



Best Practice

Evidence Based Practice Information Sheets for Health Professionals

Split Thickness Skin Graft Donor Sites: Post Harvest Management

Introduction

This *Best Practice* Information Sheet has been derived from a systematic review conducted under the supervision of The Joanna Briggs Institute¹. The focus of this review is the post harvest management of the Split Thickness Skin Graft (STSG) donor site. The primary references on which this information sheet is based are available in the systematic review report available from The Joanna Briggs Institute and from the web site:

www.joannabriggs.edu.au

Background

The use of the split skin graft as a reconstructive technique is commonplace. It involves the harvesting of a sheet of skin comprising epidermis and varying thickness of dermis. Naturally this

This Information Sheet Covers the Following Concepts

- New STSG donor sites
- Infected STSG donor sites
- Healed STSG donor sites
- Recommendations
- Consensus Conclusions

process involves the creation of a superficial wound that is the donor site. The donor site heals by a process of re-epithelialisation. Epithelial cells migrate across the wound surface from the rim of the wound and the edges of various structures in the dermal layer, such as sebaceous glands and

Levels of Evidence

All studies were categorised according to the strength of the evidence based on the following revised classification system.²

Level I Evidence obtained from a systematic review of all relevant randomised controlled trials.

Level II Evidence obtained from at least one properly designed randomised controlled trial.

Level III.1 Evidence obtained from well designed pseudo-randomised controlled trials (alternate allocation or some other method).

Level III.2 Evidence obtained from comparative studies with concurrent controls and allocation not randomised (cohort studies), case-control studies or interrupted time series with a control group.

Level III.3 Evidence obtained from comparative studies with historical control, two or more single arm studies, or interrupted time series without a parallel control group.

Level IV Evidence obtained from case series, either post-test or pre-test and post-test.

hair follicles. This process results in an epithelial cover of the STSG donor site usually within 7–14 days. The rate of healing is quite variable and is affected by factors such as the depth, site, and size of the wound along with the age of

the patient. The aim of donor site management is to maintain an environment that promotes optimal healing and prevents morbidity that may include, pain, infection and ultimately delayed healing.

Many topical applications/ dressings have been used on donor sites. In wound management generally, recent developments have revolved around the introduction of many new dressing alternatives, with the emphasis shifting to products that promote moist wound healing. The advantages of these dressings are well documented. Moist wound products prevent desiccation and the deepening of wounds, reduce the risk of mechanical damage to healing tissue at removal, and provide an environment that results in more rapid healing. Despite the advantages of using this approach, it is apparent that non-moist wound healing methods are still used in the management of STSG donor sites. Other dressings/topical agents that have been used and were reviewed include: growth factors, cultured skin, amniotic membrane, phenytoin, beeswax, hyaluronic acid and live yeast cell derivative. The systematic review process revealed a large number of clinical trials.

Management of new STSG donor sites

Following harvesting of the donor site primary dressings are placed on the wound and pressure bandaging applied. Pressure bandages remain in situ for varying periods usually in excess of 24–48 hours. Primary dressings should remain intact until dressings can be removed without trauma. If there is excessive discharge, dressings are either reinforced or changed completely. The dressings most commonly used in the management of STSGs fall into a number of generic categories. The major categories are listed below.

Mesh Gauze

There are a number of products in this category that are impregnated with various substances such as paraffin, lanolin, petroleum jelly, etc. These dressings are then covered with layers of absorbent dressings. The airflow through the dressings allows the exudate to dry and the dressings usually form a hard crust. Removal of the dressing often results in considerable pain and damage to the new epithelium. Based on the results of many well conducted randomised controlled and intra-individual trials mesh gauze dressings are inferior to moist wound products in terms of healing, infection rates and pain/ discomfort and should not be used in the management of the STSG donor site (**Level I**).

Polyurethane Semipermeable Transparent Films

These products are self adhesive, vapour permeable, polyurethane sheets. This type of dressing has gained considerable clinical acceptance and utilises the principles of moist wound healing. The review results indicate polyurethane films fared better with regard to pain and infection compared to mesh gauze (**Level I**). In comparison to other moist wound products polyurethane films do not have the same absorptive capacity.

Polyurethane Films can be recommended for use in the management of STSG donors however it has been suggested that polyurethane films are more suited to wounds with light to moderate amounts of exudate.

Hydrocolloids

Hydrocolloids also utilise the principles of moist wound healing. These products are occlusive sheets of hydrocolloid polymer on a layer of polyurethane foam that forms a gel like layer at the wound surface.

Hydrocolloids were found to be superior to non-moist wound products in relation to healing, pain, and infection **(Level I)**.

The studies directly comparing hydrocolloids with other moist products are insufficient to conclusively demonstrate their superiority. The overall cost of any of the treatments used in wound management is greatly affected by frequency of dressing changes.

It has been suggested that when hydrocolloids leak, reinforcement rather than changing the dressing outright is appropriate and has no greater risk of morbidity.

Fibre dressings

Most fibre dressings are calcium alginates although there are now others available. Fibre dressings are highly absorbent and like hydrocolloids form a gel surface when in contact with a moist wound. Many of these dressings have haemostatic properties that are useful in the management of donor sites. There were insufficient studies of adequate quality to make any judgement between the performance of calcium alginates and other moist wound healing products, or between specific products within the calcium alginate group. It is recommended that well designed clinical trials be conducted to compare calcium alginates with other moist wound healing products.

Retention Dressings

Retention dressings are sheets of fabric tape that are often used to reinforce primary dressings. They have also been used as primary dressings laid directly on the donor site and then covered initially with absorbent pads and a pressure dressing. These dressings have been particularly popular with paediatric patients. The advantage is that they conform well and are quite flexible. Patients are able to shower and then dry the dressing. At the time of review there were no comparative clinical trials found comparing these dressings with either mesh gauze or moist wound healing products. Their potential benefits particularly comfort, warrant further investigation.

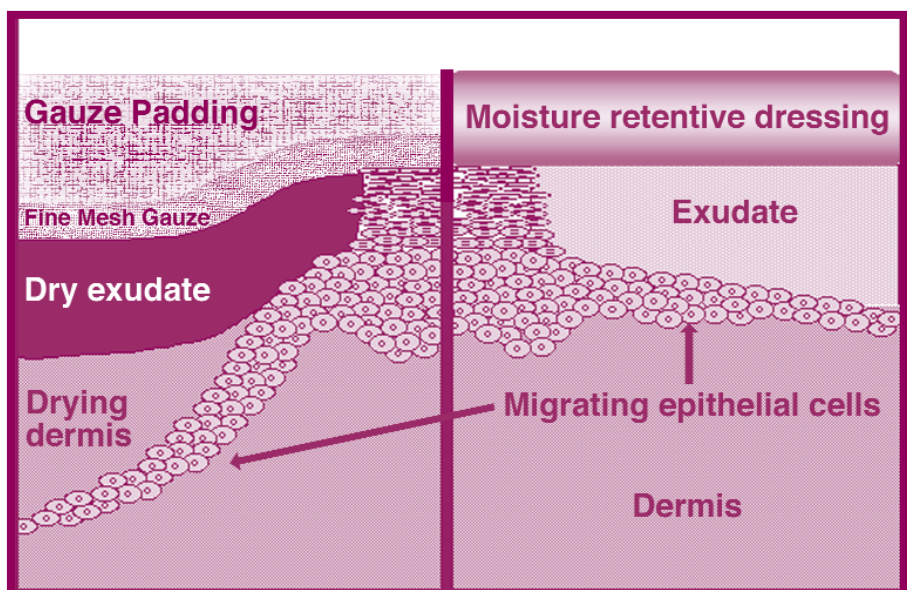


Figure 1: Moist wound healing assists to create the optimal environment for autolysis and tissue repair

Selecting the appropriate product

Time to complete healing is important but often not a critical issue. The decision to use a moist wound healing product is often based on reduced pain levels and improved patient comfort particularly with ambulation. However, for a relatively small group, eg. individuals with extensive burns that may require re-harvesting of the same donor area, rapid healing of the STSG donor site is extremely important. This has prompted a number of studies using interventions such as cultured epithelial allografts or growth factors. These have been found to be superior to non-moist dressings but there have been few studies comparing these therapies with moist wound healing products. Due to cost it is unlikely that these interventions will be used routinely for the majority of patients with STSG donor sites however, for those that require re-harvest they may be appropriate.

Management of healed STSG donor sites

The management of the healed donor site is aimed at maintaining the integrity of the new skin by preventing dehydration and reducing the risk of sun exposure. Patient education and specific interventions should include the use of moisturisers applied frequently (2-3 times daily), the avoidance of ultra violet (UV) exposure and the use of highly protective sun screens. Although some clinical trials have been conducted no specific moisturiser can be recommended. Considering the cost of many of these products, and their extensive use it is recommended that further clinical trials be undertaken.

Management of infected STSG donor sites

At the time of review no studies of clinical trials that dealt specifically with any of the alternative treatments of infected donor sites were found. A number of the studies included in the analysis examined anti-microbial products but these were used on new donor sites and not on infected wounds.

A wider search revealed a number of papers dealing with the use of antimicrobials for burns. It is logical that the evidence relating to antimicrobials and their use in managing infected superficial burns may be extrapolated to donor sites. Many antimicrobials have been used in the management of burns and infected donor sites, examples include Silver Nitrate, acetic acid, Sulfamylon, Betadine, gentamycin, Furacin, and silversulphadiazine. The management of clinical infection should be based on accurate diagnosis and consideration of the individual needs of the patient, however silversulphadiazine is often the treatment of choice with the ability to reduce bacterial load, particularly in the case of *Pseudomonas aeruginosa*. Topical treatment should be short term with regular reassessment.

Conclusion

Clearly moist wound healing products have a distinct clinical advantage over non-moist products in the management of STSG donors. This advantage relates to healing, pain/comfort and infection rates. Moist wound products can be divided into groups based on their ability to manage

exudate. Therefore it is recommended that wounds with light to moderate exudate be managed with polyurethane films; wounds with moderate exudate with hydrocolloids; and heavily exuding wounds with calcium alginates. This has yet to be tested rigorously in clinical trials.

Table 1: Examples of moist wound healing products included in the systematic review
This is not an exhaustive list of available products.

	Generic Group	Trade Names
Moist	Calcium alginates	Algiderm Kaltostat
	Hydrocolloid sheets	Comfeel Thin Dermasorb DuoDERM Granuflex Varihesive Sure Skin Wound Contact Layer
	Polyurethane semi-permeable films	Eurothane Omiderm Opsite Tegaderm Ventex
	Retention dressings	Fixomull Hypafix Mefix



Recommendation for Practice

Primary dressings that utilise moist wound healing principles such as, hydrocolloids and polyurethane semipermeable film dressings, should be used in preference to traditional mesh gauze dressings in the management of STSG donor sites. (Level 1)

Consensus Based Conclusions

- Primary dressing selection should be based on assessment of the likely amount of exudate.
- Primary dressings should be supported by pressure bandaging for at least 24–48 hours.
- If the donor site demonstrates persistent clinical signs of infection a short course of topical antimicrobials may be commenced with frequent follow-up assessment.
- Where possible dressings should remain intact until they can be removed without trauma to the site.
- If leakage occurs and clinical assessment does not indicate infection the primary dressing should be reinforced.
- If leakage persists the primary dressing should be removed and the wound assessed for clinical signs of infection. If there are no clinical signs of infection the site should be redressed with the primary dressing of choice.
- Donors sites that have complete epithelial cover should be washed gently and have a moisturiser applied at least twice daily.
- Patients should be educated that they should avoid UV exposure to the donor site. If exposure is unavoidable highly protective sun screens should be applied.

- The Joanna Briggs Institute
Margaret Graham Building
Royal Adelaide Hospital, North Terrace
South Australia 5000
<http://www.joannabriggs.edu.au>
ph:(+61 8) 8303 4880 fax:(+61 8) 8303 4881
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This sheet should be cited as:

JBI, 2002 Split Skin Graft Donor Sites: Post Harvest Management, *Best Practice* Vol 6 Iss 2, Blackwell Publishing Asia, Australia.

References

1. Wiechula R, 2001 *Post Harvest Management of Split Thickness Skin Graft Donor Sites*. A Systematic Review No. 13, The Joanna Briggs Institute, Adelaide.
2. NHMRC, 1999, A guide to the development, implementation and evaluation of clinical practice guidelines, Canberra, NHMRC.

Acknowledgments

This information sheet was derived from a systematic review conducted by Rick Wiechula of The Joanna Briggs Institute for Evidence Based Nursing and Midwifery. The review report and recommendations were reviewed by a multidisciplinary panel.

In addition the *Best Practice* sheet has been peer reviewed by experts nominated by JBI collaborating centres throughout Australia, New Zealand and Hong Kong.