

WOUND MANAGEMENT AND DRESSING SELECTION

Effective wound management requires an understanding of the process of tissue repair and a knowledge of the properties of the many sophisticated dressings that are now available. This article guides the reader through each dressing type and their properties, and examines the types of wounds that they can be used to dress.

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The correct dressing can have a significant impact on the healing of wounds.

A holistic assessment is essential before choosing a wound dressing. Wound assessment has traditionally been the responsibility of nurses and has been a subjective practice (Williams, 1998a) with a reliance on anecdotal evidence that is difficult to assess for accuracy.

A holistic approach brings about a relationship between the patient, the wound, and the treatment (Flanagan, 1997). Accurate wound assessment depends on an understanding of several factors (Table 1). Other important aspects include measurement and documentation of wound healing rates and specialised areas such as leg ulcer assessment and the risk

of pressure ulcers. The aim of local wound management is to provide the optimum environment for the natural healing process to occur (Morison et al, 1997). The different factors involved are essentially the same, whatever

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the wound type (Table 2). It can be difficult to select the correct dressing but with a good knowledge base the practitioner should be able to identify the most suitable and cost-effective option (Williams, 1998a).

The number and sophistication of modern wound dressings available makes selection an advanced skill — particularly for complex wounds. The correct dressing, used as part of holistic care of the patient, can have a significant impact on the healing of chronic and problem wounds (Casey, 2000).

The principle reasons for applying a dressing can be summarised as follows:

- ▶▶ To provide rapid and cosmetically acceptable healing
- ▶▶ To remove or contain odour
- ▶▶ To reduce pain
- ▶▶ To prevent or combat infection
- ▶▶ To contain exudate
- ▶▶ To cause minimum distress or disturbance to the patient

- ▶▶ To hide or cover a wound for cosmetic reasons (Thomas, 1997).

It is acceptable to combine a primary and secondary dressing but it has become common practice to mix wound dressings and sometimes combine three or more products. This practice can be unsafe and may give rise to unnecessary extra costs (Benbow, 1997). It also demonstrates a lack of knowledge and insight into why, when and how a particular dressing product should be used (Benbow, 2004). Inappropriate care can lead to delayed wound healing for patients and unnecessarily high costs for the healthcare provider (Dowsett, 2002).

Before applying any dressing the nurse should ask:

- ▶▶ What is the action of this dressing?
- ▶▶ When should it be used?
- ▶▶ What are the limitations/contraindications to its use?
- ▶▶ Do I know the correct method of application and removal?
- ▶▶ Do I have sufficient knowledge about the dressing and have I been trained to use it? (Benbow, 2004).

This article will now give an overview of each dressing category and the types of wounds that they can be used for.

Hydrocolloid dressings

The first hydrocolloid dressing was introduced in the mid-1970s. There are now many types available in a variety of thicknesses, shapes and sizes (Williams, 1994). Examples

include:

- ▶▶ Granuflex (ConvaTec, Ickenham)
- ▶▶ DuoDERM Extra Thin/Signal (ConvaTec, Ickenham)
- ▶▶ Comfeel (Coloplast, Peterborough)
- ▶▶ Tegaserb (3M, Loughborough)
- ▶▶ Hydrocoll (Hartmann, Heywood)
- ▶▶ Aquacel (ConvaTec, Ickenham).

When a hydrocolloid dressing comes into contact with a wound the hydrocolloid component of the dressing becomes a gel on contact with moisture from the

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wound exudate and creates a barrier that protects against infection with micro-organisms (Williams, 1996a).

Hydrocolloid dressings are capable of handling a wide range of exudate from light to very heavy (Casey, 2000).

The majority of hydrocolloid dressings are composed mainly of cellulose. The hydrocolloid dressing was originally developed from stoma products and was found to provide a barrier over excoriated skin (Williams, 1998b).

Hydrocolloid dressings can be used in a variety of wounds, e.g. pressure ulcers, leg ulcers, surgical wounds, abrasions and minor burns. They can also be used in granulating, sloughy or necrotic wounds and they can facilitate the rehydration and debridement of dry, sloughy and

necrotic wounds. The hydrofibre Aquacel is a development of the hydrocolloid. This dressing is composed entirely of hydrocolloid fibres and is very absorbent. It is best used in moderate to highly exuding, sloughy and necrotic wounds. It requires a secondary dressing, e.g. DuoDERM Extra Thin, to hold it in place. Care should be taken when using hydrocolloids on clinically infected wounds as they can encourage the growth of anaerobic bacteria (Nurse Prescriber, 2006).

A hydrocolloid dressing size should be selected to allow a minimum overlap of 2cm from the margin of the wound onto the surrounding healthy skin. Many allow patients to shower and bathe and ideally should be left in place for 3–5 days.

Hydrogel dressings

For many years hydrogel dressings have been the main treatment option in the management of dry wounds containing slough and/or necrotic tissue (Young et al, 1997). Hydrogels contain large amounts of water — 80% or more — and are combined with a range of other materials, e.g. hydrocolloid materials, alginates and starch-based polymers (Williams, 1998c).

Hydrogels are available as a gel with no firm structure (amorphous) or as sheets. Examples of amorphous hydrogels include:

- ▶▶ IntraSite Gel (Smith & Nephew Healthcare, Hull)
- ▶▶ NU-Gel, Johnson & Johnson Wound Management, Ascot)
- ▶▶ Purilon Gel (Coloplast, Peterborough)

- ▶▶ GranuGEL (ConvaTec, Ickenham) and sheet gels such as:
- ▶▶ ActiForm Cool (Activa Healthcare, Burton-on-Trent)
- ▶▶ Curagel (Tyco Healthcare, Gosport)
- ▶▶ GeliperM (Geistlich Pharma, Chester)
- ▶▶ Hydrosorb (Hartmann, Heywood).

Hydrogels donate moisture or absorb exudate depending on the state of the wound thereby providing a moist environment. This encourages or facilitates autolysis or debridement of devitalised tissue from the healthy wound bed. Hydrogels can be used in a variety of wound types and although they are mainly used in dry, sloughy or necrotic wounds they can be used during all stages of wound healing.

Hydrogels have also been used in other areas of skin and wound care (Williams, 1995a):

- ▶▶ Dermatological skin conditions
- ▶▶ Inflamed skin flexures
- ▶▶ Skin damaged by radiotherapy
- ▶▶ Extravasation injuries in neonates
- ▶▶ Excoriation of the skin caused by incontinence
- ▶▶ Management of fistula
- ▶▶ Nappy rash in infants.

Hydrogels are normally used for wounds with low to moderate levels of exudate and the amorphous hydrogels require a secondary dressing. As hydrogels release water to any dry surface, the use of secondary dressings that are dry or high-absorbency such as polyurethane foam is not recommended (Casey, 2000). A semi-permeable film is more suitable.

Alginate dressings

Alginate dressings are formed from calcium alginate, a component of seaweed.

Examples include:

- ▶▶ Sorbsan (Unomedical, Redditch)
- ▶▶ Kaltostat (ConvaTec, Ickenham)
- ▶▶ Tegagen (3M, Loughborough)
- ▶▶ SeaSorb (Coloplast, Peterborough)
- ▶▶ Algosteril (Smith & Nephew Healthcare, Hull).

In the early 1800s seaweed was discovered to be very effective in treating the wounds of sailors who had been injured in sea battles. Sailors often referred to it as 'the mariner's cure' (Williams, 1998d). When alginate

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dressings come into contact with the wound surface, the calcium from the dressing is exchanged with sodium from the wound exudate. This turns the dressing into a gel that maintains a moist environment (Casey, 2000).

The dressings are suitable for a wide range of wound types and cavity wounds that are granulating, with small amounts of slough, and moderate to high exudate levels. They are unsuitable for dry wounds or those with dry, hard, necrotic tissues. It is self-defeating to pre-moisten an alginate and use it on a dry wound — a practice that is

sometimes encouraged (Williams, 1998d). Alginates are ideal for bleeding wounds because they are natural haemostats (Williams, 1998d).

Alginates are also atraumatic and pain-free to remove (Williams, 1996b). They need to be held in place with a secondary dressing such as an adhesive foam dressing or a semi-permeable film.

Semi-permeable film dressings

Semi-permeable film dressings are all made from a thin sheet of polyurethane coated with a layer of adhesive. Examples include:

- ▶▶ OpSite (Smith & Nephew Healthcare, Hull)
- ▶▶ Tegaderm (3M, Loughborough)
- ▶▶ Bioclusive (Johnson & Johnson Wound Management, Ascot).

They are permeable to moisture, vapour and gases, but are impermeable to liquids. The different types of film dressings differ in their moisture vapour permeability (MVP), their method of application, extensibility, weight and thickness (Williams, 1998a).

Film dressings are suitable for superficial and shallow wounds, e.g. those in the final stages of healing, because they protect newly epithelialised wounds from trauma (Casey, 2000). They can also be used as a secondary dressing over most primary dressings, e.g. gels, alginates and hydrofibres, to retain them (Williams, 1995b).

Care should be taken when removing film dressings. Many have a specific method to break the adhesive bond to ensure an atraumatic removal.

Foams — polyurethane, hydrocellular, soft silicone and hydropolymer dressings

There are a variety of foams made from different base materials and constructions that have similar but varying performance characteristics. Foam dressings are available in a variety of shapes, sizes and thicknesses that can be used on medium to heavily exuding wounds including pressure ulcers, leg ulcers, burns, surgical wounds and more.

Examples include:

- ▶▶ Allevyn – hydrocellular (Smith & Nephew Healthcare, Hull)
- ▶▶ Biatain – polyurethane; (Coloplast, Peterborough)
- ▶▶ Lyofoam – polyurethane; (Mölnlycke, Dunstable)
- ▶▶ Mepilex – soft silicone; (Mölnlycke, Dunstable)
- ▶▶ Tielle – hydropolymer (Johnson & Johnson Wound Management, Ascot).

Some come in an adhesive, bordered format and some are non-bordered and so are more suitable for those patients with delicate or problematic skin, e.g. leg ulcer patients where the dressing may be kept in place with compression bandages.

Foams are recommended for use in exuding granulating wounds and are not recommended for dry superficial wounds. They are also suitable for use under compression therapy.

Deodorising dressings

The management of fungating and malodorous wounds provide a challenge for many healthcare professionals (Williams, 1998e). Deodorising dressings may be useful in the management of malodour.

Examples include:

- ▶▶ CarboFlex (ConvaTec, Ickenham)
- ▶▶ Actisorb Silver 200 (Johnson & Johnson Healthcare, Ascot)
- ▶▶ CliniSorb (Clinimed,
- ▶▶ Lyofoam C (Mölnlycke, Dunstable)
- ▶▶ Carbonet (Smith & Nephew Healthcare, Hull).

Many of the dressings contain charcoal cloth that is able to absorb gas molecules. Some deodorising dressings are combined with other dressing products such as foam, silver, alginates and absorbent pads.

Iodine dressings

Iodine-based products are antiseptics and act on a broad spectrum of micro-organisms. Examples include:

- ▶▶ Inadine (povidone iodine) Johnson & Johnson Wound Management, Hull)
- ▶▶ Iodoflex/Iodosorb (cadexomer iodine) Smith & Nephew Healthcare, Hull).

Inadine is presented as a low-adherent, knitted, viscose dressing impregnated with 10% povidone iodine. The dressing should be changed when the distinctive orange-brown colour changes to white as this shows that the povidone-iodine has been used. Iodoflex and Iodosorb contain cadexomer iodine and are available as a paste, ointment or powder.

The maximum single application is 50g and the weekly maximum application must not exceed 150g. This treatment should not exceed three months. This product may also be useful for wound debridement.

Table 1

Essential knowledge for wound assessment

Physiology of the skin
 Physiology of wound healing
 Environmental influences on wound healing
 Local conditions for optimal wound healing
 Factors that delay wound healing
 Identification of infected wounds
 Clinical appearance of the wound

Table 2

Aims of wound management

Control of bleeding
 Removal of foreign bodies that could act as a focus for infection in the wound
 Removal of devitalised tissue, thick slough and pus
 Provision of optimum environment (temperature, humidity and pH) for the cells involved in the healing processes
 Promoting the formation of granulation tissue and epithelialisation
 Protection for the wound against further trauma and pathogenic micro-organisms

Table 3

Further information

Morgan DA (2004) Formulary of Wound Management Products (9th edn). Euromed Communications Ltd, Surrey
 Surgical Materials Testing Laboratory (www.smtl.co.uk)
 Dressings.org (www.dressings.org)
 World wide wounds (www.worldwidewounds.com)
 Manufacturers' websites
 Manufacturers' freephone helplines

Silver dressings

Silver products have antimicrobial properties. They have been combined with other products to benefit from multiple properties, e.g. hydrofibre, alginate, charcoal, foam, hydrocolloid. Examples include:

Key Points

- ▶ Effective wound management requires an understanding of the processes of tissue repair and a knowledge of the properties of the dressings available.
- ▶ A holistic assessment is essential before choosing a wound dressing.
- ▶ The aim of local wound management is to provide the optimum environment for the natural healing process to occur.
- ▶ The correct dressing, used as part of holistic care of the patient, can have a significant impact on the healing of chronic and problem wounds
- ▶ Dressing selection is a complex process.
- ▶ Tissue viability nurses, or those holding similar positions, provide an important resource for selection of individual dressings.
- ▶ It is important to remember that a wound dressing does not heal the wound. It provides the optimum environment for healing to take place.

- ▶ Aquacel Ag (ConvaTec, Ickenham)
- ▶ Acticoat (Smith & Nephew Healthcare, Hull)
- ▶ Urgotul SSD (Urgo, Shepshed)
- ▶ Flamazine (Smith & Nephew Healthcare, Hull)
- ▶ Contreet (Coloplast, Peterborough).

Silver dressings can be used in a variety of wound types for clinical wound infection or critical colonisation wounds (Lansdown, 2002) or those who may have previously had a clinical wound infection. Silver therapy should

only be used for a short period of time, e.g. 2–3 weeks.

Low-, non-adherent and membrane dressings

Low- or non-adherent dressings can be used on lightly exuding wounds. Some combine an absorbent layer and can therefore be used in moderate to highly exuding wounds. The membrane dressings can be used for low to high exudate and require a simple absorbent secondary dressing.

Examples include:

- ▶ NA Ultra – silicone coated, knitted viscose (Johnson & Johnson Wound Management, Ascot)
- ▶ Tricotex – knitted viscose

Honey has been used in wound care since the time of the ancient Egyptians and has antibacterial, debriding and anti-inflammatory properties

(Smith & Nephew Healthcare, Hull)

- ▶ Release – absorbent, perforated film-faced (Johnson & Johnson Wound Management, Ascot)
- ▶ Melolin – absorbent, perforated film-faced (Smith & Nephew Healthcare, Hull)
- ▶ Exu-Dry – absorbent, perforated film-faced (Smith & Nephew Healthcare, Hull)
- ▶ Mesorb – absorbent, perforated film-faced (Mölnlycke, Dunstable)
- ▶ Mepitel – soft silicone membrane (Mölnlycke, Dunstable)
- ▶ Tegapore – soft polymer nylon membrane (3M, Loughborough).

Honey dressings

Honey has been used in wound care since the time of the ancient Egyptians. Honey has antibacterial, debriding and anti-inflammatory properties. Examples include: the Activon range (Advancis Medical, Nottingham) and the Mesitran range (Mölnlycke, Dunstable).

Activon contains Manuka honey whereas Mesitran contains between 20 and 47% medical-grade (sterilised/treated) honey.

Other dressings

Lipido-colloid dressings (e.g. Urgotul; Urgo, Shepshed) are made up of a textile net impregnated with hydrocolloid particles. It is a wound contact layer for granulating and epithelialising wounds. It requires a secondary dressing for exuding wounds, e.g. a simple absorbent pad or the padding bandage as part of the 3- or 4-layer bandage system.

The use of this dressing can improve the condition of dry, flaky skin surrounding the wound, especially in leg ulcers.

Hydrocapillary dressings (e.g. Vacutex, Protex Capillary Dressings Ltd, Hampshire) are very absorbent. They consist of two outer layers sandwiching a polyester cotton core. They work by capillary action, drawing exudate from the wound into the cotton core. They are also useful in the management of sinus and fistula wounds.

Protease-modulating matrix dressings (Promogran; Johnson & Johnson Wound Management, Ascot) contain 55% freeze-dried

collagen. It is designed for use in granulating chronic wounds. It improves healing by inactivating harmful proteases and protecting growth factors present in the wound exudate.

Conclusion

Dressing selection is a complex process. Tissue viability nurses, or those holding similar positions, provide an important resource for selection of individual dressings and for the provision of nurse education (Casey, 2000).

With such a wide range of wound dressings available, guidance can be found from books, websites and helplines (Table 3).

Finally, it is important to remember that a wound dressing does not heal the wound but it provides the optimum environment for healing to take place.

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Glossary

Extravasation: The leakage of solutions into the subcutaneous tissues through intravenous administration of drugs or fluids

Excoriation: Where the skin has become traumatised, worn away, abraded, often due to wound fluid, urine or faeces

Holistic: A way of assessing and considering the whole person, their situation and other influences on their lifestyle.]

Autolysis: The body's own natural capacity for removing necrotic tissue as it uses its own enzymes to breakdown the dead tissue

Autolytic debridement: To surgically remove dead, necrotic tissue.

Haemostats: Treatment of haemorrhage or bleeding wounds

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FREQUENTLY ASKED QUESTIONS

Q Do I need to change the dressing frequently to check the wound?

A It is advisable to leave a dressing on for a number of days. Some dressings can be left in place for up to seven days depending on the levels of exudate. Examine the dressing carefully. It can be left in place if there is no sign that the dressing is going to leak out. With some

dressings you can see the exudates on the back of the dressing and when it reaches between 1–2cm from the edge of the dressing it will need to be changed. Remember ‘a bad cook often opens the oven door’.

Q Does the dressing heal the wound?

A No, the dressing simply provides the optimum environment for healing to take place. For example,

it removes dead tissue, provides a warm, moist environment and reduces the number of bacteria in the wound.

Q Do some wounds require three or more dressings at one time together?

A It is unusual for a wound to need more than two dressings. Try and avoid using any more than two dressings at one time.