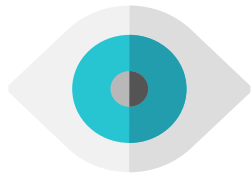


Three Nations Screening Delivery - Unique Approach, Same Goal

 **Belfast Health and
Social Care Trust**
caring supporting improving together




University Hospitals Sussex
NHS Foundation Trust


Tayside

Who We Are

- ☐ *Jane Starr – Grading Manager, West Sussex DESP*
- ☐ *Michael Foster – Lead Optometrist,
Northern Ireland DESP*
- ☐ *Andrew Gray – Senior Retinal Screener,
NHS Tayside DESP*



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General Comparison

England (West Sussex DESP)	Scotland (NHS Tayside)	Northern Ireland
36,000 patients	28,000 patients	118,000 patients
OptoMize	OptoMize	OptoMize
National Screening Council	National Services Division	National Screening Council
Some Programmes use Optoms (not ours)	Some Boards have Optom agreements	Mixed: Optoms used
Static screening	Mobile and static	Mobile and static
OCT not funded as part of programme	OCT included	OCT not funded as part of the programme
Some extended hours: 8am-6pm, Saturdays Sundays, Bank Holidays	Some extended hours: Until 8pm, Saturdays	Saturdays, Sundays, late nights
Feature based grading: R1, R2, R3a, R3s, M0, M1, U	Feature based grading: R1, R2, R3, R4, R4i, R6, M0, M1, M2	Feature based grading: R1, R2, R3a, R3s, M0, M1, U

General Comparison

England (West Sussex DESP)	Scotland (NHS Tayside)	Northern Ireland
12 month screening interval	24 month screening interval	24 or 12 month screening interval (low risk 24 months introduced from April 2023)
Dilate every patient	No dilation – only if needed	Dilate 50 years+ (<50 dilation with exceptional requirements)
2 images taken: 1 x macular 1 x nasal + anterior/extra	1 image taken: 1 x macular + anterior/extra	2 images taken: 1 x macular 1 x nasal + anterior/extra
VA always measured	VA always measured	VA only measured in Optoz/OCT clinics. SLB do not always measure.

Measuring VA

0.4 D S R K N

0.3 C K Z O H

0.2 O N R K D

0.1 K Z V D C

0.0 V S H Z O

West Sussex DESP - Jane Starr



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Measuring VA

Indicator of M1 – any microaneurysm or haemorrhage within 1DD of the centre of the fovea and only if associated with a best VA of $< 6/12$ (if no stereo).

Identify any unexplained drop in vision which needs investigation.



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M1 DS Referrals

01/01/22 - 31/12/22

Newly identified M1	351
Due to best VA \leq 6/12	25
=	7.12%



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DS Analysis

Referred to HES – DMO - injections	1
Referred to HES, Discharged back with no treatment	2
Stable on DS rescreen, stayed in DS	13
Resolved on rescreen	1
Referred to HES for R3aM1 – no specific treatment for DMO	5
Yet to be reviewed in DS	1
Offered HES appointment - DNA	1
Passed away	1

Measuring VA



0.28%

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Dilation within DESP



Northern Ireland DESP – Michael Foster

England

- Dilate every DESP patient (exceptions made when dilation not considered essential or safe)

Scotland

- No dilation** (Retinal imaging is almost exclusively non mydriatic. Certain clinical exception apply)

Northern Ireland

- Dilate 50 years and over (additional mydriasis under 50 years upon exception)



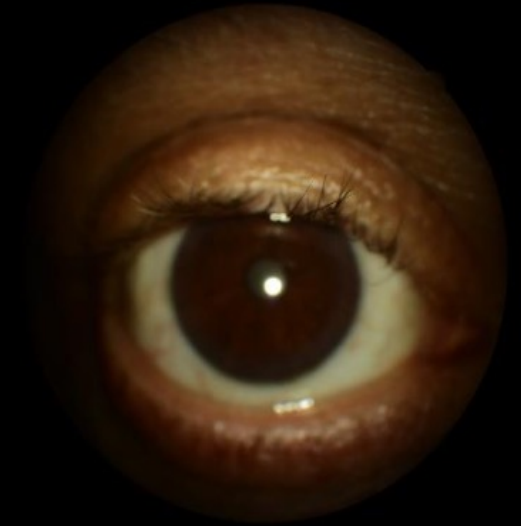
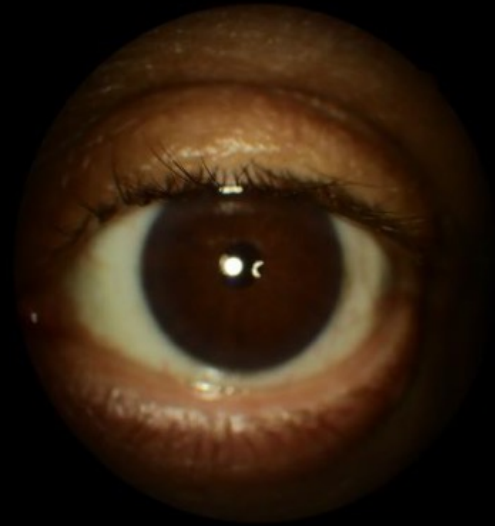
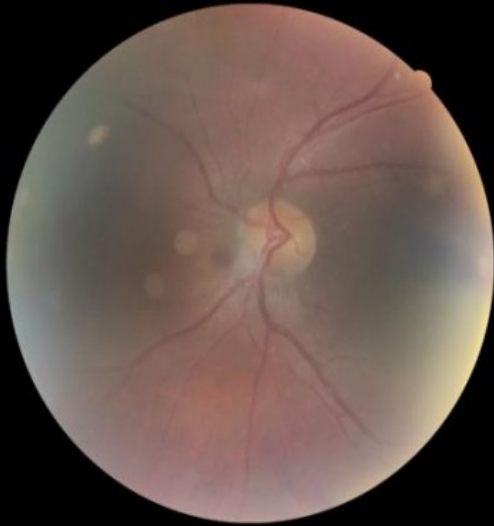
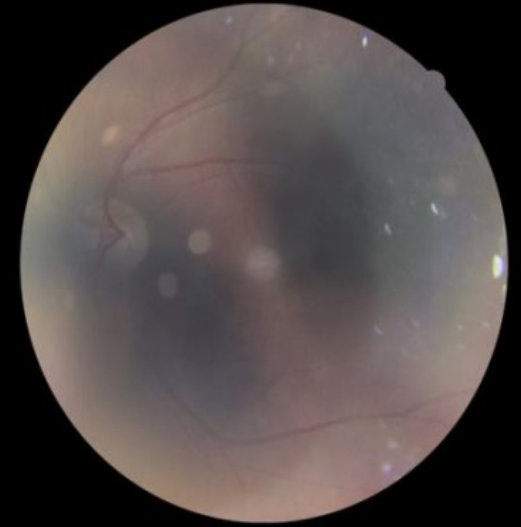
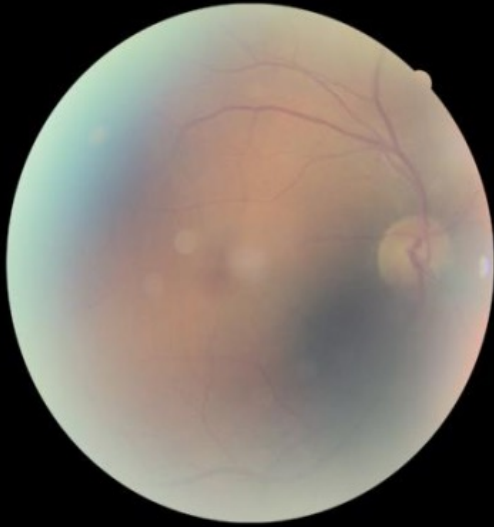
Advantages of dilation:

- Larger pupils allow more light to illuminate the retina.
- Enhanced detail of retinal vasculature and optic nerve.
- Easier to access peripheral view for non-standard images.
- May overcome media pathology that would otherwise lead to Inadequate images.
- Faster successive image capture (not limited by pupil recovery).
- Less time posturing for patients.
- Less need for adjusting flash / small pupil camera facilities / jig-saw image capture.
- Essential to facilitate Optometry Led 3D Slit Lamp Clinic.

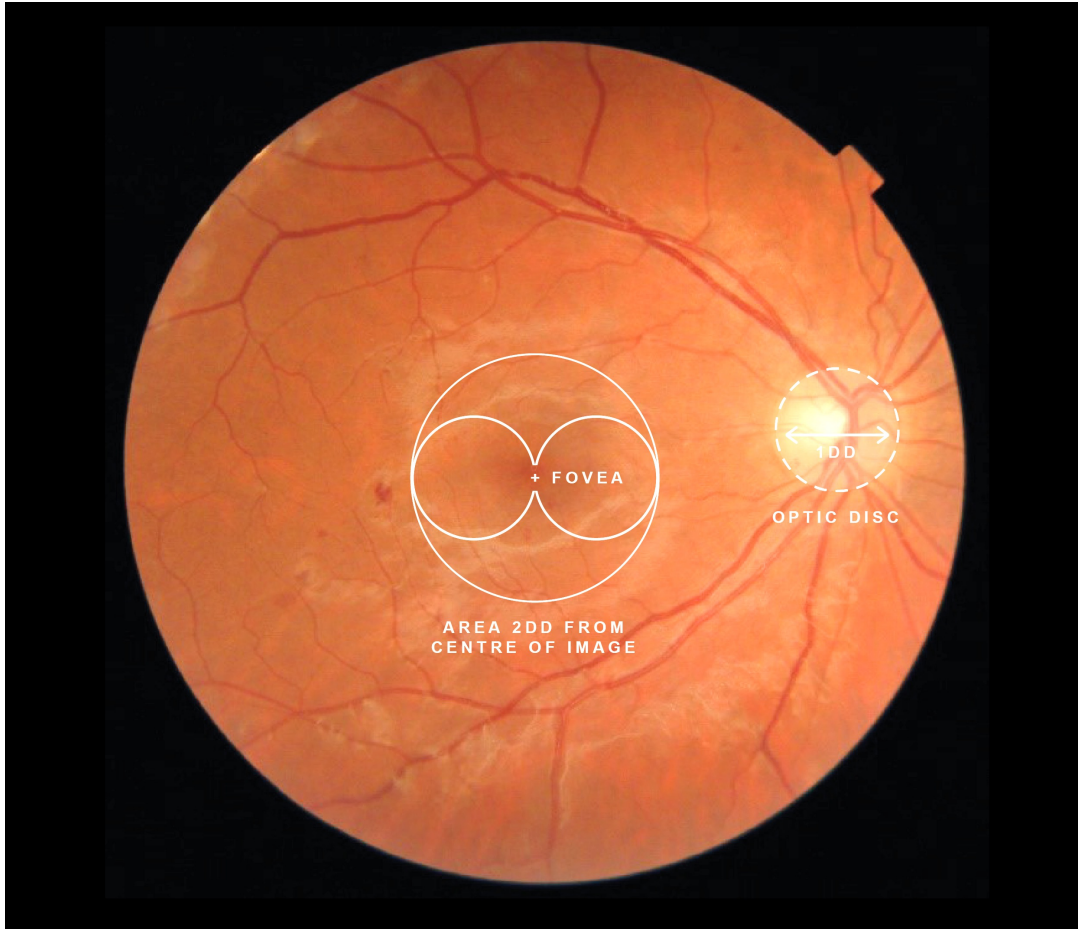


Disadvantages of dilation:

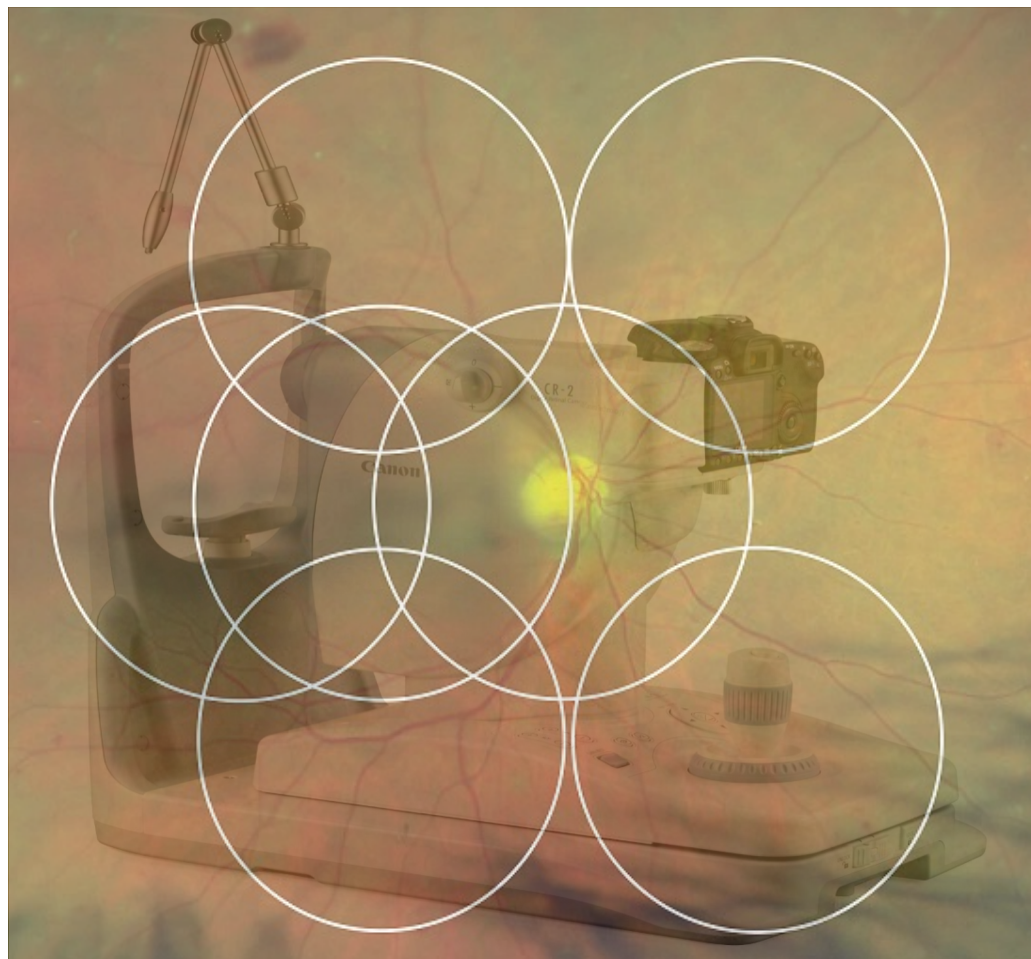
- Additional wait time for dilation process.
- Uncomfortable drops and fear of instillation.
- Driving, social and occupational restrictions / dependency on others.
- Risk of allergy (topical/systemic) and Angle Closure Glaucoma.
- Discouraged in pregnancy.
- Glare, distortion and blurred vision for several hours.
- Robust staff governance and therapeutics compliance.
- May reduce patient engagement with DESP.



Definition of adequate images quality



- ❑ A combined assessment of field position and image quality for each eye, sufficient for an adequate grade allocation.
- ❑ Enough clarity for a reliable and consistent grade application by all qualified staff.
- ❑ Macular Image: the centre of the fovea is $>2DD$ from edge of image and 3rd generation vessels visible within the macula.
- ❑ Disc Image: the complete optic disc is $>2DD$ from the edge of image and the fine vessels are visible on the surface of the disc.



Diabetic Eye Screening



Advice about receiving eye drops

To obtain good photographs of the back of your eyes, we may need to use eye drops to enlarge your pupils. If you have any concerns about this, please speak to a doctor or nurse caring for you.

These eye drops may blur your vision and can make you sensitive to bright light for approximately two to four hours. You may also experience a temporary stinging sensation in your eyes and a dry mouth. You should not drive or operate heavy machinery until your sight returns to normal and your eyes are comfortable. You may find it helpful to wear sunglasses.

Very rarely, the drops can cause a sudden, dramatic rise in pressure within your eyes. This only happens in people who are already at risk of developing this problem at some point in their lives. However, if it happens you will require immediate treatment in an eye unit. The symptoms of an acute pressure rise include:

- pain or severe discomfort in or around your eye
- redness in the white of your eye

- worsening or persistent blurred vision a few hours after being screened, sometimes with rainbow halos around lights
- nausea or vomiting.

If you experience any of these symptoms after screening, you should be seen immediately by your GP or optometrist or go to an Emergency Department near you.

If you experience any other symptoms you are concerned about, please contact your GP. The eye drops you will be given contain tropicamide 1%. Information on other possible side effects is available in the manufacturer's leaflet – please ask our staff if you would like a copy.

Please speak to a doctor or nurse caring for you if you have any further questions.



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02/16

Driving and Mydriasis

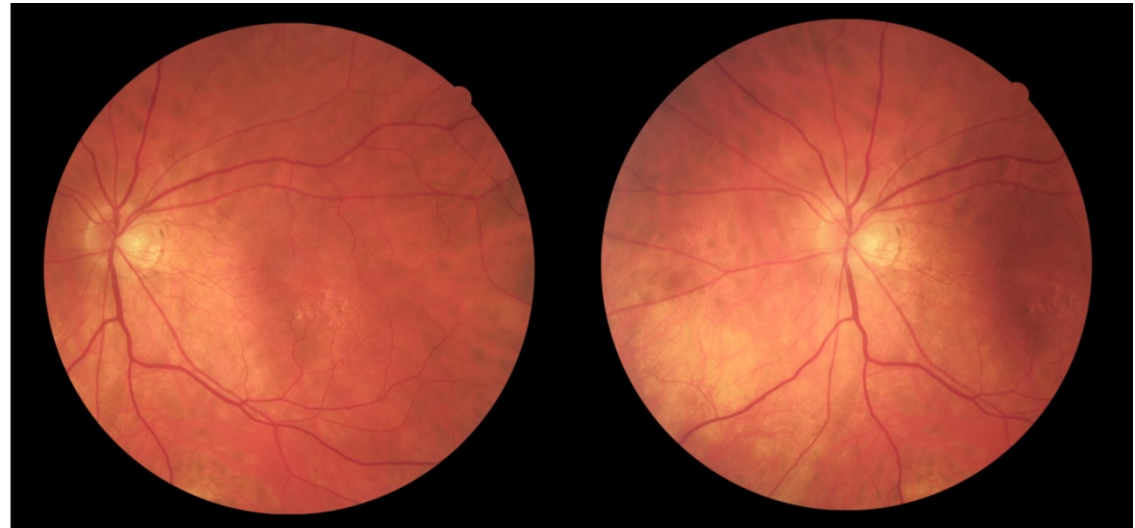
- Each invitation and appointment should always include advice in writing not to drive after mydriasis.
- Best practice is to offer driving patients who require dilation another appointment.
- Alternative options exist; collecting car later, waiting until vision has fully recovered, being able to comfortably read the DVLA required number plate standard.
- If an individual is not prepared to consider and affirm these alternatives, it would be considered unsafe to continue with drop administration and the person should be offered another appointment.
- Legal position: Tropicamide may affect eyesight, reducing it below the legal limit for driving and impair ability. SOP guidance should be documented on records.
- A person with diabetes cannot be prevented from driving and the screener can only strongly advise that they do not drive for the stated time.



Single Field Imaging vs. Two Field Imaging



vs.

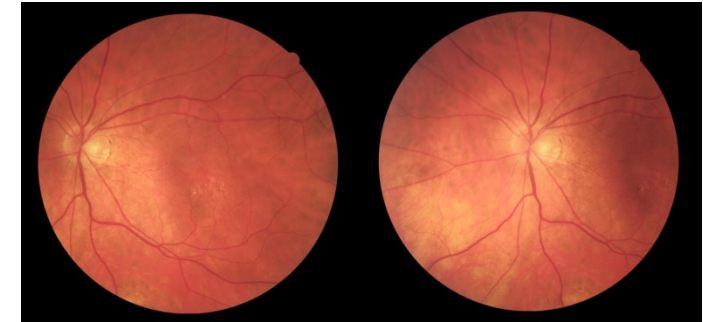


NHS Tayside DESP—
Andrew Gray

Single field vs. two field imaging

England & Northern Ireland DESPs

- ❑ Two 45° fields, one macular and one disc centred as standard.
- ❑ Dilation undertaken as a matter of course.
- ❑ Additional images where necessary i.e. pathologies cut off by edge of image, working around cataracts, jigsawing etc.



Scottish DESPs

- ❑ A single macular centred 45° image per eye as standard.
- ❑ Dilation only occurs if initial images insufficient.
- ❑ Additional images where necessary.



Why Scotland uses the single field approach

Table 4 Sensitivity and specificity of the detection of any retinopathy with different photograph strategies (only gradable photographs included). No statistically significant difference between photography strategies

	Undilated single field (n = 585)	Dilated single field (n = 750)	Dilated multiple field (n = 752)
Detection of any retinopathy			
Sensitivity (95% CI)	83% (78–88%)	86% (82–90%)	90% (86–93%)
Specificity (95% CI)	91% (88–94%)	91% (89–94%)	90% (88–93%)
Positive predictive value (95% CI)	85% (80–90%)	87% (83–91%)	86% (82–90%)
Negative predictive value (95% CI)	90% (87–93%)	91% (88–94%)	93% (91–95%)
Detection of referable retinopathy			
Sensitivity (95% CI)	77% (71–84%)	81% (76–87%)	83% (78–88%)
Specificity (95% CI)	95% (93–97%)	92% (90–94%)	93% (91–96%)
Positive predictive value (95% CI)	85% (79–91%)	79% (73–85%)	82% (77–87%)
Negative predictive value (95% CI)	92% (89–95%)	93% (91–95%)	94% (92–96%)

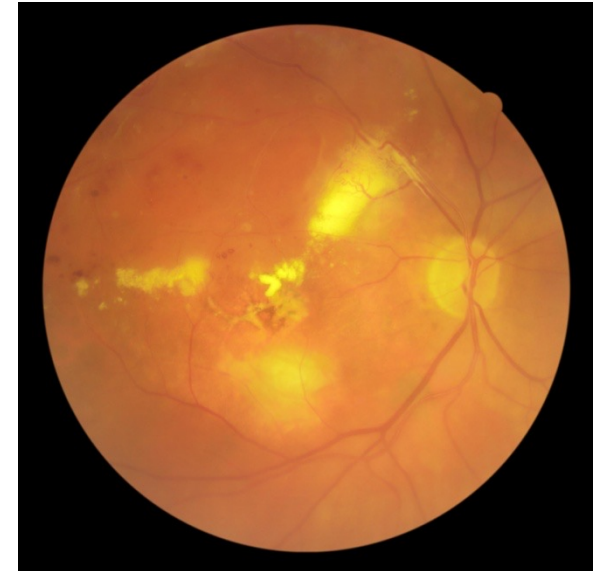
*

P < 0.001

*Murgatroyd et al, “Effect of mydriasis and different field strategies on digital image screening of diabetic eye disease”, British Journal of Ophthalmology 2004, pg 923

Advantages to single field imaging

- Average time taken to screen patients will be reduced.
- Reduced need for dilation.
- More comfortable for patients.
- Grading workload per patient reduced.
- Data storage requirements / cost reduced.
- Works better for automated grading.



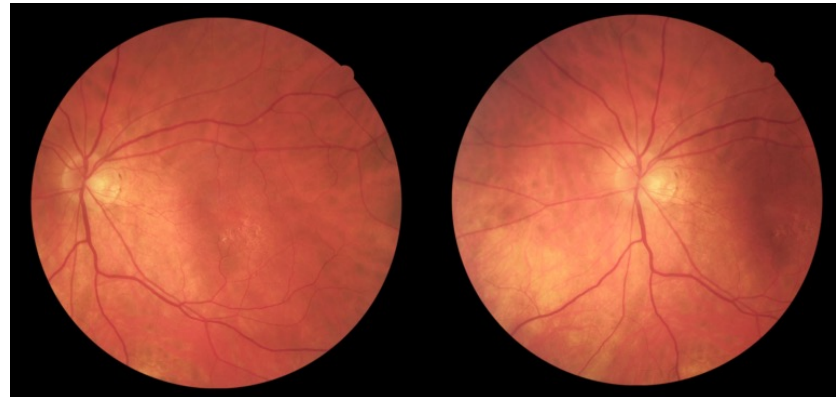
Two field approach

- ❑ This is the standard still used in the rest of the UK and Ireland. Several studies support the use of mydriasis and two fields as the superior way of detecting referable retinopathy.
- ❑ One such study by Scanlon et al.*, found that specificity using a two field strategy was 10% improved.
- ❑ Incorporates a larger view of the retina and therefore will potentially find more retinopathy than using one field alone.
- ❑ Usually paired with mydriasis, therefore reducing possibility of technical failure.

*Scanlon et al, *“The effectiveness of screening for diabetic retinopathy by digital imaging photography and technician ophthalmoscopy”* Diabetic Medicine 2003, pg

Summary

- ❑ Single field imaging can allow for a more streamlined and less resource intensive screening process, without a significant trade off in sensitivity and specificity.
- ❑ However, while that trade off is *statistically* insignificant, it nevertheless still refers to a small number of real patients who may have referable retinopathy within that second field. Several studies favour the continuation of the two fields on this basis.



Conclusion

- ❑ Although our approaches to retinal screening can differ in key areas, we are all committed to the same goal of delivering the highest standard of care for patients.
- ❑ Identifying the strengths in our different approaches and sharing them with other nations' screening programmes can allow us to learn from each other and improve our respective services.
- ❑ We hope that we have been able to open discussion and collaboration across the eye screening community, and perhaps integrate elements of each approach into each of our screening programmes in the future.

