Hard-to-heal wounds have a negative impact on patient wellbeing, are challenging for clinicians to manage and are costly to the health economy. Globally, healthcare providers are facing significant cost-efficiency drives and increasingly under pressure to balance the cost of care with the delivery of high-quality patient outcomes. Breaking the cycle of hard to heal wounds requires a proactive approach that includes recognising and understanding the extent of the problem, early intervention using advanced wound technologies that improve healing rates, reduce clinical time, avoid hospital admission and improve patient satisfaction. In addition, as more wounds are treated in the community setting instead of hospitals, the development of technologies that are easy to use can support self-management programmes, reducing reliance on healthcare professionals and empowering patients to engage in their own care.

Wounds are a significant source of cost to patients and to the health economy. Chronic wounds are often hard to heal, resulting in a cycle of pain, anxiety and reduced quality of life for the individual patient, as well as considerable cost to treat. The estimated cost of treating chronic wounds is between £2.5–3.1 million per annum, accounting for between 2–3% of healthcare budgets\(^1\). Wound healing demands are predicted to increase with a rising elderly population with long-term conditions and more complex needs. Data on health service expenditure suggest that funding of health care is unlikely to keep pace with demand and that fundamental changes will need to be made in the way wound care is delivered in the future if we are to reconcile supply with demand\(^2\).

To balance cost and care for the future, clinicians will need to be more proactive in their approach to wound care, adopting new and advanced technologies that increase healing, empower and involve patients in their care and create economic value. Poor quality care is more costly for the patient and the health economy; a proactive approach can reduce cost and improve patient outcomes. This was demonstrated by the high impact actions on reducing hospital admissions from pressure ulcers\(^3\).

A substantial proportion of acute hospital beds are occupied by patients with wounds and, in some areas, the majority of community nurse time is spent on wound care. Estimates suggest that there are 3.37 people with one or more wound per 1,000 of the population, of which 74% are being treated in community health care and 21% in acute care\(^4\). Although most patients are treated in the community, the majority of wound care costs arise in hospital, with 27–50% of acute hospital beds likely to be occupied on any day by patients with a wound\(^5\). Many of these chronic wounds are longstanding (i.e. greater than 6 months in duration) and more likely to develop complications that result in hospital admission or delayed discharge\(^6\).

Additionally, patients and their wounds have become more complex, with 76% of patients with a chronic wound having three more comorbidities and up to 46% having diabetes\(^7\), making them more likely to be hard to heal. Obesity is also on the rise, with 52% of the adult population across Europe overweight and 17% obese\(^8\). This has an impact on the prevalence of non-healing wounds as there is a direct association between non-healing wounds and chronic diseases. Obesity is also a risk factor for wound complications.

Wounds that are hard to heal are more likely to develop complications, such as infection, requiring more costly interventions and more frequent dressing changes, placing greater demands on available resources. Wound complications are associated with
longer and more intensive treatment, extended hospital stays, readmission and specialist medical or surgical intervention. Surgical site infection (SSI) is a common source of hospital-acquired infection (HAI) and impacts on patient morbidity and treatment costs. Lengths of hospital stay can be prolonged where systems are not in place to facilitate early discharge or where there is a perceived or actual lack of capacity and capability to manage more complex wounds in the community setting.

**Hard-to-heal wounds**

There are a number of factors that contribute to delayed wound healing, including patient-related factors, such as underlying pathology and comorbidities, wound-related factors, such as ulcer size, duration and location, and clinical competency factors, such as the knowledge and skill of the clinician. Additionally, resource and treatment-related factors, such as dressing availability and selection, can influence how long the wound will take to heal. Recognition of non-healing wounds demands a careful assessment and reassessment of both the patient and the wound and reviews of systems of care so that both intrinsic and extrinsic barriers to healing are identified and addressed.

Wounds in community care that are hard to heal are more likely to require hospital referral for specialist assessment and in some cases hospital admission for treatment. Strategies that focus on early recognition of those patients at risk of poor healing and those wounds on a trajectory to delayed healing are essential to break the cycle of delayed discharge and readmission as a result of wound complications.

The tension between resource availability and demand has always been present in healthcare systems and limited resources mean that choices have to be made about resource allocation for maximum benefit. Typically, the cost of wound care is driven by the dressing change frequency, notably the health provision time, the duration of treatment and the incidence of complications. There are also indirect costs, such as loss of income by the patient and welfare costs, which are more difficult to measure. Dressing costs represent a relatively small proportion of the total cost, even though with appropriate use within a wound management protocol they can improve outcomes.

**Wound dressings and treatments**

Dressings remain the mainstay of treatment for patients with wounds and a wide variety of dressings are available for use. Dressing selection will be based on a number of factors, including a detailed patient and wound assessment, identification of the underlying cause and objective of treatment, cost-effectiveness and availability of the dressing and patient preference. Increasingly, wear time is becoming an important factor in dressing selection, as the number of dressing changes impacts on community nursing visits and associated costs, such as travel.

In one study in Sweden in a community of 288,000 people, with a typical wound prevalence of 2.4/1,000, the equivalent of 57 full-time nurses were required for dressing changes alone. Dressings that require fewer changes and visits from healthcare professionals can reduce cost, free up time for other activities and increase productivity.

Increasingly, more advanced wound therapies have become available that can reduce cost by facilitating early discharge from hospital, reduce dressing frequency and promote faster healing. Often these new technologies are only available in hospital care due to their higher cost and difficulty in securing funding in community care. However, new therapies are now becoming available outside of hospital, in an effort to keep care closer to home and patients out of hospital.

Over the past decade, health technology has begun to transform health care, with the introduction of advanced wound dressings and devices and technology-based approaches, such as telehealth. Despite these advances, service delivery models often remain unchallenged. In many areas of practice, patient outcomes are poorly defined and measured, making it difficult to demonstrate the value of a new and advanced technology.

Additionally, the focus for decision makers in healthcare spending is often on the unit cost of the treatment and not on costing the whole episode of care. It can, therefore, be difficult to secure funding for new wound care technologies, which are often more expensive when outcomes are not measured or demonstrated. Success relies on understanding the extent of the problem of hard-to-heal wounds, quantifying the resource requirements and targeting new and advanced technologies to maximise efficiencies and demonstrate...
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positive outcomes for patients and the health economy.

**Cost and care**

Although new technologies can be more expensive than traditional dressings, they can be more cost-effective by facilitating early discharge, supporting out of hospital, community based wound care and reducing time to heal. Despite the recent introduction of portable devices, negative pressure wound therapy (NPWT) has often been perceived to be high cost and restricted to use in the secondary care setting, meaning patients remain in hospital for longer periods of time or are discharged and do not have access to NPWT.

Prolonging discharge significantly increases cost, with the average cost of one day’s inpatient stay estimated to be £288. It also impacts negatively on the patient’s quality of life. In one study, the mean cost of an episode of NPWT in the community for patients originating in acute care was £784 over an average duration of 20.4 days. The same care in hospital would cost £5,760, resulting in an estimated cost saving of £4,814 per patient. It makes economic sense, therefore, to get patients on NPWT back into the community as soon as possible to enhance efficiencies, or to commence NPWT in the community when the wound fails to heal in a timely manner, thus preventing hospital referral. This approach requires well-defined pathways, improved knowledge and skills of community based practitioners, involvement of service users and their families and technologies that are simple and easy to use.

In the past, NPWT devices were large, required technical skill to use and limited patient mobility, making their use problematic outside of the hospital environment. However, new lightweight and portable devices have enabled patients to receive NPWT, remain mobile and continue with their usual activities.

Further technological advances now mean that advanced dressings can also be enhanced by NPWT. This offers the opportunity for a more compact therapy system that combines
all the absorbent capabilities of an advanced dressing with the additional benefits of a simple negative pressure delivery device (Nanova™ Therapy System). Such a system is easy to use, does not require a power source and offers security to the patient and the nurse if the negative pressure is lost, as the dressing will continue to absorb exudate from the wound. The NPWT unit is lightweight, silent and discreet to use, with the opportunity of enhancing patients’ quality of life and concordance with therapy.

Although primarily targeted for out-of-hospital care, a system that combines an advanced dressing with a simple NPWT device is also useful to support discharge or transfer between healthcare settings. The simplicity of its use and minimal interference in everyday activities makes it ideal for engaging patients and their families in their own care, which can also contribute to a reduction in the costs of unnecessary call out for community nursing teams or unscheduled visits to wound clinics.

Healthcare systems around the world are becoming increasingly interested in strengthening the role of patients in their own care and empowering them to self-manage. There are some good examples of where this approach has been successful globally — for example, scaling up shared decision-making through the use of electronic medical recording in the USA and the care companion project in India, where families have a certified training programme to look after relatives post-cardiac surgery[13].

So many examples of where healthcare systems have been successful in empowering patients have relied on putting skills and tools in the hands of patients, as well as supporting professionals to have the required skill set to play a more enabling role in their care. The development of technologies that are easy to use can facilitate self-management and empower and engage patients and their carers in their care.

Conclusion
Non-healing wounds are a complex clinical problem that can take weeks or months to resolve and are costly for both the patient and the health economy. This cycle of non-healing can be perpetuated by clinicians who make poor treatment choices, fail to recognise complications or seek timely advice. Balancing care and cost in this group of patients requires good communication between all stakeholders, technologies that are available and easy to use, promote faster healing, improve patient satisfaction and free up clinical time.

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References