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Understanding effective management of postoperative wounds

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Choosing a wound dressing is an important stage of any operative procedure and has implications for the timely healing of tissues. Factors such as prevention and management of infection, pain, blistering and moisture control necessitate a high level of appropriate consideration. This paper presents a critical review of the literature pertinent to these key factors and outlines the importance of a holistic assessment of the patient when selecting a dressing. In addition data are presented from a product evaluation of a new adhesive island dressing from HARTMANN GB.

A cute surgical wounds generally heal with no problems. However, some wounds blister around the periwound area and surgical site infection postoperatively, partly due to inappropriate choice of wound dressing. These complications can cause pain, discomfort, persistent wound leakage, and possible risk of surgical site infection (Jester et al, 2000; Bhattacharyya et al, 2005; Cosker et al, 2005). Postoperative blistering and infection have been identified as the main problems in hip and knee replacement surgery (Ravenscroft et al, 2006).

WOUND BLISTERING PROBLEMS
Results of an international Delphi survey (Ousey et al, 2013) identified the mean proportion of wound blistering as 15.5%, with a range of 1% to 55%. A number of factors have been associated with wound blistering, including age, gender, incision type, medications, comorbidity, movement of the wound site, choice of dressing, and tape use (Tustanowski, 2009). The increased incidence of wound blistering in orthopaedic patients may be caused because the dressings are applied for a long period of time, usually over a joint, where movement causes friction and leads to the dressing causing a shear force (Ravenscroft et al, 2006). Skin changes in older patients, soft tissue oedema following surgery, the type of dressing used, and the mode of application of the dressing may also be contributing factors to the rate of blisters in patients who have joint replacement surgery Ravenscroft et al (2006).

There have been several studies investigating causes and treatment of wound blistering. Clarke et al (2009) evaluated wound dressings and their performance in the prevention of blistering following total joint surgery, identifying an incidence rate of 19.5%. The authors recommended a no liquid film-forming acrylate dressing design to minimise blister formation in total knee and total hip replacement wounds. Leal and Kirby (2008) compared two dressings in a gynaecology setting. The trial group were prescribed a vapour-permeable adhesive film dressing with an absorbent pad and the control group were prescribed a self-adhesive absorbent dressing. None of the trial cohort developed blisters compared with eight patients in the control group.

A comparative study between absorbent cotton pads, wound pads and adhesive tape and a hydrofiber/hydrocolloid combination dressing in 229 orthopaedic patients undergoing elective hip and knee replacement or repair of fractured hip (Meagher et al, 2009). The incidence of blistering for elective total hip and knee replacement was 21.4% in the standard dressing group and 4.1% in the combination group. Overall, the rate of blistering in both elective and trauma groups was reduced by 25% in those who had the combination dressing (P<0.001) compared to the standard dressing group (Meagher et al, 2009).

A survey of a self-adherent five-layered absorbent foam with a soft silicone wound contact layer with that of other dressings compared to basic (one-layer) dressing (island-type dressing with traditional adhesives), or a combination bandage to dress surgical wounds was presented by Pukki et al (2010). They identified that 91% of participants reported a decrease in detrimental periwound skin reactions.
following the introduction of the soft silicone
dressing, compared to previous dressing regimens.

PROTECTING THE PERIWOUND AREA
Periwound skin damage can occur as a result of
excessive moisture due to wound exudate, damage
from inflammatory enzymes in the exudate, or
incontinence (World Union of Wound Healing
Societies [WUWHS], 2007). Additionally, skin
damage may be a result of dry skin, due to it becoming
thinner, losing dermal collagen and elastin, and a
reduction in the blood supply (Wounds UK, 2012).
Skin dryness combined with reduced skin flexibility
can cause damage to the integrity of the skin, leading
to a portal that bacteria can colonise, and will increase
the risk of damage due to shear and friction (Ratliff
and Fletcher, 2007; Bianchi and Cameron, 2008). To
prevent damage to the skin, emollients or a barrier
film should be used (NICE, 2004).

MANAGING POSTOPERATIVE WOUNDS
Prior to choosing a dressing, a full patient assessment
should be undertaken and results documented
that include: general medical condition, nutritional
status, identification of comorbidities, allergies, and a
clear assessment of the wound bed and surrounding
skin. It is vital to remember that a wound dressing
does not heal a wound, but simply aids treatment.
Inappropriate or inaccurate assessment can lead to
delayed healing, pain, increased risk of infection,
inappropriate use of dressings and a reduction in
quality of life for patients (Ousey and Cook, 2011).
NICE (2008) identified that at least 5% of
patients who undergo a surgical procedure develop
a surgical site infection (SSI). More recently the
Health Protection Agency (2012) published results
of a survey of healthcare-associated infections
(HCAIs), reporting that SSI prevalence was 15.7%
of HCAIs reported (Leaper et al, 2012). Yet the
majority of surgical site infections are preventable.

IDENTIFYING WOUND INFECTION
All wounds are contaminated with a variety of
microorganisms (WUWHS, 2008), yet these
are normally the harmless skin flora naturally
found on the surface of the skin. It is essential that
practitioners are able to correctly identify a wound
infection in order to choose the appropriate product
to manage the wound effectively. The classical signs
and symptoms of a wound infection have been
described as inflammation, pain, heat, swelling,
redness and loss of function (WUWHS, 2008).
Cutting et al (2005) suggested that practitioners
should be aware of additional criteria, including
abscess formation, cellulitis, discharge, delayed
healing, discoloration, friable granulation tissue that
bleeds easily, unexpected pain, tenderness, pocketing
at the base of the wound, bridging of epithelium or
soft tissue, abnormal smell, and wound breakdown.
Infections have been categorised into those that
affect superficial tissues, skin and subcutaneous
layer of the incision and those that affect the deeper
tissues, deep incisional or organ space (Centers for
Disease Control and Prevention, 2000).

CHOOSING A WOUND DRESSING
If there are no signs of infection following
assessment, a simple dressing can be used to
cover the wound. For an uncomplicated surgical
wound NICE (2008) suggests using a low-adherent
postoperative dressing or vapour-permeable
polyurethane film dressing, with or without an
incorporated, absorptive, central “island” pad. The
product should promote patient comfort, protect
the wound, not cause excessive pain on application
or removal, allow for swelling around the wound
area, maintain a moist healing environment, be
waterproof, allow monitoring of the wound and
minimise complications. The choice of dressing
depends on wound type, position, size and depth;
consideration also needs to be given to availability

“IT IS VITAL TO REMEMBER THAT A WOUND DRESSING
DOES NOT HEAL A WOUND, BUT SIMPLY AIDS TREATMENT.”
of the dressing in hospitals and the community, size availability and conformability (Milne et al, 2012). There have been reports of significant problems associated with skin damage and blistering due to shear when dressing wounds over joints (Leal and Kirby, 2008). It is important practitioners understand that wound and periwound blistering can be caused by a range of factors and consider these during the assessment process, which will, in turn, assist in appropriate choice of dressing.

In summary, wound and periwound blistering can be caused by:

- The site of wound – friction and shear may lead to blistering if the patient is expected to mobilise the wound area, e.g. following a total knee replacement where knee bending is required.
- Swelling around the wound area.
- Application and removal of the dressing – follow manufacturer’s instructions with care taken to prevent skin stripping on removal.
- Skin condition – if the patient has very dry or friable skin, care should be taken when applying and removing dressings to ensure no damage is caused.
- Patient allergies – ensure the patient has no allergies to adhesives.

Dressing changes

Once applied, the primary wound dressing should be left in situ for as long as possible, providing there is no excessive oozing or signs of infection (Ousey et al, 2013). Frequent dressing changes are a potential risk factor for infection as bacteria may contaminate the wound during the procedure (Leaper 2000). Topical antimicrobial agents for surgical wounds that are healing by primary intention should not be used (NICE, 2008).

For surgical wounds healing by secondary intention, NICE (2008) recommends that an interactive dressing should be chosen and left in place for as long as indicated. Practitioners should ensure a continual assessment and evaluation process to keep dressing changes to a minimum. NICE (2008) suggests referral to a tissue viability nurse (or another healthcare professional with tissue viability expertise) for advice on appropriate dressings for surgical wounds that either dehice postoperatively or are electively left open to heal by secondary intention.

PRODUCT EVALUATION

HARTMANN GB have a range of products that can be used to cover a postoperative incision. These include two film dressings – Hydrofilm®, a semipermeable, transparent polyurethane film coated with a hypoallergenic acrylic adhesive, and Hydrofilm® Plus which has an absorbent pad with a soft polyethylene surface to prevent adherence. Hydrofilm® Plus has a waterproof transparent adhesive wound dressing that enables the exchange of water vapour and other gases between the wound and the outside environment, helping excess moisture to escape and so prevent wound maceration (Palfreyman and Stevens, 2010). An evaluation of these dressings identified that clinicians appreciated ease of application and removal, management of exudate, and conformability to the wound when dressing difficult areas. Patients reported a reduction in pain, and due to the products being waterproof they were able to shower without requiring a dressing change (Palfreyman and Stevens, 2010).

Cosmopor® (HARTMANN GB) is a water repellent, absorbent, adhesive island dressing that can be used as a primary contact layer for postoperative incision management (Figure 1). A 10-patient product evaluation was undertaken with podiatry patients to assess the effectiveness of Cosmopor on acute healing wounds. A questionnaire designed by HARTMANN GB was the sole data collection tool. Podiatrists were asked to use the dressing and to evaluate its results. There were no patient comments collected and patients were not asked if images could be taken of their wounds. Data was collected between July and September 2012. Ethical approval for the evaluation was sought and granted prior to commencement of the study. Podiatrists participating in the evaluation were given written information and requested to give informed consent before using the dressing.

Box 1. Wound types used for the evaluation of Cosmopor® (HARTMANN GB)

Cosmopor was used on the following wound types during the evaluation:
- Postoperative nail surgery wounds for either total or partial nail avulsions.
- Iatrogenic haemorrhages caused during scalpel debridement of callus.

Figure 1. Cosmopor® (HARTMANN GB) dressing
Wound types evaluated are shown in Box 1. Results from the evaluation were generally positive. Responses to each question are detailed in Table 1.

## SUMMARY
Choice of appropriate wound dressings to manage surgical incision is reliant on an holistic patient assessment as well as assessment of the wound bed. Practitioners must ensure that the wound product maintains a warm, moist healing environment and causes no damage to the periwound area. If practitioners are unsure as to the correct product to choose, then advice should be sought from a competent practitioner who possesses knowledge and skills in tissue viability. Milne et al (2012) maintain that effective wound management will expedite and optimise healing, and reduce rates of complications that adversely affect patients’ quality of life and healthcare costs.

## REFERENCES


### Table 1. Results of product evaluation of Cosmopor® in 10 patients

<table>
<thead>
<tr>
<th>Observations</th>
<th>Excellent</th>
<th>Good</th>
<th>Acceptable</th>
<th>Poor</th>
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<tbody>
<tr>
<td>Ease of application</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>0</td>
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<tr>
<td>Conformability</td>
<td>4</td>
<td>6</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Ease of removal*</td>
<td>4</td>
<td>4</td>
<td>1</td>
<td>0</td>
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<td>Patient comfort during wear time</td>
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<td>3</td>
<td>0</td>
<td>0</td>
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<table>
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<th>Other questions</th>
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<th>No</th>
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<tbody>
<tr>
<td>Did the patient experience pain during removal?</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>If yes, was the pain due to Cosmopor?</td>
<td>0</td>
<td>1</td>
</tr>
<tr>
<td>Did Cosmopor keep the wound dry?</td>
<td>9</td>
<td>1</td>
</tr>
<tr>
<td>Would you purchase Cosmopor?*</td>
<td>9</td>
<td>0</td>
</tr>
<tr>
<td>How long did the dressing stay in place?</td>
<td>24h–36h</td>
<td>36h–48h</td>
</tr>
<tr>
<td></td>
<td>8</td>
<td>1</td>
</tr>
</tbody>
</table>

*Nine of the ten participants responded to this question

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**PRODUCT FOCUS**