A systematic approach to complex wounds

Complex wounds fill most nurses with the feeling of unmanageable dread. This article aims to dispel such fears by showing that the nurse, once equipped with the correct physiological knowledge and an in-depth awareness of the treatments available, can provide effective wound care using the nursing process.

Wound care has undergone major development in the past few years. The use of research in this area has sought to explain the science of wound repair, and measure the effectiveness of treatments and nursing intervention. This has led to the development of new wound care materials, products and equipment, and has forced nurses to deal increasingly with issues which stretch their knowledge and expertise.

**Simple and complex wounds**

Nurses can easily identify what are described as ‘simple wounds’. Most would probably describe these as wounds that heal uneventfully. This may be a simple traumatic wound, such as a haematoma, minor abrasion or laceration, or a more substantial injury, for example an incision wound that heals as expected by primary intention.

The definition of a 'complex wound' is not so easily determined. Nursing texts and individual clinicians usually describe what they mean by this term, by referring to a wound type. Some may describe fungating lesions, others arterial ulcers, diabetic foot lesions or wound fistulae. Why these wounds pose problems to nurses is less clear (Hampton 1997).

Improvements in wound care mean that the term 'complex' becomes relative. What was complex in the past is now seen as straightforward. A few years ago, venous ulcers were seen as a complex issue. Patients invariably had a complicated medical history and frequently displayed multifactorial clinical signs and symptoms. The treatment of these wounds took up large amounts of time and cost the NHS a vast sum every year. While this may still be the case in some areas, for the most part this has changed. A number of initiatives have highlighted cost effective, clinically efficacious methods of treatment and management, and many community-based practitioners are now successfully treating venous ulcers with sustained, graduated compression bandages.

More is now known about other perspectives. For patients, the significance of a wound – and therefore its complexity – is far more likely to be related to the impact on their lifestyle and perceived health. To the ward or practice manager, a complex wound may be one that accounts for a high drain on healthcare resources – time, personnel, equipment or finances.

‘Complex’ is therefore a term which is really only useful when applied to knowledge or availability of resources and considered in the context of the whole project.

For the purpose of this article, the author will use the definition of a complex wound as one which either does not heal as expected, cannot be easily managed with the available resources or extends beyond nurses’ experience or knowledge base.

**Identifying a complex wound**

**Patient health**

Frequently, clients with so-called complex wounds have a number of inter-related or inter-dependent healthcare problems. Successful treatment of these patients requires understanding of the course of the condition, the possible complications and how these may interact and create new challenges in patient management and wound care.

For example, the patient with diabetes mellitus will not only have problems maintaining his or her blood sugar levels, but will also be prone to peripheral neuropathy, microvascular disease, delayed wound healing, and increased risk of infection (SIGN 1997).

**The evidence**

All practice should be based on sound research, but there is a noticeable deficit of good quality research in wound care. This is changing, however, with clinicians demanding the development of protocols based on randomised controlled trials (RCTs), and robust research (Laverty et al 1997).
Randomised controlled trials provide the clinician with the most objective indication of clinical effectiveness, but they are difficult to establish and conduct and do not address all scenarios. Some situations may be so unique as to lie outside the constraints of standard practice. In such cases, it may be necessary for the healthcare team to make compromises in optimal wound care treatment, but this still needs to be based on a sound knowledge of the client’s condition and circumstances and a clear, reasoned rationale.

**Products and treatments** There have been major strides in the development of new technologies and materials in wound management in the past 30 years. Manufacturers have developed a multitude of man-made fibres and materials to overcome the limitations of natural products – these can be adapted to target specific problems. Products now have very specific actions on the local wound environment, from altering wound pH and moisture content to controlling gaseous permeability. There remains, however, no single ideal dressing, other than the patient’s own tissue (Box 1). Nurses must be aware that with increasingly complicated material, comes the risk of product interaction, and thus an increased need for nurses to understand the technical capabilities and limitations of individual products.

**Costs and benefits** Wound care products are developed to meet the needs of the wider healthcare market. Products require long development periods and incur major costs to manufacturers before they can hope to see any return on their investment. It is therefore necessary for manufacturers to develop product ranges that will sell in the wound care market. This means that most products will be intended for ‘standard’ use. The ‘special’ scenario, such as in the case of complex wounds, while being important to individual patients and nurses, may not provide a large enough market to entice manufacturers to develop such products. In many cases, the nurse is faced with a situation where there is no commercially available product designed to meet the specific needs.

**Managing wounds systematically**

The traditional approach to wound care was to select products and techniques based on experience (Flanagan 1992). In some cases, this may have resulted in the use of appropriate strategies, but in most, the choice of treatment proved to be highly subjective and resistant to challenge. A more scientific approach, based on current research and understanding, needs to be undertaken by nurses if the correct clinical management of wounds is to be ensured. The selection of dressing materials and an overall wound management strategy must be based on sound clinical judgement. This is best achieved by a systematic approach using the steps recognised in the nursing process.

Wound assessment Assessment is the initial part of any nursing care and the issue of complex wounds is no different. The nurse must possess a detailed understanding of the wound healing process, the factors which delay healing and the patients’ history. Assessment should not be limited to the immediate wound area, and should incorporate factors such as pain, sleep, nutrition and body image. A full assessment will enable the nurse to identify the nature and priority of the presenting factors.

Wherever possible, management of the wound should be directed at the correction or removal of the underlying cause. In the case of foreign bodies, healing cannot take place fully until debris is successfully removed from the wound – for example, for venous ulcers, it makes little difference what treatment is used, if the underlying cause of venous hypertension remains unresolved.

In some cases, however, this approach is either unrealistic or impossible. In conditions such as fungating tumours, cure may not be an option. In such situations, the nurse should recognise that treatment must be directed at the control or relief of symptoms and the prevention of complications.

**Setting objectives** All too frequently the road to successful wound management is littered with the wreckage of several failed attempts. Objective-setting must be realistic and attainable; patient problems should be used to set the overall treatment goal or aim. It may be necessary, however, to undertake a variety of different treatments or techniques and it may be preferable to break these down into smaller, equally measurable attainable objectives. By doing so, the nurse will be able to judge the success or otherwise of each intervention and the patient and carer will be able to understand the process of healing.

**Option appraisal and planning** In planning wound care, nurses need to explore the various options that are available to them with clear understanding of products available and the particular properties of each. Subtle variations, such as the speed at which exudate is absorbed by the dressing or the moisture permeability of a film, mean that some dressings are more suitable for one situation than another.

At a more refined level, the nurse needs to be able to identify the strengths and weaknesses of individual products within each type. The nurse must be aware of product compatibility – enhancing rather than interfering or interacting with each other. Compromises are always necessary and it is the role of the nurse to recognise which compromises are safe to make and how these compromises might affect the client.

Finally, it is essential that the nurse clearly documents the chosen treatment strategy and communicates this to all members of the team.

**Implementation of treatment** If a regimen is to be effective, it is essential that wound care products are used correctly. The nurse must be aware of the practical issues involved in using certain products. For example, hydrocolloid dressings can be very effective, not only at healing low to mod-

**Box 1. Functions of the ideal dressing (Thomas 1990)**

- Control of moisture content
- Gaseous permeability
- Maintenance of pH
- Freedom from toxic and particulate material
- Low adherence
- Impermeability to micro-organisms
- Thermal properties
supplement tissue viability

Box 2. Common problems

- Haemorrhage
- High exudate
- Maceration/excoriation/contamination
- Pain
- Odour

Box 3. Indicators of wound infection

- Pus or purulent discharge, especially if a suture is removed,
  (Cruse and Foord 1980)
- Surrounding tissue becomes red, swollen and tender (Spencer 1993)
- Wound breakdown following suture removal (Irvin 1981)
- Granulation tissue that bleeds or breaks down easily
- Changes in pain or tenderness
- Increased wetness and discoloration
- An offensive smell (Morison et al 1996)

Fig. 1. Highly offensive and necrotic sacral wound

erately exuding wounds, but also in providing a protective base against epidermal stripping by adhesive tape application or enzymatic attack. However, to obtain maximum benefit, these dressings should be warmed prior to application, to ensure secure adhesion. Also, rucking of the dressing can be minimised by applying a thin layer of talcum powder to the edge following application.

Evaluation The final stage of any systematic process should be a measurable evaluation. The nurse should be able to identify the positive or negative outcome of the treatment regime. Terms such as ‘healing well’ or ‘satisfactory’ are of little help in determining the success or otherwise of a treatment programme.

Re-assessment may be necessary if the treatment chosen has not had the desired outcome, the original setting of objectives was inaccurate, or if an unexpected incident disrupts treatment, for example, if the patient develops an allergy.

Commonly encountered problems

Whatever the aetiology of the complex wound, there are a number of problems that are commonly encountered. These may present individually, or more frequently, in combination (Box 2).

Haemorrhage Bleeding from the wound is a problem common to many wounds. Gentle oozing of blood at dressing change is probably not of great significance except that it demonstrates that trauma to the wound bed and the newly formed capillary network is occurring. Repeated trauma will undoubtedly delay or prevent healing. In flat wounds, the use of a suitable low adherent dressing can successfully overcome this problem and the recently developed siliconised products have proved very successful in preventing adherence. If sheet dressings are not appropriate, the use of an amorphous hydrogel dressing will maintain a moist environment while preventing the integration of viscous serum in the weave of the dressing.

Continued bleeding from the wound bed is a cause for concern. In chronic wounds, this may be caused by a sub-clinical infection which requires systemic treatment (Morison et al 1996). It also frequently occurs in fungating tumours and can have a significant effect on the patient’s wellbeing. Alginate dressings provide good haemostasis and may be of great help, although for persistent bleeding, cautery may be considered necessary.

Maceration, excoriation and contamination A high level of wound exudate causes problems for both nurses and patients (Fig. 1). Clothing and furnishings are easily soiled, causing embarrassment and social isolation. It also increases the risk of infection from strike-through contamination (Lawrence 1994). The presence of high levels of moisture on the peri-wound skin can also lead to other problems, such as the proliferation of bacteria and the maceration of cornified epidermal tissue. This in turn lowers skin resistance to the friction damage exerted by mobile dressings or too rigorous cleansing. Excoriation is worsened in the presence of caustic fluids such as bile or small bowel effluent. In these circumstances, enzymatic attack destroys the surface of the skin, extends the wound area, causes pain and prevents the positioning of adhesive-based dressing materials.

Treatment of these wounds should be directed at the management of the exudate and the protection of the surrounding skin. Moderate to high levels of non-caustic exudate can be managed with absorbent dressings such as foams or alginites. Where enzymatic damage is a problem, fluid should be kept away from tissues with the use of drainage bags and pouches, which will not only protect surrounding tissue but also allow accurate estimation of wound leakage. If a large aperture is required, two bags may be butted together as a bridge dressing. In some cases it will be necessary to build up the surrounding skin level to provide a firm base on to which the flange may be fitted. This is best done with the use of shaped pieces of hydrocolloid wafer and, where necessary, may be applied in layers until a firm, level base is achieved.

Protection of surrounding skin can be achieved in a number of ways. Traditionally, skin has been covered with various barrier creams and ointments, which are cheap, relatively easy to use and easily available. However, they can prevent the adhesion of dressings and can lead to leaks, necessitating a more frequent change of dressing. If the surrounding tissue is dry and without complicated contours, film dressings or thin hydrocolloid sheet dressings are useful in providing a flexible barrier. For protecting tissue that is at particular risk, the recent development of an alcohol-free film barrier lotion has proved very effective.

Pain The presence of pain in or around a wound...
can be a useful indicator of both the aetiology and progress of a wound. A detailed history of the patient’s pain and coping mechanisms may assist diagnosis. Pain at dressing change can be initiated by dressing removal or cleansing, trauma, use of inappropriate dressings, dessication of the wound bed or sudden changes in wound bed temperature. Management of this pain should be directed towards correcting the cause wherever possible and providing analgesia prior to dressing changes.

Pain that is continuous or occurs at times other than during dressing changes is more likely to be related to an underlying pathology. In most cases, elevating the affected area to reduce the effects of swelling and venous hypertension, along with the use of systemic analgesia and/or anti-inflammatory medication, relieves limb pain. The increase in pain on elevation of a limb is synonymous with increased tissue hypoxia. This is most likely to occur when there is underlying arterial insufficiency. Doppler ultrasound assessment can be used to establish the presence of arterial occlusion. If conservative management is indicated, resting with the limb dependent may reduce pain but may increase peripheral oedema.

Increasing pain, particularly when associated with cellulitis and/or pyrexia may be an indication of infection. This must be investigated and treated appropriately.

**Odour** The presence of offensive odour can be very upsetting for both patients and their carers. It may occur as a result of local wound infection or colonisation, or may be caused by the putrefaction of necrotic material in the wound. The diagnosis of infection needs to be determined urgently (Box 3) and suitable management initiated (Box 4). If the odour is caused by the breakdown of tissue, the nurse is faced with three options:
- Debridement of the debris with sharp debridement, enzymatic dressings, hydrogels or alginites.