In studies of patients with acute surgical wounds there is also evidence about the relationship between stress and wound healing. Broadbent et al (2003) found high levels of preoperative stress in patients undergoing inguinal hernia surgery were associated with lower levels of proinflammatory cytokines in the wound fluid. It is known that wound inflammation is needed to clear debris and infection but, if levels of proinflammatory cytokines are reduced, this process may cause damage that delays healing (Bosch et al, 2007). On the other hand, Holden-Lund (1988) demonstrated that surgical patients who had undergone a relaxation intervention experienced significantly less anxiety and lower cortisol levels one day after their surgery compared with a control group. This indicates that implementing an intervention to reduce stress could be associated with faster wound healing.

A study investigating the impact of stress on chronic wound healing demonstrated that delayed healing was associated with higher anxiety and depression scores (Cole-King and Harding, 2001). Patients who were categorised in the top 50% of scores were found to be four times more likely to experience delayed healing than those in the bottom 50%. Similarly, a study exploring the prevalence of anxiety and depression in people with chronic leg ulceration categorised 27% of participants as being depressed and 26% as suffering from anxiety (Jones et al, 2006).

The findings of these studies suggest stress can contribute to delays in healing. Moreover, stress can affect healing in both psychological and physiological ways. However, evidence to suggest pain can influence the relationship between stress and wound healing is limited.

**ASSESSING STRESS AND PAIN**

The literature provides evidence supporting the relationship between stress and wound healing. Although less is known about the influence of pain in this relationship, it is important for nurses to acknowledge both pain and stress in clinical practice. If pain and stress are assessed and managed effectively during wound care, this could contribute to faster wound healing.

A number of methods are widely used in experimental settings to measure and assess pain and stress; these could be used by nurses as part of routine wound care. It is beneficial to measure pain and stress in patients before, during and after wound treatments such as dressing changes, to determine any differences in symptom severity.

Physiological symptoms of stress, such as increased heart rate, blood pressure and respiration rate, can be measured fairly easily using methods that may already be part of routine wound care. These assessments should be accompanied by other stress measures, however, to eliminate alternative causes (increased heart rate or blood pressure could be due to many factors).

Alongside these physiological indicators, psychological measures of stress can be used, which are designed to obtain emotional responses from patients self-reporting their personal experience of stress. There are many different types of psychological tools for measuring stress, for example the Perceived Stress Scale (Cohen, 1983), which is a self report questionnaire that measures the extent to which situations in patients’ lives, such as dressing change, are perceived as stressful. This measure has been widely used in experimental settings and is recommended for use in clinical practice. An advantage is that it focuses on patients’ appraisal of stressful situations as opposed to the number of stressful situations experienced by an individual. However, patients are instructed to complete the items with reference to how they have been feeling over the past month, which may not measure stress specifically associated with wound treatments.

Other examples of psychological measures of stress include the Hospital Anxiety and Depression Scale (HADS) (Zigmond and Snaith, 1983) and the State Trait Anxiety Inventory (STAI) (Spilberger, 1968). Both are suitable for nurses to use to measure anxiety (a reaction to stress) in clinical practice. The STAI consists of items that measure specific causes of anxiety such as dressing change, as well as items that measure general long term anxiety traits. Similarly, HADS allows for the assessment of specific anxiety.

If pain, as a stressor, has the potential to contribute to delays in wound healing, then accurate and frequent assessment of pain should be incorporated into routine wound care. A review of pain and wound care studies identified that nurses consistently rated patients’ experiences of pain lower than patients did themselves (King, 2003). This suggests that more attention should be paid to patient feedback during the wound care process.

It is apparent from the literature that both patients and nurses regard dressing change and cleansing as the most painful wound treatments. Pain can be measured using a variety of self report methods, such as rating scales. These include verbal, numerical, and visual analogue scales (Fig 1), all of which require patients to rate their level of pain using either numbers or describing words, or placing a cross on a line to indicate its severity.

Pain can also be assessed using multidimensional measures, for example the McGill Pain Questionnaire (MPQ) (Melzack, 1995). As well as measuring pain intensity, the items in this questionnaire are designed to assess different components of reported pain, how pain changes over time, and the factors that relieve or increase it. As a result of this, the MPQ is sensitive to treatment related changes and can produce information on the specific effects of a treatment on the sensory, affective and evaluative dimensions of pain.