

**Unconventional settings for screening and identifying diabetes: An example from optometric practice**

Jennifer H Howse, Steve Jones, A P S Hungin

Centre for Integrated Healthcare Research, School of Medicine and Health,  
Wolfson Research Institute, Durham University, Queen's Campus, University  
Boulevard, Stockton-on-Tees, TS17 6BH

The William Kelly Diabetes Centre, The James Cook University Hospital,  
Marton Road, Middlesbrough, TS4 3BW

Jennifer H Howse, Research Fellow, Centre for Integrated Healthcare  
Research, School of Medicine and Health, Wolfson Research Institute  
Durham University

Email [j.h.howse@durham.ac.uk](mailto:j.h.howse@durham.ac.uk)

Tel: 0191 334 0827

S Jones, Consultant Diabetologist, The James Cook University Hospital

Email: [Stephen.Jones@stees.nhs.uk](mailto:Stephen.Jones@stees.nhs.uk)

Tel: 01642 854146

A P S Hungin, Dean of Medicine, School of Medicine and Health, Durham  
University.

Email: [a.p.s.hungin@dur.ac.uk](mailto:a.p.s.hungin@dur.ac.uk)

Tel: 0191 224 0373

Correspondence to: J H Howse [j.h.howse@durham.ac.uk](mailto:j.h.howse@durham.ac.uk)

## **Unconventional settings for screening and identifying diabetes: An example from optometric practice**

### **Abstract**

**Background:** *Unconventional settings, outside general medical practice, are an underutilised resource in the attempt to identify the large numbers of people with undiagnosed diabetes worldwide.*

**Aims:** *We investigated the feasibility of using optometry practices (opticians) as a setting for a diabetes screening service.*

**Design:** *Adults attending optometry practices who self reported at least one risk factor for diabetes were offered a random capillary blood glucose (rCBG) test. Those with raised rCBG levels were asked to visit their GP for further investigations.*

**Setting:** *High street optometry practices in northern England*

**Results:** *Of 1909 adults attending practices for sight tests 1303 (68.2%) reported risk factors for diabetes of whom 1002 people had rCBG measurements taken, representing 77.9% of those reporting risk factors for diabetes. 318 (31.7%) were found to have a rCBG level of 6.1mmol/l or more, a level where further investigations are recommended by Diabetes UK. 1.6% of previously undiagnosed people were diagnosed with diabetes or pre-diabetes as a result of the service. Refining the number of risk factors for inclusion would have reduced those requiring screening by half and still have identified nearly 70% of the new cases of diabetes and pre-diabetes.*

**Conclusions:** *Screening in optometric practices provides an efficient opportunity to screen at-risk individuals who do not present to conventional*

*medical services and is acceptable and appropriate. Optometrists represent a skilled worldwide resource who could provide a screening service. This service could be transferable to other settings.*

Keywords: Type 2 diabetes, Screening, Prediabetes, Optometry

### **How this Fits in**

Screening for diabetes can be carried out outwith general medical practice by other health professionals in other locations such as within optometrists' practices. This may be successful in reaching people who would not routinely attend their family doctor. However, for screening to be successful effective communication between family doctors and optometrists is required.

## **Introduction**

Between 20% and 50% of people with diabetes are thought to be undetected worldwide (1) (2, 3) and may only be diagnosed when complications present.

Diabetes is an increasing problem worldwide with an estimated 150 million people affected in 1995, predicted to rise to 300 million by 2025 (4). Late diagnosis of disease is an international problem. While the prevalence is increasing, detection strategies are still largely confined to medical or hospital settings (5) (6).

Even with the increased awareness of diabetes and campaigns by national diabetes charities (7) which may have reduced the proportion of people with undiagnosed disease, there remains a 'hard-to-reach' group who remain undiagnosed. There is also a substantial cohort of people with impaired glucose tolerance (IGT) and impaired fasting glucose (IFG), the majority of whom are at increased risk of developing diabetes and the associated complications (8). Among adults in the US, the known prevalence of IGT is 11.2%. This increases with age rising to 22.8% for those aged 65 to 74 years (9). Similarly the prevalence of IFG among adults is 6.9%, with 14.1% of those aged 75 years and over affected (9). These figures are likely to be substantially higher in middle eastern and Asian countries (10).

Identifying those who would benefit from screening and how best to target screening are global challenges. It is a particular challenge in countries like the UK where sustained efforts to detect diabetes have yielded good returns but there still remain up to 22% of men with diabetes who are undetected (3).

While universal screening is not currently recommended, there is some

evidence for targeted screening (11), and different methods to identify those at risk have been evaluated. Screening has traditionally been the role of primary care physicians. In the UK, while there is no specific diabetes screening programme, fasting blood glucose or HbA1c measurements are included in the National Health Check programme for 40-75 year old people if certain conditions are present (12). However the service will be accessed through the doctors practices'. In the UK healthcare is free at the point of access and cost is not a factor in accessing services. Still there are many people who are not likely to use medical services for preventative care or for an earlier diagnosis. Unconventional settings may be an effective way to target these groups.

Testing for diabetes in other settings has considerable potential worldwide. Healthcare professionals other than doctors do have the ability to carry out screening tests and may be able to see individuals who would not present to their family doctor. Both pharmacists and chiropodists have evaluated the feasibility of screening within their normal practice settings, in the UK (13) (14), Australia (15), and Switzerland (16). In the UK, pharmacists have been involved in providing screening services and have developed a protocol with Diabetes UK and the Royal Pharmaceutical Society of Great Britain (RPSGB) (17). In the US, it has been determined that 60% of adults visit dentists at least once a year for routine care and so may be a suitable location to screen for diabetes (18).

Likewise, optometrists (opticians) are providers of routine, non-emergency

care and may be accessed by those who are not receiving medical care. The age of onset of presbyopia and the subsequent deterioration in near vision coincides with the age that screening for diabetes is recommended by both Diabetes UK and ADA. This again may provide opportunities for optometrists to provide tests to those who may not access other healthcare services, particularly if they have no other medical problems. Optometrists provide eye health care worldwide and have the potential to provide services in both developed and developing countries. In the UK, 17 million sight tests are performed yearly, over a third on people aged 60 years or over (19). Optometrists are in a position to ask patients about diabetes risk factors during the course of a sight test. In Australia it has been shown that around 80% of optometrists always or often ask patients over 40 years about diabetes (20). Optometrists may be in a good position to reach a section of the population who may not routinely access other health care professionals. While it is not known what proportion of people attending optometrists also regularly access GP services, it has reported that optometrists are aware they see people who do not access other services (21). Currently optometrists, though involved in diabetic retinopathy screening in different countries (20) (22), have not been involved in screening for diabetes itself. It has been shown that some optometrists would be willing to be involved in screening (21).

## **Aims**

To ascertain the practicality of random capillary blood glucose testing in optometry practices to detect high-risk individuals who may benefit from

further investigations to identifying diabetes and pre-diabetes.

## **Methods**

The study was set in optometry practices in northern England. Opticians were contacted by letter and meetings arranged with those who expressed an interest in participating. Ten optometrists, from five practices representing a mix of practice size and organisation, agreed to participate. The participating practices were situated in 3 different Primary Care Trusts (PCT). These areas had a total population of 735,000 and were served by 75 optometry practices. Each practice covered a population of around 10,000. The programme was implemented for 4 weeks in each practice. As the aim was to evaluate the feasibility and practicality of the scheme we attempted to minimise direct practice workload using healthcare assistants in the practices to conduct the tests. Letters explaining the study procedures were sent to local general practices. Ethics approval was gained from Durham University School of Medicine and Health Ethics committee and screening carried out between 18<sup>th</sup> May 2009 and 11<sup>th</sup> September 2009.

Adults attending for sight tests with no prior diagnosis of diabetes were given an information sheet and list of inclusion criteria (shown in figure 1). Those self reporting at least one risk factor were invited to participate. They were seen by a healthcare assistant who had received training in the use of the blood glucose meters and the process of taking informed consent. The procedure was explained, consent obtained and permission to report results to the participants' family doctor was sought. Capillary blood glucose levels

were measured using a Bayer Contour® glucose meter, which was calibrated daily using control solutions to ensure accuracy. This meter gives a reading within 5 seconds and the whole screening procedure took between 5 and 10 minutes. The risk factors reported and whether participants had been screened previously were recorded.