Wound discharge outcomes of a specialist wound telehealth service in 38 nursing homes over a three-year period

Pam Cooper, Veronica Doody, John McRobert, David Rouncivell, David Gray

A specialist wound telehealth service was established to deliver equitable service with parity of access to wound care for all residents of 38 nursing homes in Sussex with wounds of any type (n=579). All patients were managed using a systematic telehealth approach that combined digital and in-patient consultations according to established protocols and care pathways. Data for a three-year period was analysed by hand to determine patient demographics, wound type and discharge outcomes for all patients with wounds. The results showed that the mean age of patients was 86 years, with the majority being female (80% healed and 66% deceased). Referral outcomes were referred onwards (n=92), healed (n=234) or deceased (n=253). The most prevalent wound type was pressure ulceration in both healed and deceased patient groups (60% and 59%, respectively), followed by lower limb wounds (20% and 26%, respectively). Mean time to healing or death were 103 days versus 86 days, respectively. The authors concluded that the collaborative use of a specialist wound telehealth service ensured that all residents received prompt, evidence-based wound care. Healing was achieved in this vulnerable patient population, despite the existence of numerous barriers to healing. Patients nearing end of life with a wound received palliative wound management. The time to healing in this group cannot be commented upon due to lack of comparative studies in this patient population.

KEYWORDS:

Wounds Nursing homes Telehealth Discharge outcomes
 Specialist wound telehealth service

t is well known that the existing healthcare system and its services, including wound care, are under unprecedented pressures (Guest et al, 2020). The burden incurred by wounds on the NHS is continually increasing year on year, as a consequence of an aging population living for longer with an increased number of co-morbidities, many of which are known risk factors for the development of chronic wounds (Guest et al, 2015; 2020; Kostovich et al, 2022). Residents of nursing homes are, therefore, at particular risk of developing a wound (Lavallee et al, 2018). In this patient group, delayed healing can be costly and result in complications such as infection, which can lead to rapid deterioration, subsequent hospital admission and mortality (Vowden and Vowden, 2013; Bondini et al, 2020).

It is also recognised that the majority of chronic wounds are managed by nurses in a community setting, yet the skilled community nursing workforce is in decline (Guest et al, 2020). Guest et al (2020) reported a 4% decline in practice nurses and 30% decline in district nurses between 2012–17. Conversely, there was a 399% increase in the number of community and district nurse visits over this period, and a >10,000% increase in healthcare assistants delivering wound care was reported, along with a 2% decrease in specialist nurse visits. Despite this trend towards less skilled practitioners delivering wound care, the literature shows that specialist involvement in care improves healing rates and outcomes (Moffatt et al, 1992; Gray et al, 2020).

As a consequence of the changing workforce, unwarranted variation in care has occurred, with studies reporting a failure to record complete data sets within patient notes, carry out correct wound diagnosis and assessment and subsequently, evidence-based treatment (Guest et al, 2015; 2020; Gray et al, 2018). The loss of skilled clinicians able to deal with patients with increasingly complex wounds, including those residing in nursing homes, can put them at risk of less than optimal care resulting in delayed healing and complications, and increased morbidity and death (Guest et al, 2020).

Improvement in wound healing was recommended as a way to enhance wound care services (Guest et al, 2015; 2020; Gray et al, 2018), although the authors' acknowledged that this was unlikely to happen without a differing approach by

Pam Cooper, clinical partner, Pioneer Wound Healing and Lymphoedema Centres, Eastbourne and visiting lecturer, Wound Healing Practice Development Unit, Birmingham City University; Veronica Doody, nurse consultant; John McRobert, clinical director; David Rouncivell, data manager, all at Pioneer Wound Healing and Lymphoedema Centres, Eastbourne; David Gray, managing partner, Pioneer Wound Healing and Lymphoedema Centres, Eastbourne and professor, Wound Healing Practice Development Unit, Birmingham City University

Table	Table 1: Protocol of care for new patients referred to the specialist telehealth service				
Step	Action	Rationale			
1.	A patient is referred by a care home to the specialist telehealth service who then send a trained healthcare support worker (HCSW) and/or associate lymphoedema practitioner (ALP) to the home to undertake an initial patient and wound assessment. Standardised documentation for the wound type is completed in full and high quality images are taken. The data is uploaded to a system that can be accessed remotely by the specialist from any location in line with the Data Protection and Security Tool Kit requirements. The patient is triaged by the remote specialist to ensure that urgent reviews are prioritised, within a week of referral, with very urgent referrals responded to upon receipt	In the authors' previous experience of telehealth services, it was noted that the quality of wound images and data recorded and uploaded was inconsistent, leading to patient safety concerns. This was reflective of national issues with wound assessment, diagnosis and data collection observed nationally and reported by Vowden and Vowden (2013), Guest (2015; 2020), and Gray et al (2018). Thus, each patient referred to the telehealth service undergoes assessment and image recording by an in-person visit via trained staff from the telehealth service. These visits are usually undertaken in pairs, as previous experience has shown it is not always possible to obtain immediate assistance from a member of nursing home staff, for example with repositioning a patient, and this can lead to delays. Sending two trained members of the telehealth team to the nursing home means that high quality data and images are recorded and no delays in referral are experienced			
2.	The remote specialist will undertake the assessment and, if required, call to discuss the patient with the relevant staff member delivering their care, e.g. care home staff or GP. If further information is not required, a comprehensive care plan is developed, which is delivered to the home, in addition to a week's supply of dressings. If needed, an additional specialist visit will be scheduled, for example, to undertake a specialist intervention, such as sharp debridement	The authors have observed in previous services that there may be delays in accessing the treatment plan by frontline staff due to limited access to email or information governance issues. There may also be a delay in initiating treatment due to delays in prescription writing and dispensing. Via the telehealth service, a treatment plan and products are delivered within 72 hours of initial assessment so that treatment can begin			
3	A review date for the patient is set at the time of initial assessment, when the telehealth team return to the home to carry out a repeat assessment, collecting data and uploading images, so that the remote specialist can compare findings to the baseline information gathered at initial assessment. Documentation used also contains a field to enable communication between the frontline staff and specialist, e.g. the telehealth team may observe that the treatment prescribed has not been delivered, or the nursing home staff may include information that can inform the specialist	In previous services, the authors have found that it is not always possible to obtain accurate feedback on the patient's status by relying solely on images and data supplied by the home staff, as subtle communication can be lost. Thus, an option for frontline staff to communicate with the telehealth service is available. Patient review is repeated until the patient is discharged from the service, dependent on clinical needs			

the NHS (Gray et al, 2018; Guest et al, 2020).

Telehealth can provide a different approach to care delivery that increases efficiency for both patients and healthcare systems. Used appropriately, telehealth can allow timely care delivery and judicious use of specialist intervention, helping to reduce the burden of wounds upon clinicians, patients and healthcare systems (Kostovich et al, 2022).

There is little evidence of the use of telehealth in a nursing home environment for specialist wound intervention. A study by Vowden and Vowden (2013) reported on the use of telehealth and remote telehealth experts versus usual care in 16 nursing homes in Bradford. They found that telehealth improved outcomes and offered potential cost savings by improving product selection and use and avoided inappropriate referral and delayed healing (Vowden and Vowden, 2013).

Equity of care delivery is important with every person entitled to receive evidence-based care regardless of social position or circumstance. However, Vowden and Vowden (2013) demonstrated that patients with wounds in nursing homes were waiting for periods ranging from four days to three weeks for a tissue viability nurse specialist visit following referral. Telehealth was successfully used to speed up referral time, and, in turn, allow early recognition of deterioration and prompt intervention to prevent worsening of the patient's condition. Longterm inappropriate treatment and poor documentation were also identified in normal practice and improved via telehealth (Vowden and Vowden, 2013).

This article reports on the discharge outcomes of a specialist wound telehealth service (WTS) used across nursing homes in East Sussex, England to improve outcomes and prevent complications for all patients with wounds of any type.

BACKGROUND

Pioneer Wound Healing and Lymphoedema Centres (formerly known as Healogics) is a specialist wound telehealth service that was commissioned to deliver wound management services to a total of 38 nursing homes in East Sussex, England. Pioneer Wound Healing and Lymphoedema Centres is a third party provider of NHS services.

A risk assessment process identified that as residents of the care homes could not always attend clinic there could be a time delay in their receiving specialist review via a domiciliary route. As part of the review process, it was recognised that a specific specialist service arm for this group of patients was required to:

- Ensure equity of service and parity of access to specialist wound treatment to all nursing and care home residents in the area
- Improve outcomes and reduce complications.

CARE DELIVERY

All new patients referred to the specialist wound care service were treated according to the protocol outlined in Table 1. These steps and their rationale (Table 1) were developed utilising the combined clinical experience of the specialist team in delivering telehealth services over a 15-year period. Clinical care pathways derived from best practice evidence and specialist clinical experience exist within the service. Each pathway outlines clear management options and are followed in daily clinical practice. The inclusion here of all of the clinical pathways utilised for this patient group, however, is beyond the scope of this article. Of key importance to the telehealth service is the routine recording of wound data to pre-determined criteria, with completion of all required data fields for each patient, and recording of high-quality images. This documentation is supported by interventions when needed from healthcare support workers (HCSW) and qualified associate lymphoedema practitioners (ALP) with additional training in wounds, and/or limited in-person specialist interventions, such as vascular assessment and debridement. This approach has been developed to deliver high quality care and prompt access to it, regardless of location to ensure equity of service to all nursing home residents referred to the service.

METHODS

Data for all nursing home residents referred to the service and who were subsequently discharged within the 36-month period of May 2017 to April 30 2020 were collected. This period was chosen as it was the time in which the lead nurse who set up and ran the service was in post, providing consistent patient care over this time. All patient notes were reviewed by hand and analysed by the same individual to determine patient demographics, wound type, reason for discharge (healing, death, or other), and time to discharge. The data presented are derived from the key performance indicators data gathered as part of the contract and reported to the commissioners monthly.

RESULTS

Five-hundred and seventy nine patients were referred to the service from 38 nursing homes in the East Sussex area over a 36-month period. Patient demographics are presented in *Table 2*.

Of the patients (n=579), 92 were referred onwards to other care locations which are outlined in *Table 3*.

For the remaining patients (n=487), reasons for discharge were either healed (n=234) or deceased (n=253). For these patients (n=487), wound aetiology is described in *Table 4*, and time to discharge in *Table 5*.

DISCUSSION

This study reports on the discharge outcomes of residents of nursing homes with wounds (n=579) who were managed by a specialist wound telehealth wound service over a three-year period. Of these, 92 patients were discharged to another location or specialist service, e.g. dermatology or podiatry (*Table 2*).

Of the remaining patients (n=487), discharge outcomes were categorised as either healing or death. The majority of patients achieving healing were female (80% versus 20% male), as were the

Table 2: Patient demographics					
	Female (n; %)	Male (n; %)	Mean age (years) [range]		
Healed	164 (80%)	70 (20%)	85 [31–106]		
Deceased	168 (66%)	85 (34%)	87 [33–104]		
Total	332 (73%)	155 (27%)	86 [31–106]		

Table 3: Discharge location for patients referred onwards from specialist wound care service

Discharge location	Number of patients
Patient's home	31
Referral to appropriate specialist, e.g. podiatry, dermatology	50
Transferred to specialist clinic	3
Other (hospital admissions, nursing home transfer)	8
Total	92

number of patients who died (66% of females versus 34% of males). This could be considered reflective of the general population where females experience greater longevity than males (Office for National Statistics, 2021), and therefore are more likely to make up more of the resident population within nursing homes. Mean age was similar between both healed (85 years) and deceased (87 years) groups.

Pressure ulcers were the most common wound type in this cohort, in both healed and deceased patient groups (60% and 59%, respectively). Although there is scant evidence in the literature, this is in line with the findings of other studies into wound types encountered within nursing homes. In England, an audit of a tissue viability service by Kingsley et al (2010) found that the largest single type of wound treated in the nursing home setting was pressure ulcers, making up 44.6% of wounds. Similarly, Vowden and Vowden (2009) observed 68% of wounds in an English nursing home population were pressure ulcers. Studies in Germany and Canada (Peckford, 2018; Raeder et al, 2020) also reported pressure ulcers to be the largest wound type, making up 50.5% and 58% of the wounds, respectively.

These findings are unsurprising as it is well recognised that this vulnerable patient group who are mostly non-ambulatory are at an increased risk of developing this wound type as a consequence of advanced age, immobility and comorbidities (Lavallee et al, 2018).

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Table 4: Wound types as per discharge group (n=487)				
Wound type	Healed	Deceased		
Pressure ulcer	140 (60%)	149 (59%)		
Lower limb*	47 (20%)	67 (26%)		
Other**	47 (20%)	37 (15%)		
Total	234 (100%)	253 (100%)		

* Includes all types of ulceration, wounds secondary to lymphoedema, skin tears and trauma

** All other wounds, including upper limb skin tears, fungating lesions, head trauma, and non-healing surgical wounds

Table 5: Mean time to healing or death (in days)				
Healed	103 (range = 7–893 days)			
Deceased	86 (range = 1–867 days)			

Pressure ulcer development is a recognised complication of the final stages of life and a recent systematic review from Ferris et al (2019) identified that skin failure, as with other organ failures, may be an inevitable part of the dying process for some patients. More surprisingly, the results reported here show that as many patients with pressure ulceration went on to achieve healing over the duration of the study, despite the presence of multiple known barriers to healing.

Likewise, the percentage of patients with lower limb wounds or wounds of 'other' cause that were healed or died were similar (lower limb wounds = 20% healed versus 26% deceased; other wounds = 20% healed versus 15% deceased). Lower limb wounds mainly occur as a consequence of circulatory and lymphatic failure, the likelihood of which increases with advancing age, immobility and co-morbidities (NHS Inform Scotland, 2022). As stated, this patient group is also susceptible to skin failure and breakdown at the end of life (Lavallee et al, 2018).

As expected in this population, a high mortality rate was noted. Mean time to death was 86 days from initial referral, with 75% of patients dying within 100 days. It should be noted that the patients who died during the study period did so with a wound, but not as a consequence of the wound. Specialist practitioners prescribing in nursing and care home environments should be mindful of this, as it points to a palliative wound service, rather than treatment, and this should be considered when developing a care plan.

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Perhaps more surprisingly, a similar number of patients were healed in an average of 103 days. Unfortunately, there is a paucity of outcomes data in the field of wound healing in general and in nursing/ care homes specifically, which makes it difficult to comment where the authors' findings sit nationally and if they represent a good outcome for this patient population.

Moffatt et al (1992) demonstrated that in ambulatory patients with VLU, high rates of healing could be achieved in a specialist clinic setting. Ennis et al (2017) also demonstrated healing in 73-75% of patients with wounds in specialist clinics. More recently in the UK, Gray et al (2020) demonstrated a mean healing rate of 86% at 117 days for patients with VLU treated by a specialist service over a six-year period. These results all relate to either a mix of ambulatory and domiciliary caseloads or ambulatory caseloads (Ennis et al, 2017; Gray et al, 2020). There is a paucity of outcomes data in the field of wound healing in general and in nursing/care homes specifically.

The rate of healing reported here can be described in a number of ways:

- As a percentage of the total population who were treated (n=579; 40%)
- As a percentage of those patients not discharged to another location or specialist service (n=92; 48%)
- As a percentage of those who did not die (70%).

The differing numbers obtained demonstrate the importance of reaching a consensus on how to express healing rates. More research is required in this area if the tissue viability specialty are to understand where quality improvement is required and what represents a high standard of care.

The results presented in this paper demonstrate the importance of equity of care in this patient population, since residents achieving healing will experience improved quality of life, will no longer be at reduced risk of costly wound complications such as infection, and will require less wound management and nursing time as a consequence. Without the insight provided by these findings, it may be easy for frontline staff to accept the wound's status and dismiss the wound as being a consequence of the patient's stage of life, when in fact the results presented here demonstrate

Practice point

Skin compromise at the end of life (SCALE) is unavoidable as it arises due to multiorgan failure. This depletes the skin of essential oxygen and nutrients that are needed to maintain skin integrity (Mitchell and Elbourne, 2018).

Pressure ulcers are caused by exposure of the skin to pressure and shear forces. They also commonly arise at the end of life.

Each individual patient should be assessed for pressure ulceration or SCALE and managed according to their individual condition (Mitchell and Elbourne, 2018)



Remember...

Resource use associated with unhealed wounds is greater than that used on healed wounds.

The annual mean cost of an unhealed wound is £3700, 2.5 times more than that of a healed wound (£1500) (Guest et al, 2020).

Therefore, healing wounds, where this is a possibility, saves valuable resource, including nursing time.

that prompt intervention can achieve healing. The findings also demonstrate, however, that there is a fine line between palliation and treatment.

The prevention of pressure ulcers has historically received more attention and focus than lower limb conditions. Recent publications by Guest et al (2015; 2020) and Gray (2018) highlighted the increasing number of older patients with chronic wounds, such as pressure ulcers and lower limb conditions, and the burden that these place on healthcare services. Of particular relevance was poor note-taking, wound assessment and diagnosis of lower limb conditions (Guest et al, 2015; 2020; Gray et al, 2018). As a consequence, sub-optimal care of patients with lower limb wounds in England is now under the microscope and measures have been introduced by NHS England to improve unwarranted variation in care. The National Wound Care Strategy Programme (NWCSP) has been introduced to improve wound care outcomes nationally, while leg ulceration and pressure ulcer risk assessment have been targeted for 2022/23 CCG CQUIN schemes (Adderley, 2019).

While unwarranted variation in wound care currently exists nationally, the authors are confident that every patient referred to the wound telehealth service received timely, evidencebased care. A specialist lead clinician and an experienced team with up-to-date training and skills worked in partnership with frontline staff to deliver the best care possible. The protocol of care followed by the service (*Table 1*) seeks to ensure that:

- Patients are seen in a timely and equitable manner
- A consistent, high quality dataset is captured at regular intervals
- Evidence-based treatment plans and wound care products are delivered promptly to avoid potential delays in the start of treatment.

'While unwarranted variation in wound care currently exists nationally, the authors are confident that every patient referred to the wound telehealth service received timely, evidencebased care. A specialist lead clinician and an experienced team with up-to-date training and skills worked in partnership with frontline staff to deliver the best care possible.'

Importantly, the telehealth service was supported by inperson specialist visits when the frontline staff were not competent in specialist skills, such as sharp debridement or vascular assessment, so that treatment could be initiated without delay.

While telehealth is not a new concept in wound healing and has been applied effectively for a quarter of a century (Burdick et al, 1996; Ablaza and Fisher, 1998; Vowden and Vowden, 2013), variations in approach exist and influence its successful implementation (Kostovich et al, 2022). Telehealth in wounds requires more than a single static image sent electronically from one party to another with a treatment plan generated in response to this limited information. For telehealth to be successful, the authors believe it requires the prescriber to understand the environment into which they are prescribing, the skill and knowledge of colleagues required to deliver the treatment plan, addressing of local cultural and environmental issues, and an understanding of the evidencebased treatment options available (Ellis, 2005; Barrett et al, 2009).

As mentioned, the fine line between palliation and treatment in this cohort also demonstrates the importance of the prescribing telehealth specialist collaborating with the frontline staff caring for the resident to understand their overall health situation. This means looking beyond making an assessment based on just images of the wound and limited referral information. Within this study cohort, patients in their 80s and 90s achieved full healing where the pressure ulcer was part of a significant deterioration in the patient's global health, that will result in death. The authors believe that establishing a collaborative relationship with nursing/care home staff is essential, for example, a simple phone call to discuss the patient can inform the specialist before prescribing.

Furthermore, the authors continually strive to improve the service by seeking to continually adapt and improve it to meet the needs of patients with wounds.

CONCLUSION

The findings of this study demonstrate that a specialist wound telehealth service can achieve wound healing in a vulnerable patient group residing in nursing homes, despite the existence of numerous barriers to healing, or can offer palliation at the end of life. Of key importance is equity of service and parity of access for all patients, regardless of their circumstance. In the current healthcare environment, it is difficult to meet this aim due to diminishing budgets and staff shortages, but a collaborative telehealth approach is one way in which it can be achieved.

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KEY POINTS

A specialist wound telehealth service was established to deliver equitable service with parity of access to wound care for all residents of 38 nursing homes in Sussex with wounds of any type (n=579).

All patients were managed using a systematic telehealth approach that combined digital and in-patient consultations according to established protocols and care pathways.

- Data for a three-year period was analysed by hand to determine patient demographics, wound type and discharge outcomes for all patients with wounds.
- Mean patient age was 86 years, with the majority being female (80% healed and 66% deceased).
- Referral outcomes were referred onwards (n=92), healed (n=234) or deceased (n=253). The most prevalent wound type was pressure ulceration in both healed and deceased patient groups (60% and 59%, respectively), followed by lower limb wounds (20% and 26%, respectively).
- Mean time to healing or death were 103 days versus 86 days respectively.
- A collaborative approach to telehealth ensured prompt and evidence-based care was delivered to all patients with wounds.
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