

# Podiatrists' perceptions of NHS provision of foot care for people with diabetes

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## Article points

1. National diabetic foot care standards were not being met and there are deficiencies in key areas of foot care provision.
2. Respondents identified barriers to optimum foot care delivery and there may be limited access to multidisciplinary diabetic foot care for vulnerable groups.
3. Improvements in care could be made including patient education strategies and referral pathways for orthotic therapy to offload at-risk pre-ulcerative high pressure areas.

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**The authors aimed to elicit podiatrists' perceptions of NHS diabetic foot care services and to identify any perceived barriers to delivery of optimal care. A mixed-methods approach was adopted. A survey and focus groups were undertaken with podiatrists employed by NHS Greater Glasgow & Clyde. The majority of participants did not perceive that national care guidelines, screening targets and national diabetic foot care standards were being met.**

**D** iabetic foot ulcers are a debilitating and potentially life-threatening complication of diabetes, associated with an increased risk of infection, amputation and death (Leese et al, 2007; Morbach, 2012). There is evidence to suggest that contact with a podiatrist has a positive effect on short-term outcomes, including patient knowledge and ulcer recurrence rates, but there are limited data available from randomised controlled trials on the effects on amputation rates (Buckley et al, 2013).

## Background

The NHS Greater Glasgow and Clyde (NHS GG&C) health board provides healthcare to over 56,700 people with diabetes through a Managed Clinical Network (MCN) (NHS GG&C MCN, 2012). The purpose of the MCN is to implement the strategy for diabetic care outlined in the Scottish Government's Diabetes Action Plan 2010 (Scottish Government, 2010; Buckley et al, 2013), together with the Scottish Intercollegiate Guidelines Network (SIGN) guideline 116 on the management of diabetes (SIGN, 2010). These guidelines specify the recommended standards for the podiatric management of foot problems in diabetes and provide comment on screening and risk stratification, patient education, preventative footwear, and management of active foot disease (Scottish Government, 2010; SIGN, 2010; Kennon, 2012; Buckley et al, 2013).

Diabetic screening forms part of routine primary care in the UK, where the objective is to identify patients at risk of ulceration in order to initiate

timely access to footcare services (Crawford et al, 2011). The Scottish Government set specific targets for NHS Scotland through the Diabetes Action Plan 2010, which states at least 80% of people with diabetes in Scotland should be screened/assessed and subsequently allocated a foot risk score to be recorded in the Scottish Care Information–Diabetes Collaboration (SCI–Diabetes) shared national electronic database. The risk tool adopted to stratify patients accordingly is based upon key criteria for ulcer risk, including vascular status, monofilament sensation, presence of foot deformities, and self-care ability (Leese et al, 2006).

Recent reports suggest that targets for screening were met in 2012 (Stang, 2013). However, minimal evidence exists to suggest the outcomes of screening subsequently triggered appropriate and timely access to footcare services. There is little evidence to suggest meeting screening targets has led to tangible improvements to the foot health of the diabetic population in Scotland. Moreover, recent research suggests that the screening and risk stratification strategy may not be cost-effective, given that the absolute events of ulceration in the diabetic population are low (Crawford et al, 2011).

Little is known regarding whether or not diabetic footcare management guidelines are being adhered to by NHS podiatry services, and whether or not there are any actual or perceived barriers to optimal diabetic footcare among the NHS podiatry workforce.

## Aims

The aims of this study were to elicit podiatrists' perceptions of an NHS diabetic footcare service, and to identify any perceived barriers to optimal diabetic footcare.

## Methods

### Design

A mixed quantitative and qualitative methodological approach was adopted. This comprised a cross-sectional survey followed by a focus group that were assessed for themes. The Glasgow Caledonian University Ethics Committee granted ethical approval for this study.

### Participants

The Health and Care Professions Council (HCPC) registered podiatrists employed by NHS GG&C, who managed patients with diabetes were invited to participate. Written informed consent was obtained from all participants. Participants were recruited at a professional development event held by NHS GG&C. Survey participants were invited to participate in a subsequent focus group.

### Phase 1: the survey

Survey questions were developed to explore compliance with the footcare recommendations specified in SIGN 116 (SIGN, 2010). The survey questionnaire was pilot-tested extensively prior to administration (Collins, 2003) and reviewed by a non-podiatrist academic, two podiatry lecturers, and four NHS-employed podiatrists, including a diabetes specialist podiatrist.

A hard copy of the survey questionnaire was issued. An electronic version of the survey was also created using *SurveyMonkey.com* and emailed to participants. Only completed questionnaires were included in the analysis; only one questionnaire was permitted per IP address.

### Phase 2: focus group

A semi-structured focus group session was conducted. Open-ended questions, based on a literature review (Graham et al, 2011), were developed to promote in-depth discussion in the group. Provisional scripts were reviewed by all authors, and two non-podiatry academics. Topics included were: experience of available treatments and their effectiveness,

knowledge of clinical guidelines, opinions on the foot risk stratification model, footcare accessibility and acceptability, barriers to optimal care, and suggestions for improvement to footcare services.

The focus group was held in a private seminar room at Glasgow Caledonian University by two researchers (JS and GJH). The session was recorded via digital voice recorder and transcribed verbatim.

### Statistical analysis

Analyses were performed using SPSS 19.0 for Windows (SPSS, Chicago, IL). Data were analysed using descriptive statistics.

### Qualitative data analysis

The qualitative data were analysed thematically where emergent themes were identified by JS and GJH and coded prior to interpretation (Boyzatis, 1998). Final coding was reached by consensus between the two researchers. Excerpts from the transcript representing the most expressive articulation of each theme were identified and presented to confirm the trustworthiness of the analysis process (Barbour, 2001; Brocki and Wearden, 2006). The focus group transcript was circulated to all participants for verification to ensure credibility of the data (Barbour, 2001; Brocki and Wearden, 2006).

## Results

### Phase 1

Fifty-nine complete survey responses were submitted in total, representing a response rate of 39% based upon a total of 150 delegates attending the event. Of 59 respondents, 20 (34%) indicated they worked within a multidisciplinary diabetic foot care team.

### Provision of foot care for diabetes

Descriptive frequencies for participant responses to questions concerning footcare for people with diabetes are summarised in *Figure 1*. Patient education was the most commonly reported intervention routinely provided with 43 (73%), 48 (81%), 52 (88%) and 49 (83%) respondents reporting they provided the service across low-, medium-, high-risk and active foot disease patient categories, respectively. Perceived access to the specific healthcare professionals via the diabetes multidisciplinary team are summarised in *Figure 2*. Access to dieticians and vascular and orthopaedic consultants via the multidisciplinary team was limited.

### Page points

1. A mixed quantitative and qualitative design comprising a survey and semi-structured focus group to elicit podiatrists' perceptions of diabetic footcare.
2. Survey questions were developed to explore podiatrists' compliance with diabetic footcare as specified in SIGN 116.
3. A survey response rate of 39% was achieved, equating to 59 respondents in total out of 150 attending an NHS podiatry training event.

### Key words

- Diabetes
- Foot health
- Podiatry
- Foot ulcer
- Survey
- Mixed-methods

Figure 1 (left). Responses to the question (% of all respondents): "Which services do you regularly provide to low-, moderate- and high-risk and active disease diabetic patient groups?"

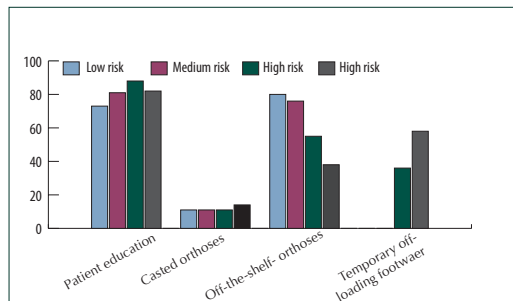
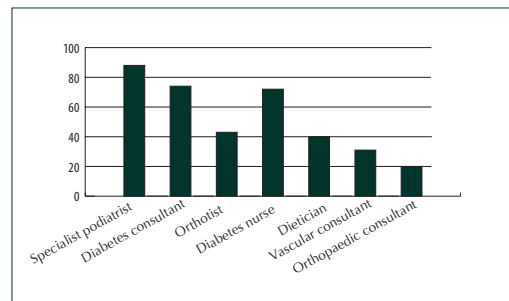


Figure 2 (right). Responses to the question (% of all respondents): "Which of the following professions work within your local multidisciplinary team?"



**Diabetic foot care guidelines**

Twenty-five (42%) respondents perceived national guidelines for diabetic foot care were being met and 26 (44%) felt screening targets were being met. Fifty-seven (97%) respondents indicated they had access to the SCI–Diabetes system to allow identification and entry of diabetes patient risk categories. Over 50% of respondents indicated limited resources, paperwork duties, staffing capacity and/or time constraints affected their ability to meet current care guidelines. Frequencies of respondents' perceptions of barriers to optimal care provision are summarised in Figure 3.

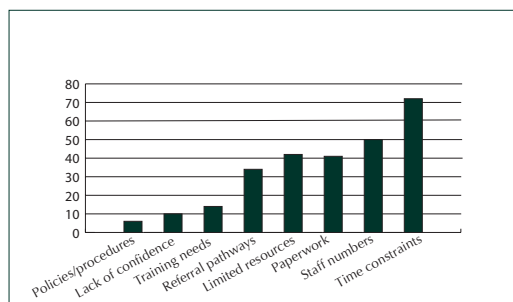
**Phase 2**

Six females (aged 28–45 years old) and three males (aged 33–53 years old) with experience of the podiatric management of diabetes consented to participate. Three recurring themes emerged from the data: inadequacies of current risk stratification procedures; barriers to accessing appropriate services; and strategies for delivering more effective foot health education.

**Theme 1: inadequacies of current risk stratification procedures**

Focus group participants reported that the Diabetic Foot Risk Stratification and Triage (DFRST) 'traffic light' tool (Figure 4) used to stratify patients to risk categories did not always reflect the practitioner's

Figure 3. Responses to the question (% of all respondents): "Which of the following factors have affected or may affect your ability to meet the current care guidelines for diabetes?"



clinical assessment of the patient. Several problems with this tool were identified and outlined in subthemes below.

**Subtheme 1: rigidity of the DFRST tool**

Participants described how experienced clinicians often take a wide range of factors into account when evaluating the ulceration risk. They reported the computer-based system determines the risk level of the patient based on a specific set of criteria and does not allow adjustment based on other circumstances that may contribute to increased risk of ulceration.

Several participants reported having to manipulate the data they entered into the computer-based triage tool to ensure the risk category generated matched their clinical assessment. Participants described how certain entry combinations on the assessment form would elevate or reduce the risk level, while other important factors, such as blindness or learning disabilities, were not taken into account. Participants reported having to adjust their entries on the system in order to 'over-ride' the automated risk category allocated to ensure patient safety was not compromised. Several participants expressed concerns about the consistency and transparency of this system and its value when the data may not accurately represent patient characteristics.

"What we do is kinda falsify stuff to try and get the right risk that we're aiming for, so you'll put down that they can't manage, but actually they can, you have to do something to get it to the right risk." (Participant 7)

**Subtheme 2: non-podiatrist healthcare workers**

Concerns were raised by participants regarding the use of the DFRST tool by non-podiatrist healthcare workers who may lack the training or experience to consider other risk factors that could conceivably impact upon the risk level. Participants indicated

that following the DFRST tool too rigidly could result in incorrect grading or underestimation of ulceration risk.

“If you open the notes... and it says ‘moderate risk, no previous ulceration’, whatever, the clinician might say, well they can wait till next week’s appointment — and there’s actually something wrong with the foot.” (Participant 4)

### Subtheme 3: low and moderate risk screening

The focus group participants questioned whether the evidence base supported the screening of patients at low or moderate risk of ulceration. Screening was described as a resource-intensive activity, which was of limited benefit and not necessarily predictive of ulceration. Several participants supported the view that resources currently used to conduct screening clinics could be better employed increasing the service provision for high-risk and active disease patients.

“We’ve done the preventative low-risk screening for 14 years, but unfortunately no-one’s taken any evidence from that or to see whether that has had an effect or not.” (Participant 2)

## Theme 2: barriers to accessing appropriate foot care services

### Subtheme 1: multidisciplinary team services in the community

Focus group participants reported serious problems in providing certain patient groups with appropriate diabetic foot care. Patients with diabetes, specifically in nursing homes, requiring domiciliary care, and with mental health issues/learning disabilities perceived multidisciplinary diabetic clinics to be successful in achieving healing and preventing ulceration, but were concerned about inability to provide a multidisciplinary service in the community. Several participants described patients who could not, or would not attend a multidisciplinary clinic, and emphasised how difficult it was to provide care to these groups. It was reported that a pilot outreach scheme was being developed to address the lack of multidisciplinary service provision to domiciliary care home patients.

“People with specialist skills in diabetes will go to these patients and check, are they on the right

antibiotic regimen, is the pressure relief in place, take information back to the medics and allow them to make some decisions around their medical care.” (Participant 9)

### Subtheme 2: community orthotics services

Participants discussed the importance of offloading high-pressure areas of a pre-ulcerative or ulcerated foot, and described difficulties initiating patient access to an orthotist. Respondents reported that podiatrists are required to send a referral request letter to the patient’s general practitioner to request referral to the orthotic department. According to participants, this process was required regardless of whether it was a new patient or the patient had been issued with footwear previously. This indirect referral pathway was considered by several participants to be an unnecessary and inconvenient process that often caused delays. Participants indicated they are often concerned that discomfort in prescribed shoes could lead to ulcers developing, and early rectification of this could prevent future ulceration. Participants perceived that offloading measures were often only initiated in an attempt to promote the healing of an ulcer, but not for prevention of an ulcer occurring.

“We can’t refer directly to orthotics and that’s a huge problem for us, you have to go via the GP... Its another stage that you could really do without when you’re trying to organise various different types of care for that patient.” (Participant 8)

## Theme 3: strategies for delivering more effective foot health education

Participants described that, at present, patients’ foot health and self-management education is provided during their annual screening and assessment sessions. Patients are advised of their risk level and provided with a corresponding information leaflet. At diagnosis, type 2 diabetes patients are also sometimes offered the opportunity to attend a Diabetes Education and Self-Management for Ongoing and Newly Diagnosed (DESMOND) course, which is a comprehensive, structured, group education programme.

### Subtheme 1: challenges to effective education

Participants talked at length about the importance of educating patients and the challenges they

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experienced conveying information about diabetes, foot health, footwear, and self-management. It was reported that some patients showed reluctance to change their harmful behaviours until a negative event, such as ulceration occurred. Participants expressed concern that current educational information provided to patients in their screening and assessment sessions may be inefficient and inconsistently delivered. It was also acknowledged there was poor uptake of alternative group educational approaches, such as the DESMOND course and conversion mapping. Several participants stated they felt that such educational approaches may not be appropriate for every patient.

“Up until now the system has been that the podiatrist has gone in [to screening clinics] and given them the education, we're not quite sure how much education they're getting.” (Participant 1)

### Subtheme 2: re-targeting educational provision

Several participants suggested the emphasis for ulcer prevention should shift from undergoing screening only to receiving education for low- and moderate-risk patients. It was highlighted that the most intensive educational programs were aimed at the high-risk and active disease patients, which may be inadequate since these patients already have ulcers or are pre-ulcerative. It was suggested that these interventions would be of greater benefit to low and moderate risk patients to prevent them becoming high risk.

“We've been [...] highlighting patients that have high risk feet, and bringing them in and doing a conversation map about educating them about high-risk feet. Now these are people that have already got high-risk feet.” (Participant 2)

### Subtheme 3: improving delivery of education

The participants suggested a variety of ways in which the delivery of educational interventions could be improved. Changing specifically *when* education programmes are offered to patients from the point of diagnosis to several months later was proposed as a way of improving information retention. To improve uptake of group classes, evening and weekend sessions were suggested by one participant, while another

commented that the smoking cessation model was very successful and could be emulated.

“When a patient's diagnosed initially, they're bombarded with information... so it's a lot to take on board. So maybe they get their initial advice about their feet, but I think 6 months down the line... it maybe sinks in a wee bit better.” (Participant 1)

## Discussion

Several potential deficiencies in current foot care provision were identified from survey responses and subsequent focus groups. A key finding was the high proportion of respondents who indicated that they do not believe national footcare guidelines are being met.

A recent systematic review identified a range of behavioural and system barriers to adherence to clinical practice guidelines that highlight the challenges facing healthcare professionals in the clinical environment (Cochrane et al, 2007). Our results suggest seemingly inter-related system barriers, such as time constraints, staff numbers, paperwork, limited resources and referral pathways may play a role in preventing podiatrists adhering to footcare guidelines. The specific referral pathway to orthotic services was identified as a major barrier to optimal care by the focus group. These findings highlight the challenges podiatrists experience and suggest that footcare delivery could be improved by system-level change (Timmermans and Mauck, 2005).

Most respondents indicated that they do not believe national diabetic foot screening targets were being met. This is at odds with the literature, however, given a recent report states that the target for screening 80% of the Scottish diabetes population, outlined in the Scottish Diabetes Action Plan, had been met in 2012 (Stang, 2013). It is possible that respondents were simply unaware of the report finding that targets had been met; alternatively respondents may not perceive diabetic foot screening to be an effective strategy for preventing ulceration. Several focus group participants expressed concern with the DFRST tool (used to assign risk scores to diabetic patients), resulting in the system being over-written by podiatrists. Therefore, is it possible that in spite of the apparent sensitivity of DFRST to predict ulceration (Leese et al, 2006; 2007; 2011), the

tool has not been sufficiently evaluated for its acceptability to the podiatry workforce?

Many of the focus group questioned the benefit of screening those in lower-risk categories. Findings from a cohort study also question the benefit of screening low–medium risk patients as absolute events of ulceration are low, suggesting that resources should be diverted to those at the highest risk of ulceration (Crawford et al, 2011). This problem exists because the effectiveness of the screening strategy has not been evaluated through robust comparative-effectiveness research.

The findings presented here suggest that core podiatric footcare strategies (e.g. provision of foot health education and offloading therapies in the form of casted foot orthoses or temporary offloading footwear) are not routinely provided for all patients with diabetes. The authors acknowledged that these results are difficult to interpret as not all patients necessarily routinely require offloading and therefore this is not necessarily indicative of under-provision of care.

Foot health education provision and reinforcement is recommended by SIGN for all people with diabetes (SIGN, 2010). Patient education about diabetic footcare appears to positively influence patient knowledge and behaviours in the short term, but there is as yet no robust evidence that it is effective in reducing ulceration and amputation rates (Dorresteijn et al, 2012). The authors found that foot health education was not universally provided for all people with diabetes and, as such, this may represent a deficiency in current footcare standards that could be improved upon.

The focus group highlighted several challenges to the delivery of education strategies, including patient resistance to behavioural change and poor uptake of educational opportunities. Focus group data suggest that podiatrists are aware of the difficulties surrounding foot health education and potential improvements could be possible through targeting low–medium risk patients with preventative education and by offering more convenient class times.

Off-the-shelf foot orthoses were the most frequently reported offloading treatment method routinely prescribed by respondents. At present, there appears to be a lack of consensus in the literature with regards to the most effective strategy

for offloading vulnerable areas of the foot in order to prevent ulceration. A recent single-blinded randomised-controlled trial (RCT) found that custom-made foot orthoses were marginally more effective at reducing plantar pressures in neuropathic diabetic subjects over a 6-month period, but at a greater cost (Paton et al, 2012). Despite not conducting a formal cost-effectiveness analysis, the authors subsequently recommended that cheaper off-the-shelf devices should be used where possible (Paton et al, 2012). Therefore, it is understandable that, given the limited resources of the NHS, podiatrists in this study appeared to favour the cheaper treatment option. In contrast, results from a single-blind RCT demonstrated that foot orthoses designed according to patients' foot shapes and plantar pressures were more effective than standard orthoses at reducing plantar ulcer recurrence over 15 months (Ulbrecht et al, 2014).

The role of temporary offloading footwear is less clear, despite promising effects from cross-sectional studies (Bus et al, 2008; Arts et al, 2012; Healy et al, 2013). The lack of consensus in the current literature suggests there is an urgent need for a definitive RCT to evaluate the clinical- and cost-effectiveness of customised versus off-the-shelf foot orthoses for the prevention and healing of diabetic foot ulcers.

Prevention of diabetic foot ulcers through offloading strategies is largely limited to removable devices such as orthoses and footwear. However where a patient has developed an ulcer, results from two meta-analyses show non-removable offloading to be more effective than removable offloading for healing plantar neuropathic forefoot ulcers (Bus et al, 2015). Nevertheless better research evidence is required in order to improve preventative offloading strategies.

The results of the survey suggest that significant proportions of respondents perceived that dieticians, vascular consultants and orthopaedic consultants did not work as part of their local multidisciplinary team. A key role of the multidisciplinary foot clinic for diabetes patients is to allow intensive treatment and rapid access to orthopaedic and vascular surgery for control of infection, revascularisation, and/or foot-saving amputations (SIGN, 2010; Leese et al, 2011). The best available evidence suggests that multidisciplinary foot clinics are responsible for significant reductions in major amputation rates

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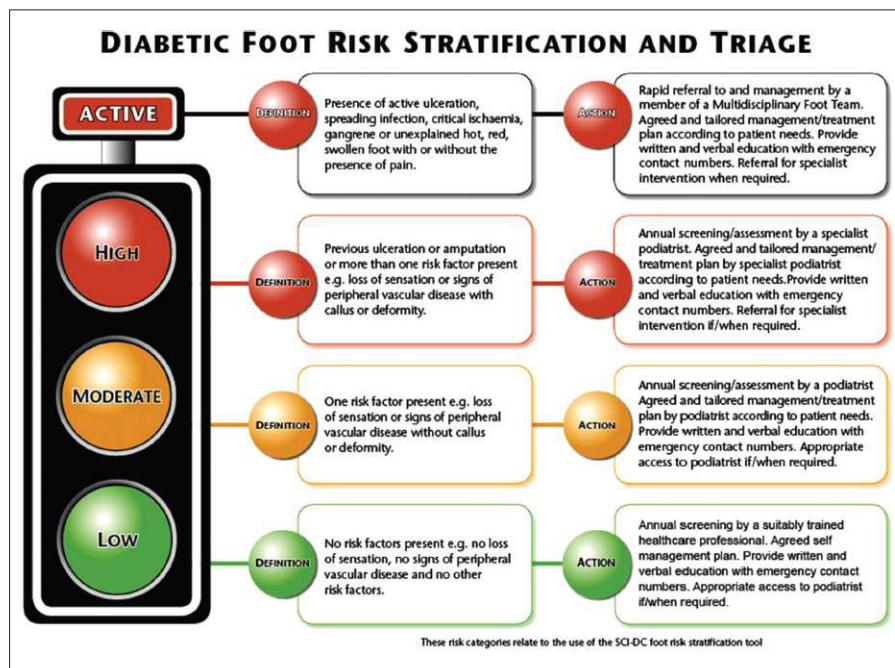


Figure 4. The Diabetic Foot Risk Stratification and Triage (DFRST) 'traffic light' tool (Leese et al, 2011).

The authors acknowledge this study has certain limitations that merit attention. The survey data do not necessarily represent actual diabetic footcare provision, but rather podiatrists' opinions and perceptions of this service. As a result, these data may be subject to response and recall bias. In addition, despite extensive survey questionnaire piloting, it is possible that the specific wording and format of the questions included in the survey could lead to inexact interpretations of the data.

While the response rate of 39% is generally considered to be a good return for survey research (Mandfreda et al, 2008), the sample was small and obtained from a small population of podiatrists working within a single NHS Health Board area and the views and perceptions are not necessarily representative of the wider population of NHS employed podiatrists in Scotland. However, a key strength of this study was the mixed methods approach permitted important survey data to be corroborated and explained in greater detail through qualitative focus group data.

### Conclusion

The majority of podiatrists in this study perceived that national diabetic foot care standards were not being met. Valuable information regarding podiatrists' perceptions of deficiencies in key areas of diabetic footcare provision, barriers to optimum footcare delivery, and limited access to diabetic footcare for vulnerable groups were identified that may prove useful for improving diabetic footcare services in future. The podiatrists in this study were not content with the current foot ulcer screening and risk stratification strategy, with many suggesting that it is labour intensive, not predictive of ulceration, and often requires manipulation so as not to underestimate risk. ■

### Acknowledgements

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(Krishnan et al, 2008). As such, it is surprising that such large proportions of podiatrists appear to believe their patients may not have access to key members of the team. However, it is possible that there is rapid referral access to orthopaedic and vascular surgeons where necessary and these key members are not routinely present at multidisciplinary clinics. Further research is required to determine whether these perceptions are valid and reflect actual deficiencies in multidisciplinary foot care provision.

An important and novel finding from the qualitative component of this study was that some podiatrists highlighted there are certain patient groups for whom access to appropriate footcare was lacking. It is widely recognised that being a resident of a nursing/residential home, and having learning difficulties are both considered to be barriers to accessing mainstream and specialist NHS services (National Coordinating Centre for NHS Service Delivery and Organisation, 2005; Ali et al, 2013; Walker et al, 2014). To the best of the authors' knowledge, this is the first study to specifically identify there may be foot care access inequalities for these patient groups. The authors acknowledge that this finding emerged from subjective opinions derived from qualitative data and as such needs to be substantiated with quantitative research. However, if this is indeed a valid indication of unmet need, then significant improvements may be required to ensure that vulnerable patient groups are not placed at an increased risk of ulceration/amputation as a result of restricted access to footcare.

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