

• Advanced Level/Diploma
  – To prepare optometrists to participate in community or hospital-based schemes for the management of patients with COAG. Optometrists working at this level should additionally possess all of the competencies required at Certificate and Higher Certificate Level.
Glaucoma Training Evening

Welcome and introduction
Glaucoma: Classification and epidemiology (RH)
Anterior segment examination and differential diagnosis (AFS)
Pachymetry (JRM)
Visual Fields (DBH)
Tonometry (RH)
Optic nerve head (AFS)
Clinical guidelines and monitoring for change (CHF)
My Perspective

• GRRS was the beginning as you will hear…..
• Team developed Cecilia, Amanda, Jo, Jane, Leon, Eleni…
• Multidisciplinary working is a great success
• Important to build a team with additive skills and foster team spirit
• Clinical governance structure in place
• Professional development of team
• Learn change management!
• Creates confidence in patient care
A Closing Parable

In a perfect NHS world
The chefs are French, the lovers are Italian, the mechanics are Swiss, Ophthalmologists take account of the rapidly changing healthcare system and everything is organised by the British

In a real NHS world
The chefs are British, the lovers are Swiss, the mechanics are French, Ophthalmologists remain as ever and the whole thing is organised by the Italians

Alan Jones