

**FOOTCARE**  
CASE STUDY 1: FEBRUARY 2015

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# Fixing footcare in Sheffield: Improving the pathway

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## SUMMARY

The Sheffield Teaching Hospitals NHS Foundation Trust diabetes team transformed local footcare services for people with diabetes, reducing amputation rates by 45% over three years. The Trust has made significant financial savings and 90% of patients rated the service they have received positively.

The 2007- 2010 Sheffield diabetes footcare profile<sup>1</sup> showed amputation rates that were significantly higher than the England average. This was despite being a tertiary centre, with access to a well-established multidisciplinary footcare team<sup>2</sup> (MDFT), as recommended by NICE and Diabetes UK.

The diabetes team identified problems and delays in the patient journey by using simple, proven service improvement techniques such as root cause analysis<sup>3</sup> and process mapping.<sup>4</sup> The consultant diabetologists then led a service redesign, working with members of the footcare team to streamline the referral process. The changes (made over a two year period from 2010- 2012) are shown in the table on the following page.

## Key interventions to reduce amputation rates

Introduction of a diabetes foot hotline, carried by a consultant diabetologist, to provide immediate advice to any community healthcare professional and enable fast-track to the MDT foot clinic.

Simplification of the footcare pathway and a single point of referral for all foot-related referrals.

Improved access to training for primary care screeners, including the development of a community-based diabetes podiatrist whose role was to target GP practices with training needs, as well as to manage vulnerable patients with foot problems who had difficulty accessing the MDT clinic.

Improved education of patients, including the development of specific leaflets which included important contact telephone numbers, enabling them to access specialist services without the need for referral by their GP.

Redesign of MDT foot clinics using service improvement tools, specifically process mapping and PDSA cycles.

Closer liaison with microbiology, including detailed protocols for surgical and wound swab specimens and consultant microbiologist presence in MDT meetings, with the aim of ensuring more appropriate antibiotic prescribing.

Daily automated email to inpatient diabetes foot team of any admission of a known foot clinic patient.

Development of a simple inpatient foot screening tool.

The project took at least 80 hours of clinician time. Consultants allocated supporting professional activities (SPA) time for the project and were given access to quality improvement resources. This was key to the project success. An industry sponsored external facilitator supported the service mapping. No additional staff were commissioned and the financial savings to the acute trust are around £300,000 annually.

## The case for change

Foot disease is a recognised complication of diabetes and can have devastating consequences, both for the individual and for the healthcare system. Foot ulcers can result in prolonged hospital admissions and may ultimately lead to amputations. The NHS spent an estimated £639 to £662 million on footcare between

2010- 2011.<sup>5</sup> Up to 80% of amputations are potentially preventable.<sup>2</sup>

Foot disease is complex to manage and requires input from multiple specialists. MDFTs have been shown to improve outcomes for people with foot disease,

1 Diabetes footcare activity profiles for each CCG are published by Public Health England, available at: <http://www.yhpho.org.uk/default.aspx?RID=116836>

2 Multidisciplinary footcare teams should include representatives from all of the clinical specialties involved in managing diabetic foot disease. More details can be found at: Diabetes UK Putting Feet First Campaign <http://www.diabetes.org.uk/putting-feet-first>.

3 Information on conducting root cause analysis can be found at: <http://www.nrls.npsa.nhs.uk/resources/collections/root-cause-analysis/>

4 Information on conducting process mapping can be found at: [http://www.institute.nhs.uk/quality\\_and\\_service\\_improvement\\_tools/quality\\_and\\_service\\_improvement\\_tools/process\\_mapping\\_-\\_an\\_overview.html](http://www.institute.nhs.uk/quality_and_service_improvement_tools/quality_and_service_improvement_tools/process_mapping_-_an_overview.html)

reducing amputation rates by up to 50%.<sup>5</sup> However, for the MDFT to be effective there must be clear referral pathways in place ensuring effective transfer across boundaries of care. The MDFT must also be well coordinated with primary care and community Foot Protection Teams to ensure that patients who are developing active foot disease have immediate access to specialist treatment.<sup>2</sup>

The complexity of delivering effective integrated care

remains a challenge for the NHS. In 2010, Sheffield had a well-established MDFT but amputation rates were the fourth highest in the country. 4.4 people per 1000 with diabetes required an amputation each year. Mapping of the care pathway demonstrated a high level of complexity that was often difficult for both healthcare professionals and patients to navigate. Foot checks were carried out in primary care but an estimated 61% of GP practices had not received any training. Demand on the MDFT was increasing year on year.

## Identifying the issues in Sheffield

The Sheffield MDFT had representation from podiatrists, diabetologists, vascular surgeons, diabetes nurses, orthotists, microbiologists, orthopaedic surgeons, vascular nurses and interventional radiologists. This is in line with recommendations from NICE.

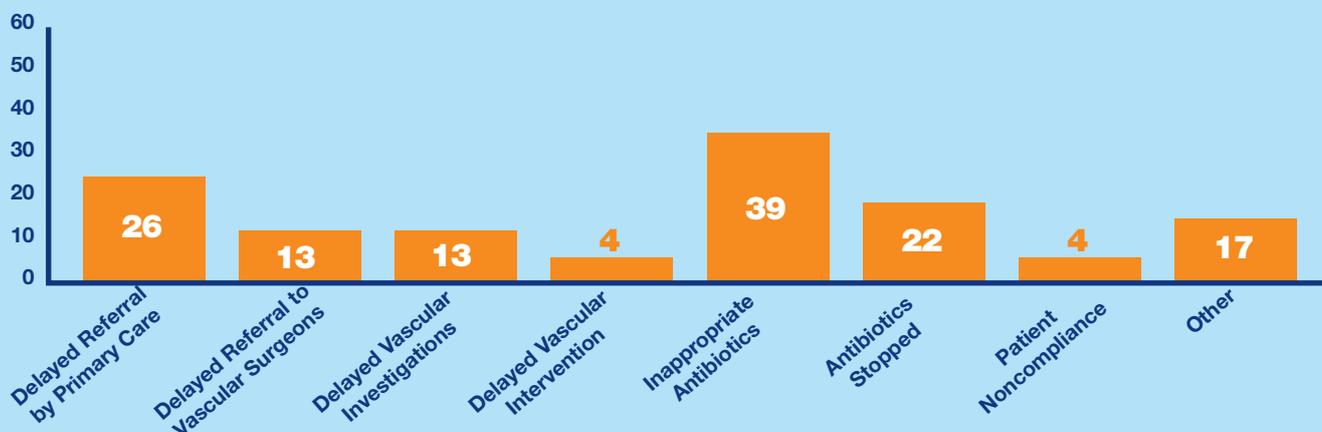
The diabetes team carried out the following steps to understand why diabetes related amputation rates were high despite the existence of the MDFT:

- 1 The diabetes consultants performed Root Cause Analysis (RCA).

### FOCUS POINT

#### The Benefits of RCA

RCA ‘identifies how and why patient safety incidents happen.’<sup>6</sup> This involves auditing all of the local diabetes related amputations to identify those that may have been avoidable. This enables targeted, specific improvements to be made to a service. RCA is used successfully within industry and the NHS, and is recommended by NICE and Diabetes UK.<sup>7</sup> Some areas of the country are now carrying out peer reviewed RCA to identify issues in their footcare pathways. The Sheffield team reviewed 140 amputations carried out in 2011, of which 20% could have possibly been avoided. The results are shown below.<sup>8</sup>



<sup>5</sup> Kerr M, Foot Care for People with Diabetes: The Economic Case for Change 2012 Report for NHS Diabetes <http://www.diabetes.org.uk/Documents/nhs-diabetes/footcare/footcare-for-people-with-diabetes.pdf>

<sup>6</sup> NHS Direct Patient Safety website accessible (along with toolkits for carrying out RCA) at: <http://www.nrls.npsa.nhs.uk/>

<sup>7</sup> Diabetes UK Putting Feet First Campaign and NICE Guidelines <http://www.diabetes.org.uk/putting-feet-first>

<sup>8</sup> The lack of local data sharing between primary and secondary care meant that only hospital notes were accessible. The accuracy in recorded length of time before patients were referred to secondary care therefore relied on patient recall during initial clerking.

**2** The diabetes team worked with an external consultant to map the existing footcare pathway, identifying where there were gaps within the service and if there was any duplication of resources. MDFT referrals are made from multiple different teams and specialties. As all patients with active foot disease must be referred to the diabetes MDFT as soon as possible (enabling them be seen by the MDFT within 24 hours of referral if required), understanding the patient journey was an essential step towards improving the service.

**3** The diabetes team met with hospital management (patient safety lead), primary care leads for diabetes<sup>9</sup> and other MDFT team members to highlight their concerns,

present the findings of the root cause analysis, explore different stakeholder perceptions and ‘find a common goal’- to reduce the number of amputations by improving local footcare services.

**QUICK FACTS**

**RCA:** Took more than 100 hours to complete. Work was carried out by a medical student working with two diabetes consultants.

**Meetings:** One afternoon session with diabetes team and primary care. Four meetings (around ten hours) with the diabetes team, vascular surgeons and vascular radiologists.

**The following issues were identified**

- Both outpatient and inpatient referral pathways were too complex with no clear point of contact for patients or healthcare professionals
- There was limited awareness, training and support for non-specialist healthcare professionals in managing footcare problems
- The patient experience was less than ideal
- There were delays in accessing vascular investigations
- There was a need for closer liaison between microbiology and other specialties in the MDFT- to ensure that samples were taken appropriately and that microbiology protocols were better adhered to.

## The improved model of care

**KEY RECOMMENDATIONS FROM DIABETES UK**

Healthcare professionals carrying out foot checks should be appropriately trained<sup>10</sup> and conduct them according to NICE guidance

All patients should receive appropriate written and verbal education and be told their level of risk (low, moderate, high)

Patients at increased risk should have an agreed and tailored management/treatment plan and be given emergency contact details

Moderate or high risk patients should be assessed regularly by a specialist podiatrist or member of a Foot Protection Team

Patients with active disease should be managed by an MDFT with referral for specialist intervention made where necessary and according to NICE guidance

All patients with diabetes should have their feet checked on admission to hospital

<sup>9</sup> The importance of well represented stakeholder meetings has been discussed in a previous case study. *Networking for success: A ‘burning platform’* in Berkshire West. Diabetes UK. 2014.

<sup>10</sup> Putting feet first: National minimum skills framework, Revised March 2011, Diabetes UK, NHS Diabetes [http://www.diabetes.org.uk/Documents/Professionals/Education%20and%20skills/NMSF\\_16Feb2011.pdf](http://www.diabetes.org.uk/Documents/Professionals/Education%20and%20skills/NMSF_16Feb2011.pdf)

## Healthcare professionals carrying out footchecks should be appropriately trained and conduct foot checks according to NICE guidance<sup>10</sup>

The local community diabetes team are commissioned to provide educational resources and teaching for non-specialist healthcare professionals carrying out screening foot checks and seeing people with foot disease.

Opportunistic screening is encouraged. For example, healthcare assistants on the renal unit have been trained to carry out regular foot checks on patients attending for dialysis (these people are at high risk of foot complications).

Podiatrists teach regularly on the undergraduate medical course to embed an awareness of the importance of diabetes foot problems.

## All patients should receive appropriate written and verbal education and be told their level of risk (low, moderate, high)

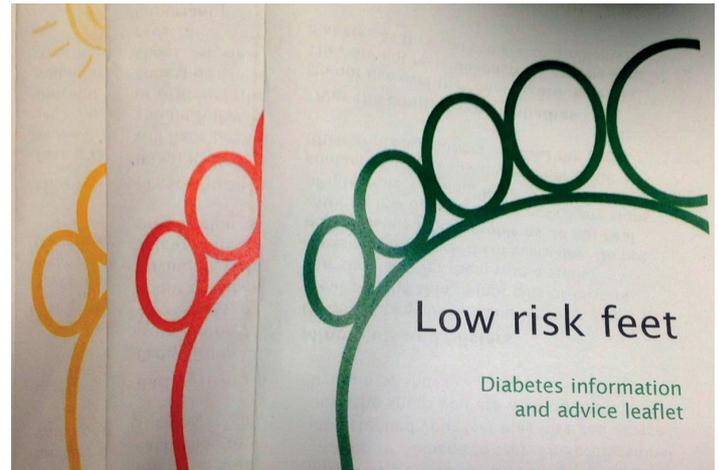
### Patients at increased risk should have an agreed and tailored management/ treatment plan and be given emergency contact details

Patient leaflets were redesigned based on those produced by the Scottish Foot Action Group.<sup>11</sup> They show individual risk scores and give clear contact details of where to seek advice in the event of a problem.

### Moderate or high risk patients should be assessed regularly by a specialist podiatrist or member of a Foot Protection Team

Patients at increased risk are seen regularly by the community podiatry team.

An experienced hospital podiatrist has been commissioned to work between primary and secondary care. The podiatrist is responsible for upskilling community teams and educating healthcare



professionals. This has resulted in improved channels of communication between community and hospital services, reinforcement of the foot care referral pathway through teaching sessions, signposting to resources and access to specialist input for patients at high risk or with active foot disease who decline hospital services.

## Patients with active disease should be managed by an MDFT with referral for specialist intervention made where necessary and according to NICE guidance

The delays in accessing specialist vascular interventions and review were addressed through discussions between the diabetes team and the vascular surgeons. Diabetes consultants are now able to request vascular investigations directly.

Together with the vascular and orthopaedic surgeons and with microbiology the diabetes team developed joint protocols for the handling of operative and biopsy specimens.

Robust microbiology guidelines were developed. Podiatrists are now trained to carry out tissue punch biopsies, an intervention aimed at providing more reliable culture results, in turn allowing more targeted antibiotic treatments. An automated checking system facilitates prompt receipt of microbiology results and recognition of the need for changes in antibiotics based on sensitivities where indicated.

<sup>11</sup> NHS Scotland Diabetes Information and Advice leaflets are published online by the Scottish Diabetes Group- Foot Action Group <http://www.diabetesinscotland.org.uk/Publications.aspx?catId=2>

**FOCUS  
POINT**

## Referrals

In Sheffield, a consultant diabetologist now receives referrals directly from any healthcare professional via a dedicated mobile phone between 9am-5pm Monday to Friday. Written referrals are faxed and triaged within 24 hours. The telephone service enables fast track referrals, advice and support. The consultant receives between 10-20 phone calls a week, the majority of which lead to a referral. Sheffield NHS Foundation Trust is a specialist centre, so there were enough diabetes consultants available to make the hotline possible without the need for additional staff.

People with diabetes who are known to the footcare clinic are given a contact number to phone if they have complications or queries and can self-refer to the clinic to be seen later that day.

Block commissioning of local inpatient and community diabetes services ensures that funds are less likely to be silo'd into different parts of the system, enabling direct referrals to be made, for example between community podiatry and the MDFT clinic.

### **All patients with diabetes should have their feet checked on admission to hospital**

A simplified inpatient foot screening tool was developed and integrated into the patient drug charts.

Please email: [sharedpractice@diabetes.org.uk](mailto:sharedpractice@diabetes.org.uk) for an example of the current Sheffield footcare referral pathway and the inpatient footcare screening tool.

### **Pathways of care must ensure prompt and effective transition across health care boundaries**

The diabetes team worked with the MDFT to simplify

the footcare pathway, introducing a single point of access for referrals. The new pathway was heavily promoted via a local awareness campaign. Written and electronic resources (e.g. posters with pathway and contact details in every GP surgery) have been produced. This pathway forms the basis of all teaching/ training sessions provided by the team.

The Trust developed an automated email system that alerts the inpatient foot team of any patient attending the diabetic foot clinic if they are admitted anywhere in the hospital. This ensures that the MDFT are able to proactively see patients in hospital and can advise on foot protection measures for the highest risk patients.

# Lessons learned

1. **Use simple techniques such as RCA and process mapping to identify issues and make structured improvements.** Understanding the complexity of the referral process in Sheffield and highlighting the specific areas of delay that were contributing to avoidable amputations enabled the clinical team to make targeted improvements to the service. Further information on improvement tools and techniques is available at <http://www.nhs.uk/capacity-capability/nhs-change-model.aspx>
2. **Simplify the referral process.** Despite the existence of an MDFT the previous referral pathway was complex. RCA and stakeholder feedback showed that there were avoidable delays at several points during the patient journey. Because referrals to the MDFT come from multiple channels (community service, general practice, secondary care) and are often being made by non-specialists, the referral pathway needs to be user friendly, reliable and accessible. This was a core part of the Sheffield redesign and required agreement from each member of the MDFT. Posters advertising the new referral system were widely distributed and adapted into a 'wallet sized' form following user feedback.
3. **Give healthcare professionals access to protected time and resources to drive service improvement.** Consultants at Sheffield NHS Foundation Trust are given protected SPA time along with access to quality improvement resources through the Trust service improvement team. This was essential in enabling them to arrange stakeholder meetings, investigate the issues with the service and drive improvements. The total process took at least 80 hours of clinician time to implement.

4. **There is no need to re-invent the wheel.** The changes that were made in Sheffield were adapted from changes that had been made elsewhere. RCA illustrates that delays in referrals is a problem with footcare services across the country. Simplified referral processes, footcare hotlines and inpatient screening tools have been used with varying success in several trusts already. The strength of the Sheffield redesign was that these changes were introduced in a systematic fashion, maximising pre-existing local resources.

## Outcomes

- Total amputation rates reduced from 4.4 per 1000 people with diabetes in 2007-2010 to 2.7 per 1000 people with diabetes in 2010- 2013. There was a reduction in major amputations from 1.75 to 0.9 per 1000 people with diabetes over the same time period.
- This represents estimated annual financial savings in Sheffield of at least £300,000.<sup>12</sup>
- Reduction in number of bed days for people with diabetic foot problems from 265.4 (2007-2010) to 170.9 days per 1000 people with diabetes (2010- 2013). The reduction in bed days is likely to have generated further savings.
- A patient survey carried out in 2013 showed that overall patient satisfaction with the service was above 90%.

**Of note, these outcomes were achieved despite an increasing demand on the service. The prevalence of diagnosed diabetes in Sheffield was 23,690 people over the age of 17 in 2008–2009, representing 4.2% of the total population. Over this period there was an 80% rise in foot clinic activity.**

<sup>12</sup> These cost savings are based on the NICE guideline 147 <http://www.nice.org.uk/guidance/cg147/resources/cg147-lower-limb-peripheral-arterial-disease-costing-report2>. Minor amputations, pre and post-op care and bed days saved have not been included.

## Future plans

The Sheffield team are taking part in the national diabetic foot ulcer audit. They are also undertaking an audit of the inpatient care of patients with foot problems, comparing practice with NICE guidance for inpatient diabetes foot care (CG119).

As a result of their experience, they plan to embed root cause analysis as a key part of the assessment of every major amputation undertaken in Sheffield, in an effort to continue to eliminate all unnecessary amputations.

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## Acknowledgements

Diabetes UK would like to thank Dr Rajiv Gandhi, Dr Nuala Creagh, Jeremy Walker and all members of the Sheffield foot care team for their support in developing this case study.

## Further information

For further information on this case study or to be put in touch with a member of the Sheffield footcare team, please contact Diabetes UK at [\*\*sharedpractice@diabetes.org.uk\*\*](mailto:sharedpractice@diabetes.org.uk)

### Disclaimer

The information in this case study was gathered via members of the Sheffield footcare team (2014). The views expressed in this publication do not necessarily reflect the views of Diabetes UK.

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