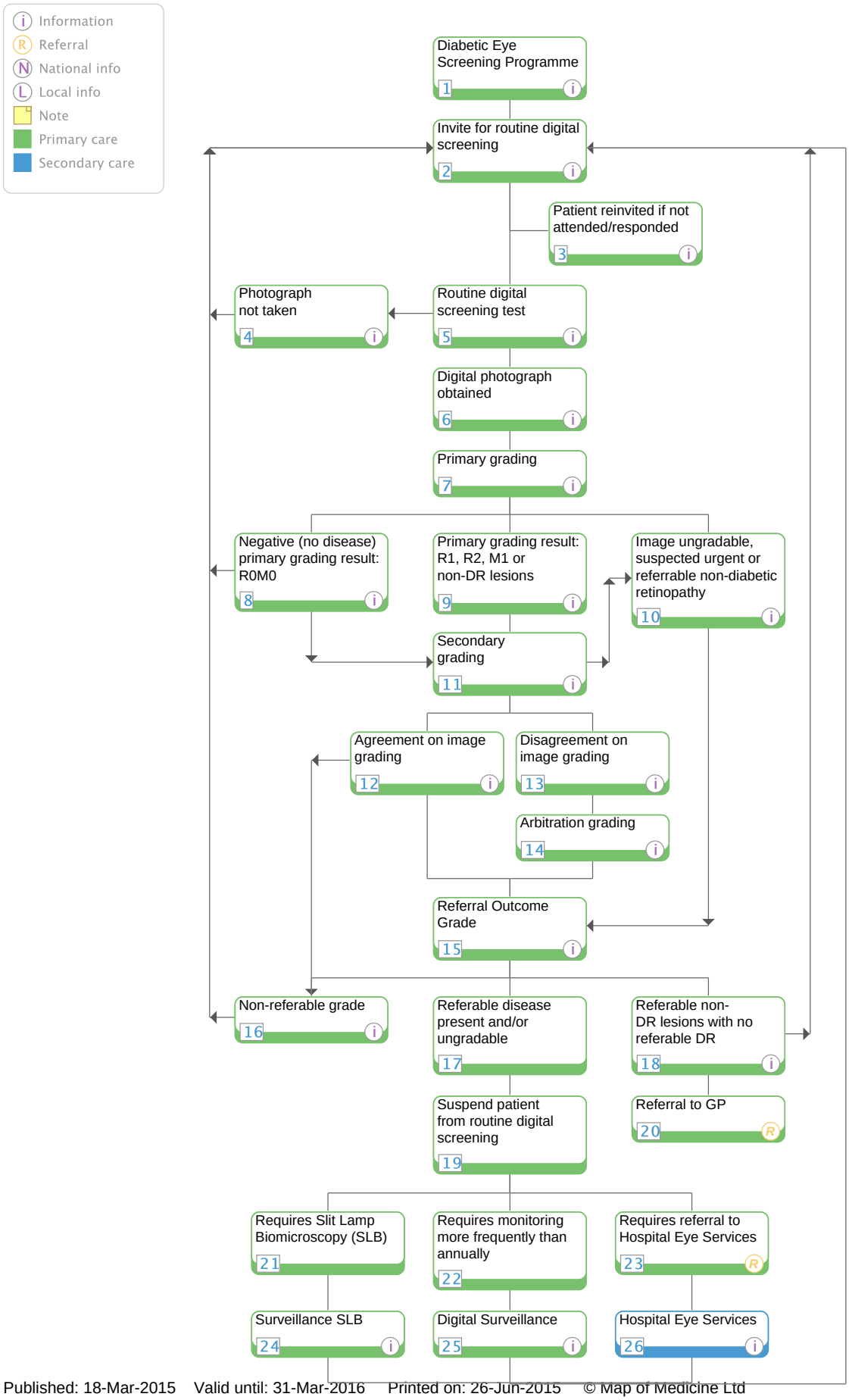
Diabetic eye screening (DES)



Published: 18-Mar-2015 Valid until: 31-Mar-2016 Printed on: 26-Jun-2015 © Map of Medicine Ltd

This care map was published by England. A printed version of this document is not controlled so may not be up-to-date with the latest clinical information.

Diabetic eye screening (DES)

1 Diabetic Eye Screening Programme

Quick info:

Patients aged 12 and over who have a diagnosis of Diabetes Mellitus should be referred to the NHS Diabetic Eye Screening Programme (NDESP) for diabetic retinopathy screening. NDESP will consider all these patients eligible except in cases where there is No Perception of Light (NPL) in both eyes. Exclusions based on Patient Opt-Out or Medically Unfit determinations can be made; however these patients should still be referred to NDESP and will be excluded within the programme's central call/recall system.

Local Diabetic Eye Screening Programmes hold collated lists of people with diabetes who are registered with GP Practices in their area. Lists include:

- demographics, including contact information
- consent status for additional data transfer
- eligibility for screening in opinion of GP.

2 Invite for routine digital screening

Quick info:

Patients are invited to Routine Digital Screening on an annual basis. Invitations may be for a fixed appointment time, or as an invitation for the patient to phone in and schedule an appointment at their convenience.

3 Patient reinvited if not attended/responded

Quick info:

Patients who do not attend or respond to their screening invitation are reinvited. Local protocol will determine how many additional invitations are sent to the patient before their GP is notified of their non-attendance; patients will then be recalled on the next annual screening due date.

4 Photograph not taken

Quick info:

Situations where a patient attends routine digital screening appointment but no photograph can be taken include:

- equipment failure (e.g. digital camera)
- patient leaves clinic prior to photography
- evacuation of clinic required.

Note this does not apply to situations where the patient is unable to be photographed due to a medical condition.

Patients are reinvited to routine digital screening appointment via the same process as previous invitation.

5 Routine digital screening test

Quick info:

After arrival at the eye clinic and confirmation of demographic details with the clinic clerk, consent is taken and the following observations will usually be recorded:

- brief eye history
- visual acuities (mandatory).

Prior to consultation and examination, pupils of both eyes will typically be dilated using mydriatic eye drops.

The screener or screener/grader then performs the screening test by taking two digital images of the retina in each eye.

Published: 18-Mar-2015 Valid until: 31-Mar-2016 Printed on: 26-Jun-2015 © Map of Medicine Ltd

This care map was published by England. A printed version of this document is not controlled so may not be up-to-date with the latest clinical information.

6 Digital photograph obtained

Quick info:

Two images of each eye are taken and retained for grading purposes. Digital images obtained may be up to gradable standard (adequate), in which case standard grading of the digital images will proceed. In cases where the digital images are not up to gradable standard (inadequate), the images will be sent to the Referral Outcome Grader for final decision. In cases where the patient is unable to be photographed, a 'placeholder' photograph will be taken to demonstrate that the equipment was operational at the time of appointment, and the underlying reason why the patient's eye could not be photographed will be identified and noted within the grading form.

7 Primary grading

Quick info:

Digital images determined to be adequate for grading will be reviewed by a primary grader and identified features of pathology will be recorded on the grading form. Identified features will generate a nationally recognised grade for diabetic retinopathy (R0, R1, R2, R3S, R3A), and another for diabetic maculopathy (M0, M1). These features-based grades will determine the next step in the pathway.

8 Negative (no disease) primary grading result: R0M0

Quick info:

90% of R0M0 (no disease) results from primary grading do not go to secondary grading. The results are sent in writing to the patient and their GP and a named clinician, eg Diabetologist / obstetrician / paediatrician where the appropriate field is populated on the database. The patient will be reinvited for routine digital screening in 12 months' time.

The remaining 10% of R0M0 primary graded images proceed to secondary grading as a quality assurance measure.

9 Primary grading result: R1, R2, M1 or non-DR lesions

Quick info:

R1M0, R1M1, R2M0, R2M1 - These grades indicate some level of disease and cases move to secondary grading.

R3SM0, R3SM1, R3AM0, R3AM1, U or non-referrable Non-DR lesions - These grades will be expedited and sent directly to the Referral Outcome Grader for clinical decision and to determine the Referral Outcome Grade (ROG).

10 Image ungradable, suspected urgent or referrable non-diabetic retinopathy

Quick info:

Some images are sent directly from the primary or secondary grader to the Referral Outcome Grader (ROG) for clinical decision; this is done in three cases: 1) where grader determines images are not of adequate quality to be graded, or 2) where features identified by primary grader relate to R3SM0, R3SM1, R3AM0 or R3AM1 grades, indicating the need for urgent attention by the ROG, or; 3) where features identified by the primary grader indicate a non-DR lesion requiring urgent clinical attention and possible referral to HES.

11 Secondary grading

Quick info:

Digital images are reviewed by a secondary grader, completely independent from the primary grader. Secondary graders will also grade identifiable features, and software will assign the appropriate grade.

12 Agreement on image grading

Quick info:

Agreement on grading between primary and secondary graders refers to the grade assigned by the software based on features identified by the grader. Not all features must be agreed by both graders, only the grade that results from the combination of features marked on the grading form.

Where non-referable grades (R0M0, R1M0) are agreed between primary and secondary graders, final results are generated from the agreed result and are deemed to be the final grading results for these images. Results are sent in writing to the patient and their GP and a named clinician, eg diabetologist / obstetrician / paediatrician where the appropriate field is populated on the database. The patient will be reinvited for routine digital screening in 12 months' time.

Where referable grades (R1M1, R2M0, R2M1) are agreed between primary and secondary graders, digital images are sent to the Referral Outcome Grader (ROG) for final clinical decision.

13 Disagreement on image grading

Quick info:

Disagreement on grading will occur when the grade determined from the features selected does not match between primary and secondary grading.

Where referable grades (R1M1, R2M0, R2M1) are not agreed between primary and secondary graders, digital images are sent to the Arbitration grading queue.

14 Arbitration grading

Quick info:

Arbitration graders are able to see the first and second grades and provide an arbitration grade.

15 Referral Outcome Grade

Quick info:

The Referral Outcome Grade (ROG) is considered as the final grade. The ROG is determined by a Lead Clinician, or in some cases by a very senior level grader who is supervised by a Lead Clinician. The ROG may or may not agree with previous grades. The ROG also determines the action outcome (digital surveillance, slit lamp biomicroscopy, Hospital Eye Services, return to annual routine digital screening) for the patient.

Results are sent in writing to the patient and their GP and a named clinician, eg diabetologist / obstetrician / paediatrician where the appropriate field is populated on the database.

If the ROG is a non-referable grade (R0M0, R1M0), the patient will be reinvited for routine digital screening in 12 months' time.

16 Non-referable grade

Quick info:

If the final grade is a non-referable grade (R0M0, R1M0), the patient will be reinvited for routine annual digital screening in 12 months' time.

18 Referable non-DR lesions with no referable DR

Quick info:

Patients with referable non-DR lesions are referred to their GP and returned to routine annual digital screening for diabetic retinopathy.

24 Surveillance SLB

Quick info:

If patient requires Slit Lamp Biomicroscopy (SLB) for single examination or annually they are moved to SLB Surveillance. They may be returned to routine annual digital screening at a later date if appropriate.

Published: 18-Mar-2015 Valid until: 31-Mar-2016 Printed on: 26-Jun-2015 © Map of Medicine Ltd

This care map was published by England. A printed version of this document is not controlled so may not be up-to-date with the latest clinical information.

Patients in SLB Surveillance should be invited, graded and informed of results in the same way as those patients in routine annual digital screening.

25 Digital Surveillance

Quick info:

If patient requires monitoring by digital photography more frequently than annually they are moved to Digital Surveillance. They may be returned to routine annual digital screening at a later date if appropriate.

Some stable patients with R2 and M1 may only require surveillance at 12-month intervals but they must be kept in the digital surveillance service. No patient with R2 and M1 grades can be returned to annual digital screening.

Patients in Digital Surveillance should be invited, graded and informed of results in the same way as those patients in routine annual digital screening.

26 Hospital Eye Services

Quick info:

After assessment and/or treatment by Hospital Eye Services, unless appropriately excluded or suspended, patients return to routine digital screening, digital surveillance or SLB surveillance as clinically indicated.

Published: 18-Mar-2015 Valid until: 31-Mar-2016 Printed on: 26-Jun-2015 © Map of Medicine Ltd

Provenance: Diabetic Eye Screening

Provenance

It is important that each care map is referenced in line with Map of Medicine guidelines.

Classification

When creating or updating each care map you will need to use the following classification, please note not all classification may be applicable;

[G] – guideline

[M] – meta – analysis

[S] – systematic review

[A] – randomised controlled trail

[B] – non-randomised prospective study

[C] – retrospective study

[Q] – cost or decision analysis

[P] – performance measures or policy documents

[E] – practice based information (expert opinion)

Rohan TE, Frost CD, Wald NJ. Prevention of blindness by screening for diabetic retinopathy: a quantitative assessment. BMJ, 1989; 299:1198-201[Q]

Diabetes care and research in Europe: the Saint Vincent declaration. Diabet Med 1990; 7:360 [G]

Kristinsson JK, Gudmundsson JR, Stefansson E, Jonasson F, Gislason I, Thorsson AV. Screening for diabetic retinopathy. Initiation and frequency, Acta Ophthalmol Scand 1995; 73:525-8 [E]

Bachmann M, Nelson SJ. Screening for Diabetic Retinopathy: A quantitative overview of the evidence, applied to the populations of health authorities and boards. Report Bristol: Health Care Evaluation Unit, University of Bristol; 1996 1996 – December [Q]

Stefansson E, Bek T, Porta M, Larsen N, Kristinsson JK, Agardh E. Screening and prevention of diabetic blindness. Acta Ophthalmol Scand 2000; 78:374-85 [E]

D H. National Service Framework for Diabetes: Delivery Strategy - Department of Health. London2002 [G]

Scanlon PH, Foy C, Chen FK. Visual acuity measurement and ocular co-morbidity in diabetic retinopathy screening, Br J Ophthalmol 2008 Jun; 92(6):775-8 [B]

Garvican L. Issues regarding quality assurance in the English National Screening Programme for Sight-threatening Diabetic Retinopathy: response to paper by C. Arun et al., 'Establishing on-going quality assurance in a retinal screening programme'. Diabet Med 2007; 24:688-90; author reply 90-1 [E]

Complications of diabetes: Screening for retinopathy, Management of foot ulcers: NHS Centre for Reviews and Dissemination, University of York; 1999 August 1999 [S]

Garvican L, Clowes J, Gillow T. Preservation of sight in diabetes: developing a national risk reduction programme. Diabet Med 2000; 17: 627-34 [E]

Gillow JT, Gray JA. The National Screening Committee review of diabetic retinopathy screening Eye 2001; 15:1-2 [E]

Management of Type 2 diabetes - retinopathy screening and early management NICE 2002 [G]

Type 1 diabetes: diagnosis and management of type 1 diabetes in adults. NICE 2004 [G]

Scanlon PH, Malhotra R, Greenwood RH, et al. Comparison of two reference standards in validating two field mydriatic digital photography as a method of screening for diabetic retinopathy. Br J Ophthalmol 2003; 87:1258-63 [B]

Garvican L, Scanlon PH. A pilot quality assurance scheme for diabetic retinopathy risk reduction programmes. Diabet Med 2004; 21:1066-74 [B]

Scanlon PH, Carter SC, Foy C, Husband RF, Abbas J, Bachmann MO. Diabetic retinopathy and socioeconomic deprivation in Gloucestershire. J Med Screen 2008; 15:118-21.54 [B]

Leese GP, Boyle P, Feng Z, Emslie-Smith A, Ellis JD, Screening uptake in a well-established diabetic retinopathy screening program: the role of geographical access and deprivation. Diabetes Care 2008; 31:2131-5 [C]

Hutchinson A, McIntosh A, Peters J, et al. Effectiveness of screening and monitoring tests for diabetic retinopathy--a systematic review. Diabet Med 2000; 17:495-506 [S]

Sharp PF, Olson J, Strachan F, et al The value of digital imaging in diabetic retinopathy, Health Technol Assess 2003; 7:1-119 [S]

Harding SP, Broadbent DM, Neoh C, White MC, Vora J. Sensitivity and specificity of photography and direct ophthalmoscopy in screening for sight threatening eye disease: the Liverpool Diabetic Eye Study. BMJ 1995; 311:1131-5 [B]

Taylor DJ, Fisher J, Jacob J, Tooke JE, The use of digital cameras in a mobile retinal screening environment. Diabet Med 1999; 16: 680-6 [B]

Pandit RJ, Taylor R. Quality assurance in screening for sight-threatening diabetic retinopathy, Diabet Med 2002; 19: 285-91 [B]

Scanlon PH, Malhotra R, Thomas G, et al. The effectiveness of screening for diabetic retinopathy by digital imaging photography and technician ophthalmoscopy, Diabet Med 2003; 20:467-74 [B]

Harding S, Greenwood R, Aldington S, et al. Grading and disease management in national screening for diabetic retinopathy in England and Wales. Diabet Med 2003; 20:965-71[E]

Scanlon PH, Stratton IM, Histed M, Chave SJ, Aldington SJ. The influence of background diabetic retinopathy in the second eye on rates of progression of diabetic retinopathy between 2005 and 2010, Acta Ophthalmol 2013; 91:e335-9 [C]

Murgatroyd H, Cox A, Ellingford A, Ellis JD, MacEwen CJ, Leese GP. Can we predict which patients are at risk of having an ungradable digital image for screening for diabetic retinopathy? Eye 2008; 22:344-8 [B]

Scanlon PH, Foy C, Malhotra R, Aldington SJ. The influence of age, duration of diabetes, cataract, and pupil size on image quality in digital photographic retinal screening, Diabetes Care 2005;28:2448-53 [B]

Healy R, Sallam A, Jones V, et al. Agreement between photographic screening and hospital biomicroscopy grading of diabetic retinopathy and maculopathy, Eur J Ophthalmol 2014;24:550-8 [C]

Sallam A, Scanlon PH, Stratton IM, et al. Agreement and reasons for disagreement between photographic and hospital biomicroscopy grading of diabetic retinopathy. Diabet Med 2011; 28:741-6 [C]

Prasad S, Kamath GG, Jones K, Clearkin LG, Phillips RP. Effectiveness of optometrist screening for diabetic retinopathy using slit-lamp biomicroscopy, Eye 2001; 15:595-601[C]

Olson JA, Strachan FM, Hipwell JH, et al. A comparative evaluation of digital imaging, retinal photography and optometrist examination in screening for diabetic retinopathy, Diabet Med 2003; 20:528-34 [B]

Warburton TJ, Hale PJ, Dewhurst JA. Evaluation of a local optometric diabetic retinopathy screening service, Diabet Med 2004; 21:632-5 [C]

Mackenzie S, Schmermer C, Charnley A, et al. SDOCT Imaging to Identify Macular Pathology in Patients Diagnosed with Diabetic Maculopathy by a Digital Photographic Retinal Screening Programme. PLoS One 2011; 6:e14811 [B]

Contributors

The following individuals have contributed to this care map:

Name of Screening Programme: Diabetic Eye Screening Programme		
Contributor Name	Job Title	Conflicts of Interest
Lynne Lacey	Programme Manager - NHS Diabetic Eye Screening Programme Young Person and Adult Screening Programmes NHS Screening Programmes	None declared
Peter Scanlon	Consultant Ophthalmologist, Gloucestershire Hospitals NHS FT	None declared
David Taylor	National Quality Assurance Manager, NHS Screening Programmes	None declared
Hazel Rudge-Pickard	Project Lead - YPA Screening Programmes NHS Screening Programmes	None declared