

## TECHNOLOGY UPDATE:

### Understanding film dressings



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Film dressings provide a simple and effective method of creating a moist wound environment and promoting healing in shallow wounds. They are indicated for the management of minor burns and simple wounds and their flexibility also means that they can be used to cover sutures following surgery. This article examines the main innovations in film dressing technology currently available to clinicians.

#### Page points

1. Film dressings are indicated for the management of minor burns and simple wounds
2. Film dressings can also be used to cover sutures after surgery

#### References

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#### INTRODUCTION

Film dressings can be used as primary or secondary dressings and often form part of the construction of other dressings such as hydrocolloids, foams, hydrogel sheets and composite dressings, which are made up of several materials with the film being used as the outer layer. Films are also used as theatre drapes, as a seal in negative pressure wound therapy systems and as a protective cover over intravenous catheter sites to prevent infection. Film dressings have a long history in wound management and are frequently used in day-to-day clinical practice.

#### BACKGROUND

The first film-like product was manufactured from isinglass (a form of collagen obtained from the dried swim bladders of fish) in the 1880s. These were used as post skin graft dressings and were considered a major advance in wound management at the time<sup>[1]</sup>. Later, during the Second World War in Italy, Bloom described the use of cellophane in burns patients,<sup>[2]</sup> while in 1948 Bull *et al* developed a nylon film dressing<sup>[3]</sup>.

Schilling *et al* conducted the first clinical trial of a film dressing in 1950<sup>[4]</sup>, although the first major trial was the now famous Winter study, which was conducted on animals in 1962<sup>[5]</sup>. A 1963 study on humans by Hinman<sup>[6]</sup>, provided further support for the clinical use of film dressings.

In 1971, Smith & Nephew launched Opsite™, an incise drape made from a type-1 polyurethane coated with a vinyl ether adhesive. Over the years other companies followed this lead and introduced their own versions<sup>[1]</sup>.

Modern film dressings are manufactured from thin polyurethane (polymer) membranes coated with a layer of acrylic adhesive and are moisture vapour- and oxygen-permeable, although these properties vary from brand to brand. They are impermeable to microorganisms and moisture and their flexibility and transparency allows for the easy assessment of wounds.

Importantly, traditional simple film dressings do not permit the absorption of exudate.

#### INDICATIONS FOR USE

Film dressings are indicated for the management of minor burns and simple wounds (eg scalds, abrasions, lacerations and lightly exudating wounds). Their flexibility also means that they can be used to cover sutures following surgery<sup>[7,8]</sup>. Even after sutures or clips are removed, film dressings can still be applied over an incision site for a few months and are especially good at reducing the skin tension on flexor surfaces.

Film dressings can also be used in the following circumstances:

- To protect the skin from shearing forces<sup>[9-12]</sup>
- As a protective and securing cover for intravenous catheters<sup>[13]</sup>
- To prevent and treat superficial pressure ulcers<sup>[14]</sup>
- To provide a semi-occlusive dressing over topical anaesthetic cream to improve absorption into the skin<sup>[7,8,15-21]</sup>
- To protect donor sites following skin harvesting<sup>[22,23]</sup>
- Polyurethane films can also be used as a carrier vehicle for antiseptics.

## MOISTURE VAPOUR-PERMEABILITY

Probably the most important physical property of film dressings is their ability to transmit water vapour from beneath the dressing to the external environment<sup>[20]</sup>. This is important because the loss of water vapour from intact skin is 240–1,920g/m<sup>2</sup> per 24 hours, and the water vapour loss from an open wound is about 4,800g/m<sup>2</sup> per 24 hours<sup>[24]</sup>.

Although the study results presented in [Table 1](#) were performed some time ago, it is interesting to see the differences in moisture vapour-permeability among film dressings<sup>[1]</sup>.

## INNOVATIONS

Developments in film dressings have been ongoing with the introduction of medicated film dressings and films with additional absorbent layers. Some of the different types of film dressing are shown in [Table 2](#).

### Medicated films

One example of a medicated film dressing is Tegaderm™ Plus (3M), a thin polyurethane membrane coated with a layer of acrylic adhesive that contains 2% available iodine in the form of an iodophor. When it comes into contact with skin, the iodophor slowly releases the iodine, which reduces bacterial load and provides protection against infection<sup>[25]</sup>.

A film with a completely different use is Tegaderm Chlorhexidine Gluconate (CHG) IV Securement dressing (3M), a transparent antimicrobial film used to cover and protect catheter sites and to secure devices to patients' skin.

### Absorbent films

There are island versions of film dressings available, which are made up of a simple absorbent cotton pad covered by the film. These are designed to absorb small amounts of wound exudate. There are also acrylic versions – these have a greater absorbency and remain transparent, allowing clinicians to observe a wound's progress without the necessity for removal.

Tegaderm Absorbent Clear Acrylic Dressing (3M), for example, incorporates an acrylic polymer pad – wound exudate moves through perforations in the base layer of transparent film, which is coated with a moist-skin adhesive. Through the process of diffusion, wound exudate is absorbed into the pad and moisture vapour is released through the upper breathable, waterproof layer, which also provides a barrier to outside contaminants.

OpSite™ Post-Op Visible (Smith & Nephew) is another example of a transparent film with an absorbent component. This dressing incorporates a lattice foam structure and a high moisture vapour-transmission rate (MVTR), which allows it to control moisture and absorb wound exudate, thereby preventing the build up of fluid underneath the dressing and allowing for longer wear time<sup>[25]</sup>.

Simple, smaller versions of film dressings make a good alternative to first aid plasters. The MVTR properties of films mean that they are less likely to cause maceration, which is a common problem with plastic plasters<sup>[10,19,21]</sup>.

## APPLYING A FILM DRESSING

When applying a film dressing it is important to follow the manufacturer's instructions in order

### Page points

1. One of the important characteristics of a film dressing is the ability to transmit water vapour from beneath the dressing to the external environment
2. Innovations in film dressing development include medicated film dressings and dressings with additional absorbent layers

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### DRESSING BRAND

### CUP UPRIGHT G/M<sup>2</sup>/24 HOURS

(Measures moisture permeability upwards through the dressing)

### CUP INVERTED G/M<sup>2</sup>/24 HOURS

(Measures moisture permeability downwards through the dressing)

Opsite™ Flexigrid (Smith & Nephew)	839	862
Biodclusive™ (Systagenix Wound Management)	547	605
Dermafilm™ (Vygon)	422	472
Tegaderm™ Film (3M Healthcare)	794	846

Table 1 – Comparison of moisture vapour permeability of different wound dressings<sup>[1,10]</sup>

## Useful links

3M Healthcare  
 B. Braun  
 Covidien  
 Hartmann  
 Mölnlycke Health Care  
 Smith & Nephew  
 Systagenix Wound Management  
 Vygon

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to avoid creasing and to prevent the dressing sticking to itself and becoming unusable.

An appropriately sized piece of film should be used, both to cover the wound itself and to provide an overlap of at least 3–4 cm around the wound edge. It is important to ensure that the skin surrounding the wound is dry and free from oils or cream – these may reduce the film’s ability to adhere to the skin. The backing paper should then be removed and the film dressing carefully applied over the wound (it is important to apply a light but firm stretching motion on the edges of the film). Some films have an upper cover that should be removed once the dressing is in place.

## REMOVAL

Film dressings can remain in place for a week or even longer and the optimum removal time will depend on the position, type and size of the wound. It is important to remove film dressings with care – the dressing should not be pulled back across itself as this may cause damage to the underlying skin, particularly in the elderly and in those with thin dry skin. While light pressure is applied to the centre of the film, it should be carefully lifted away until it is removed entirely.

## Discontinuing a film dressing

The use of any film dressing should be re-assessed in the presence of increasing exudate levels – this can cause pooling under the dressing and may lead to maceration of both the wound and the surrounding skin. If

maceration is a problem an island film dressing with a non-adherent pad is preferable.

## PRECAUTIONS/ CONTRAINDICATIONS

Care should be exercised in applying film dressings to damaged or fragile skin because of the risks of further damage on removal. In the management of skin tears, film dressings should be used with caution because of the risk of causing a new tear on removal<sup>[10,26]</sup>. Film dressings are not recommended for use over deep cavity wounds or full-thickness burns. Film dressings are also not suitable if a wound becomes clinically infected – infected wounds can produce a lot of exudate and it is best not to occlude them<sup>[10]</sup>.

## CONCLUSION

Film dressings provide an effective method of creating a moist wound environment and promoting healing in shallow wounds. The fact that they are transparent, waterproof and flexible means that they will continue to be a first-line product used in the treatment of simple wounds and as an essential component of other dressings. .

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BRAND	MANUFACTURER	TYPE
Opsite™ Flexigrid	Smith & Nephew	Moisture vapour-permeable adhesive film dressing
Opsite™ Post-op		Film island dressing
Tegaderm™	3M Health Care	Transparent vapour-permeable film dressing
Askina Derm®	B. Braun	Plain film
Polyskin™ II	Covidien	Plain film
Hydrofilm®	Hartmann	Plain film
Hydrofilm® Plus		Island film
Mepore Film®	Mölnlycke Health Care	Plain film
Mepore Film® and Pad		Island film

Table 2 – Film dressings<sup>[1]</sup>