

The impact of psychological factors on wound healing



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The links between the mind and the body have long been explored, and evidence demonstrates this can have a direct effect on wound healing (Wynn and Holloway, 2019). Cole-King and Harding (2001) established the link between anxiety and depression and wound healing: patients scoring in the top 50% of total Hospital Anxiety and Depression Scale (HADS) scores were four times more likely to have delayed healing than those scoring in the bottom 50%. In addition, the psychological toll of living with a chronic wound can also impact on quality of life. In an international webinar broadcast on November 5, 2020 and available to watch on demand on [Wounds International TV](#), Gerry Hussey and Trudie Young explored how effectively managing the associated stress of living with a chronic wound can positively impact patient wellbeing and enhance wound healing. This webinar included two cases, which provide practical examples of appropriate wound care product selection in different care settings. In the cases selected, 3M products have been used to manage the chronic condition and help improve patient wellbeing and quality of life.

Patients with a chronic wound usually have multiple underlying comorbidities, which are more complex to address than the wound itself. In some cases, they may have undergone a long-term process of trying different therapies that haven't worked. For these patients, there is a lack of certainty as to whether their wound will heal, as progress can be so slow that they lose hope. On the other hand, some patients can become complacent and accept the wound as part of their 'new normal', with the belief that it may never heal. For both patient groups, they may experience pain, stress, social isolation, loss of self-esteem and an inability to carry out activities of daily living.

As such, psychological tools are necessary to fight the ongoing frustration of a long-term chronic state and should be used by clinicians in order to engage patients in their own care, and optimise their mindset around their healing journey. By focusing on communication and getting to know patients, we can begin to understand their individual needs, worries and concerns. Positivity can help to boost overall

wellbeing and have a tangible effect on the body: this can be reflected by the words clinicians use — i.e. taking a more positive slant — which is a practical method to engage patients and help build a therapeutic relationship.

The importance of patient wellbeing

The field of performance psychology and coaching centres around the links between the mind and the body – i.e. the idea that our thoughts and stress levels have a physical impact on the body. This field can be extrapolated into wound healing and patient wellbeing. Considering each of the factors that contribute to a patient's wellbeing may help to identify how patients can be supported holistically – for example, using appropriate dressings to reduce pain levels could potentially minimise stress.

Stress management is not a one-off intervention and recommendations for managing stress in patients with a chronic wound are needed [Table 1]. An holistic team approach to wound management is advised, that accounts for stress and psychological

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| Recommendation | Key message |
|--|--|
| Get to know the patient | Establishing a good rapport with patients can help to create a close and trusting environment – they are more likely to be honest about their symptoms |
| Communicate effectively | Using positive language can help to build patient understanding, safety and satisfaction |
| Help the patient achieve a positive mindset | If patients can achieve a positive mindset by replacing internal discouraging and negative thoughts and maintaining an inner sense of belief, focus and passion, this will help them through their wound healing journey |
| Encourage a healthy diet | A balanced diet helps to keep the immune system healthy and strong and improves wound healing |
| Encourage meditation or controlled breathing | Using these techniques can help patients gain a new perspective on stressful situations, focus on the present and reduce negative emotions |

factors as potential causes of delayed wound healing. Clinicians should also be aware of any other sources of anxiety that may be associated with stalled wound healing, such as self-image, odour, social isolation, debility and disruption of daily activities (Price et al, 2008; Woo et al, 2008; Woo, 2010).

The following strategies are recommended to aid identification and optimisation of stress-related factors (adapted from Woo, 2010):

- Engage patients by talking openly about their concerns relating to wound care

- Encourage patients to actively participate in their assessment and treatment plan
- Empathise with the individual living with a chronic wound
- Educate patients by explaining procedures and how they are performed, helping to dispel any myths and misconceptions that may be causing anxiety
- Look at the whole patient, and any factors that may be affecting their wound healing beyond the physical.

The physiological impact of stress

Stress has many definitions, but for the purposes of this paper, can be defined as ‘a process whereby environmental demands exceed a person’s individual perceived ability to cope, resulting in behavioural and physiological changes’ (Cohen et al, 1997). Stress can be subdivided into two distinct types: acute stress, resulting from a short traumatic experience, and chronic stress, associated with long-term issues, which could include social or personal factors or disease progression in the case of wounds or comorbidities (Segerstrom and Miller, 2004).

Stress can affect physiological and behavioural changes (e.g. poor diet, little exercise, smoking or alcohol use), which may lead to an increase in inflammatory markers and wound healing time (Christian et al, 2006; Gouin and Kiecolt-Glaser, 2011).

The wound healing process

The stages of normal wound healing proceed in an automated fashion and follow four processes: haemostasis, inflammation, proliferation and maturation, see [Table 2](#) (Stacey, 2016). However, these processes are susceptible to interruption due to local

| Phase | Timeframe | Cells involved | Function | Cellular and biophysical events |
|---------------|-----------|---|----------------------------------|--|
| Haemostasis | Instant | Platelets | Clotting to prevent blood loss | Vascular constriction, Platelet aggregation, degranulation, Thrombus formation |
| Inflammation | 1-4 Days | Monocytes, Lymphocytes, Neutrophils, Macrophages | Phagocytosis | Neutrophil infiltration, Monocyte infiltration, Lymphocyte infiltration |
| Proliferation | 4-12 Days | Lymphocytes, Macrophages, Angiocytes, Neutrophils, Fibroblasts, Keratinocytes | Wound bed filling, Wound closure | Re-epithelialisation, Angiogenesis, Collagen synthesis |
| Maturation | 21+ Days | Fibrocytes | Develop tensile strength | Collagen remodelling, Vascular maturation, Regression |

and systemic factors, including stress. Within a systematic and holistic assessment and treatment plan, if healing does not progress as suspected, stress should be considered as a possible factor (Gouin and Kiecolt-Glaser, 2011).

Stress and the mechanisms of healing

Wound healing requires pro- and anti-inflammatory cytokines, with the suppression of pro-inflammatory cytokines having an adverse effect on the inflammatory stage of healing. In particular, chronic stress has been found to cause abnormal extension of the inflammatory response, with measurable increases in inflammatory cytokines, disrupting the normal wound healing phases and prolonging wound healing times (Christian et al, 2006; Walburn et al, 2009). Glucocorticoids cause delayed wound healing by suppressing the systemic release of pro-inflammatory cytokines, which are required for the wound healing process (Kato et al, 2017), such as interleukin-1, interleukin-6, interleukin-8, tumour necrosis alpha and keratinocyte growth factor.

Stress and the immune system

Stress can negatively impact immunity (Morey et al, 2015). The immune system comprises cells, proteins, organs and tissues that work to protect and fight off bacteria and viruses. During acute stress, certain cells are mobilised into the bloodstream, preparing the body for injury or infection as part of the 'fight or flight' response. This response can last a matter of minutes and increases blood levels of pro-inflammatory cytokines. These increased levels can also be linked to chronic stress, which may last days or years and can dysregulate the immune system and increase the risk for chronic diseases (Morey et al, 2015).

Enabling the patient to understand the relationship between stress and the immune system and what enables a wound to heal can have a significant effect in improving outcomes.

Wound-specific stressors

Literature contains numerous examples of factors known to cause stress to a patient living with a chronic wound: these are known as wound-specific stressors. These include physical stressors, which can delay wound healing, and psychological stressors, which can impair an individual's quality of life and impact the wound healing

process. Pain has also been established as a key cause of delayed healing due to the associated inflammatory responses, as well as psychosocial impacts that may include behavioural changes secondary to pain-related stress (Snyder, 2006). Chronic wound-related pain constitutes a psychological stressor that triggers the hypothalamic-pituitary-adrenal axis, promoting the production of glucocorticoid (cortisol) and vasopressin (McGuire et al, 2006). This has been associated with greater perceived stress and subsequent delayed healing (Ebrecht et al, 2004). Increased levels of stress and heightened anxiety have been linked with a lower pain threshold, as the person may become more vigilant of somatic signals: this can result in a vicious cycle of pain, stress/anxiety, and worsening of pain (Woo, 2010). Relatedly, the anticipated effect of pain has been demonstrated to intensify the actual pain experienced during a dressing change (Woo, 2010).

Snyder (2006) also identified odour and body image issues as major sources of stress in patients with a wound. The inability to carry out activities of daily living was also found to cause secondary social isolation and feelings of hopelessness. Cole-King and Harding (2001) recommended further investigation into behavioural and pharmacological interventions, to reduce the level of anxiety and depression in patients with potentially stress-induced delays in healing. In individuals experiencing pain that cannot be managed by medication (e.g. painful diabetic neuropathy) — psychological interventions may be necessary.

Monitoring stress

While stress can be difficult to measure (Wynn and Holloway, 2019), various methods have been suggested. Biomarkers such as cholesterol, blood pressure and body mass index may help to guide identification and management of stress, and provide a broad picture of an individual's health. Cortisol and interleukin-6 levels may also be checked, although these are not always routine tests.

Looking beyond the physical

A healthy mindset is a key component of a healthy body and attention should be paid to how an individual views themselves. If clinicians look only at the physical factors, they may miss underlying psychological and emotional factors that are affecting the



Figure 1. Coban 2 Lite Two-Layer Compression System.

Case study 1. Living with a chronic venous leg ulcer (Courtesy of Melinda Brooks, Nurse Practitioner, Melbourne, Australia).

Background: In October 2019, Jack presented with a chronic venous ulcer on his left lateral calf, which had been present for 3 months. The wound was small, measuring 1.5cm x 1.0cm, with partial-thickness tissue loss and significant oedema in the lower limb, mainly due to his comorbidities. These included cardiac failure, sedentary lifestyle due to limited mobility and mild peripheral arterial disease. The wound was impacting significantly on Jack's quality of life. It was painful, reduced his mobility and prevented him from carrying out activities of daily living. Due to his cardiac issues, Jack had many episodes of feeling unwell and would spend stints in hospital.

Treatment: Treatment initially commenced with a tubular form, tight compression system to allow ease of application for staff in his nursing home; however, this led to high levels of exudate, further maceration and skin breakdown. The wound increased significantly in size, measuring 6cm x 4cm. The decision was made to use a super-absorbent dressing and 3M™ Coban™ 2 Lite Two-Layer Compression System [Figure 1] to provide consistent compression to reduce the lower-leg oedema. Jack was involved in the decision-making process; potential complications, such as shortness of breath, were discussed to ensure he would be comfortable with the system. Two nurses were educated on how to apply the compression system safely to ensure continuity of care and avoid trauma to the tissues and limb.

Results: Coban 2 Lite Two-Layer Compression System was comfortable, lightweight and the compression therapy effectively reduced limb size. The wound progressed well and healed in a reasonable timeframe, despite Jack's complex comorbidities. Jack had peace of mind that the goals set out at the beginning of care had been achieved, which were to heal the wound as quickly as possible, reduce pain and improve quality of life.

Case study 2. Living with lymphoedema (Courtesy of Síle Dillon).

Background: Síle is a 39-year-old lymphoedema patient. In 2015, she was diagnosed with cervical cancer and underwent a radical hysterectomy, followed by 29 rounds of radiotherapy and six rounds of chemotherapy. Secondary to cancer treatments, Síle developed lymphoedema, which presented in her leg a year after treatment and caused extreme swelling from hip to toe. The effects of this disease on her daily life — personal and social — were devastating. Whereas Síle previously enjoyed wearing high heels, dresses, fancy leggings and skinny jeans, with her swollen leg, she had to switch to runners a size bigger to fit her swollen foot, and wide leg trousers to accommodate her swollen limb. As a family, they had enjoyed long walks and attending football matches, but this was no longer possible as Síle was unable to walk as fast or as far. Síle also had to leave her job as she was unable to be on her feet without pain and uncontrollable swelling.

Treatment: Beginning in 2016, Síle and her team worked together to help find her relief from her condition and improve her quality of life. Everything was tried from compression stockings to a revolutionary new lymphatic pump, which Síle currently uses for an hour, up to three times a day, to help massage and displace the fluid in her leg. She also tried multi-layer bandaging and manual lymphatic drainage; however, this was incredibly painful and showed no results. A 3M representative introduced Síle to 3M™ Coban™ 2 Two-Layer Compression System — a bandaging system which changed her life [Figure 2]. It didn't slip, it felt light and supportive, plus conformed to her leg everywhere it was needed. Síle could walk without pain and after a few weeks, could even get back into a pair of wide leg jeans with her bandages on. Treatment continued for four months, by which point Síle had definition again and was able to see her ankle and knee, which brought tears to her eyes.

Results: Coban 2 Two-Layer Compression System has been life changing. Since March 2020, Síle has used the product intermittently to help control the build-up in her limb, along with compression garments and a lymphatic pump. It has given Síle back some confidence and made things possible again, like walking the dog, going to football matches — even getting dressed and putting on socks and shoes. Although lymphoedema is a lifelong condition with no cure, she is grateful to have Coban 2 Two-Layer Compression System as part of her therapy.



Figure 2. Coban 2 Two-Layer Compression System.

patient, their wellbeing and quality of life. Clinicians can advise patients on what the healing process looks like, how to help heal their wound and how to change their dressing, as well as helping to identify factors that motivate and encourage patients to engage and continue participation in their care.

However, patients can lose their 'why' (motivation and passion) when living with a chronic wound. It is vital for clinicians to understand this 'why?' to increase resilience and provide coping strategies, which can positively influence patient wellbeing and a positive mindset. Therefore, clinicians should provide support, hope and effective ways of adjusting to the new reality of their situation.

In assessing patients, it is important to look beyond the physical body and focus on the psychological factors which may be affecting patient quality of life and wound progression, such as:

- Sense of self/identity – a patient may feel they no longer know who they are and have lost a sense of self or identity
- Self-confidence — a patient may no longer have the confidence to carry out activities of daily living and wish to hide away from social situations
- Future dreams — a patient may feel they have lost sight of future dreams and that they are no longer attainable
- Sense of hope — a patient may feel hopelessness and discouragement as the wound is not progressing as expected
- Meaning — a patient may feel life no longer has any meaning and that they are simply surviving, rather than living
- Self-belief — a patient may have a low opinion and be overly critical of themselves.

Ultimately, it is about giving the patient confidence — accepting that they may lose this along the way — and helping them to see what the future could look like. With every positive and encouraging interaction between clinician and patient, the goals set out at the beginning of care can be achieved: to optimise wound healing and patient wellbeing.

It is also necessary for clinicians to identify what patients view as a stressor and subsequently include interventions in treatment plans, which will effectively manage the psychological factors contributing to delayed wound healing. Essentially, good wound care should involve an individualised and holistic approach, taking into account and actively optimising the links between the mind and the body.

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Conclusion

This article explores the impact of psychological factors on wound healing and how clinicians can improve their practice by considering the whole patient including the body, the mind and the wound. Understanding the importance of patients' wellbeing, the effect of stress on wound healing and the psychological impact of living with chronic wounds can help to optimise wound healing for each individual patient. WINT

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