Knowledge development and research utilization in evidence-based wound care
Eskes, A.M.

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What is the most commonly used treatment for donor site wounds after split-skin grafting: A survey of national policies and current reviews

Anne M Eskes,
Louise AA Gerbens,
Dirk T Ubbink,
Hester Vermeulen.

ABSTRACT

Aim: To investigate current treatment policies for donor site wounds (DSW) in medical centers in the Netherlands, to assess extent of treatment variation and most common local treatment options presently in use, and to create recommendations for uniform treatment of DSWs.

Methods: Dutch medical centers with a surgical department were selected from the internet site www.kiesbeter.nl. Doctors and specialized wound care nurses at these centers were contacted by telephone and email and asked two questions; a) “Does your institution have a DSW treatment protocol?” and b) “Which dressings do you use to cover DSWs?”

We retrieved systematic reviews to formulate evidence-based recommendations from relevant literature databases (Cochrane Wounds Group Specialized Register, CENTRAL and Medline).

Results: A high response rate 92% (78/85) was achieved. Thirty-two percent of the responding centers had a wound dressing protocol. In total, 23 different types of dressing were reported. The five most-used dressing groups were films (45/78 centers; 58%), alginates (36/78; 46%), hydrofibers (25/78; 32%), silicone dressings (20/78; 26%), and paraffin gauze (15/78; 19%). Alginates were mostly used for primary dressings (46%). Films were the most popular secondary dressing material (21/78; 27%), covering a wide range of primary dressings.

Based on four systematic reviews, moist dressings seem preferable over non-moist dressings in the management of DSWs.

Conclusion: This national survey revealed a large variation in the dressing materials currently in use to cover DSWs. These findings call for an evidence-based guideline on the treatment of DSWs. We recommend the use of dressings that create a moist wound environment in the management of DSWs.
BACKGROUND

Wound care, particularly of wounds with an extended healing time, is a large and challenging problem worldwide\(^1\). Large because almost 50% of all inpatients have a wound which involves high costs\(^2\), and challenging because of the large number of treatment options available.

There are many different wound dressings available and it is possible that the great variety of wound dressings causes variation in wound care, in some cases resulting in suboptimal care. The correct choice of dressing is not only essential for wound healing, but also has consequences for patients and the cost of health care\(^3\). Although choice of treatment and responsibility for wound care primarily rests with physicians, in practice it is often specialized wound care nurses and surgical nurses who carry out local wound care and who have some freedom in choosing wound care products\(^4\).

Research in the Netherlands has shown a large variation in dressings used for the local treatment of open surgical wounds\(^5\). There are several reasons for non-standardized dressing management: the large variation in types of wound and wound dressings, personal opinions, and the absence of convincing evidence for the effectiveness of individual dressing materials all make optimum care difficult\(^4\). If variety of wounds is really an important factor for the variation of wound care, then less variation is to be expected in the care of ‘standard’ wounds.

One wound that could be described as ‘standard’ is a donor site wound (DSW) following harvesting of the upper layer of the skin, known as split-skin grafting (SSG)\(^6\). This technique is commonly used to cover skin defects, such as burn wounds, traumatic wounds, and chronic ulcers. In 2008, 702 SSG operations were recorded by the Dutch National Medical Registration Office. The skin is harvested in a relatively uniform manner using a dermatome, and involves harvesting only the epidermal layer and part of the dermis\(^7\);\(^8\). The donor site too is fairly uniform, being mostly located on the upper leg\(^9\). The SSG procedure leaves a superficial wound which, depending on its thickness, generally fully re-re-epithelializes in 7 to 21 days\(^7\).

In the Netherlands there are known variations in the approach to treating these standard wounds and it is unclear which of these treatments is most effective. The aim of this national survey was to explore the extent of treatment variation and the local treatment options presently in use.
Methods

National survey
Between April and July 2009, we contacted 85 hospitals over a period of 11 weeks. Hospitals with surgical departments were selected via www.kiesbeter.nl. All kinds of hospitals were contacted, i.e. university, general, and burn centers.

In addition, the network of wound-care nurses which is part of the Dutch Union of Nursing Professionals (V&VN; “Verpleegkundigen & Verzorgenden Nederland”, a professional society for nurses and nursing assistants) was contacted by email. These nurses are specialized in wound care and work in a range of health care institutions where they determine wound care policy. Due to this, they have insight into the availability of protocols, the variation in wound treatment, and choice of dressings. In the absence of a specialized wound care nurse we contacted doctors (e.g. surgeons). If there was no response, a second attempt was made to improve the response rate by telephoning.

Doctors and specialized wound care nurses at these centers were asked two questions:
1) “Do you have a DSW treatment protocol?”
2) “Which dressings do you use to cover DSWs?”

Formulating evidence-based recommendations
To formulate evidence-based recommendations we retrieved all systematic reviews (SR) evaluating the effectiveness of dressings for DSWs of SSGs from the relevant literature databases (Cochrane Wounds Group Specialized Register, CENTRAL, and Medline). The search terms used were ‘skin graft donor site’ and combinations of the words ‘skin grafts’, ‘donor’ and ‘dressings’. In order to take all considerations into account recommendations were formulated in accordance with the Dutch evidence-based guideline development methods (www.cbo.nl).

Analysis
Descriptive analysis was applied to the questionnaire data and percentages were calculated. Dressings were categorized by generic name and as either a primary dressing (in direct contact with a wound) or a secondary dressing (used as fixation material for a primary dressing). SRs were also presented descriptively.
RESULTS

The first attempt by email yielded little response (19%), even after four reminder emails. The second attempt by means of telephone calls resulted in a response from 78 out of 85 hospitals, i.e. a response rate of 92%. Of these 78 hospitals, 8 were university clinics, 23 STZ (“Association of tertiary medical teaching hospitals”), 3 burn centers, and 44 general hospitals.

Local treatment protocol

Twenty-five of 78 hospitals (32%) claimed to have a protocol on local treatment of DSWs. These protocols gave different recommendations on primary and secondary dressings. Fifteen of 25 protocols (60%) recommended alginates as the primary dressing after skin harvesting. Eight of 15 protocols (53%) advised covering these alginates with gauze, 5 out of 15 (33%) advised covering with film, one (7%) with foam, and one (7%) with a silicone dressing (Figure 1).

In 4 out of 25 protocols (16%), films were prescribed as the primary dressing. Combination products, such as foam with silicones (3/25; 12%), hydrofibers (2/25; 8%) and paraffin gauze (1/15; 4%) were less often used as a primary dressing.

![Figure 1. Recommendations based on protocols for primary dressing of donor site wounds](image)

Usage of DSW dressings in local practice

In total, 23 types of dressing were mentioned (Figure 2). Some hospitals used more than one type of dressing for donor site wounds. The five most frequently used...
dressing groups were films (45/78 centers; 58%), alginates (36/78; 46%), hydrofibers (25/78; 32%), silicone dressings (20/78; 26%), and paraffin gauzes (15/78; 19%). Combination products (12/78; 15%) and foams (11/78; 14%) were mentioned less frequently.

When a distinction between primary and secondary dressings was made, different usage rates for films, silicones, paraffin gauzes and foams were observed (Figure 3). Alginates were most often used as primary dressings (36/78; 46%), followed by films (29/78; 37%) and hydrofibers (24/78; 31%). The most used secondary dressings were films (21/78; 27%). Silicones (2/78; 2%) and foams (2/78; 2%) were also used as secondary dressings.

**Systematic literature search**

Four systematic reviews comparing the effectiveness of different dressings to cover DSWs after split-skin grafting were found. These SRs were published between 1998 and 2009. Where the number of studies included in these SRs ranged from 33 to 75. One of the SRs included non-randomized studies. Three out of four SRs concluded that strong evidence about the effectiveness of various types of donor site dressing is lacking, particularly concerning the use of alginates.

Nevertheless, all SRs concluded that a moist wound environment seems to be most effective in treating DSW in terms of time to complete wound healing. Dressing materials to create a moist wound environment are not gauze-based, but comprise...
Commonly used treatments for donor site wounds

films, alginates and hydrocolloid\textsuperscript{4,8,11}. This prevents the formation of a scab which could otherwise delay wound healing, and it simultaneously closes the wound to external bacterial penetration\textsuperscript{4}.

Wiechula concluded that a moist wound environment decreases pain and infection rates\textsuperscript{8}. Only Rakel et al. concluded that film seems to be most cost-effective in treating DSWs in terms of wound healing, pain and infection\textsuperscript{11}. However, their conclusions were only based on the price of films.

DISCUSSION

This national survey showed that there was a large variation in the dressing materials currently in use to cover DSWs. The uniformity of this wound does not go hand-in-hand with a uniform choice of dressing. It seems that the variety of wound etiologies is not a predictive factor for the large variation in wound dressings. In the Netherlands, films and alginates were found to be the most frequently used products for the treatment of DSWs. These materials create a moist wound environment. The available literature indicates that a moist wound environment seems most effective in treating DSWs\textsuperscript{8,10,12}. However, there is still no guideline or strong evidence for a specific dressing which could improve the uniformity of dressing choice\textsuperscript{8,10-12}.

Figure 3. Types of primary and secondary dressing used in the treatment of donor site wounds

![Bar chart showing the use of different dressing types in donor site wounds.](chart.png)
The Netherlands is not unique

Our results are in accordance with two other national surveys carried out in Australia and Great Britain\textsuperscript{9,13}. These surveys also found variation in the local treatment of DSWs after split-skin grafting. Furthermore, in both countries, alginates were the most frequently used product. Notably, evidence for the effectiveness of alginates on wound healing is still lacking\textsuperscript{8,10-12}. This preference could be connected with its supposed additional haemostatic capacity\textsuperscript{14,15}.

Film is less popular in the other surveys than it is in the Netherlands. Remarkably, 10% of the respondents in the British survey did not want to use film as a local treatment option for the treatment of DSWs\textsuperscript{9}. In the Australian survey, only 13% used film. However, after alginates film is the most frequently used product in the Netherlands. Although films have practical disadvantages, such as the accumulation of fluids below the film in the acute phase of the wound, it seems that films decrease pain rates more than other materials\textsuperscript{11}.

Another international survey which included burn centers, also found a large variation in dressing choice\textsuperscript{16}. In the burn centers conventional, gauze-based materials were used most frequently for the treatment of DSWs. The reason they gave was that they prefer tried and tested dressing materials to the as yet unproven modern dressings. This differs remarkably from the results of our survey.

Lack of evidence and underestimation

The explanation for variation could be that the variation exists as a consequence of the lack of evidence. This is probably an important reason why there are many dressing materials in use.

Our national survey may be underestimating the real variation in practice. Only specialized wound care nurses and a few doctors were contacted, thus not all doctors and nurses who are involved in the treatment of DSWs. However, more than half of the respondents said they used dressing materials which create a moist wound environment. The available literature supports this\textsuperscript{8,10-12}.

The fact is that most of the hospitals contacted do not have a protocol for the treatment of DSWs, which increases the chance of variation. Doctors and nurses could possibly be treating wounds in a different way than specialized wound care nurses. Specialized wound care nurses have often more knowledge of the different materials.

Generalizability of available literature for the Netherlands

Modern dressings are used on a regular basis in the Netherlands and are generally available in each health care institution. However, the cost-effectiveness of different dressings and health care professionals available should be taken into account by making dressing choices. The cost price of dressing materials ranges from €0.46 to €10.23 per item (size 10x10cm)\textsuperscript{17}. However, the total cost of the local wound treatment
is strongly dependent on the combinations of products used and the frequency of
dressing changes. The risk of major complications due to a moist environment in DSWs
is low. The depth of harvesting of the skin is important for the cosmetic result, but also
influences the time to complete wound healing. It is not known if the use of some
dressings leads to a poor cosmetic result, such as keloid, hypo- or hypertrophic scarring.

Wound treatment can have side effects (e.g. itching and eczema) due to
oversensitivity of the skin to specific components of the dressing materials, particularly
hydrogels and hydrocolloids. However, taking into account the frequency
with which these dressing materials are used, allergic reactions can be considered
uncommon.

Other complications such as infections, occur only in 5% or fewer of all DSWs. However, health care professionals should take precautions to prevent infection which
could increase costs and lengthen hospital stay.

The future
Despite the lack of strong evidence a Cochrane Systematic Review is necessary.
The protocol for such a Cochrane SR has already been published. Furthermore, a
randomized clinical trial to investigate the effectiveness of various dressing materials is
ongoing in the Netherlands (www.rembrandt-trial.nl, NTR 1849). Although guidelines
on the treatment of DSWs are lacking, these findings call for an evidence-based
guideline on the treatment of acute wounds, including DSWs. This guideline, coupled
with an implementation project, should decrease the variation in wound care and
increase the quality of care for such wounds in the future. Other recommendations
are desirable in the sphere of pain- and itching treatment and haemostatic- and skin
harvesting methods.
REFERENCES


