Transformative strategies in diabetic foot care: a comprehensive approach to lower-limb ulcer recurrence

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Key words

- Diabetic foot care
- Lower-limb foot ulcer recurrence

Article points

1. Diabetes puts individuals at risk for infection but also represents a precursor to severe consequences such as sepsis and lower-limb amputation.
2. The multidisciplinary role is crucial in mitigating lower-limb foot ulcer recurrence, a pervasive issue affecting a substantial portion of the diabetic population.
3. In addition, a more active high-risk population could ultimately be a lower-risk population with reduced expected mortality rates.

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Diabetes is a pervasive and lifelong condition and poses significant challenges, with one of its most debilitating complications being foot diseases, particularly foot ulceration. This condition not only places individuals at risk for infection but also represents a precursor to severe consequences, such as sepsis and lower-limb amputation (Lipsky et al, 2023). This article delves into the multidisciplinary role that is pivotal in mitigating lower-limb foot ulcer recurrence, a pervasive issue affecting a substantial portion of the diabetic population.

Diabetic foot ulcers, characterised by non-healing wounds below the ankle, are the result of a complex interplay of neurological, vascular and biomechanical factors (Armstrong et al, 2023). The vulnerability of foot tissues to normal pressures, coupled with the lack of protective pain signals, contributes to the formation and persistence of these ulcers. Moreover, single traumas, initially undetected, may exacerbate the situation. The severity of the issue is underscored by its status as the primary cause of non-traumatic amputation in individuals with diabetes, carrying a 30.5%–55% 5-year mortality rate, which soars to over 70% post-amputation (Armstrong et al, 2020; Robbins et al, 2008). Salford has observed similar mortality rates with 40% at 4 years (Schofield et al, 2021).

Beyond the personal toll, diabetic foot disease extracts a substantial economic toll on healthcare economies. In the UK, the NHS expends up to £962 million annually on diabetes foot disease, equivalent to 0.9% of its overall budget, or 12% of the lower-limb wound cost of £82 billion (Kerr et al, 2019; Guest et al, 2010). Comparable figures prevail in the US (Armstrong et al, 2023), with social care costs ballooning to £13.9 billion per year (Wounds UK, 2018), underscoring the strain on healthcare systems and families, and we are seeing the same level of end-stage disease in people with peripheral arterial disease without diabetes. We are, therefore, seeing a shift from diabetes focussed to lower-limb focussed. I (AS) was once asked the question: "What happens to podiatry if we cure diabetes?" This is now an easy answer — we apply our learning and service delivery to those with active disease but without diabetes.

The imperative of a multidisciplinary approach

Recognising the intricate nature of diabetic foot disease, a multidisciplinary approach has been deemed imperative since the 1980s (Edmonds et al, 1986). Systematic reviews, including those by Musuuza et al (2020), Crawford et al (2019), and Korzon-Burakowska and Dziemidok (2011), emphasise the pivotal role of multidisciplinary teams in both preventing and healing foot ulcers. Challenges, however, persist, with re-ulceration rates reaching alarming levels and, as we move forward, a step-down MDT may be an approach to consider (Dargis et al, 1999; Armstrong et al, 2017; 2023).

Our Story: Salford Care Organisation (SCO) implementing Manchester Amputation Reduction Strategy (MARS)

Within this challenging landscape, Salford Care Organisation's Lower Limb Multidisciplinary Service (MDS), in collaboration with the Manchester Foundation Trust vascular service, emerges as a beacon of success. Achieving a remarkable 42% reduction in the number of amputations and 46% reduction in prevalence of amputations over 6 years (essentially halving) between 2015/16–2021/22, SCO's journey showcases the transformative power of early multidisciplinary team intervention and seamless collaboration, the cornerstone of the MARS project. Despite challenges posed by the international pandemic, Salford Care Organisation exemplifies the effectiveness of a collaborative, integrated approach.

SCO's strategic shift from a diabetes-focused MDS to a broader focus on lower-limb issues reflects the adaptability needed for sustained success. Over the past 6 years, SCO has not only addressed the complexities of diabetic foot disease but has also embraced a holistic 'whole systems' strategy to encompass all lower-limb amputations. Despite an increase in demand and population growth, amputation rates in Greater Manchester and Salford decreased significantly, resulting in substantial cost savings. It should be noted that the 2015/16 amputation rate in Salford was 20% above the regional average, while in 2021/22, it was 10% below the regional average

Lower-limb amputations, primarily linked to diabetes and peripheral arterial disease, account for over 95% of cases. SCO's shift from a purely diabetes-focused MDS is particularly noteworthy, given that more than half of major and a third of minor amputations occur in non-diabetic individuals. This strategic shift aligns with the work over the past 4 years of the National Wound Care Strategy Programme.

Despite population increases in Greater Manchester (1.6%) and Salford (9%), amputations have decreased by 21% and 42%, respectively, leading to a 22% and 46% reduction in overall prevalence. Notably, amputations in diabetes patients decreased by 18.1% and 31.4%, outpacing diabetes incidence increases. Major amputation prevalence was 7.4 and 7.9/100,000 in Greater Manchester and Salford, with minor amputations at 13.2 and 9.8/100,000. Savings resulting from fewer amputations were £194k in Salford and £1m in Greater Manchester.

Utilising the clinical expertise at the right time has been a major part of this success. Appropriate interventions at the critical stages aid the management of this complex patient cohort and the MDT has aimed to allow conversion rates to extend in to the >90% for the clinic. The result is inversely proportionate with patient numbers decreasing and the appropriateness of the patient increasing.

Greater Manchester, being a large metropolitan area, faces unique challenges, and Salford, as the 18th most deprived locality in England, exemplifies the disparities in healthcare outcomes. Salford has implemented the Manchester Amputation Reduction Strategy (MARS), demonstrating a commitment to addressing the root causes of lower-limb amputations. This has been achieved through improved early assessment in the community.

Since the early 2000s, Salford has recognised that the MDT is not just the team in the acute-based foot clinic and all members of the podiatry service across community and acute are able to assess patients and escalate in to the non-medical consultant-led clinic. Over time, the skillset of the assessing podaitrist has meant they can instigate tests historically reserved for consultants, e.g. Duplex, MRI scan and CT-angiogram. This is only possible through a truly integrated MDFS and having integration across the care settings. By assessing appropriately and early, we have seen an improved flow of patients in to the podiatry consultant-led clinic. Essentially, more appropriate referrals into MDFC have improved capacity and we can now extend the service to allow leg ulcers/lymphoedema in this setting as well. In implementing these changes over time, we have levelled up access, are reducing inequality and achieving the National Wound Care Strategy goals.

Success factors and lessons learned

SCO's success story emphasises the significance of a coordinated, integrated approach to reduce amputations. The 'whole systems' strategy, aligned with the National Wound Care Strategy, proves

effective in improving outcomes and reducing costs. Notably, despite the complexities of diabetic foot disease, SCO achieved sustained improvements without significant resource changes, showcasing the efficiency of collaborative efforts with services, patients, industry and academic stakeholders.

Sustainability must be the short- and long-term aim for any MDT in an overstretched NHS. Effective use of MDT time not only provides best value for money but also improves patient outcomes. One way that SCO has tried to address this is by ensuring that patients have had suitable investigations prior to MDT appointments. Expansion in scopes of practice to aid requesting of MRI scan, arterial and venous duplex plus CT angiograms has facilitated this. Furthermore, interpretation of investigations and management within community services for chronic limb-threatening ischaemia (CLTI) and complex infection for patients who are poor surgical candidates has come from close working with the MDT.

Thinking towards the future

Adopting a whole system approach to the management of a complex patient groups can demonstrate an innovative way to caseload management. Using the skills of healthcare professionals not typically associated with a diabetic foot MDT needs to be explored further to fully understand the benefits as we look to address the high levels of recurrence in these patient groups. Activity champions and mental health experts who can provide holistic approaches to some of the lesser addressed aspects of high-risk foot care, such as anxiety, depression and sedentariness, may also prove beneficial in the MDT. A more active high-risk population could ultimately be a lower-risk population with reduced expected mortality rates.

Conclusion

SCO's success story underscores the feasibility and benefits of a comprehensive, coordinated approach to reducing amputations, applicable to both diabetes and non-diabetes populations. The 'whole systems' strategy, aligned with the National Wound Care Strategy and incorporating the MARS project, proves effective in improving outcomes and reducing costs. While acknowledging data limitations, this submission advocates for the widespread implementation of such transformative strategies in diabetic foot care. ■

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