Strategies for improving diabetic foot care: An example from Scotland

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In a series of documents under the banner of the Scottish Diabetes Framework, the Scottish government set a challenging agenda for the improvement of diabetes care in Scotland. Improving the care of the diabetic foot is one element of this ongoing project. The Scottish Diabetes Foot Action Group has been primarily responsible for driving change and promoting best practice in this area. Here, the authors report on the range of activities – and their ongoing outcomes – that have been undertaken by the group since it was established in 2006.

Article points

1. The *Scottish Diabetes Framework: Action Plan* identified improvement of diabetic foot care as a health care priority.
2. The Scottish Diabetes Foot Action Group was formed in 2006 to drive forward the Action Plan's foot-related objectives.
3. Direct and indirect impacts on diabetic foot care have been achieved in Scotland by improving patient and healthcare professional education, and through service developments.

Keywords

- National-level diabetic foot care
- Scottish Diabetes Foot Action Group
- Scottish Diabetes Framework

The *Scottish Diabetes Framework* (Scottish Executive, 2002) was published almost a decade ago, and served as an umbrella for a range of existing and new initiatives, drawing together existing guidance and best practice. Two of the main focuses of the Framework were the development of an IT system to coordinate diabetes care (titled Scottish Care Information - Diabetes Collaboration [SCI-DC]; see http://bit.ly/uG9Z6w), and a retinal screening programme. The document was refreshed in 2006 as the *Scottish Diabetes Framework: Action Plan* (Scottish Executive, 2006) and diabetic foot care was identified as a new priority area.

To drive forward the Action Plan's foot-related objectives, a subgroup of the Scottish Diabetes Group – the Scottish Diabetes Foot Action Group (SDFAG) – was formed and a full-time National Diabetes Foot Co-ordinator was appointed in 2007 (with the post continued as half-time from 2010 for a further 2 years).

Five years after the Action Plan's publication, do people with diabetes notice any improvement in their foot care?

Direct impacts on people with diabetes

Patient information leaflets

One of the first activities of the SDFAG was to develop six nationally agreed patient information leaflets that address high-, medium- and low-risk feet, the "holiday foot" and active ulceration (*Figure 1*). The leaflets were approved by the Plain English Campaign and made available through SCI-DC. Subsequently, a leaflet on Charcot foot was added and all the leaflets were translated into Arabic, Bengali, Cantonese, Polish and Urdu with assistance from the Minority Ethnic Health Inclusion Service. These leaflets allow for consistent patient information and self-care advice to be delivered across Scotland, reducing the variation in messages people with diabetes receive.

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Page points

1. A number of areas in Scotland have established patient foot care education programmes for those at low risk of ulceration.
2. Algorithms of appropriate questions specifically for the diabetic foot have been agreed between Scottish Diabetes Foot Action Group and NHS 24 that are designed to result in agreed pathways of referral for each health board.
3. Ensuring competency to carry out risk screening across such a diverse set of healthcare professionals is a challenge. To provide support for healthcare professionals carrying out diabetic foot screening, the FRAME website was developed.

Patient education programmes

People with diabetes whose feet are at low risk of ulceration are encouraged to care for their own feet. Consequently, it is important that this group has the skills to undertake this, and are made aware of the problems to look out for and how to access urgent medical services should the need arise.

A number of areas in Scotland have established patient foot care education programmes for those at low risk of ulceration (e.g. the Footsteps Programme; see http://bit.ly/v88BFb for details). The aim is to roll out such programmes across Scotland, and to extend them into more detailed group sessions for people at high risk of foot ulceration.

Emergency services

Access to emergency telephone numbers has been shown to improve outcomes for the diabetic foot (Gonzalez et al, 2009). People in Scotland are now able to access out-of-business hours call centre-based healthcare advice and information using NHS 24 (www.nhs24.com; the equivalent of NHS Direct in England).

Algorithms of appropriate questions specifically for the diabetic foot have been agreed between SDFAG and NHS 24. These questions are designed to result in agreed pathways of referral for each health board. The referral options include direct hospital admission, attending a local accident and emergency department for assessment, review by an out-of-hours GP, a recommendation to contact a podiatrist with specialist diabetes skills urgently, a recommendation to contact their usual podiatrist, or reassurance provided to the caller.

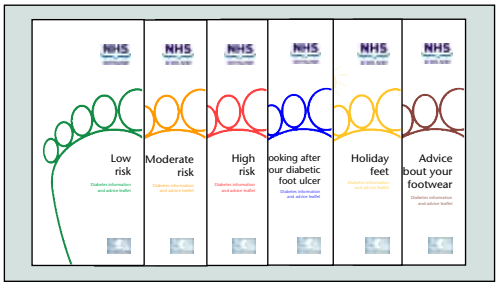

Figure 1. The first six leaflets designed by the Scottish Diabetes Foot Action Group. The leaflets can be downloaded from http://bit.ly/vTpWGE

Indirect impacts on diabetic foot care by improving healthcare professional education

An educational tool

Many healthcare professionals, with a range of skills and experience, carry out screening of the diabetic foot, including practice nurses, GPs, community- and hospital-based podiatrists, diabetologists and others. Ensuring competency to carry out risk screening across such a diverse set of healthcare professionals is a challenge.

To provide support for healthcare professionals carrying out diabetic foot screening, the FRAME website (www.diabetesframe.org) was developed and launched by SDFAG working in conjunction with the University of Edinburgh. FRAME is an online training and self-assessment platform that leads healthcare professional though the diabetic foot screening process and, if completed correctly, generates a continuing professional development certificate. In the 4 months since its launch, FRAME has had nearly 3000 visitors with over 46900 page views. Interest in the site reflects the need for such a learning tool.

Professional competency framework

Currently, there is no framework that clearly defines the knowledge and skills required by healthcare professionals working with the diabetic foot. NHS podiatrists work at varying levels – from basic diabetes experience to extended-scope practitioners – with their knowledge and skills having been attained through a variety of routes. With no clear pathway or competency set to define a diabetes specialist podiatrist, inconsistences in the competencies of similarly titled podiatrists have occurred throughout the UK (Stuart and McInnes, 2011).

Seeing the clear need to set levels of quality and consistency in diabetic foot care, SDFAG formed a subgroup tasked to develop

a framework that identifies the competencies required to manage the diabetic foot at every level of ulcer risk and during active disease.

The subgroup has podiatry, physician, manager, NHS Education Scotland, Skills for Health and educational provider members and published a draft of the *Competency Framework for the Prevention, Treatment and Management of the Diabetic Foot* in 2010 (available from http://bit.ly/v9FTnG). Because the majority of the competencies are generic – with some podiatry profession specific elements – the document is transferable to any profession working with the diabetic foot (for example, an orthotics version is under development).

The Framework provides clear guidance on the mix of foot-care competencies that people with diabetes require access to at each stage of their journey. It also provides a tool for individuals and managers for career and workforce planning, and should inform diabetes foot service developments of the future. It has been endorsed by a range of stakeholders (Society of Chiropodists and Podiatrists, Faculty of Podiatry Managers, Foot in Diabetes UK, *The Diabetic Foot Journal*, Skills for Health, Scottish Diabetes Group, NHS Education Scotland) and is currently under review by Diabetes UK, Association of British Clinical Diabetologists and Primary Care Diabetes Society, with favourable initial responses.

The Framework will revolutionise diabetic foot care by setting standards for individuals and services, and will help to ensure that people with diabetes receive high-quality foot care at the right time, undertaken by a healthcare professional with the right skills.

Indirect impacts on diabetic foot care through service redesign

Foot risk stratification

Too often, even if feet are examined at an annual diabetes review, information on ulcer risk is not acted on. An early priority for SDFAG was to formalise foot screening and introduce a foot risk stratification programme. A foot screening programme itself does not improve outcomes, rather it allows the identification of those at high risk of a complication to be referred to an appropriate individual or team so that a management plan can be offered to them

To ensure that routine foot examination is linked to a specific action, a clear referral pathway needs to be developed and implemented. The SDFAG's risk stratification and triage tool (*Figure 2*) was designed to work within SCI-DC, and uses a validated tool that effectively identifies people at high risk of ulceration (Leese et al, 2006; 2011). Other foot screening tools are available (Peters and Lavery, 2001; Boyko et al, 2006), but these have not gained widespread use in clinical practice.

SDFAG was given the target of electronically recorded foot risk stratification data for 75% of all people with diabetes in Scotland by April 2010 (Scottish Executive, 2006). This ambitious target required a change in culture among clinicians, the establishment of IT links from GP systems to SCI-DC, and agreement on which healthcare professionals should be responsible for screening within each health board. Given the range of implementation challenges, only 56% of people were risk stratified by April 2010. However, some people will have undergone risk stratification, but the results were not available electronically or verifiable,

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1. The *Competency Framework for the Prevention, Treatment and Management of the Diabetic Foot* provides clear guidance on the mix of foot-care competencies that people with diabetes require access to.
2. The Framework will revolutionise diabetic foot care by setting standards for individuals and services, and will help to ensure that people with diabetes receive high-quality foot care at the right time, undertaken by a healthcare professional with the right skills.
3. The Scottish Foot Action Group's risk stratification and triage tool was designed to work within the Scottish diabetes care IT system, and uses a validated tool that effectively identifies people at high risk of ulceration.

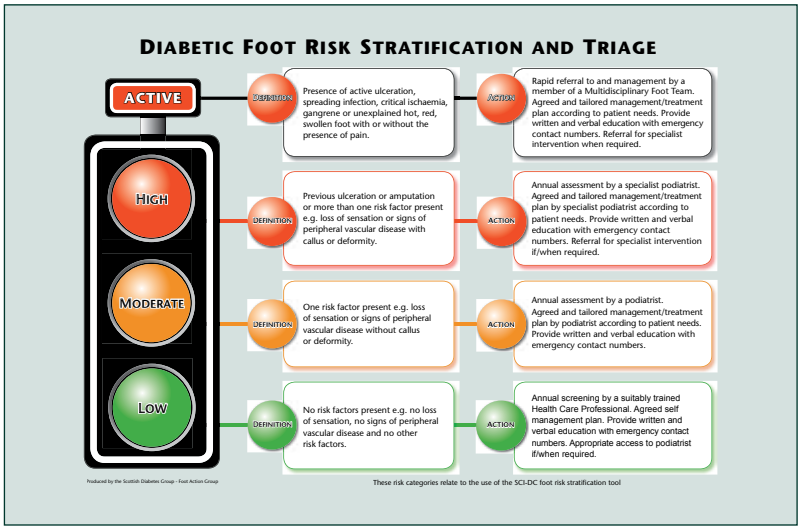

Figure 2. The diabetic foot risk stratification and triage tool.

Page points

1. By October 2011, 71% of people with diabetes in Scotland had undergone an electronically recorded foot risk stratification.
2. Since the Scottish Diabetes Foot Action Group's (SDFAG's) establishment in 2006, the number of people with diabetes in Scotland has increased by 37%, yet there has been no appreciable increase in the number of NHS podiatrists during the same period.
3. Foot screening will be most effective if downstream diabetic foot care services are effective and well organised; SDFAG has agreed the minimum professional members of a multidisciplinary foot clinic, yet a survey in 2008 revealed that less than 60% of health boards fulfilled SDFAG's criteria.

so the overall result may have been higher than 56%. It was also found that 92% of people with diabetes in Scotland had their feet examined at some stage, with 81% in the previous 18 months. These figures highlight the gap between the existing practice of simple foot examinations, and the new culture of recorded foot risk stratification.

Over time, the numbers in the foot-screening programme have increased; by October 2011, 71% of people with diabetes in Scotland had undergone an electronically recorded foot risk stratification (55% in the previous 15 months), with 94% having undergone some form of foot examination (79% during the past 15 months). Furthermore, variation in rates of screening between health boards is decreasing; currently the percentage of people being risk stratified ranges from 54–91% among the health boards – an improvement on the 12–83% in 2009.

To come in line with the new screening and risk stratification process, some health boards have created local GP enhanced services, while others have employed podiatrists directly to undertake this role. Where such initiatives have been introduced, rates of risk stratification have been higher (82%) than in those health boards where no initiative has been introduced to aid the screening and risk stratification process (67%). It is hoped that the recent introduction of foot risk stratification into the Quality and Outcomes Framework (British Medical Association and NHS Employers, 2011) will further improve these figures, although it is disappointing that only one point is allocated to this measurement.

Service access and team members

Since SDFAG's establishment in 2006, the number of people with diabetes in Scotland has increased by 37% (64 681 individuals), yet there has been no appreciable increase in the number of NHS podiatrists during the same period, and in some health boards the number of podiatry posts has actually decreased (Scottish Diabetes Survey Monitoring Group, 2011). Thus, in addition to identifying those at greater risk of ulceration, risk stratification determines which patients are given access to the relatively scarce resources of a podiatrist, and the even more limited resource of a podiatrist with expertise in diabetes working within a multidisciplinary team.

Foot screening will be most effective if downstream diabetic foot care services are effective and well organised. Although there is reasonable evidence that multidisciplinary foot clinics (MDFC) reduce amputation rates (Edmonds et al, 1986; Larsson et al, 1995; Faglia et al, 1998), there remains no firm consensus on which healthcare professionals should be members. SDFAG have agreed that, as a minimum, an MDFC should include:

- A podiatrist specialised in diabetes care.
- A consultant diabetologist (with time for MDFC participation within their job plan).
- An orthotist with competence in diabetes (who should be co-located with the MDFC).

Radiology, vascular surgery, orthopaedics, microbiology and diabetes nursing services should be available to, if not direct members of, the MDFC. Immediate access to hospital admission is essential. For remote and rural areas, these services may need to be organised more flexibly.

An SDFAG survey conducted in 2008 identified that only 58% of health boards in Scotland had a consultant with one or more sessions dedicated to diabetic foot care in their job plan, and only 42% had an orthotist available to attend a MDFC (unpublished data). This suggests that MDFCs are inadequately supported and require greater priority within health board planning. This is a deficit that the SDFAG is working to redress.

It is important that the MDFC is able to accommodate people with urgent foot complications at short notice, and for there to be a well-planned discharge pathway for these patients back to community podiatry when they no longer need the services of the MDFC. This cycling of patients from community podiatry services, through the MDFC during active disease, and back into community care allows space for new referrals. Well-developed

community services, with competent and confident community podiatrists, who communicate well with the central MDFC are needed to facilitate this (Prompers et al, 2008).

SDFAG has created a model where a diabetes specialist podiatrist acts as a liaison person for the community podiatrists in their area, and allows backfill for interested community podiatrist to attend the MDFC periodically to gain education, experience and confidence, and develop a close working relationship with the specialist podiatrist in the MDFC. This model has been well received by both community and specialist podiatrists (Donohue et al, 2002; Leese et al, 2008), and the SDFAG is supporting its rollout across Scotland.

Treating infection

SDFAG collaborated with the Scottish Infectious Diseases Society to establish a working group comprising local clinicians and international experts. The working group published antibiotic guidelines for the treatment of the infected diabetic foot (Leese et al, 2009).

Scotland has the advantage that the antibiotic sensitivities of the commonly infecting organisms – such as *Staphylococcus aureus* and coagulase negative Streptococcus – are similar across the nation (Health Protection Scotland, 2011). The guidelines recommend, in the main, the avoidance of antibiotics that are associated with multiresistant *S. aureus* and *Clostridium difficile*. For the majority of infections, this involves starting with high-dose flucloxacillin (up to 1 g, four times daily), until antibiotic sensitivities become available from microbiological culture. A number of second- and third-line choices are described if microbiological sensitivities prove problematic, which is often the case.

Inpatient care

Care of the diabetic foot in the hospital setting – be it the reason for admission, active disease concurrent to the admitting complaint, or the protection of an at-risk foot during an inpatient stay – is challenging. SDFAG has endorsed the recommendations made in *Putting Feet First: Commissioning Specialist Service for the Management and Prevention of Diabetic Foot Disease in Hospitals*, which was produced by Diabetes UK (2009) in partnership with NHS Diabetes and clearly defines a pathway of care for people admitted to hospital with active foot disease (immediate care; management between 4 and 48 hours; continuing specialist care). The document also makes recommendations on how to prevent the development of new foot problems during inpatient stays, with special reference to the prevention of foot problems in inpatients with established renal failure who are at particularly high risk.

Pressure management

SDFAG (2011) has recently produced guidance on pressure relief for the diabetic foot. The document addresses issues of pressure relief for both the prevention and treatment of diabetic foot disease. Diabetic foot pressure relief for inpatients is covered in this document, and mirrors the recommendations made in *Putting Feet First: Commissioning Specialist Service for the Management and Prevention of Diabetic Foot Disease in Hospitals* (Diabetes UK, 2009).

Conclusion

Work continues to ensure that best practice in diabetic foot care is clearly defined and implemented across NHS Scotland. This article demonstrates that SDFAG has developed and implemented several initiatives for the benefit of people with diabetes. Although a lot of work has been done, it feels as though only the surface has been scratched; but clinicians who care for people with diabetic foot disease are in a business where the end is never nigh! The support and efforts of many will be needed to maintain the momentum of improvements to diabetic foot care that have just begun in Scotland. ■

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Acknowledgement

The authors wish to thank the Scottish Diabetes Group for funding the work described here.

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