

# Advanced wound care products for accelerating healing

In recent years, our knowledge of wound care has grown and nurses have been at the forefront of efforts to speed up the process of healing chronic wounds. Despite these efforts, many chronic wounds heal very slowly, fail to heal or even worsen (Kloth and McCulloch, 1996).

This article aims to update you on the advanced wound care products available and how these can help to improve wound healing.

## Wound measurement

Wound measurement enables nurses to monitor the progress of wound healing (Flanagan, 2003), the stages of which are shown in *Figure 1*. The length and breadth of a wound can easily be measured by tracing a wound. It is more difficult to measure the depth of a wound, because some parts may be shallow and other parts deep.

## Visitrak system

The most up-to-date method of checking if wounds are healing is to use the Visitrak system (Smith & Nephew, <http://wound.smith-nephew.com/uk>), which costs £400. This system uses a light pen and a digital clipboard. You trace the wound using the light pen and the surface area of the wound is calculated and displayed on the digital clipboard.

When you know the exact size of the wound, you can measure wound healing progress. When necrotic tissue is cleared from the wound bed, you should expect a 20% or more reduction in surface area within 2–3 weeks (Flanagan, 2003). If the wound is not healing as expected, then you need to consider different treatments.

## Larval therapy

Larvae, or maggots, have been used to treat infected, gangrenous and necrotic wounds

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## Linda Nazarko gives an update on the latest products and techniques for activating the healing of chronic wounds.

for thousands of years. Before antibiotics were discovered, they were used on battlefields to clean wounds. Larvae clean wounds rapidly, reduce odour and treat infection (Weil et al, 1993). They are now being used in hospitals to treat wounds infected with multiresistant strains of bacteria (Rayner, 1999).

Larval therapy is cost effective, safe and simple to use and is now used worldwide to treat wounds and prevent or treat infection (Sherman et al, 2000). One of the barriers to their use in nursing homes was that they were not available on prescription. This has now changed, and larvae can now be prescribed and obtained by local chemists from the Biosurgical Research Unit in Wales.

Larvae secrete enzymes that liquefy necrotic tissue. They then ingest the slough and necrotic tissue. The secretions promote healing and destroy bacteria (Thomas

and Andrews, 1999). On arrival, the maggots are the size of pinheads.

## Procedure

- The wound is prepared by using an occlusive dressing around the wound, so that the wound itself is exposed.
- Saline is added to the larvae pot and the larvae and saline placed on the wound.
- A fine nylon mesh is taped over the wound and a secondary dressing applied.
- An absorbent dressing soaks up liquefied eschar and wound secretions. The dressing is changed as often as necessary.

When the larvae are applied to the wound, they look like very fine, almost invisible pieces of thread. The larvae should be removed from the wound after 3 days; at which point they are fat maggots.

A further application of larvae can be applied when the first application is removed. The secondary dressing can be changed daily if required. The larval secretions kill *Streptococcus* and *Staphylococcus* bacteria (Thomas and Andrews, 1999).

Most hydrogels kill larvae, so if you are using these it is important to irrigate wounds well before applying the larvae (Thomas and Andrews, 1999). Larvae need to breathe and the hydrogels cause them to drown by blocking their breathing apparatus.

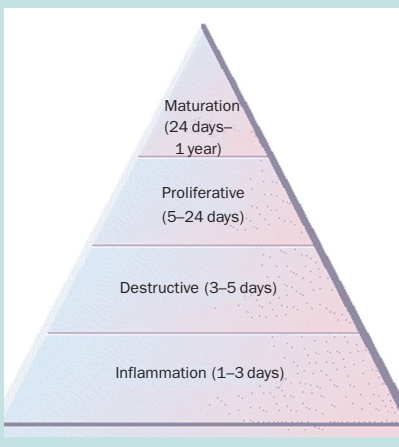
## Bioelectric stimulation

When living tissue is damaged, biological repair mechanisms are triggered (Kloth and McCulloch, 1996). These repair mechanisms include an endogenous bioelectric system that causes cells such as neutrophils and fibroblasts to move into the wound. These cells stimulate wound healing (Kloth, 1995).

When wounds fail to heal, passing an electrical current into the wound can accelerate wound healing. This process is known as bioelectric stimulation. Indeed, non-healing wounds have been shown to be lacking this 'current of healing.'

**Figure 1.**

### THE FOUR STAGES OF WOUND HEALING



**POSiFECT RD wound care dressing**

A product is now available that provides bioelectric stimulation: the POSiFECT RD bio-electric wound care dressing (Biofisica, [www.biofisica.net](http://www.biofisica.net)). The single-use disposable dressing delivers the current directly to the wound from its own power source.

A recent study found that 8 weeks of bio-electric stimulation therapy effectively kick-started the healing process in many non-healing wounds. After 8 weeks of therapy, it was possible to use traditional dressings until wound healing had taken place (Hampton and King, 2005), which in many cases led to complete healing of the wound.

**Laser therapy**

Laser therapy is the application of red and near infrared light over injuries or lesions to improve wound or soft tissue healing and give relief for both acute and chronic pain. It is now officially referred to as low-level laser therapy (LLLT).

LLLT is used to resolve inflammation and enable wounds to heal. It aims to accelerate the healing process. The red and near infrared light (600 nm–1000 nm) can be produced by laser or a high-intensity light-emitting diode (LED). The intensity of LLLT lasers and LEDs is not high, like a surgical laser, so the skin does not become hot or burnt.

LLLT has been used successfully to treat chronic wounds (Hawkins et al, 2005). However, further research is required before it can be recommended as evidence-based therapy (Samson et al, 2004).

Figure 2a shows a wound before treatment with LLLT and Figure 2b shows the same wound after 6 weeks of treatment.

**Active matrix dressings**

These consist of a sheet of collagen mixed with cellulose. The dressing is not suitable for use on necrotic wounds. Dry wounds must be moistened before it is used.

The dressing is placed on the wound, where it absorbs liquid and forms a gel. This gel inactivates substances in wounds that slow wound healing. A low-adherent dressing is then used as a secondary dressing. The dressing may need to be changed daily if the wound is exuding a lot of fluid; otherwise, it can be left in place for 2–3 days.

Active matrix dressings such as Promogran (Johnson & Johnson, [www.jnj.com](http://www.jnj.com)) enable non-healing wounds to begin healing. Then,

normal wound care products can be used. Active matrix dressings have been successfully used to treat pressure sores, leg ulcers and other chronic wounds (Thomas, 2002).

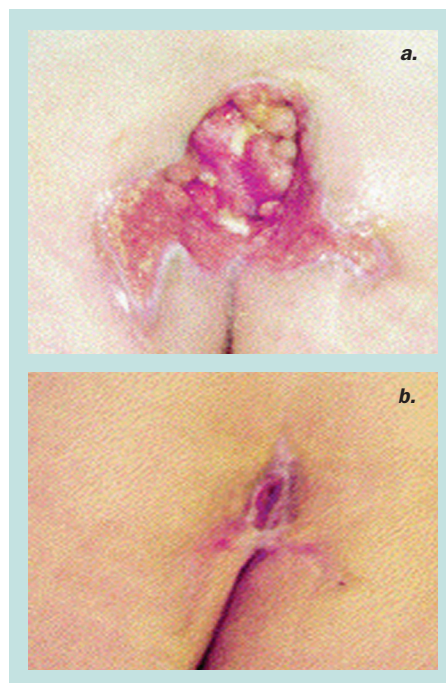
**Vacuum-assisted dressings**

Vacuum-assisted therapy, such as the Vacuum Assisted Closure (V.A.C.) system (KCI, [www.kci1.com](http://www.kci1.com)), is a fairly recent development in the treatment of chronic wounds. It has been used on diabetic foot ulcers (Eginton et al, 2003), pressure sores (Wanner et al, 2003) and other chronic wounds (Joseph et al, 2002). Vacuum-assisted therapy is used for deep chronic wounds with moderate to high levels of exudate.

**Procedure**

- A foam dressing is shaped to the size of the wound. This is inserted in the wound so that it maintains direct contact with the wound.
- A drainage tube is placed in the foam.
- A transparent adhesive dressing is then placed over the wound.
- A vacuum pump is connected to the drainage tube, which creates a hypoxic environment that causes the death of aerobic bacteria (bacteria that need air to survive). It causes the microcirculation to regenerate quickly and provides increased levels of oxygen for tissues. It

**Figure 2. (a) A wound before treatment; (b) after 6 weeks of treatment with laser therapy.**



removes slough and necrotic material and leads to the closure of 93% of wounds within 5–10 weeks (Smith, 2004).

Vacuum-assisted therapy limits mobility but in practice, people with such extensive wounds are rarely mobile. In my experience, this therapy is expensive but highly effective.

**Hyaluronic acid**

Hyaluronic acid is a synthetic compound that plays an important role in tissue repair. Dressings containing hyaluronic acid are available – for example, Hyalofill (ConvaTec, [www.convatec.com](http://www.convatec.com)). These non-woven fleece dressings are placed on the surface of the wound and a secondary dressing is applied. They are replaced at least every 2–3 days. Using dressings containing hyaluronic acid can speed up wound healing (Brown, 2004).

**Honey**

Honey was once used routinely in wound care, but was gradually discontinued when antibiotics became available (Molan, 2002). Now that there are widespread problems with antibiotic resistance, honey is once again being used in wound care (White and Molan, 2005). The therapeutic properties of honey are as follows (White and Molan, 2005):

- Reduces infection
- Removes debris from wounds
- Neutralizes odour in malodorous wounds
- Stimulates anti-inflammatory activity that rapidly reduces pain, oedema and exudate and minimizes scarring.

In the past, nurses poured honey onto low-adherent dressings or even into the wound. Honey-impregnated dressings are now available on prescription. Examples are:

- The Mesitran hydroactive range of dressings (Medlock Medical, [www.medlock-medical.com](http://www.medlock-medical.com))
- Medihoney wound care dressings (Medihoney, [www.medihoney.com](http://www.medihoney.com))
- Acticon Tulle (Advancis Medical, [www.advancis.co.uk](http://www.advancis.co.uk)).

The use of home-made dressings is not recommended – the raw honey may contain fungal spores, which could possibly lead to a fungal wound infection (Dunford, 2005).

**Expert advice**

It is important to prepare the wound bed before using advanced wound therapy

(Falanga, 2001). The tissue viability nurse specialist employed by your local primary care trust can advise you on wound bed preparation and how to obtain and use advanced wound therapy products.

Some products, such as larvae and specialist dressings, are available on prescription. Other therapies, such as the V.A.C. system, may be funded by the primary care trust if the wound care specialist considers them necessary.

**Conclusion**

Advanced wound care therapy can be used to enable chronic wounds to heal. This reduces infection risks, pain and discomfort and improves quality of life. **NRC**

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**KEY POINTS**

- **Traditional dressings are not effective in healing some wounds.**
- **Accurate wound measurement enables you to check healing rates and identify non-healing wounds.**
- **Advanced wound therapy products include larvae (now available on prescription) and dressings incorporating bioelectric stimulation, collagen and hyaluronic acid.**
- **Newly developed therapies such as low-level laser therapy and vacuum-assisted systems show impressive results and are becoming more widely used.**
- **Use the expertise of tissue viability nurse specialists to help you treat non-healing, complex or slow healing wounds.**

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