

Wound Pain: Assessment and Management



BY Cynthia A. Fleck

Abstract

In the past, research has focused on healing as the major outcome of wound treatment, with very little attention paid to other patient-centred outcomes such as pain. However, with the development of quality-of-life assessment in patients with chronic wounds, pain has been identified as a major issue in the past 10 to 15 years.

Mr. G.B. is a 57-year-old male with Type 2 diabetes mellitus and frequent diabetic neuropathic ulcers. He is a pleasant man who spends most of his days working as a diesel mechanic, standing up for long periods at a time. He often brings a smile and a contagious laugh to whomever he meets. Today he is not his jovial self, and he looks tired and depressed. You ask him how he is feeling and he says, "I think my wound has taken a turn for the worse. It's been hurting all of a sudden. That's why I called and made an appointment. It's even been keeping me up at night." When you ask Mr. G.B. to rate his pain on a numerical rating scale, he states that it is a "9" on a scale of 1 to 10.

After he takes his diabetic shoes off, you remove his dressing, and Mr. G.B. winces in pain. He states, "It has been hurting pretty much all of the time, but it really smarts when you mess with it." As you gently remove the dressing, the wound appears bright red, friable and inflamed, with slough tissue present. The peri-wound tissue is tender to touch, warm and red. You immediately suspect infection.

Objectives

One of the first questions for the wound-care profes-

sional to ask during the initial assessment is "What end-points are expected?" Is wound closure the goal? Stabilization? Improvement? Or are palliative issues such as a decrease in the wound's pain and/or odour the ultimate objective? Does symptom management outweigh a curative treatment plan, such as with an end-of-life wound? This issue should be answered initially upon admission and must be consistent with the overall purpose and priorities of treatment.

Evidence

The evidence to support the hypothesis that wound pain is a problem experienced across the spectrum is solid. Dallum et al. reported that only two per cent of patients with pressure ulcers who reported pain or discomfort received pharmacologic treatments in their qualitative, cross-sectional study of 132 patients with pressure ulcers.² Krasner found that 42 per cent of patients reported pain as continuous, occurring both at rest and at dressing changes.³ Only six per cent of these patients were prescribed analgesics.⁴ During a one-day descriptive study involving 50 patients, Shukla and colleagues showed that 92 per cent experienced pain.⁵

The American Geriatric Society (AGS) Panel on

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Persistent Pain in Older Persons found that up to 80 per cent of nursing home residents with pressure ulcers have significant pain that is under-treated.⁶ A study of 94 patients by Hofman showed that the main areas of pain were within and around the wound.⁷ Hofman also found that 64 per cent of patients rated their pain as “severe,” and 50 per cent used mild or no analgesia.

Wound Discomfort

Greater attention should be paid to wound-product evaluations and surveys where characteristics such as pain, maceration, trauma and comfort are observed.⁸ From a sensory dimension, information about how the wound “hurts” and what it feels like is uncovered. Following the initial tissue damage, the inflammatory response sensitizes the pain receptors in the skin. This helps the individual locate the extent and site of the wound so that it can be protected. When evaluating non-verbal and/or cognitively impaired individuals, start by performing a physical exam for evidence of purulent discharge, bone involvement, tenderness, erythema or induration. Many cognitively impaired patients can respond to a simple pain scale like the Wong-Baker FACES if asked.⁹

In the acute wound, the pain generally subsides with healing. In chronic wounds, however, the impact of the prolonged inflammatory response can cause the patient to have an increased sensitivity in the wound (primary hyperalgesia) and surrounding skin (secondary hyperalgesia). Further painful or noxious stimuli due to repeated manipulation, such as during dressing changes, will act as a “wind-up” mechanism, which locks the patient into a cycle where any sensory stimulus will register as pain (known as allodynia).⁸

The current understanding of wound pain is primarily drawn from the literature relating to other conditions and the physiology of acute and chronic pain. A quick review will be helpful in comprehending wound-specific pain. There are two major types of pain: nociceptive and neuropathic.

Nociceptive pain results from mechanical or thermal excitation or trauma to peripheral receptors called nociceptors. Nociceptive pain involves the ordinary processing of stimuli that damages normal tissues or has the potential to do so if prolonged. In this way pain becomes a “conscious” perception. This type of pain is usually responsive to non-opioid and/or opioid drugs.

Nociceptive pain can be categorized into **somatic** and **visceral** pain. Somatic pain arises from bone, joint,

muscle, skin or connective tissue. It is generally aching or throbbing in quality and is well localized. Visceral pain arises from visceral organs, such as the gastrointestinal (GI) tract and pancreas. Visceral pain tends to be vague and poorly localized and may radiate to unexpected locations.

Neuropathic pain is described as burning, “pins and needles,” electrical, shooting or lightning-like pain. It results from either injury to or malfunction of the central or peripheral nervous system. Nerves can be affected by either compression or infiltration by infections, scar tissue or tumours. Neuropathic pain responds poorly to opioids and analgesic treatment and may persist for years.

Since wounds consistently involve damage to nerves, some patients may experience altered sensations as a result of the changes in how the nerves respond (neuropathic pain).¹⁰ Even the lightest sensation, such as a change in temperature or air blowing on the wound, can produce an exaggerated response from the central nervous system, causing the individual excruciating pain. Wound-healing complications, such as maceration, infection and ischemia, may further contribute to the pain response.¹¹

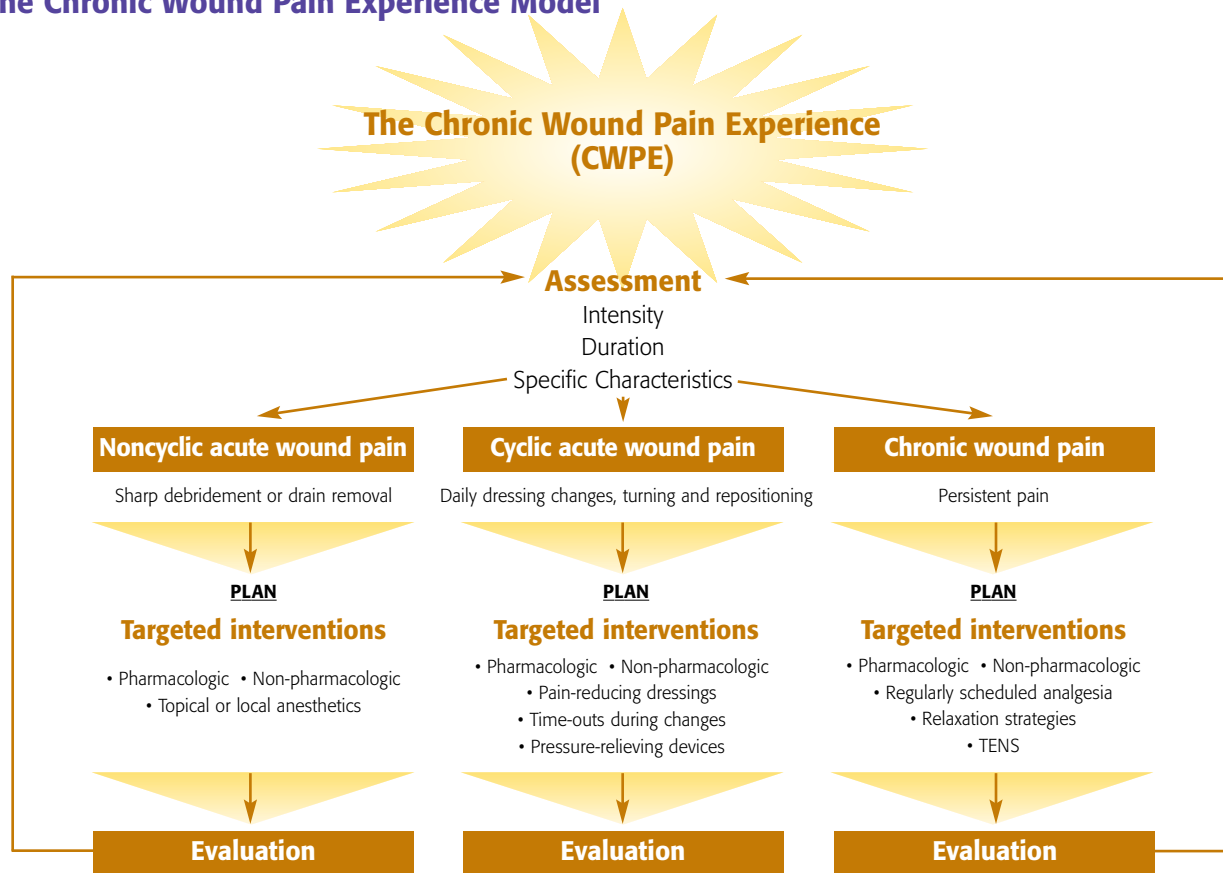
The first model for chronic wound pain assessment and treatment was presented by Krasner in 1995.³ This useful model highlights the difference between background pain associated with the underlying etiology of the wound and the pain caused by treatment (iatrogenic pain), such as dressing pain. The model is shown in Figure 1.

The European Wound Management Association (EWMA) published a position statement—developed by a multinational group of interprofessional wound-care practitioners—on wound pain and trauma, including wound pain during dressing change.⁸ The key findings of this report are shown in Figure 2. This position document began from a growing acknowledgement that pain is a common symptom in patients with a variety of wounds. Findings from a multinational survey study of health-care professionals involved in wound management revealed that 63 per cent of patients experience pain at the time of dressing change.¹² An additional 30 per cent experience pain during routine wound cleansing.

Wound pain can serve as an indicator of inadequate wound management, an untreated underlying cause and/or an infection, as in the case of Mr. G.B. Such pain frequently occurs during dressing change or

FIGURE 1

The Chronic Wound Pain Experience Model



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debridement because of exudate pressure around wound edges, in the infected wound, with the application of antiseptics, and during certain wound-cleansing procedures.⁸ Consider not only pain-free wound dressings but also advanced dressings to decrease the frequency of dressing changes.

Unresolved pain can negatively affect wound healing, which, in turn, has a negative impact on quality of life, causing activation of the sympathetic branch of the autonomic nervous system, leading to tissue hypoxia, stimulating the hypothalamic-pituitary-adrenal axis, causing a release of cortisol, and ultimately negatively affecting wound healing.^{13,14}

Professionals often define and understand a patient's wound pain based on clinical assumptions. For example, it is frequently accepted that arterial ulcers are more painful than venous ulcers and that small ulcers are less painful than large ulcers. The relationship, however, between the intensity of pain a patient experiences and the type or size of the injury is highly variable and is not an accurate predictor of

pain.⁸ In a review by Langemo and associates, 50 per cent of patients with pressure ulcers have pain, particularly those with Stage III and IV pressure ulcers.¹⁵ The degree of pain has also been correlated to the stage of the pressure ulcer, thus contradicting the common wisdom that Stage IV pressure ulcers are painless.¹⁶

In their quantitative study, Szor and Bourguignon have reported that 87.5 per cent of patients reported pain at dressing change and 84.4 per cent of patients with wounds reported pain at rest. Of those patients reporting pain during dressing changes, 18 per cent described it as "horrible" or "excruciating." Forty-two per cent of patients reported it as continuous, occurring both at rest and at dressing change. Only six per cent of the patients had been prescribed analgesics to address their pain.²¹ This study used a cross-sectional method to examine the pain experience of 32 patients with Stages II to IV pressure ulcers both at rest and during dressing change.

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Wound Pain Fundamentals

Assume that every wound is painful and that every patient who has a wound is in pain.¹ Patients frequently experience pain during dressing changes (e.g., from dried dressings, strong adhesives, debridement, and the pressure of exudate), especially around wound edges and in infected or inflamed wounds. Wound pain can serve as an important indicator of inadequate wound management, untreated underlying cause, and/or infection.

Moist wound healing has been demonstrated to result in faster healing,^{33,34} less scarring, and less pain. The pain reduction is attributed to the bathing of nerve endings in fluid, preventing dehydration of the nerve receptors.³⁵

In summary, the following pain-relief strategies are intuitive yet sometimes forgotten:

- Handle all wounds gently.⁹ Flush, don't rub, when cleaning.
- Avoid unnecessary stimulus to the wound, such as prodding or poking or drafts from an open window, fan or vent.
- Protect wound edges with barrier co-polymer, cream or a hydrocolloid wafer cut to fit around the wound.
- Allow patients to change their own dressing if possible.³⁶
- Allow patients to call "time out" verbally or by some nonverbal cue like raising their hand.³⁷
- Encourage slow, rhythmic breathing and other relaxation techniques.
- Let patients know that there are "no points for bravery" and that blood flow can actually be decreased during episodes of pain.
- Medicate prior to dressing change and debridement. Choose a topical anesthetic that is safe and easy to use. It should be applied approximately 20 to 30 (or up to 60) minutes before the procedure, and under occlusion (plastic wrap), depending on the area to be treated and the extent of treatment.³⁸
- Use dressings least likely to adhere and to cause pain such as hydrogels, hydrofibers, alginates, soft silicones³⁹ and cellulose.⁴⁰ Dressings that can dry out, such as gauze, can cause tremendous pain, especially when removed.⁴¹
- Avoid aggressive packing. Fill, don't pack, the wound with open or dead space.
- Avoid using gauze, which is a key factor in the development of painful wounds.⁸ Novel alternatives like the polyacrylate dressings provide moist wound healing and fast, efficient debriding without the pain.^{28,42}
- Choose high-tech dressings that are appropriate for a particular wound and can remain *in situ* for longer periods of time to reduce the need for frequent dressing changes.
- Select dressings with absorbency that matches exudate levels.⁹

Dressing and Treatment Tactics

Dressing removal is considered to be the time of most pain.⁸ Dried dressing and adherent products are most likely to cause pain and trauma at dressing changes. Products designed to be non-traumatic should be used to prevent tissue trauma. Gauze is most likely to cause pain and should be avoided.¹⁷ Clinicians should avoid wet-to-dry regimens as well.¹⁷

Consider novel alternatives such as polyacrylate debriding. This method debrides a mean rate of 38 per cent¹⁸ and produces no discomfort¹⁹ while potentially removing biofilm²⁰ and debriding just as well as collagenase-based²¹ products used in the United States and elsewhere and now available in Canada.

One of the most important considerations in selecting a dressing to diminish wound pain is that the chosen dressing must minimize the degree of sensory stimulus to the sensitized wound area.¹ Any dressing that sticks to the wound bed, such as gauze, or dries within the wound bed and is then pulled away, sends more sensory information to the skin's receptors than one that is easily rinsed away or slides off the inflamed tissue.¹ Dressings such as sheet and amorphous hydrogels, hydrofibers, alginates, soft silicones⁸ and cellulose dressings²² provide beneficial wound-healing environments and offer a virtually pain-free dressing removal while curtailing the pain experience during wearing time.

Be sure to select dressings with absorbency that matches exudate levels.¹ Choose dressings that can remain *in situ* for longer periods of time⁹ to minimize the chances of wound manipulation and a harmful aggravation of the pain cycle. Contact layers or dressings that remain in close proximity to the wound bed during dressing changes also have proven beneficial in the pain arena.²³ Don't neglect pain management during wound cleansing either. Appropriate non-cytotoxic wound cleansers used at body temperature (~37°C) at 4-15 psi are best to reduce discomfort.²⁴ Avoid cytotoxic solutions, such as povidone-iodine or hydrogen peroxide, when cleaning the wound,²⁵ as these can cause discomfort and can be lethal to fibroblasts and keratinocytes.

Simple measures, such as the use of skin preparations (primarily the stingless varieties) in the form of polymers that adhere to the skin to strengthen and prepare it for adhesive application, can lead to less trauma to sensitive peri-wound skin.²⁶ Use them whenever you dress a wound. When removing a dressing,

avoid unnecessarily manipulating the wound, thus preventing further damage to the delicate granulation and healing tissue within the wound bed and peri-wound skin. If the dressing has become dried out, moisten it with an isotonic solution before removing.²⁷ Choose dressings that allow less frequent and therefore less painful dressing changes. Also, consider contact layers that stay in place when the dressings are changed, thus staving off potential wound-bed pain.

Silver dressings, especially ionic silver hydrogels, could be one of the most ideal pain-free dressings. These dressings provide a broad-spectrum antimicrobial action with little or no known resistance in nature²⁸ and maintain moisture balance with pain-free application and removal. They also provide autolytic—thus pain-free—debridement. Silver-based dressings may also display anti-inflammatory actions²⁹ while eliminating any offensive odours.³⁰

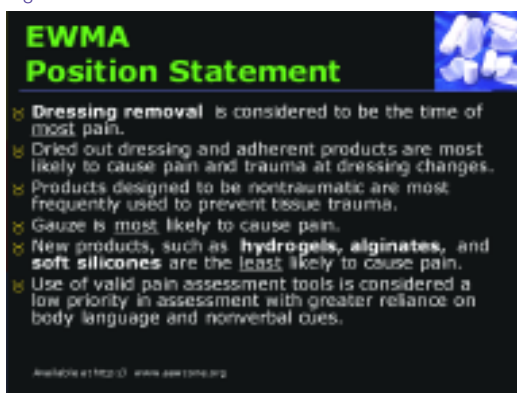
Another area of concern is how the dressing is attached. In a study by Dykes et al., some adhesive dressing caused skin stripping upon removal.³¹ One of the many myths surrounding wound pain is that “paper tape is the least painful way to secure a dressing.” Heightened nerve sensation in a wide area around a wound can make any adhesive tape painful to remove.¹ A thorough review of the dressings and tapes that you and your facility use is imperative. Are they gentle on thin, aging epidermis as well as on young, immature skin or skin that has endured critical illness? Do these dressings adhere to the underlying skin with a low sensitivity adhesive, yet allow for easy removal and repositioning? Careful evaluation of your protocols is a necessary and important first step. State-of-the-art “tapeless” ways of securing a dressing have been around for centuries; Montgomery straps, Kling gauze, elastic netting, “grip” elastic support bandages and tubular dressings that offer a bit of support and compression (7-8 mm Hg) not only provide support to the dressing but also further protect from the injury and pain of removal and reapplication of tape.³²

Other Pain-reducing Strategies

Additional pain-relieving tactics that can easily be integrated into advanced wound-caring practice include the following:

- In a qualitative study of patients with pressure ulcers, Dallum and associates showed that pain was significantly lower in patients using support surfaces for pressure reduction.² Support surfaces take pressure off of the body's frame and soft tissue, promote a healthy

Figure 2



Key findings of EWMA Position Statement.⁸

microclimate, and conform to body contours. Check to see if your protocols and procedures include the use of offloading support surfaces for pain management as well as prevention and treatment of pressure ulcers.

- For gentle skin care, use a four-pronged approach: clean, moisturize, protect, and nourish the skin of every patient—every time. Consider going soap-free. Newer products without harsh surfactant-type cleansers use phospholipids to clean, leaving the skin healthier and more comfortable. Look for ingredients like methylsulfonylmethane (MSM), which slows the conduction of pain fibres and helps to reduce inflammation.⁴³
- When utilizing Negative Pressure Wound Therapy (NPWT), patients often experience pain. Consider pre-medicating 30 to 60 minutes prior to dressing removal. Pain can be dramatically reduced by instilling normal saline onto the dressing, and/or by a physician or nurse practitioner's order for lidocaine solution to be injected 30 to 60 minutes prior to removal of dressings. Line the wound bed with an amorphous hydrogel or powder with ionic silver—their use not only helps relieve pain on initiation and removal but can also potentially cut offensive odour and number of days on NPWT—or a non-adherent gauze.⁴⁴ Also, be sure to apply a skin prep or sealant to the peri-wound skin prior to applying the occlusive drape.⁴⁵ Other strategies include keeping exposed tissue moist with normal, saline-soaked gauze or impregnated hydrogel gauze during long dressing changes and NPWT changes. Ensure that adequate personnel participate in the dressing change to minimize the time spent. More than one clinician is usually necessary to change these complex dressings.

Revisiting Mr. G.B.'s case

Mr. G.B.'s case is certainly not an isolated one. Wounds and pain often go hand-in-hand, and patients suffer

silently. Pain as a symptom can indicate critical colonization, or worse, infection, which happened with Mr. G.B. Therefore not only should pain be assessed at regular intervals—such as during dressing changes—but also patients should be encouraged to report pain.

After the interprofessional team met to discuss Mr. G.B.'s case, they developed an extensive plan of care, including the eradication of his wound infection and the associated pain. After discussing the strategy with Mr. G.B., the physician debrided the slough tissue and peri-wound callus of his Wagner grade III ulcer. The staff then used a safe, broad-spectrum, antimicrobial cleanser containing benzethonium chloride (BC) and sent a bottle of the cleanser home with Mr. G.B. to use at every dressing change.

Since the wound produced signs and symptoms of clinical infection and was highly exudative, an ionic silver alginate/CMC combination dressing was applied, which was later changed to an ionic silver amorphous hydrogel because the wound became dry. Additionally, the infectious disease physician ordered systemic antibiotic therapy. The chiropodist/podiatrist was consulted for appropriate offloading and, later, new diabetic-shoe fitting as the ulcer healed. Often, systemic antibiotics are unable to reach ischemic tissue, including that of diabetic patients, so a topical antimicrobial should always be used in addition to systemic therapy.⁴⁶

Mr. G.B. reported a decrease in pain on the numerical rating scale from a "9" down to a "2" within the first 24 hours. His mood and attitude were much more positive and consistent with his normal personality. Now, when the home-care nurse visits, she calls to report that the redness, tenderness and exudate levels have diminished and that Mr. G. B. is laughing and telling jokes as before.

Victory came by challenging this important pain issue directly and by dealing with the impending critical colonization. Simple solutions to address the various types of wound pain are available and can easily be incorporated into the plan of care. ☺

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