OCT and Screening

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Background

M1 Definitions and Prediction

- ISMO study
- John Olsen

Aston University
Birmingham

NHS
HEART of ENGLAND
NHS Foundation Trust

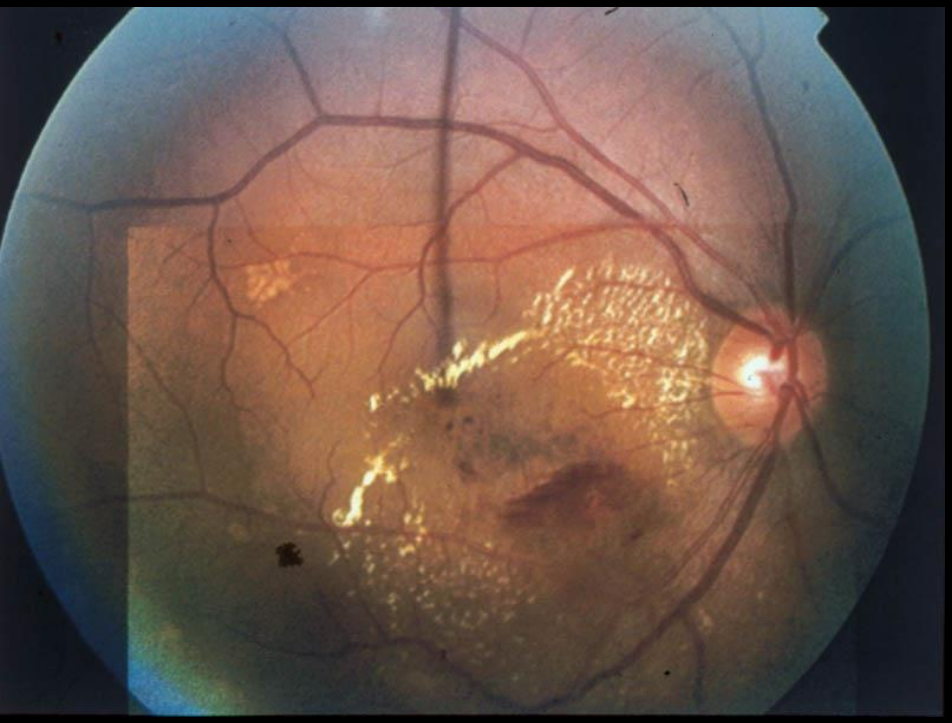
UK National Grading system

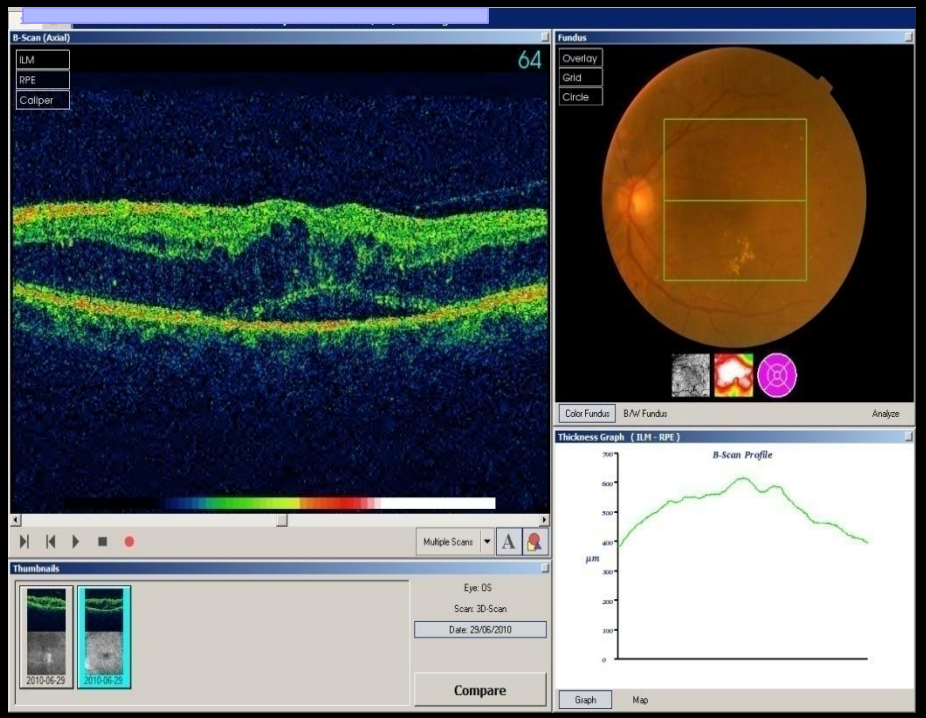
Maculopathy (M)

level	*description*	*action*
• **MO**	no maculopathy	annual rescreen
• **M1**	circinate < 2DD exudate ≤ 1DD HMA ≤ 1 DD + best VA < 6/9 if no stereo CSMO if stereo	REFER HES

Maculopathy Definitions

Macula oedema
2 D image to 3 D phenomenom



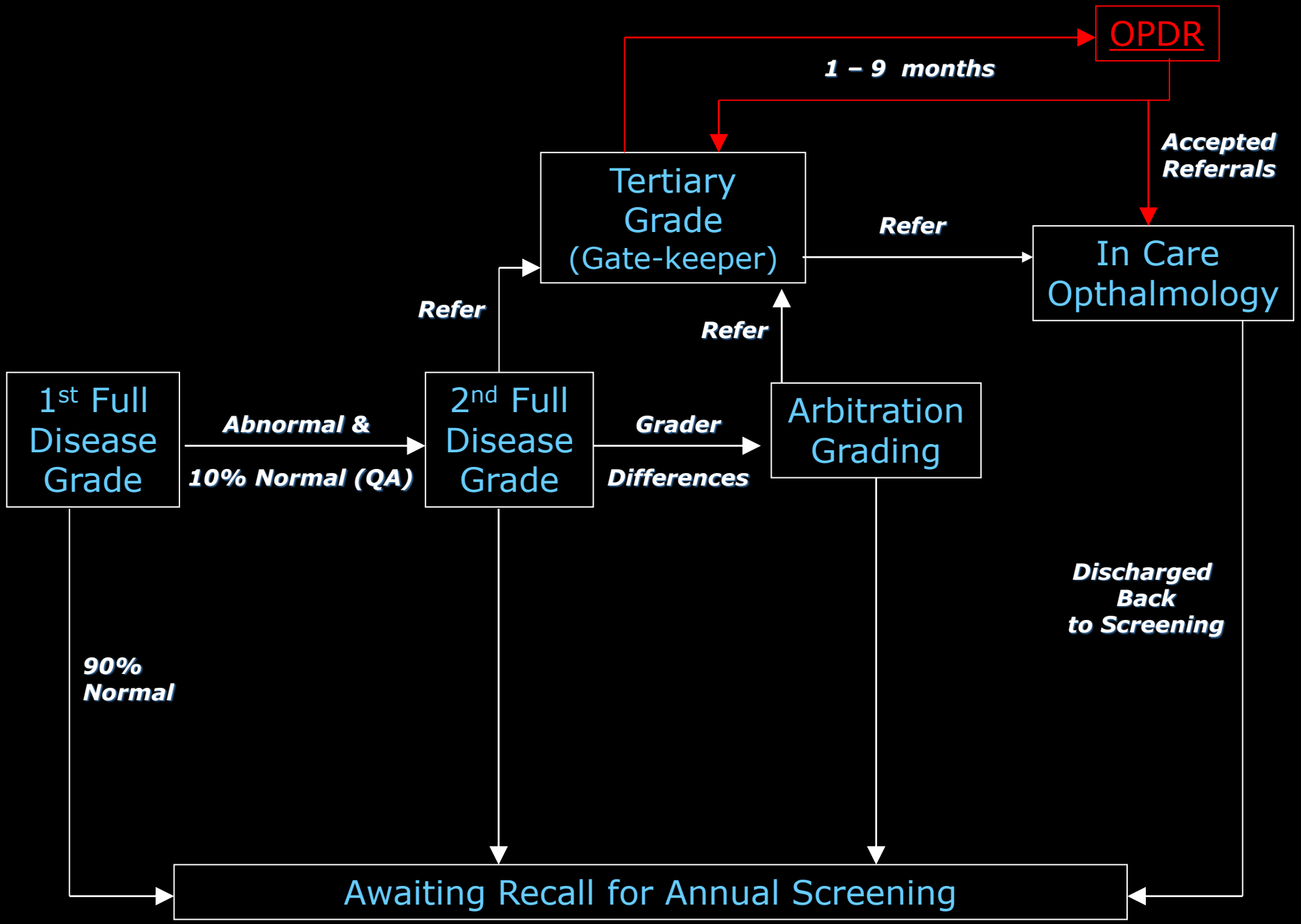


OCT & DR – The Facts

- Surveillance with photography alone
- M1 definitions - Predicts Macula Oedema
- OCT machines – types time v spectral
- OCT cost price – reducing
- Site of Surveillance – purchase or steal !
- Cost of an OCT surveillance clinic visit
- True versus unseen pathology
- Cost Effective ?

DR Screening - M1

	BIRMINGHAM	ENGLAND
Annual Screens	82,275	1,800,000
M1	7045	106,020
Macula Oedema (estimated 2%)	1650	36,000


OPDR
1 – 9 months
Accepted Referrals
Tertiary Grade (Gate-keeper)
Refer
In Care Opthalmology
Refer
Refer
1st Full Disease Grade
Abnormal &
10% Normal (QA)
2nd Full Disease Grade
Grader
Differences
Arbitration Grading
Discharged Back to Screening
90% Normal
Awaiting Recall for Annual Screening

Outcome of 455 patients- 4 years

297 definite M1, 113 ? Exudate, 12 MA/VA, 33 Lones

- **280** were put back to **Annual Recall (62%)**
- **141** were referred to the **Diabetic Eye Clinic (31%)**
- **1** patient remains in **Surveillance Clinic (<1%)**
- **33** patients **DNA/RIP/OOA (33%)**

(Average 2 visits per patient & 68% didn't need HES)

Instruments Being Compared

Time Domain OCT (Stratus OCT)

Axial resolution: 8 – 10 µm

A-scan speed: 400 A-scans/sec

Scan protocol: 6 x 512 A-scans

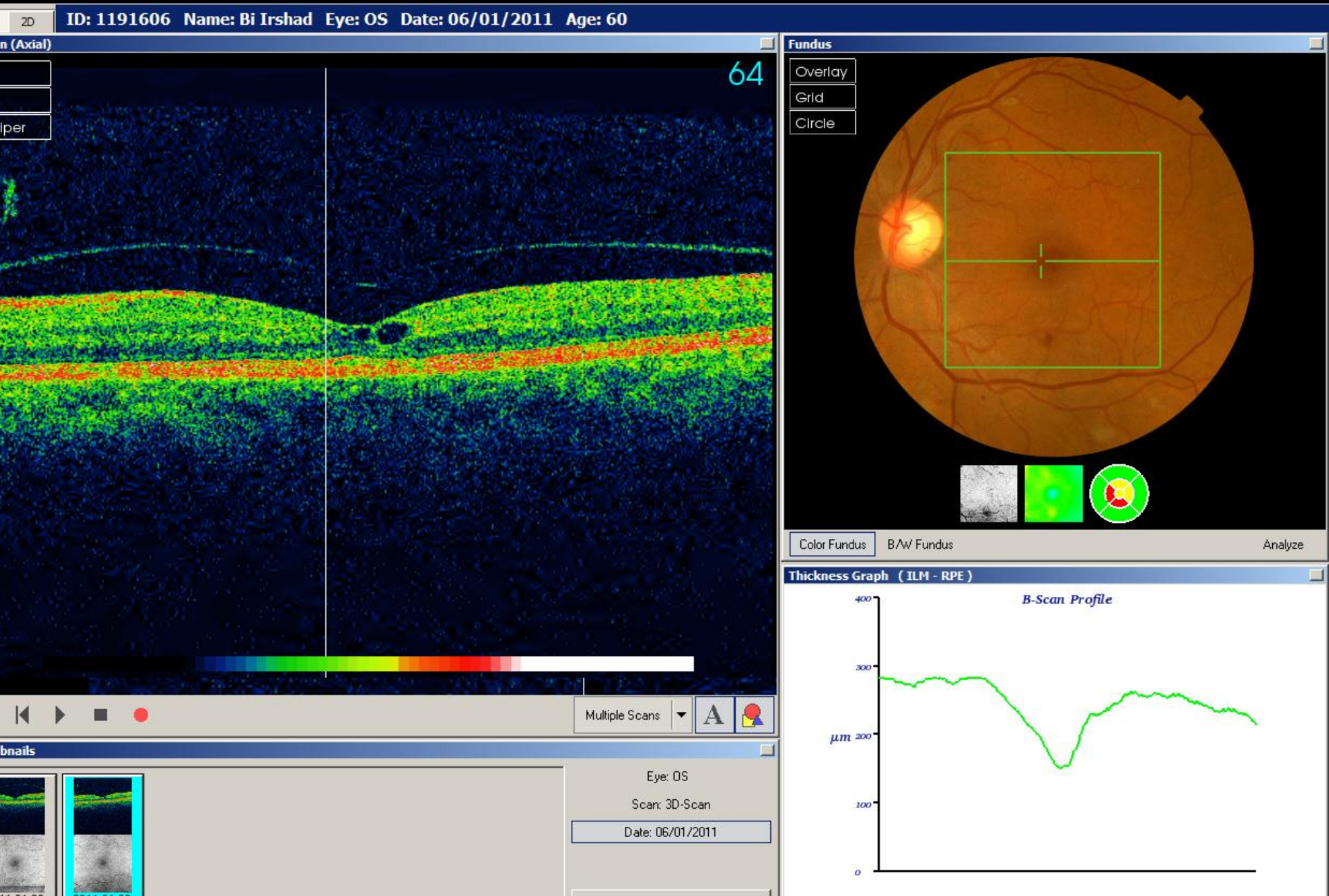
Fourier Domain OCT (3D-OCT)

Axial resolution: 6 µm

A-scan speed: 18,000 A-scans/sec

Scan protocol: 128 x 512 A-scans

Foveal Cysts



Summary - All M0 & M1 patients

M0	374 patients 10 (3.4%) thickening on OCT
M1 due haem/MA & VA ≤ 6/12	80 patients 11 (14%)thickening on OCT
M1 due to exudate within 1DD or circinate within macular	155 patients 45 (29%)thickening on OCT Exudate pattern didn't predict
Total M1	235 patients 56 (24%) thickening on OCT

76% monitored in OPDR clinic

ISMO STUDY

Improving the cost-effectiveness of photographic screening for diabetic macular oedema: a prospective, multi-centre, UK study

Gordon Prescott,1 Peter Sharp,2 Keith Goatman,2 Graham Scotland,1 Alan Fleming,
Sam Philip,3 Roger Staff,4 Cynthia Santiago,5 Shyamanga Borooah,6
Deborah Broadbent,7,8 Victor Chong,9 Paul Dodson,10 Simon Harding,7,8
Graham Leese,11 Roly Megaw,6 Caroline Styles,12 Ken Swa,13 Helen Wharton,14
John Olson15

- BJO Online First, published on March 28, 2014 as 10.1136/bjophthalmol-2013-304338
- Downloaded from bjo.bmj.com on April 7, 2014 - Published by group.bmj.com

ISMO Methods

- 7 UK centres n= 3540, 370 excluded
- Macula view & OCT, Manual & Automated
- Central & any 5 inner EDTRS areas > 250μ
- Of 3170 243 (7%) had Macula Oedema
- Macula Oedema +
- Exudates in 1DD 14 %
- Blot Haem in 1DD 12 %
- MA's alone in 1DD 3.2 %
- Exudates 1-2 DD no further cases

DR Screening - M1

Table 1 Referral criteria for manual grading strategies

Criteria for referral to ophthalmology	Micro-aneurysm/dot haem within 1 DD	Blot haem. within 1 DD	Exudate within 1 DD	Exudate within 1–2 DD (if not in 1 DD)
England	Only if logMAR VA 0.3 or worse	Only if logMAR VA 0.3 or worse	Yes	Yes
Scotland	No	Yes	Yes	No
Hybrid	Only if logMAR VA 0.3 or worse	Yes	Yes	No

DD, disc diameter; haem, haemorrhage/s.

Detection of Macula Oedema M1 prediction versus OCT

	Sensitivity (%)	Specificity (%)
ENGLAND	73	67
SCOTLAND	60	79
HYBRID	73	71
AUTOMATED	76	74

Costings Used

- Photographic screen £ 47
- Add OCT + £ 32
- Initial referral £ 143
- Treatment £ 160
- Ongoing per visit £ 117

- Automated grading – no capital cost
- Cost SVI and QUALY threshold

COST EFFECTIVE ?

- Addition of OCT had cost benefit and savings up to a cost of + £58 for an OCT without reducing health benefits
- Photography + OCT is cost effective
- Automation costings did **not** include cost of software deployment etc

Conclusions

OCT borderline criteria are defined as:

- The presence of intraretinal cystoid spaces, or subretinal fluid, without any change in the ILM contour, and foveal central subfield ≤ 300 µm in the central 1 mm macular subfield
- with VA of 6/9 or better
- *without a large area of leakage of greater than 1 disc area the edge of which is within 1 disc diameter of the central fovea*

Peter Scanlon personal communication

Outcomes – Gloucester OCT surveillance clinic

OPDR	426	59%
HES	146	20%
A/Screen	122	17%
Rebooked	21	3%
DECEASED	9	1%
TOTAL	724	

Peter Scanlon personal communication

Summary - OCT

- Revolution – diagnostic and monitoring of retinal layers
- Used in clinics and Surveillance streamline referrals to HES
- Logical and good news for patients to guide appropriate referrals and care
- ISMO study – cost effective

  suggested revisit M1 definitions

If you have been listening

Thank you for your attention