

# The Scottish Diabetic Retinopathy Screening programme

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**Sonia Zachariah** Associate Specialist: Diabetic Retinopathy Screening Service, Glasgow, Scotland.

**William Wykes** Consultant Ophthalmologist and Clinical Director: Diabetic Retinopathy Screening Service, Glasgow, Scotland.

**David Yorston** Consultant Ophthalmologist: Tennent Institute of Ophthalmology, Gartnavel Hospital, Glasgow, UK. [dbyorston@btinternet.com](mailto:dbyorston@btinternet.com)

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Diabetic retinopathy (DR) is the leading cause of blindness and visual impairment in the working age population in high-income countries. Since DR is asymptomatic until it reaches an advanced stage, early detection by retinal examination is crucial. This is the goal of a Diabetic Retinopathy Screening (DRS) Programme. In keeping with guidelines for screening programmes, it must adhere to a standardised protocol, have an acceptable standard of sensitivity and specificity, and be amenable to quality assurance at every stage. Simple procedures and easy access for the patient helps to include all those eligible within the population.

The Scottish Diabetic Retinopathy Screening programme was started in 2003. It uses a network of non-mydratic fundus cameras and specialist software. The software helps with the accurate grading of retinopathy and can generate appointments and referrals to hospital-based eye clinics. It also stores images and patient data.

All eligible patients are invited for photographic screening. First, visual acuity testing is done (using a Snellen chart). Since the fundus cameras are non-mydratic, dilatation is carried out only if the photographer is unable to obtain an adequate image through an undilated pupil.

The stored images undergo three levels of grading. At Level 1, images with disease are separated from images with no disease. Most Level 1 grading is done automatically, using a computer programme that detects microaneurysms, but some grading is performed by trainee graders as part of their training.

Level 2 graders are either optometrists or nurse practitioners who have been trained in DR grading. Images with no sight-threatening retinopathy or maculopathy are assigned one of two outcomes:

- return for screening in 6 months
- return for screening in 12 months

Images showing sight-threatening retinopathy or maculopathy which requires referral to hospital eye clinics are sent to Level 3 graders. These graders are medical retina trained ophthalmologists who are responsible for the final arbitration of referable DR. The Level 3 grader also undertakes internal quality assurance for Level 1 and Level 2 graders, with five hundred random images from each grader included for internal quality assurance each year. All Scottish graders (Level 1 to Level 3) must also participate in external quality assurance once a year, where 100 images are graded over a period of four weeks.

The Scottish Diabetic Retinopathy Screening protocol also includes a list of common non-diabetic pathology, which is detected opportunistically. These are dealt with as per local protocols.

# Tips for an effective DR screening service in sub-Saharan Africa

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**Tunde Peto** Head: Ophthalmic Image Analysis Unit, Moorfields Eye Hospital NHS Foundation Trust and UCL Institute of Ophthalmology, London, UK.

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Screening for diabetic retinopathy is of increasing importance. It requires identification of people with diabetes, an accurate examination and/or photograph of the retina and competent analysis of the findings and/or images.

It is imperative that, where screening exists, treatment is available and that it is affordable and sustainable. Laser treatment is the mainstay of treatment in sub-Saharan Africa and it is important that laser machines are maintained and that an eye health professional is taught to provide safe and adequate laser treatment.

In addition to diabetic retinopathy, screening can pick up other ocular diseases, either as media opacities or abnormalities of the fundus. Fundal abnormalities include vascular diseases (e.g. arterial and venous occlusions), glaucomatous disc changes, age-related diseases, and some inherited retinal diseases.

Health care professionals working in the hospitals that receive patients from screening should be fully aware of how the screening is carried out, what the referral criteria are from screening to treatment and how and when they can discharge the patients back for follow-up. A good referral pathway will allow for growth (based on growing demand) and will build trust between health care providers and the population.



Business card-sized promotional materials are available at health centres and the Ministry of Health in Botswana. CREDIT: Peter Blow