

# GOING DIGITAL FOR ASSESSING AND MANAGING PATIENTS WITH DIABETIC FOOT ULCERS

## Summary

This case study shares early adopter experience with a new electronic wound imaging, assessment and information management system (Silhouette™, ARANZ Medical), based on first phase deployment by the clinical team at Diabetic Foot Clinic, Kings College Hospital NHS Foundation Trust. The discussion also outlines the adoption journey and the change process of taking forward a new emerging technology for the management of Diabetic Foot Ulcer (DFU) patients, in a secondary care setting.

“A system providing digital wound imaging, 3D measurement and information management represents a significant advance in our ability to assess, monitor and manage Diabetic Foot Ulcer outcomes more effectively” Maureen Bates, Podiatry Manager, Diabetic Foot Clinic, Kings College Hospital NHS Foundation Trust.

## Clinical Challenge and Opportunities for Improvement

Diabetes is a major health challenge in the UK, with a rapidly increasing number of people affected by the condition in the UK. It is estimated that by 2025 five million people will have diabetes in the UK.<sup>1</sup> Diabetes is a serious condition with the added risk of significant secondary complications such as heart disease, stroke, kidney failure, blindness, foot disease and amputation.<sup>1</sup>

Data from the Diabetes in the UK 2012 report estimates that £10 billion is spent by the NHS on diabetes, representing 10 per cent of the annual NHS budget.<sup>1</sup>

Active disease of the foot is a crisis situation for a patient with Diabetes and the patient needs to be assessed as soon as possible by an expert multidisciplinary team.<sup>2</sup> Healing and active management of the Diabetic Foot Ulcer is a critical imperative for patients with active foot disease, every hour counts to avoid further deterioration and loss of the limb.<sup>2</sup>

The Kings College Hospital Diabetic Foot team is committed to looking at new approaches that advance clinical practice in this important area and outline their early adopter experience with a new electronic wound assessment and information management system for the management of patients with Diabetic Foot Ulcers.

## New Technology for Assessing and Managing Diabetic Foot Ulcer Patients

The Diabetic Foot Clinic at Kings College Hospital NHS Foundation Trust, Denmark Hill, London is the first NHS organisation in the UK to deploy an innovative electronic wound assessment and information management system (Silhouette™) to conduct clinical studies and develop their clinical practice for the management of patients with Diabetic Foot Ulcers.<sup>3,4</sup>

The system allows the Kings Diabetic Foot Clinic team to assess and monitor, much more effectively than traditional methods, the progress of Diabetic Foot Ulcers.



SilhouetteStar™ camera for digital wound imaging and 3D wound measurement.



SilhouetteConnect™ Patient Dashboard showing assessment data with wound progress chart and latest wound size measurements.

The system also allows the team to generate critical clinical information more rapidly and reproducibly:

- high quality digital wound imaging
- automated, non-contact wound measurement (area, perimeter, depth, volume)
- objective wound assessment and outcomes monitoring with quantitative data
- easy and robust wound progress review with wound size change charts
- electronic documentation of wound assessment and treatment plan
- electronic PDF wound assessment reports
- higher quality DFU progress information to guide treatment planning
- an opportunity to educate and engage patients in their treatment plan using the assessment dashboard charting DFU progress

In addition to validating the above functionality of the system, the Kings College Diabetic Foot Team can see strong potential to harness the following capability to support future development of the Diabetic Foot Pathway and Service Delivery:

- access to critical data for the multidisciplinary team (MDT) from any location, based on the wound information database which can be accessed securely using a Microsoft Internet Explorer web browser
- enhanced health informatics for management decision making including population-level analysis and service key performance indicators analysis



SilhouetteCentral™ database gives care team secure access to DFU wound assessment data for patients, from multiple locations.

- scope to connect clinicians and wound assessment data generated in primary care and secondary care to support rapid referral and timely management of patients via a telehealth service model

## The Technology Adoption Journey and Clinical Benefits

The Kings College Hospital Diabetic Foot team is at the early stages of adopting this new technology and there is further work to be done to deploy the system to its full potential.

The first phase of adoption has helped establish that the technology is very easy to use and can be integrated into the clinical work flow without disruption. The degree of customisation possible with clinical notes and reports also means that the team are assured they can reflect their internal processes and protocols when they are ready for full implementation downstream.

“This digital wound assessment and information management system is an enabling technology and makes the team’s job significantly easier” commented Maureen Bates, Podiatry Manager and Tim Jemmott, Deputy Podiatry Manager.

Maureen Bates added “The system we have adopted generates quality assessment data, including digital wound images and measurements plotted over time, plus it allows the capture of electronic notes. This means all members of the care team can easily and quickly access the patient dashboard and information database for an objective review of how the ulcer is healing and to confirm if treatment is working. We can also discuss the images and results on screen with our patient which really engages them when they can see how they are improving and understand the impact of their treatment”.

Based on this early experience, the team are confident that there is strong potential in taking this technology through to mainstream clinical practice to support improvements in clinical quality, integrated care and productivity, ultimately contributing to more cost-effective and successful outcomes for the Diabetic Foot patient population.

## Collaboration with IT Expertise

A key part of the adoption journey to date for the technology has been close and successful collaboration between the Kings clinical team, Kings IT managers and Entec Health/ARANZ Medical, the industry partners. Based on an initial system pilot set up for a clinical research study, using anonymised patient data, the IT team has established that the solution meets the required data management, security and system compatibility requirements for the Trust’s IT strategy. At full implementation stage, the system database would be hosted on the NHS Trust server and accessed via secure internet browser by authorised users, with a full audit track available of system users. The IT team has also reviewed the data integration capability of the system and has mapped out that the PDF wound assessment report can be linked to an electronic patient record on the Trust clinical system via HL7 messaging ensuring a complete view of up to date patient information.

## Developing the Business Case

The clinical team is now developing a business case to secure finance for the deployment of the electronic wound assessment and information management system for the out-patient Diabetic Foot clinic and hospital wards. The team’s aim is to secure support and budget at management level to utilise the system as part of a clinical and cost improvement plan (CIP) to deliver better value to NHS stakeholders.

The business case rationale is based on use of quality information generated by the technology to stratify patients by wound progress and risk-status. This supports the Diabetic Foot clinical pathway and the goal of early referral and treatment for patients with active DFU and at high risk.<sup>2</sup>

The clinical quality improvement targets for deployment of this new technology include a range of clinical improvements with associated potential service cost reduction:

- Better patient risk stratification to support early intervention and improved DFU healing rates
- Reduction in wound deterioration
- Optimised discharge process and time

- Reduction in hospital admissions
- Reduction in length of stay (LOS) for admitted patients
- Integrated foot care pathway for improved outcomes and patient experience

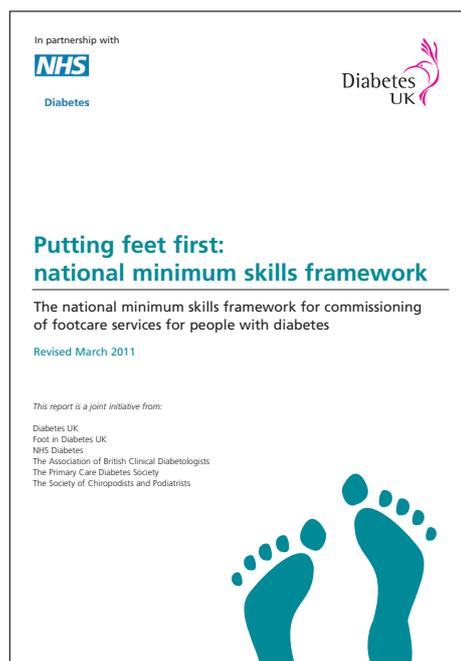
The investment required in going digital with this type of technology has clear payback potential for NHS Trusts in terms of improved patient safety, clinical quality, successful patient outcomes, increased productivity, service cost management and clinical governance. The team would look to incorporate a robust monitoring mechanism to track the full implementation to build evidence on the clinical outcomes, financial gains and the organisational learning and development achieved to establish the Return on Investment (ROI) delivered for the Trust.

### Future Potential – Telehealth Service Model

The Kings Diabetic Foot Clinic Team aims to expand the use of this enabling technology further for a future Kings Health Partners Spoke-Hub model of service delivery for Diabetic Foot Patients. In this Spoke-Hub service model, it is envisaged that the system can be integrated as a telehealth capability, allowing clinicians to share wound assessment images, data and reports across the care team from any location, on a secure internet-enabled data platform. This opens up the possibility of remote review and consultation within a site and between secondary care and primary care specialists to help ensure that patients with Diabetic Foot Ulcers are seen and treated on time to reduce deterioration, optimise quality of life, prevent admissions and ultimately deliver best outcomes possible, cost-efficiently.

### References

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Availability of robust DFU assessment data on a shared, secure information platform presents an opportunity to support successful delivery of The Foot Health integrated care pathway.<sup>2</sup>

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