

## A unique, multifunctional dressing in chronic wound management



Authors (clockwise from the top left):

Harikrishna KR Nair,  
Sylvia SY Chong,  
Mohd Hasbullah

Wound experts worldwide are simplifying their formularies to produce a class of innovative multifunctional wound care dressings. PolyMem (Ferris Mfg. Corp.) is a multifunctional dressing that can replace common wound care products such as alginates, hydrogels, hydrocolloids and foams. The polymeric membrane dressing can be used as a primary or secondary dressing and also as a combination to support the entire healing process. This study demonstrates the efficacy of polymeric membrane dressings in chronic wound healing by simple randomisation. The study took place in an outpatient setting at the Wound Care Unit at Kuala Lumpur Hospital (WCUHKL) in Malaysia, where patients were given the standard of care by a WCUHKL nurse. Wounds were assessed using the TIME framework. The wounds were cleansed using distilled water and debridement was done where necessary before being covered by polymeric membrane dressings. All wounds dressed with polymeric membrane dressings showed improvement and half closed within four weeks.

**Harikrishna KR Nair** is Head of Wound Care Unit, Department of Internal Medicine, Hospital Kuala Lumpur; **Sylvia SY Chong** is Research Assistant, Wound Care Unit, Department of Internal Medicine, Hospital Kuala Lumpur; **Mohd Hasbullah** is a Staff Nurse, Wound Care Unit, Department of Internal Medicine, Hospital Kuala Lumpur

**G**lobal life expectancy has doubled since the 1900s and is now more than 70 years (Roser et al, 2013). The risk of developing chronic diseases increases with age. Chronic non-healing wounds are increasingly recognised as an emerging epidemic within healthcare. Although the healthcare system has evolved tremendously in the past few decades and continues to change for the better, chronic wound management is a massive financial burden. De La Torre and Chambers (2019) define a chronic wound as one that has failed to proceed through the phases of healing in an orderly and timely fashion and shows no significant progress in 30 days. Types of chronic wound aetiologies include, but are not limited to, venous leg ulcers (VLU), diabetic foot ulcers (DFU) and pressure ulcers (PU).

Wound bed preparation is crucial, as emphasised by Sibbald et al (2000). Management of devitalised tissue and slough with debridement, bacterial burden and exudate management is important. In contrast to acute wound fluid, chronic wound fluid inhibits re-epithelialisation and contains degradation products vitronectin and fibronectin, which inhibit keratinocyte

migration. Furthermore, when chronic wound fluid is added to cultures of keratinocytes, fibroblasts, or endothelial cells, it fails to stimulate DNA synthesis directly, in contrast to the DNA-synthesising ability of acute wound fluid. Another key biochemical difference in chronic wounds is that they exhibit considerably higher protease activity than acute wounds (Leveriza-Oh and Phillips, 2005). Therefore we need to manage the exudate or fluids well to allow the wounds to epithelialise.

Prolonged wound management times can delay chemotherapy and radiation treatments, extract a significant toll on people's quality of life, compound psychological devastation on top of injury and illness, and may lead to cosmetically unacceptable results (Ferreira et al, 2006). Nussbaum et al (2018) estimate that up to 2% of the population in developed countries suffer from chronic wounds.

The basic function of the wound care materials is to protect from infection, absorb blood and exudate, promote healing and possibly apply a medication to the wound. In the past, the development of wound dressings was managed in accordance with personal experience or historical knowledge. More recently, the development of advanced wound

dressing has been guided by clinical studies and evidence-based medicine intended for better wound care management.

Advanced wound dressings have evolved as experts simplify their formularies to produce an innovative class of multifunctional wound care dressings. PolyMem® is a multifunctional polymeric membrane dressing comprising a hydrophilic polyurethane matrix that contains a mild, non-toxic wound cleanser (F-68 surfactant), soothing moisturiser (glycerin), a superabsorbent starch copolymer and a semi-permeable backing film, which is not included for cavity products (Ousey et al, 2015). Many different types of studies, including case reports, clinical series, clinical evaluations, comparative clinical trials, and randomised controlled trials, have found the polymeric membrane dressing effective (Fiowler and Papen, 1991; Edwards and Mason, 2010; Wilson, 2010; Cahn and Kleinman, 2014; Benskin, 2018). Clinical evidence demonstrates that this dressing facilitates autolytic debridement (Agathangelou, 2011), reduces pain and inflammation (Agathangelou, 2011; Agathangelou, 2012; Rahman and Shokri,

2013; Haik et al, 2012; Tamir and Haik, 2008; Beitz et al, 2004; Weissman et al, 2013; Hayden and Cole, 2003; Kahn, 2000), ensures non-adherence to the wound bed (Tamir and Haik, 2008), reduces time to epithelialisation (Rahman and Shokri, 2013; Weissman et al, 2013) and is also an effective wound contact layer under negative-pressure wound therapy (Skrinjar et al, 2011; Vanwalleghem, 2013).

## Objective

Use of the polymeric membrane dressings for healing of chronic wounds.

## Methods

This study was done by simple randomisation, which involved application of polymeric membrane on patients with wounds of different aetiology. The study was carried out in an outpatient setting at the Wound Care Unit of Kuala Lumpur Hospital in Malaysia (WCUHKL). Patients were given standard of care by the WCUHKL nurse. Wounds were assessed with TIME (tissue management, inflammation and infection control, moisture balance, epithelial/

### Case 1

■ A 35-year-old male with no known medical illness presented with a post-motor vehicle accident wound

10 June 2019



1 July 2019



### Case 2

■ A 36-year-old male with no known medical illness presented with a postoperative keloid removed from the chest

7 June 2019



5 July 2019



### Case 3

■ A 59-year-old female with a history of diabetes mellitus and hypertension developed an ulcer on the right shin after exposure to hot infrared therapy

11 June 2019



9 July 2019



### Case 4

■ A 40-year-old female with no known medical illness developed bilateral venous ulcer due to long standing hours

21 June 2019



6 August 2019



## Case 5

■ A 58-year-old male with a history of diabetes mellitus and hypertension presented with a right lower limb chronic venous ulcer

13 January 2019



14 April 2019



## Case 6

■ A 67-year-old male with a history of diabetes mellitus and hypertension presented with a left hallux diabetic foot ulcer

10 June 2019



6 August 2019



edge advancement) framework. The wounds were cleansed using distilled water and debridement was done where necessary before being covered with polymeric membrane dressings. Crepe bandage was used for the post-motor vehicle accident wound, postoperative wound, post-radiation wound and the diabetic foot ulcer. A two-layer compression bandage was applied for those patients with chronic venous ulcers.

### Results

We recruited six patients with different wound aetiologies, post-motor vehicle accident wound, postoperative wound, post-radiation wound, chronic venous ulcer and DFUs?

All wounds showed improvement and half the cases closed within four weeks. The venous leg ulcer took longer owing to chronic venous

insufficiency. Compression was applied and the wound closed in 12 weeks.

### Discussion

PolyMem is a multifunctional dressing that is proven to effectively cleanse, fill, absorb and moisten wounds throughout the healing processes. The polymeric membrane dressing helps maintain a clean wound bed by loosening necrotic tissue, slough and other debris. The hydrophilic polyurethane membrane matrix, containing a superabsorbent starch co-polymer, draws fluid and debris from the wound bed and swells into a non-adherent gel, which helps reduce the risk of maceration. Additionally, glycerol helps to ensure non-adherence to the wound bed so that the dressing can be removed without disturbing the healing tissues. Glycerol also helps to control odour while softening

non-viable tissue. The membrane is covered by a semi-permeable continuous film, which is optimised for oxygen and moisture vapour permeability, and acts as barrier to liquids.

The polymeric membrane dressing was effective in wound closure in all six wounds, however, the study is limited due its small sample size.

### Conclusion

The polymeric membrane dressing is an all-in-one, easy-to-use dressing that can replace common wound care products such as alginates, hydrogels, hydrocolloids and foams. The ability to combine a number of actions can simplify dressing selection, reduce risk and improve outcomes. In addition, the polymeric membrane dressing can be used as a primary or secondary dressing, or as combination of both to aid the healing process in its entirety.

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### Declaration of interest:

The authors have no conflicts of interest to declare, and received no funding for this study.

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