

The cost of cost-savings

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Abstract

Over the past decade there has been an explosion of scientific research and new products in the field of wound healing. Our primary care clinics in South Africa, however, make very little use of these new dressings, stating cost as the reason.

We undertook a study in the burns clinic of the Red Cross Children's Hospital in Cape Town to determine the cost implications of using a polyurethane film dressing (Omiderm®) for patients with small to intermediate-sized partial thickness burns in place of conventional daily silver sulfadiazine dressings. Twenty patients with partial thickness scald burns ranging from 1-15% total body surface area (TBSA) were included in the study. We demonstrated that by using Omiderm dressings we achieved an average saving of R260 (AU\$47) per patient, a saving of over 60%. These results show not only the significant cost reduction that can be attained by using a new generation dressing such as Omiderm, but also demonstrate the considerable hidden costs of conventional dressings.

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Introduction

The health care system in South Africa is in crisis as it battles to cater for the country's majority that previously had limited access to adequate health care facilities. Furthermore, burn injuries in South Africa are a 'disease' afflicting predominantly the lower socio-economic groups, those that live in makeshift dwellings, cook on open flames and employ candles as their light source. In 1990 (when the last reliable figures were obtained) over 8000 patients were treated for burn injuries in the Cape Town metropolitan region alone

[Peden M. National Trauma Research Programme of South Africa data; personal communication], utilising a significant proportion of the local health budget on their way to recovery. Our developing day hospital system (outpatient only, primary care clinics) treats the majority of small and intermediate sized partial thickness burns not requiring hospitalisation. However, these institutions are frequently severely understaffed and understocked, and their clinical practices outdated. It is thus understandable that conventional treatment methods are seen as 'cost-saving' when they are, in reality, 'cost-ly'.

We undertook a study in the burns clinic of the Red Cross Children's Hospital to determine the cost-implications of continuing to use conventional antimicrobial cream, gauze-and-crêpe dressings as opposed to a polyurethane film (Omiderm®, Omikron Scientific Ltd). Omiderm is a semi-permeable, transparent, non-adhesive, polyurethane film dressing. It is available in both unmeshed (used in this study) and meshed forms.

Patients and methods

The study was conducted on 20 children with superficial to intermediate depth partial thickness burns who, under our health care system, would ordinarily have been treated at the day hospitals. The day hospital management of partial thickness burns involves 5 times per week (daily Monday to

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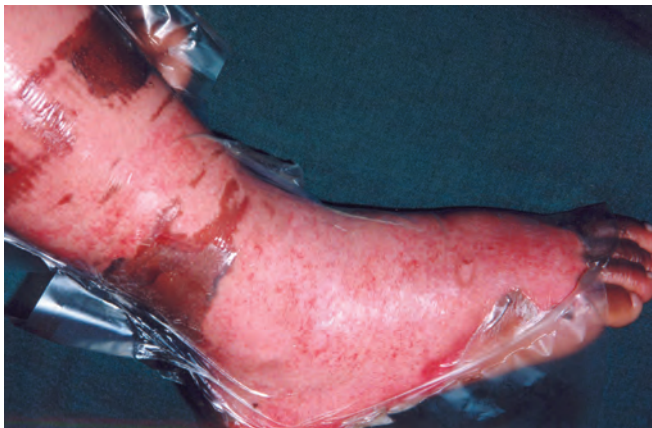
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Friday) dressings of paraffin-impregnated gauze, a topical antimicrobial such as silver sulfadiazine, gauze and a crêpe bandage.

All patients underwent thorough assessment in the burns clinic and were deemed suitable for outpatient management. This consisted of oral analgesia half an hour before the dressing change, cleansing of the wound with a chlorhexidine solution and normal saline, and subsequent application of Omiderm with a border of normal unburnt skin of at least 3cm (Figure 1 & Figure 2). The Omiderm was held in position with a crêpe bandage secured with adhesive tape (Micropore®).

Patients with small burns (<5% total body surface area [TBSA]) were seen a week later. The remainder were seen 3 or 4 days later at the next clinic. When the burns registrar determined that the burn wounds appeared healthy and were healing well, the time interval between appointments was increased to 7-10 days. Outpatient analgesia (paracetamol and, if necessary, ibuprofen) was prescribed. All parents of the patients in this study were informed of the risk and signs of infection and advised to go directly to our burns unit if there was any concern.

Figure 1 & 2. Omiderm in place on a 2 day old hot water burn.



At the follow-up visits, the crêpe bandaging was removed and the burn wound inspected through the transparent Omiderm. If the Omiderm had shifted slightly, it was moistened with warm saline and repositioned over the burn. A complete dressing change of the Omiderm was performed only if it had cracked in multiple places, or it had shifted and crumpled upon itself, rendering further use of it impossible.

On complete healing of the patients' burn wounds, a cost analysis was carried out comparing the total cost encountered with the cost that would have occurred with the day hospital system of daily dressings.

Results

The 20 patients ranged in age from 1-12 years and had all sustained partial thickness hot water burns. The average burn size was 5.5% TBSA (1-15%). The burns involved the limbs and trunk only – burns of the face, hands and perineum were excluded from the study. The burn wounds of 17 of the 20 children healed uneventfully. Two children developed minor burn wound infection (as evidenced by increased wound exudate, surrounding cellulitis and positive bacterial cultures). Both children had the Omiderm removed and daily SSD (silver sulfadiazine) dressings instituted. One was subsequently lost to follow-up while the other took approximately 4 weeks to heal. One other patient was lost to follow-up. Only the data from the two children lost to follow-up were excluded from the cost analysis.

Unfortunately, the time to completed healing could not be determined accurately because of our extended (7-10 day) follow-up period, but the average time spent under our care for acute burn wound management was 13 days (6-32 days). Sixteen of the 18 patients were healed within 2 weeks post-burn. One healed within the 2-3 week mark and one took beyond 3 weeks to heal.

An analysis of the number of dressings required revealed that the 18 patients as a group required a total of 35 dressing changes as opposed to 212 dressing changes (weekends excluded) that would have been required in the day hospital system. Seven patients required only one application of Omiderm; one patient required four applications.

Table 1 demonstrates the on-paper predicted difference in cost of conventional dressings performed 5 days per week and Omiderm dressings once per week. (In the study, however, several of our patients had their initial Omiderm dressing intact for longer than 1 week). The cost analysis of our clinical study demonstrated a saving of R260 (AU\$47) per

Table 1. Weekly dressing costs#.

Product	Conventional	Omiderm
Flamazine® (SSD)	R51.55	–
Omiderm®	–	R56.19
JeloNet®	R14.10	–
Gauze	R18.40	R0.92
Elastoform®	R15.80	R3.16
Sterile dressing pack	R9.05	R1.81
Chlorhexidine	R4.90	R0.98
Normal saline	R0.90	R0.18
Sterile plastic gloves	R3.20	R0.64
Micropore®	R0.45	R0.09
Linensaver	R7.10	R1.42
Paracetamol syrup	R0.50	R0.10
Ibuprofen syrup	R3.80	R0.76
Cost of dressing nurse time*	R29.05	R2.91
TOTAL/week	R158.80	R69.16
(A\$28.60)	(A\$12.50)	

#This cost analysis was based on a 4 year old boy with approximately 5% TBSA burns to his lower limbs

*Dressing time Omiderm: 15 minutes/week
SSD: 30 x 5 = 150 minutes/week

patient and a total saving of R4680 (AU\$842) for the group.

The overall cost of the Omiderm dressings proved to be approximately 34% of what could have been expected had 'conventional dressings' 5 days per week been used. Of note is that the cost of the initial silver sulfadiazine dressing(s) that the patients received prior to attending the burns clinic has been added to the total cost of the Omiderm dressings, i.e. had the patients had the Omiderm dressing at first presentation, we would expect the saving to be even greater.

A secondary, subjective finding was the decreased amount of pain the children experienced with the Omiderm dressings. Although not specifically studied, this was apparent to all staff involved in the burns clinic.

Discussion

Burns are costly. In 1997, the 460 patients that were admitted to the Red Cross Children's Hospital burns unit cost the state R6.9 million (AU\$1.24 million). In the United States 60,000-80,000 people require in-hospital care for burns each year, with the average cost for hospital care of a patient injured by flame and/or smoke inhalation ranging from US\$36,500-117,500, and much higher for severely injured patients¹. The majority of burn patients, however, do not require in-hospital

care. True cost-effectiveness of outpatient management of burn patients is thus critical to decreasing the cost of total burn costs for any health care system.

In 1962 *Nature* published the landmark article by Winter² revealing the superiority of moist wound healing over air-drying of wounds. The production of moist wound healing dressings began in earnest almost 2 decades later with the introduction of the first polyurethane film onto the market. Over the past decade there has been an explosion of scientific research and new products in the field of wound healing. Despite the multitude of studies showing the improved healing and numerous advantages of 'new generation' moist wound healing dressings³⁻⁹, conventional antimicrobial cream, gauze and crêpe dressings are still widely used, frequently under the banner of 'lower cost'.

Our study clearly demonstrates the lower overall cost obtained by using a new generation dressing even though it has a significantly higher unit cost than conventional dressings. Numerous factors account for this, the most significant of which is that fewer dressing changes are required. Not only does this on its own ultimately lead to a decreased total cost as a result of the fewer dressing consumables used, but it also significantly decreases the amount of nursing time spent on dressings. Although not specifically studied, we also found that the patients with Omiderm dressings required less analgesia.

In 1990, 7232 patients with scald burns were seen in the Cape Town metropolitan area, of which 5872 (81.2%) were treated exclusively by primary care institutions [Peden M. National Trauma Research Programme of South Africa data; personal communication]. If we extrapolate our data to this group of patients of whom our study group are a sub-sample, we are able to predict an annual saving of R1.5 million (AU\$270,000) for the Cape Town metropolitan area alone. This represents a substantial saving for any health department.

The aim of our study was to investigate whether a cost-saving which we had shown on paper would in fact hold true in our clinical setting. It was not aimed at proving the superiority in healing of moist wound healing dressings over conventional dressings; this has been demonstrated convincingly by multiple investigators³⁻⁹ and we accept that there are possibly other dressings that will result in more rapid healing.

Our reason for choosing the polyurethane film, Omiderm, is its ease of application and removal and, most importantly, the fact that once applied to a wound it may be left on until

the wound is healed. It then falls off of its own accord leaving a completely healed wound. In the initial stages of the study, the Omiderm was at times removed by the dressing nurse when it was not necessary. Education is thus paramount whenever a new product/protocol is introduced.

Such a dressing that can be applied shortly after occurrence of the burn, and that requires no, or few, subsequent dressing changes is ideal for the population we treat. They are almost exclusively of poor socio-economic status, have no personal transport, and depend on our mini-bus taxi system of public transport for visits to the hospitals. Each visit costs R5 (just under \$1) in mini-bus taxi-fare, as well as the lost income from a day off work waiting at an overcrowded day hospital. This is unaffordable for these patients and, we believe, unnecessary.

A second vitally important finding emerged. This was the smiles on many of the children's faces as they entered the burns clinic. Although this was the subjective experience of the burns registrar and the dressing staff, it was further borne out by the minimal analgesic requirement that these children had. Having escaped the agony of daily painful dressing changes, these children displayed an affect totally contrary to that of most children returning to a burns clinic for dressings. These findings confirm previous reports^{6,8,9}. Further advantages of moist wound healing dressings include greater patient comfort, improved compliance, less limitation of activity and decreased time for individual dressing changes³⁻⁹.

As with the use of any new dressing product, there is a learning curve. We identified the following problems for which we offer solutions:

- *Curling*. Curling up at the edges where the Omiderm overlapped normal skin was a problem until we discovered that moistening the surrounding skin with saline eliminated this.
- *Shift*. Complete shift and crumpling upon itself rendered further use of the Omiderm impossible. This was due to the crêpe bandaging being applied as for a 'one-day' dressing, when in reality it had to last for 7-10 days. Spiralling the adhesive tape around the entire limb solved the problem. Moistening the Omiderm with warm saline and gently shifting it back into position rectified problems with minor shift.
- *Strikethrough*. Dressings covering Omiderm applied shortly after the burn injury required reinforcing of the dressing with Kerlix®, Velband® or similar to compensate

for the non-absorptive nature of Omiderm. At the first dressing check/change, this could be reduced to a light crêpe bandage only.

- *Removal*. Omiderm does not adhere to dry (in this case, healed) skin and thus lifts off as the healing progresses. These lifted edges can be trimmed. Should one wish to remove the Omiderm before healing is complete, moistening it with warm saline allows it to be removed with minimal discomfort to the patient.

Conclusion

In conclusion, we demonstrated a significant cost-saving when Omiderm dressings were used for partial thickness burn wounds in place of conventional daily silver sulfadiazine dressings. Secondary findings were decreased patient morbidity and decreased analgesic requirements. Although further studies are required to elucidate the exact cost implications of different dressings in the burns outpatient setting, we suspect similar findings will emerge. In this time of worldwide financial strain on health services, we strongly recommend that burns departments continually re-evaluate their conventional practices, lest significant potential savings pass them by unnoticed.

Acknowledgments

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