

Issues in clinical practice: Dressings 2

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Abstract

This article is the second part of the practice review of modern wound dressings. The abstract at the beginning of part one covers both articles. Part one described the nature of the article as well as the objectives of the workshops from which the article was derived. It also discussed some broader wound management concepts that facilitate the selection of a particular dressing.

This second part will consider dressings that broadly fall in to the classes of hydroactive, alginate, hydrocolloid, hydrofibre, cadexomer iodine and zinc paste bandages.

Dressing classifications

Hydroactive dressings

Description

Hydroactive dressings are similar in nature to hydrocolloid dressings but, rather than forming a gel when combined with wound exudate, they trap the fluid within the structure of the matrix and swell up. The adhesive matrix is secured by a film dressing which controls the evaporation of fluid from the dressing. Hydroactive dressings provide a moist wound environment, do not adhere to the wound surface, are waterproof and bacteria proof and highly conformable. They are available in thick, thin and island forms as well as cavity fillers.

Indications

Hydroactive dressings are indicated for wounds with a moderate to high level of exudate. They can be used on minor burns, grazes and lacerations, pressure wounds, leg ulcers and cavity wounds. Due to their high degree of elasticity, hydroactive dressings are ideal for use over flexible joints such as fingers, knees and elbows.

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Method of application

Hydroactive dressings need to be applied to the wound such that they cover at least 3-4 cm of intact skin around the wound. The dressing should be warmed before application and the edges pressed firmly to prevent lifting of the dressing during use.

Cavity dressings are cut and folded to fit the wound. When filling cavities, it is important to keep in mind the swelling that occurs as the dressing absorbs fluid. The dressing should not occupy more than 30 per cent of the cavity space on application.

Limitations

Hydroactive dressings are not indicated for wounds with low-level exudate or clinical infection. Care needs to be exercised when removing hydroactive dressings from very fragile skin.

Available products

Brand name	Properties	Manufacturer
Cutinova Thin®	Thin	Beiersdorf
Cutinova Hydro®	Regular hydroactive	Beiersdorf
Cutinova Cavity®	Cavity	Beiersdorf
Biatain® Foam	Regular hydroactive	Coloplast
Biatain® Adhesive Foam	Island dressing	Coloplast
Tielle®	Island dressing	Johnson & Johnson

Alginates

Description

Alginates are fibre products derived from seaweed. They consist of calcium and sodium salts of alginic acid. Calcium

alginate is a solid but, in contact with wound fluid, ionic exchange occurs and the resulting sodium alginate is soluble. Thus, when alginates are placed on exuding wounds they absorb exudate and form a gel. The gel does not adhere to the wound and promotes a moist wound environment. In addition, the calcium ions released during ionic exchange stimulate platelet aggregation and coagulation and thus play a role in haemostasis.

The integrity of the gel that is formed when alginates absorb exudate depends on the relative composition of the sodium alginate. Some alginates form a soft amorphous gel whilst others form a firm gel that maintains its structural integrity even after absorption of large volumes of exudate.

Alginates are available as non-woven sheets and ropes or ribbons for packing cavities. They are also produced in combination with hydrocolloids or activated charcoal.

Indications

Alginates are indicated for use on moderate to highly exuding wounds such as leg ulcers, pressure ulcers, cavity wounds or donor sites. They are also useful for the initial management of acute traumatic wounds that are bleeding heavily.

Method of application

Alginates should be cut to the size of the wound and applied directly to the wound surface. They are then covered with a secondary dressing such as a film or foam. The dressing can be left in place for up to 3-4 days, depending on the level of exudate. Dressing changes are required when the dressing has completely gelled and the gel is saturated. Cavity wounds are loosely packed with alginate rope or ribbon.

The secondary dressing is selected primarily on the basis of exudate level. If the gel is drying out, using a more occlusive dressing such as a film will help to minimise fluid loss from the alginate. On the other hand, using a dressing such as a foam will enhance the fluid handling capabilities of the alginate when used on excessively wet wounds. Other factors to consider in the choice of secondary dressing are location, size, need for waterproof coverage etc.

The method of removal of alginates will depend on the nature of the gel formed. Soft gelling alginates are simply flushed from the surface of the wound with sterile saline. To remove a firm gelling alginate, the dressing is soaked with sterile saline and gently removed with forceps. If the alginate has not completely gelled, thorough soaking with saline may be required. In these cases, the dressing frequency should be reduced, or the alginate should be ceased and a less absorbent dressing applied.

Alginates can be used on clinically infected wounds, provided the patient is on systemic antibiotics. In these situations, the dressings must be changed at least once daily.

Limitations

Alginates are only appropriate for use on wounds with a moderate to high level of exudate. Due to the degree of absorbency, they can in fact dehydrate wounds with lower exudate levels. The use of alginate dressings should be discontinued if the dressing does not gel completely.

Due to the fibrous nature of most alginates, they can leave un-gelled fibres in the wound which may then stimulate a foreign body response. Caution also needs to be exercised when inserting alginate dressings into very deep or narrow sinuses, as complete removal from these wounds can be difficult.

Some (but not all) alginates have a tendency to wick laterally. Therefore, if the dressing is not cut to the size of the wound, there is a risk of macerating the peri wound skin.

Available products

Brand name	Properties	Manufacturer
KALTOSTAT [®]	Firm gelling. Available in sheets or rope	ConvaTec
KALTOCARB [®]	Firm gelling, contains activated charcoal for odour control	ConvaTec
Algoderm [®]	Firm gelling. Available in sheets or rope	Johnson & Johnson
Seasorb [®]	Firm gelling. Freeze-dried, non-fibrous. Available in sheets or rope	Coloplast
Tegagen HI [®]	Firm gelling. Available in sheets	3M
Sorbsan [®]	Soft gelling. Available in sheets or rope	Seton Scholl
Tegagen HG [®]	Soft gelling. Available in sheets	3M
Algisite M [®]	Soft gelling. Available in sheets or ribbon	Smith + Nephew

Hydrofibre dressings

Description

Hydrofibres are very similar in function to alginates but are made up solely of carboxymethyl cellulose fibres. They absorb very large amount of fluid and form a gel very similar in appearance to a sheet hydrogel. The hydrofibres are much less likely to dry out and will not leave fibres in the wound. Hydrofibres are not haemostatic.

Indication

Hydrofibres are indicated for use on highly exudative wounds such as leg ulcers, minor burns, donor sites, pressure ulcers etc.

Method of application

Hydrofibres are used in the same manner as alginates, but it is not necessary to cut the dressing to size as they do not wick laterally.

Limitations

Hydrofibres are only indicated for use on highly exuding wounds. Secondary dressings are required.

Available products

Brand name	Properties	Manufacturer
AQUACEL®	Available in sheets or rope	ConvaTec

Zinc paste bandages

Description

Zinc paste bandages consist of an open weave bandage impregnated with zinc oxide paste. Zinc is thought to stimulate epithelialisation and is very beneficial in the management of venous eczema.

Indications

Zinc paste bandages are used on chronic wounds (usually leg ulcers) that are in the final stages of healing to promote epithelialisation. In these cases, they are applied as a patch over the wound. When used to manage and soothe venous eczema, the zinc paste bandage is applied over the entire affected area.

Method of application

When used to stimulate epithelialisation of a wound, an appropriate length of bandage is folded over 3-4 times to make a patch that is large enough to cover the wound surface and peri wound skin. A secondary dressing such as a foam or a non-stick dressing is required to absorb any exudate and to hold the patch in place. The zinc patch can be left *in situ* for up to 7 days, with the secondary dressing being replaced as often as required.

When applying a zinc paste bandage to a large area for the treatment of venous eczema, the method of application will depend on the brand of bandage used. Some brands of bandage are rigid (i.e. non-elastic), whilst others are elastic. The elastic bandages can be applied in a spiral up the leg as the elasticity allows for any oedematous swelling of the leg.

The rigid bandages need to be applied in such a way that, should the leg swell, the bandage will not induce a tourniquet effect in the leg. This involves never circling the entire leg,

but rather starting at the shin or top of the foot, wrapping the bandage once around the leg or foot (back to the starting point) and then folding the bandage back on itself and circling the leg or foot the other way. This motion is repeated up the entire leg and thus, if any swelling occurs, the bandage opens up along the front and does not constrict the leg in any way.

The bandage can then be covered with a crepe bandage or tubular retention bandage if there is no exudate, or wrapped with orthopaedic wool if the leg is exuding. A foam can be placed over any areas with high levels of exudate. Once again, the zinc paste bandage can be left in place for up to a week, with the orthopaedic wool or foam changed as frequently as required.

Limitations

Zinc paste bandages are quite difficult to work with and can be very messy. Occasionally zinc can give a green tinge to a wound or soiled dressings that can be mistaken for infection. Some zinc paste bandages contain preservatives that can cause allergic reactions in certain patients.

Available products (unpreserved zinc paste bandages)

Brand name	Properties	Manufacturer
Steripaste®	Rigid	Seton Scholl
Gelocast®	Elastic – gives some compression (approx 6mmHg)	Beiersdorf
Flexi-Dress®	Rigid	ConvaTec
Zipzoc	Tubular zinc paste bandage	Smith + Nephew

Cadexomer iodine

Description

Cadexomer iodine dressings are made of a long chain polysaccharide polymer (starch) that is double stranded. The cross-links that connect the two strands contain iodine (0.9 per cent w/w) which is released as the dressing absorbs exudate. As the iodine is released, the starch chains interact with the exudate to form a gel – with the ability to hold up to six times the weight of the dressing in exudate. This gel that is formed facilitates the moist wound healing environment. The paste sheet, ointment and powder all form a gel in contact with wound exudate.

Indications

This class of product is indicated for sloughy, chronic wounds (pressure ulcers, leg ulcers) with high to moderate exudate. Cadexomer iodine is also useful for malodorous wounds as it helps reduce the bacterial load of the wound surface, reducing the odour these bacteria may produce.

Method of application

Before application of any cadexomer iodine product, cleanse the wound and surrounding area first with water or saline (no need to dry the wound). Cadexomer iodine dressings should be changed 2-3 times a week usually (indicated by loss of colour), but may be changed daily if very heavy exudate present. A secondary dressing is needed over the cadexomer iodine to absorb any excess exudate and to help hold the dressing in place initially.

To apply the paste sheet (Iodoflex[®]), remove the carrier gauze and apply the sheet directly to the wound surface – the dressing may be cut or moulded in a gloved hand to the shape of the wound – and cover with an appropriate secondary dressing and compression if desired.

For the ointment version of cadexomer iodine, apply the required amount of ointment to a spatula for application directly to the wound or to the secondary dressing of choice and press onto the wound itself. The dressing should be applied to a depth of approximately 3mm. The powder may be carefully poured onto a flat wound bed to a depth of 3mm and a secondary dressing applied.

In all cases, the dressing may be removed as part of the normal wound cleansing routine. Change of dressing is indicated by a loss of dark-brown colouration of the dressing. Dressings may be soaked to facilitate removal particularly from fragile or sensitive tissue.

Limitations

Two main limitations on use of these products are cost and pain. As with any modern wound management product, appropriate and judicious use, combined with other interventions to improve wound healing (e.g. compression, etc) of cadexomer iodine should produce a cost effective outcome in terms of frequency of dressing changes and healing times. Local pain is sometimes experienced for the first hour or so after application. For many patients this wears off and the dressing is then quite comfortable for the duration of its application. In a small number of patients, this pain endures requiring dressing removal and a new dressing to be recommended.

Some practitioners and patients have found difficulty in application of the powder as it is very fine and may drift or run-off when applied. It is important to consider the location of the wound before applying the powder as it is more easily used on flat horizontal surfaces.

Due to the iodine contained in the dressing, patients with known sensitivity to iodine should not use this product, and

it may also interfere with thyroid function tests. No more than 50g should be applied in one day, and not more than 150g per week should be used. The duration of treatment should not exceed 3 months.

Available products

Brand name	Properties	Manufacturer
Iodoflex [®]	Rolled sheet of paste, 3mm thick, in various sizes. Can be cut to size	Smith + Nephew
Iodosorb ointment [®]	Paste/ointment in tubes of various sizes	Smith & Nephew
Iodosorb powder [®]	Powder in 3g sachets	Smith + Nephew

Comment

In the workshop itself, participants had a ‘hands-on’ opportunity with a range of sample products available in each class. The experience of applying dressings to oneself or colleague and removing them gave more insight into the content of the workshop.

Where possible, a similar exercise is useful for practitioners wishing to familiarise themselves with or refresh knowledge of various products while reading this article. It is important in each case to review the relevant manufacturer’s literature for the product as well, particularly if one is unfamiliar or uncertain about its indications and use.

Summary

This second part of the dressings review has highlighted key features of the remaining major classes of modern wound management products – alginates, hydrofibre dressings, hydroactives, cadexomer iodone and zinc paste bandages. As discussed in part one, it is important to consider these products in context of the clinical setting. While the theory of the function and form of a dressing is important, it is how it is relevant in a clinical setting that is vital. The information provided here should be considered in that context with better therapeutic and economic outcomes as the goal.

Further reading

Given the format of the workshop, no specific references have been stated. The following texts and websites are useful to provide information on a range of aspects of wound dressings including physical properties, clinical use, etc.

Sussman C & Bates-Jensen B. Wound Care – A Collaborative Practice Manual for Physical Therapists and Nurses. Aspen Publishers, Gaithersburg, 1998.

Thomas S. Wound Management and Dressings. The Pharmaceutical Press, London, 1990.

Website of the Surgical Materials Testing Laboratory, Wales 2001 <<http://www.dressings.org/>>. ■