Improving Provider Knowledge of Chronic Wound Management Strategies: A Quality Improvement Project

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Abstract

Effective care for chronic non-healing wounds relies on a clear understanding of which factors impair healing and how these can be modified. The Institute for Healthcare Improvement offers guidance for the structuring of process improvement, and this framework was employed to develop a non-specialist provider centered presentation discussing considerations for the care of non-healing wounds. The aim of this project is to provide clear structure for understanding which factors impair healing and how these might be mitigated, relying on the American Board of Wound Management standard for healing. Important factors include addressing impaired perfusion, the presence of devitalized tissue, adequate edema management, evaluating microbial activity, examining pressure accumulation, and assessing the patient's overall health and contributing comorbidities. An educational presentation was designed around these concepts with learning assessed by the administration of pre- and post-educational evaluations, including clinician confidence scores. Improvement between these assessments was clinically significant, as were the number of providers who indicated a substantial rise in confidence related to wound management following the presentation. Additional resource allocation for chronic wound management training among non-specialists is warranted, given this outcome.

Problem Description

Chronic wound management as a field of science and the evidence supporting its practice is relatively new when compared to other defined specialty fields within the healthcare system. Under most circumstances, a wound is considered a problem unto itself and treated as such. When chronic health conditions were less common, this was not a harmful approach, though many of the practices used did not rely on an established evidence base and there was little consistency among wound care practices. As lifestyles change, the American population ages, and chronic disease becomes both more survivable and more prevalent, non-healing wounds as a manifestation of unaddressed underlying conditions become more common and require a more appropriate approach (Sen, 2023).

The clinical education to appropriately recognize when a wound is in a non-healing state is generally not appropriately provided outside of specialty training, which often leaves clinicians uncertain when higher levels of care are appropriate (at best) or functionally incapable of correctly identifying failure to heal at all (at worst), leading to a higher likelihood of serious infection, major amputation, and higher wound-associated mortality (Dung et al., 2020) (Chuang et al., 2023). Understanding which factors (lack of arterial perfusion or edema, presence of non-viable tissue, pressure accumulation, moisture imbalance, bioburden) impact healing and how these can be mitigated is instrumental in achieving wound closure. If these factors were more widely known, many wound-related complications could be prevented almost entirely (Sen, 2022).

The development of a comprehensive wound management curriculum which incorporates concepts of normal tissue healing with common causes of healing failure or stall has been identified as a potential meaningful solution to clinical unfamiliarity with wound management. Current barriers to this solution have been the lack of a centralized authority on wound

management, as several competing organizations have claimed this position without any clear governing body to direct practice. As a result, wound care practices have been driven by reliance on ritualistic practices among clinicians without regard to best practice or clinical evidence, lack of specialist involvement in existing educational programs, as well as corporate-controlling interest and bias among existing wound care research (Welsh, 2017).

The medical specialty of chronic wound management has been recognized for less than forty years, meaning that the longitudinal practices within the profession have changed very drastically during that period (Shah, 2012). While compiling and synthesizing available evidence, it is necessary to examine existing provider perceptions and comfort with the provision of wound care, and then isolate which barriers obstruct standardization of wound care education.

Available Knowledge

The studies examined during this process concluded that present wound care education is lacking in evidence or is simply not taught at all. The studies were evaluated using the Cochrane Risk of Bias tool and included two level-1 non-randomized experimental trials, as well as a level 3 cross-sectional study, all of which were designed to explore methods of enhancing available clinical wound care education (Dung et al, 2020, Moore et al, 2022, Chung et al, 2023).

In assessing how to implement an effective wound and healing management curriculum, appropriate indicators of effective learning must be evaluated. To this end, examining provider knowledge retention, provider confidence in diagnosing and treating chronic wounds, or a combination of these elements can guide the effectiveness of any specific wound care training regimen. Studies performed on wound care education initiatives and additional resources have predominantly relied on provider confidence as an overarching measure of effectiveness (Dung et al, 2020, Moore et al, 2022, Chuang et al, 2023), though these studies varied regarding the specific

educational intervention employed. The most robust of these studies involved the enrollment of 43 RNs into a 24-hour practical wound care rotation, as well as 11 hours of wound care theory (Dung et al, 2020). Pre- and post-intervention questionnaires were used to assess provider confidence and pre- and post-knowledge assessment tools demonstrated that all of the RNs involved showed greatly increased competence following training.

Likewise, the Moore study, which implemented the use of an algorithmically-driven application to assist in the provision of wound care, showed a significant increase in provider confidence among non-specialists, and represents a feasible method of offering instruction to clinicians who were not offered wound care management instruction during their primary education and who may have limited access or ability to attend continuing education sessions on this topic (Moore et al, 2022). Similar to studies by Chuang (2023) and Dung (2020), the results of this implementation change showed a statistically significant increase in provider confidence in the ability to correctly diagnose and treat non-healing wounds.

Rationale

A lack of appropriate provider education on the topic of delayed wound healing is a key contributor to delayed treatment access and poor patient outcomes, including major amputation and mortality (Johnston et al., 2024; Casciato, 2023). A presentation was designed by first reviewing the physiologic stages of appropriate healing, and then addressing in step-wise fashion the factors which delay healing. Appropriate interventions to address these were discussed, as well as when and how to refer patients to higher levels of care if necessary.

The American Board of Wound Management (ABWM) considers the understanding of multifactorial healing impairment a primary component of wound management competence, and so the presentation was designed with direct focus on those core concepts (American Board of

Wound Management [ABWM], 2024). The presentation avoided excessive focus on industry-driven wound care or specific product use, as the evidence available is of low quality. Access to wound care products varies greatly depending on each healthcare system (Goudy-Egger & Dunn, 2018).

Specific Aim

The framework utilized for this project closely follows the Plan, Do, Check, Act approach, and required construction of the presentation (plan), the delivery of the presentation (do), an assessment of whether the information was appropriately delivered through the pre-and-post presentation assessment (check), and the revising of the presentation (act) if an improvement in post-presentation assessment scores was not observed (Institute for Healthcare Improvement, 2024).

As wound healing science and the principles of chronic wound management are largely not taught, the challenge in constructing and delivering the presentation lies in laying physiologic groundwork for understanding the concept of delayed healing, defining wound-specific terminology and delivering the relevant information in a manner that is not overwhelming and is also contained within the time provided. For this reason, numerous versions of this presentation were delivered in other settings in order to elicit feedback before the presentation was given at the chosen clinical site.

Context

Central City Concern is an integrated health organization with facilities and services across the Portland Metro area, primarily focused on the provision of care to unhoused and vulnerable individuals as a federally-qualified health center. The medical staff are distributed across the organization into clinical departments, with most incorporating providers of various disciplines. The largest clinical setting includes six registered nurses (RNs), one naturopathic doctor (ND), two

medical doctors (MD), one physical therapist (PT), one nurse practitioner (NP), and a support team including medical assistants (MA), registrars and social outreach specialists.

The caseload is variable at Central City Concern, treating approximately 10-12 patients per day. Patient type tends to reflect lower socioeconomic groups and underserved minority populations, though patients from any background are accepted into care. Roughly 30% of clinical cases involve chronic non-healing wounds or conditions that highly predispose patients to their development.

Intervention

Using principles of chronic wound management developed by the American Board of Wound Management and supplemented by various other sources, the DNP student constructed a one-hour long presentation highlighting both normal healing and factors which compromise healing potential (Azar et al., 2022, Avishai et al., 2022). After this was constructed, permission was obtained to present for all interested providers either in person or online. This included providers at all practice levels (MA, MD, NP, ND, RN). A questionnaire was also developed, which was administered pre- and post-presentation and included 12 content-relevant questions and one subjective question regarding provider confidence.

The presentation was scheduled during the clinic's monthly staff meeting and was initially intended to be conducted entirely in-person. As many more individuals from other practice settings wished to attend than were initially anticipated, a synchronous video component was added and the presentation was recorded by request of the clinic. As this was unforeseen, the pre-and post-tests were provided only to those who attended in person.

Measures

The outcome measure for this project was to evaluate for increased competence and confidence in the provision of wound care among primary care (non-specialist) providers. This was evaluated by observing pre- and post-presentation assessments and comparing scores, as well as evaluating for a rise in provider confidence following the presentation. Process measures included the number of attendees and the number of completed assessments.

Results

This project was conducted on December 18th, 2024 over the course of one hour. Data was collected at that time and compiled after the presentation. 17 providers completed both pre- and post-assessments and their scores were averaged. Prior to the presentation, the mean score was 66%. Afterward, the mean increased to 84%, demonstrating a statistically significant improvement in understanding.

Likewise, 6 providers indicated “no confidence” in their ability to address chronic wounds prior to the presentation, 6 indicated they were “somewhat lacking confidence” and 5 indicated they felt “somewhat confident.” Following the presentation, all individuals ranked their confidence more highly than they had initially, with 12 respondents indicating they felt “somewhat confident” and 5 feeling “confident.”

Policy and Practice Implications

Wound care was originally established as a nurse-led field, primarily driven by dressing selection because, at that time, wounds were not generally complicated by chronic disease consideration. Provider-led wound care became widely established in the early 1990’s and was largely implemented by for-profit wound care management companies which tightly controlled

their research into wound-resolution strategies (Avishai et al., 2017). For this reason, provider knowledge related to chronic wound management has changed very little and lags far behind the developed evidence base.

Because of these proprietary considerations, no single wound care accreditation body exists. This leads to significant discrepancies between standards of practice even among wound care certified individuals. The establishment of a single, unified wound care accrediting body would significantly improve the provision of clinical wound care and lead to more wide-spread dissemination of wound care evidence-based practice.

Discussion

The expectation of this project was to increase provider familiarity and confidence in the provision of care to chronically wounded patients by increasing their understanding of conditions that contribute to failure to heal. This presentation was not expected to take the place of specialist care. It was designed to offer providers practical knowledge regarding healing to effectively monitor their patients, provide recommendations for care they are capable of in their setting, and refer appropriately based on what they observe.

The initial low assessment scoring followed by the score rise upon completion of the presentation indicated that this presentation met its goal of increasing provider familiarity and confidence regarding wound management. After the project concluded, Central City Concern requested that this presentation video be archived for their incoming providers as a means of appropriate wound care training. This feedback along with a positive response among attendees speaks to the success of the intervention in the clinical setting and the potential viability of its implementation in other practice settings.

Limitations

The provider distribution in attendance was not restricted to any one discipline, largely owing to the varied professions who practice wound care. For this reason, educational topics and verbiage were standardized at a level that could be grasped by everyone in attendance, regardless of their role. There may be some place to separate out types of teaching or focus more heavily on specific topics depending on job title.

Due to unforeseen circumstances prior to the presentation, the number of providers who would be in virtual attendance was underestimated. For this reason, questionnaires were not made available for those individuals and the effectiveness of the teaching in the virtual setting could not be captured.

Conclusion

Patients with chronic, non-healing wounds require treatment that considers the underlying cause of their failure to heal. As these patients are generally first assessed by their primary care providers, a robust understanding of how to address chronic non-healing wounds improves outcomes. Important factors include addressing impaired perfusion, the presence of devitalized tissue, adequate edema management, evaluating microbial activity, examining pressure accumulation, and assessing the patient's overall health and contributing comorbidities. When we give providers a framework for their thought process and direct wounded patients to the best level of care, we place them in the best possible position to address and resolve their wounds.

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Appendix

Provider Knowledge Assessment Pre and Post-test

Wound Management Presentation

The MOST reliable indication of poor arterial circulation is:

a.) Capillary refill greater than 3 seconds

b.) Dependent rubor

c.) Lower extremity hair loss

d.) ABI of 0.7, TBI of 0.35

Which is the MOST common cause of delayed healing?

a.) Infection

b.) Immunodysfunction

c.) Tissue hypoxia

d.) Protein/calorie malnutrition

Which agents are appropriate for routine wound cleansing?

a.) Hydrogen peroxide

b.) Povidone Iodine

c.) Diluted isopropyl alcohol

d.) Saline solution or soap and water

Chronic wound infection is MOST commonly represented by:

a.) Increased pain, increased wound size

b.) Fever

c.) Erythema

d.) Purulence

What's the distinction between an infected and colonized wound?

a.) Colonized wounds heal regularly, infected wounds show healing delay

b.) Presence of white blood cells on culture is more suggestive of true tissue infection

c.) Multiple types of bacteria present on culture suggest infection rather than colonization

d.) These terms are interchangeable in the setting of chronic wounds

Which is the most effective treatment of a colonized wound?

a.) Debridement

b.) Iodine application

c.) Systemic antibiotics

d.) None of the above

What is the MOST common cause of high wound exudate?

a.) Tissue edema

b.) Bacterial contamination

c.) Arterial insufficiency

d.) Cellulitis

What is the MOST common cause of lower extremity edema?

a.) Congestive heart failure

b.) Chronic venous disease

c.) Arterial insufficiency

d.) COPD

Which of these methods is generally effective for prevention/management of peripheral edema?

a.) Compression stocking use

b.) Vein ablation

c.) Velcro-closure garment application

d.) All of the above

The most appropriate treatment of a draining ulceration in the setting of profound peripheral edema would be:

a) Compression stockings

b.) Compression bandaging

c.) Diuretic use

d.) Leg elevation

Lower extremity hair loss is most commonly caused by:

a.) Arterial insufficiency

b.) Venous insufficiency/peripheral edema

c.) Congestive heart failure

d.) This is a normal change associated with aging

Well-controlled diabetes (A1C of 6.5, CBGs routinely at or less than 120) impairs healing:

a.) True

b.) False

How confident do you feel in treating chronic wounds?

a.) Very confident

b.) Somewhat confident

c.) Somewhat lacking confidence

d.) Not confident at all