

PolyMem dressings made easy

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Introduction

As healthcare budgets are put under pressure, providers increasingly need to balance reduced cost with providing high-quality outcomes. This has led to more wounds being treated in the community, creating a need for non-specialists to acquire knowledge about advanced wound care products. However, the wide variety of dressings available means that there is often confusion about which product to use and when. An easy-to-apply multifunctional dressing capable of stimulating the healing process, providing pain relief, and continuous wound bed cleansing can simplify dressing selection and encourage patients to be involved in their care. This Made Easy describes the PolyMem range of multifunctional polymeric membrane dressings, which offer a simplified and cost-effective approach to healing and pain relief in a wide range of acute and chronic wounds.

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How healthcare trends impact wound care

Over the last decade the delivery of wound management in Europe has shifted in location from hospital towards community settings^{1,2}. As such, patients are often cared for by a wide range of people with different knowledge levels and skills.

In addition, for some patients with complex comorbidities, wound healing is prolonged and accompanied by major symptoms that adversely affect quality of life. Healthcare professionals therefore face the dual challenge to meet patient expectations of providing best care in the community setting, and to recognise and act appropriately for those patients for whom healing is prolonged^{3,4}.

As care moves away from the acute hospital environment, patients will no longer be able to access 24-hour care from a healthcare practitioner. Therefore it is essential that patients, families and their carers are able to take an active role in their own management. Consideration of the skill set of the person who will be performing the dressing change must therefore be taken into account when selecting a treatment protocol. This should include a dressing that is easy to apply, comfortable to wear and minimises pain at dressing changes. In addition, dressings should ideally protect the

wound from infection risk. This includes dressings that can facilitate autolytic debridement, reduce inflammation (including manage the bioburden), swelling and pain.

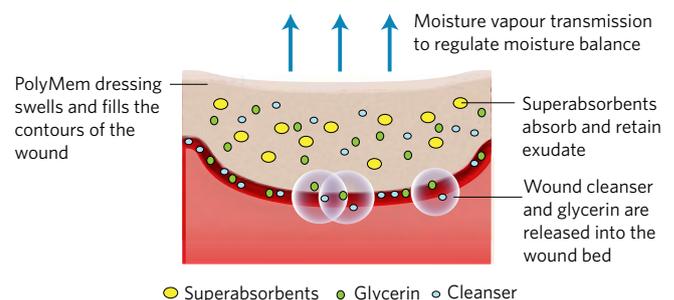
To simplify this process, community practitioners require multifunctional wound care products (e.g. PolyMem) that can stimulate wound healing in a wide variety of wounds at different stages of wound healing. This is fuelled both by a requirement to reduce risk, and the practicalities of having access to a limited range of dressings.

PolyMem: what makes it different?

PolyMem multifunctional polymeric membrane dressings comprise a hydrophilic polyurethane matrix that contains a mild, non-toxic wound cleanser (F-68 surfactant), soothing moisturiser (glycerin), a superabsorbent starch co-polymer and a semi-permeable backing film (not included for cavity products).

When PolyMem is applied to the wound, the dressing components work individually and synergistically to support healing and pain relief:

- Following application of the dressing, the wound cleanser is continually released into the wound. It loosens the bonds between slough/fibrotic tissue and healthy granulation tissue for effective autolytic debridement.
- The moisturiser (glycerin) is simultaneously released to help create a moist wound environment and to prevent the dressing from sticking to the wound bed. It draws fluid (including nutrition and growth factors) from deeper tissues into the wound bed to stimulate healing.
- The superabsorbents draw wound exudate into the dressing. The excess fluid binds to the superabsorbents, which prevent it from being released back into the wound. This helps to balance moisture levels and reduce the risk of maceration.
- The semi-permeable membrane allows excess exudate to evaporate, regulating moisture and temperature at the wound surface. The film also protects the wound and serves as a barrier to the ingress external liquids.



PolyMem dressings made easy



Using PolyMem to reduce wound inflammation, swelling and pain

Inflammation is a biological response to tissue injury and is essential for the re-establishment of haemostasis and progression towards healing. However, an out-of-control inflammatory reaction is associated with persistent wound inflammation and delayed healing⁵. Moreover, long-term inflammation can lead to adaptive changes in the nervous system that increase or alter pain sensations⁶. Therefore, taking steps to ease inflammation is an effective means of interfering with the process of pain sensitisation.

Evidence suggests that PolyMem dressings reduce the inflammatory response at the wound site and in the surrounding tissues⁷, with an associated decrease in bruising and swelling (oedema), even when applied to intact skin⁸.

PolyMem may also modify pain-signalling pathways, inhibiting the actions of nociceptors (pain receptors)⁹ by absorbing sodium ions from the skin and subcutaneous tissues under the dressing¹⁰. This reduction in nociceptor response is thought to occur without interfering with the normal inflammatory response required for healing¹¹.

PolyMem's unique actions synergistically combine to help reduce inflammation, swelling and somatic pain to promote rapid healing.

Additional benefits of using PolyMem

Simplifying dressing choice

Another key feature of PolyMem dressings is their ability to combine wound cleansing, debridement and fluid handling (absorption and retention of fluid). This makes them highly suitable for a wide variety of wounds

and at different stages of wound healing. By helping to make dressing selection less confusing, the risks of placing the wrong dressing on a wound are reduced with the potential to improve outcomes.

Ease of use

The combined actions of the wound cleanser and moisturiser minimise (and often exclude) the need for additional wound cleansing at dressing change. This simplifies the dressing change procedure, saves time for clinical staff, causes less pain, and reduces the potential for infection and disruption of newly formed granulation tissue. Finally, since PolyMem does not stick to the wound bed there is usually very little pain associated with the removal of these dressings, even in complex patients¹².

Patient involvement

PolyMem dressings have a clear visual indicator for when they need to be changed. This, and the simplicity of the dressing change process, allows patients to take an active role in managing their own care, reducing the reliance on qualified nursing staff¹³. In helping the patient to feel empowered, this can also result in better outcomes and improve concordance with the care plan¹⁴.

When is PolyMem indicated?

PolyMem is suitable for a wide variety of acute and chronic wounds including — but not limited to — pressure ulcers, leg ulcers, diabetic foot ulcers, donor and graft sites, surgical wounds, skin tears, first and second degree burns, radiotherapy-induced skin damage, dermatological disorders (e.g. epidermolysis bullosa), fungating wounds, exposed tendons and tube sites.

How to select from the PolyMem range

Prior to application, a holistic assessment should be performed to determine which

dressing best reflects the needs of the patient and the wound (*Table 1*):

- **For wounds with low-to-moderate exudate levels, regular PolyMem can be used.**
- **For medium-to-high exuding wounds, select PolyMem MAX for a longer wear time.**
- **For wounds with signs and symptoms of infection, or at high risk (e.g. burns patients) select from the PolyMem Silver range of dressings. These contain nanocrystalline silver particles, which act on bacteria within the dressing.**
- **PolyMem WIC (regular and Silver) can be used in cavity wounds including sinus tracts, tunneled wounds and fistulae (*Box 1*).**
- **PolyMem Finger and Toe dressings are tubular and can be used for injuries to the fingers and toes.**

Box 1 PolyMem and cavity wounds

These wounds are often deep and difficult to manage. PolyMem WIC is designed for cavity wounds where the clinician has full visibility.

A rope version can be used for tunnels, sinuses or cavity wounds where the clinician does not have full visibility and is available as a silver product only¹⁵. They do not have a film backing and can be layered or cut.

Clinical work has shown PolyMem to be effective in managing complex deep wounds. The dressings do not stick to the wound and are easy to insert and remove^{16,17}.

Guide to application

1. Before application of PolyMem, the wound bed should be prepared according to local policy. In most cases (apart from initial use of PolyMem) there is no need to cleanse the wound prior to application unless the wound is infected or contaminated.

Table 1 PolyMem dressing selection guide

Wound phase and exudate level					
Non-infected	<p>POLYMEM</p> <p>For initial days of POLYMEM usage POLYMEM MAX</p> <p>POLYMEM WIC + POLYMEM MAX</p>				
Critically colonised, infected, or infection risk*	<p>POLYMEM SILVER</p> <p>For initial days of POLYMEM usage POLYMEM MAX SILVER</p> <p>POLYMEM WIC SILVER + POLYMEM MAX SILVER</p> <p><small>*POLYMEM SILVER dressings can be used when visible signs of infection are present Address underlying cause of the infection using appropriate medical treatment</small></p>				
Cavity/undermining/tunneling (used in combination with above dressings)	<p>POLYMEM WIC (non-infected)</p> <p>POLYMEM WIC SILVER and POLYMEM WIC SILVER ROPE (critically colonised, infected and at risk)</p>				

2. Select a dressing that is at least 1cm larger than the wound and sufficient to cover any inflamed or damaged areas surrounding the wound. If required, cut to shape.
3. Place the dressing directly on the wound (film side out so the grid is visible). PolyMem WIC does not have a backing film and either side can be placed on the wound.
4. Secure dressings using a fixation method suitable for the location of the wound (e.g. tubular bandage, tape or retention garments).

Tips for application

- ✓ PolyMem is marked with a grid, which can be used as a cutting guide or use paper templates to cut complex dressing shapes for difficult-to-dress areas.
- ✓ If appropriate, cut slits a third of the way into the dressing on each side when placing over a joint to allow unrestricted movement.
- ✓ For very dry, non-exuding wounds, moisten the dressing or wound slightly with saline or water prior to application. This will help to activate the dressing components. Do not saturate the dressing.
- ✗ Do not occlude PolyMem with excess tape or bandage as this will reduce the dressing's fluid handling capacity.

How frequently should the dressing be changed?

When first using PolyMem there may be an increase of exudate. This is not uncommon and indicates that the dressing is working. Dressings may need to be changed on a daily basis initially. If dressing changes are required more than once a day then change to PolyMem MAX or use PolyMem WIC together with an absorbent pad. Exudate will gradually decrease over a period of a few days or weeks.

For exuding wounds, fluid will become visible on the top of the dressing (Figure 1). This provides a visual indicator that can be used to determine dressing change frequency. Ideally, the dressing should be changed before the exudate reaches the wound margin, when it is clinically appropriate, or after no more than seven days. If the dressing becomes saturated, it is important to change it as soon as possible. Failure to change the dressing may lead to deterioration in the wound and the periwound skin can become macerated.

Things to consider at dressing changes

- On occasion, the wound may appear larger during the first few dressing changes. This is due to debridement of non-viable tissue and is part of normal healing.
- If there are signs and symptoms of local or spreading infection (e.g. increased or new pain, heat, odour or erythema) or evidence of maceration, hypergranulation, deterioration in the wound condition or lack of healing, refer to a specialist for reassessment of their underlying condition and wound management plan.



Figure 1: Exudate is visible through top of dressing, acting as a visual indicator for dressing change. It is helpful at dressing changes to mark the approximate wound size on the outside of the dressing as a guide.

PRODUCTS FOR PRACTICE

Clinical evidence for PolyMem

Clinical studies, including a randomised controlled trial, have found PolyMem to be effective (Table 2). These are supported by numerous case reports and poster presentations, focusing on a wide range of wound types. These demonstrate that PolyMem can:

- facilitate autolytic debridement¹⁸
- reduce pain and inflammation¹⁸⁻²²
- be non-adherent to the wound bed²¹

- reduce time to epithelialisation²⁰
- reduce infection rate^{19,22}
- be an effective wound contact layer under negative pressure wound therapy^{23,24}

Further case studies can be found at www.polymem.com or polymem.woundresources.com. The following case studies on pages 5–6 provide real-life examples of using PolyMem dressings in practice.

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Table 2 Summary of published studies using PolyMem in the clinical setting

Reference	Title	Type	Purpose	Key findings
Hegarty F, Wong M. <i>Br J Nurs</i> 2014; 23: Suppl 20: S38–46	Polymeric membrane dressing for radiotherapy-induced skin reactions	Clinical evaluation	To determine efficacy of polymeric membrane dressings (PolyMem) over 4 weeks in the management of post-radiotherapy-induced skin reactions (n=23)	<ul style="list-style-type: none"> ■ Significant reduction in pain at dressing change and not related to dressings, with rapid decline in wound pain scores between week 1 and week 2 ■ Increased healing rates within 14 days ■ Evidence collated from 12 patient diaries demonstrated that as their skin condition improved, hours of sleep increased, improving their quality of life
Cahn A, Kleinman Y. <i>J Wound Care</i> 2014; 23(8):394, 396–9	A novel approach to the treatment of diabetic foot abscesses – a case series	Case series	To explore a non-surgical approach (PolyMem WIC Silver Rope plus topical oxygen therapy) to the treatment of diabetic foot abscesses and osteomyelitis (n=6)	<ul style="list-style-type: none"> ■ All patients showed complete recovery within 2–9 months with no recurrence during a follow up period of 13.7±7.84 months) ■ PolyMem may be an alternative to surgery in patients with tunneling wounds and abscesses in the diabetic foot
Scott A. <i>Br J Nurs</i> 2014; 23(10): S24–30	Polymeric membrane dressings for radiotherapy-induced skin damage	Clinical evaluation	Evaluate whether a polymeric membrane dressing (PolyMem) is effective in the management of head and neck cancer patients with radiotherapy-induced skin damage (n=20)	<ul style="list-style-type: none"> ■ Free-text diaries gave insight into patient experience with considerable reduction in pain relief (11/20 did not require additional analgesia) and improved quality of life ■ Part of an ongoing multicentre study
Weissman O, Hundeshagen G, Harats M. <i>Burns</i> 2013; 39(6): 1316–20	Custom-fit polymeric membrane dressing masks in the treatment of second-degree facial burns	Case series	To investigate the use of a polymeric membrane dressing face mask in the management of second-degree facial burns (n=8) and compared to a historical cohort of patients with facial burns treated with antibiotic ointment	<ul style="list-style-type: none"> ■ Mean time to full epithelialisation 6.5 days (compared to 8.5 days in cohort) ■ Low pain ratings (2.6 vs 4.7) resulting in pain-free dressing changes with no dressing adherence ■ Inflammation contained to actual wound site and good absorbency capacity of the dressing
Yastrub DJ. <i>Care Manage J</i> 2004; 5: 213–8	Relationship between type of treatment and degree of wound healing among institutionalized geriatric patients with Stage II pressure ulcers	Randomised, controlled trial	To review the outcomes using polymeric membrane dressings (PolyMem) versus antibiotic cream and dry clean dressing (gauze) in post-CVA patients (n=44) with a Stage II pressure ulcer	<ul style="list-style-type: none"> ■ Improvement in wound healing found in 87% (n=18) in the polymeric membrane dressing group compared to 65.2% (n=15) in the antibiotic/gauze dressing group
Kim Y, Lee S, Hong S et al. <i>J Korean Soc Plast Reconstr Surg</i> 1999; 109: 1165–1172	The effects of PolyMem on wound healing	Comparative clinical trial	To compare the use of polymeric membrane dressings (PolyMem) with conventional methods (gauze) in patients with second-degree burns (n=44) and split thickness skin grafts (n=28)	<ul style="list-style-type: none"> ■ Significant decreases in wound site pain in the PolyMem groups (p<0.01) compared to gauze ■ Average healing time was significantly decreased in the PolyMem groups (p<0.01) with increased rates of epithelialisation (p<0.05) ■ Degree of comfort was significantly increased in the groups using PolyMem (p<0.01)
Blackman JD, Senseng D, Quinn L et al. <i>Diabetes Care</i> 1994; 17(4): 322–5	Clinical evaluation of a semi-permeable polymeric membrane dressing for the treatment of chronic diabetic foot ulcers	Comparative clinical trial	To compare the use of polymeric membrane dressings (PolyMem) with wet-to-dry saline dressings in patients with uncomplicated diabetic foot ulcers (n=19)	<ul style="list-style-type: none"> ■ After 2 months, the ulcer size was reduced 35+/-16% from baseline in patients using the polymeric dressing. Whereas the patients in the conventional treatment group had an increased ulcer size of 105+/-28% from the baseline value ■ Further improvements were seen in patients crossed over to the polymeric dressing after an additional 2 months

CASE STUDIES

CASE STUDY: USE OF POLYMEM IN A PATIENT WITH DIABETES

BACKGROUND

A 58-year-old gentleman with a 10-year history of type 2 diabetes developed an ulcer on the right medial malleolus. On presentation the wound bed contained 40% slough and there was erythema around the wound indicative of infection. There was also an offensive odour. The wound measured 11.5cm x 4cm (Fig 1). The patient was experiencing wound-related pain (4 on a 10-point visual analogue scale) and he had difficulty sleeping. He was taking tramadol 50mg three times daily for the pain.

TREATMENT

It was decided to use PolyMem Silver dressings to manage the local wound environment, with dressing changes scheduled for every 2 days. Systemic antibiotics were also prescribed to manage infection in this high-risk patient.

During the first week of using PolyMem Silver, the wound showed good progress with evidence of effective wound cleansing. At week 3, there was 20% slough with 70% granulation tissue and good epithelialisation (Fig 2). The wound had reduced in size to 9cm x 3cm and exudate levels were reduced. The patient reported a pain score of 1 out of a possible 10. By week 6, the wound size had further reduced to 7cm x 2cm with minimal slough (5%) (Fig 3).

OUTCOME

During the course of treatment, there was a reduction in size, reduced slough and increased granulation tissue formation. This was associated with a reduction in odour and pain, with the patient reporting an improvement in his sleeping.

DISCUSSION

The use of PolyMem polymeric membrane dressing with silver was successful in managing the local signs and symptoms of infection and was able to stimulate healing in this difficult to treat chronic wound. Pain also was reduced — as evidenced by a reduction in his pain score (from 4 to 1 by week 3) and use of tramadol from three times daily to taken as required by week 3. He was able to stop the tramadol by week 4 and was now able to sleep better.

Acknowledgement: Dr HariKrishna KR Nair, Kuala Lumpur, Malaysia



Fig 1: On presentation



Fig 2: At week 3



Fig 3: At week 6

CASE STUDY: USE OF POLYMEM IN A NEONATE WITH SEVERE EPIDERMOLYSIS BULLOSA

BACKGROUND

This infant presented at birth with marked skin fragility and a wound covering his left foot and lower leg (Fig 1). The wound resulted from trauma caused by intra-uterine movements and further damage occurred during delivery. Analysis of a skin biopsy later showed the infant to have severe generalised dystrophic epidermolysis bullosa (EB).

TREATMENT

Hydrofiber strips were placed between the toes in an attempt to prevent digital fusion at this early age. Using a template, a boot shape was cut from PolyMem and wrapped around the foot and lower leg. The boot was secured by overlapping the PolyMem and taping it to itself. Initially PolyMem MAX was applied and after one week changed to PolyMem as the exudate reduced. Oral morphine and paracetamol were used pre-procedure and pain control was effective.

OUTCOME

Healing was rapid and the limb fully healed within 21 days. The wound remained clean and free from infection (Figs 2 and 3). When PolyMem was used initially an odour was perceived. Malodour does not necessarily indicate infection; it is usually confined to the dressing and the wound is clean. To avoid frequent dressing changes, we used a charcoal dressing in conjunction with PolyMem and the odour reduced over a few days.

DISCUSSION

In neonates the dermis does not fully develop until after birth and at full term it is only 60% of adult thickness²³. In addition, the fibrils connecting the dermal-epidermal junction are reduced in number and are more widely spaced. This decreases skin elasticity and the skin is more likely to be damaged by shear forces and is prone to trauma from adhesive dressings and tapes²³. Dressings such as PolyMem contain glycerin, which prevents the dressing sticking to the wound bed and can be used on fragile skin areas to prevent further damage and protect immature skin. To prevent frequent handling of sick neonates, a more absorbent dressing such as PolyMem MAX can be used to decrease dressing change frequency.

For fragile skin or at-risk skin (and in extreme cases such as EB), this case demonstrates that, appropriately used, PolyMem provides for ease of application and removal and allowed the parents to take an active role in dressing changes.

Acknowledgement: Jackie Denyer, London, UK.

Note: Silver dressings should be used with caution in paediatric patients and under close specialist supervision.

For further hints and tips for using PolyMem dressings in patients with EB see Denyer J, Winblad R. *PolyMem Dressings in the Management of Epidermolysis Bullosa*. Available at: polymem.woundresources.com/howto/FLASH/index.html



Fig 1: Wound over foot and lower leg



Fig 2: Wound after 5 days



Fig 3: Wound after 14 days showing good level of improvement with epithelialisation and progression to wound healing

CASE STUDY: USE OF POLYMEM IN A LARGE NECROTIC HEEL PRESSURE ULCER

BACKGROUND

A 60-year-old lady with Alzheimer's Disease and reduced mobility developed a heel pressure ulcer while hospitalised for dehydration. After discharge the patient was treated by the general practitioner with application of hyaluronic acid for approximately 4 months. The wound failed to progress, measured 8cm x 6cm x 2cm and was putrid with visible bone and malodour (this prevented the family from visiting) (Fig 1). Despite multiple medications to decrease inflammation and pain, including opioids, the patient's pain level was 9 out of a possible 10.

TREATMENT

PolyMem WIC Silver cavity dressing was selected due to its ability to inhibit nociceptor response, facilitate autolytic debridement and promote rapid healing. As slough is liquefied and absorbed by the dressing, this also eliminates the need for painful manual cleansing during dressing changes.

PolyMem WIC Silver cavity dressing was covered with a charcoal dressing to minimise wound odour. 1–2ml saline was added at the initial dressing application to stimulate autolytic debridement. Following application, exudate became copious, requiring dressing changes 1–2 times a day. As the wound became cleaner, dressing change frequency reduced.

OUTCOME

After 2 days the wound was significantly cleaner and odour was controlled (allowing the family to visit). After 2 weeks the dressing changes were reduced to daily and silver dressings were changed to regular PolyMem WIC. After 4 weeks the charcoal dressings were discontinued (Fig 2) as there was no odour. At 6 weeks the patient's pain had reduced to 5 and by 8 weeks, she was completely pain-free without medication. At just over 3 months, the large cavity had completely closed (Fig 3).

DISCUSSION

Using PolyMem WIC Silver cavity dressing, there was rapid resolution of odour and pain with effective wound cleansing (avoiding the need for irrigation or debridement at dressing changes) and healing.

Acknowledgement: Dr Charalambos Agathangelou, Nicosia, Cyprus. Full study available at: <http://bit.ly/1Ha6yBS>



Fig 1: At start of treatment with PolyMem WIC Silver



Fig 2: 4 weeks after starting treatment



Fig 3: Wound healed after 3 months of treatment

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Summary

There is a need to find simple solutions to complex wound healing problems. PolyMem polymeric membrane range of dressings are multifunctional and can be used on a wide variety of wounds and at different stages of healing. In addition to wound cleansing, debridement and fluid handling, PolyMem can reduce pain, swelling and inflammation to stimulate healing. The ability to combine a number of actions can help to simplify dressing selection, reduce risk and improve outcomes.