

The Effectiveness of KerraPro™ Heel Pads and Mepilex® Border Heel Dressing in the prevention of Heel Pressure Ulcers

Dr Stephen Young

Managing Director, InControl Cambridge, 17 Greenacres, Duxford, Cambridgeshire, CB22 4RB, Steve@InControlCambridge.com

Introduction

The study assessed the pressure reducing effects and the prevention of pressure ulcer formation of a silicone heel pad (KerraPro, Crawford Healthcare) compared with a self-adhesive foam dressing (Mepilex Border Heel dressing, Mölnlycke Health Care) in heels, both of which had pressure damage of no more than category I, using KerraPro on one heel and Mepilex Border heel dressing on the other (n=5). Category I pressure ulcers are classified as having intact skin with non-blanchable redness of a localised area, usually over a bony prominence. The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue and may indicate 'at risk' persons.¹

Method

Photographic evidence of the patient's skin and clinical assessment conducted weekly, assessing the effect of treatment on offloading and healing. A High Definition Ultrasound was undertaken at day 0 (start of the study) and day 28 (end of the study), in addition to the weekly photographic evidence. Weekly measures on each heel during the 4 weeks assessed: clinical acceptance, non-blanching erythema, product performance, and patient views. Males or females were recruited, primarily from care of the elderly homes and had a Waterlow risk assessment score of 15 or more, with no signs of clinical infection. The skin was reassessed once a week to ensure that the heel pads are being applied appropriately. APBI was not be undertaken as part of this study. Randomisation conducted at the start of the study, applying Mepilex Border to the right heel and KerraPro to the left heel in all patients.

Scans of the injured skin were compared with scans of the 'normal' skin (adjacent to the affected area) to give a measure of the difference between tissues at the start of the study and the progress as the study advanced. Using the scanners image analysis software enabled the measurement of the amount of oedema within the dermal tissue. Each scan of the tissue was analysed using a form of pixel distribution analysis whereby pixels below certain intensity are classed as low echogenic pixels (LEP). The ratio of LEP's to total pixel count (TP) has been shown to reflect changes in dermal water content² and can provide a quantitative assessment of the level of oedema present in the damaged tissue.

Results

KerraPro treated heels had fully resolved from Category 1 status by week 2 whereas the Mepilex Border treated heels required an additional week to resolve (Figure 1).

Patient	Time 0		1 week		2 week		3 week		4 week	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
KJ	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No
MD	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No
MF	Yes	Yes	Yes	Yes	No	No	No	No	No	No
MG	Yes	Yes	Yes	Yes	No	No	No	No	No	No
RW	Yes	Yes	Yes	Yes	No	Yes	No	No	No	No

Figure 1 Table indicating presence of non-blanching erythema

Category 1 pressure ulcers can be painful and a visual analogue scale of pain was measured at time zero and weekly. Pain was reduced in the KerraPro treated heels in all but one patient after two weeks, but was only resolved in the Mepilex Border treated heels in week 3 (Figure 2). There appears to be a close relationship between resolution of non-blanching erythema and reduction in pain.

Patient	Time 0		1 week		2 week		3 week		4 week	
	Left	Right	Left	Right	Left	Right	Left	Right	Left	Right
KJ	5	5	2	2	0	2	0	0	0	0
MD	0	0	0	0	0	4	0	0	0	0
MF	1	1	0	0	0	0	0	0	0	0
MG	5	5	5	5	0	3	0	2	0	0
RW	2	2	1	1	1	1	0	0	0	0

Figure 2 Table showing pain assessment

After 4 weeks, the ultrasound scan on the KerraPro treated heels had returned the injured skin to an almost uninjured condition (Figure 3) whereas the Mepilex Border treated heels had improved but not as much (Figure 4).

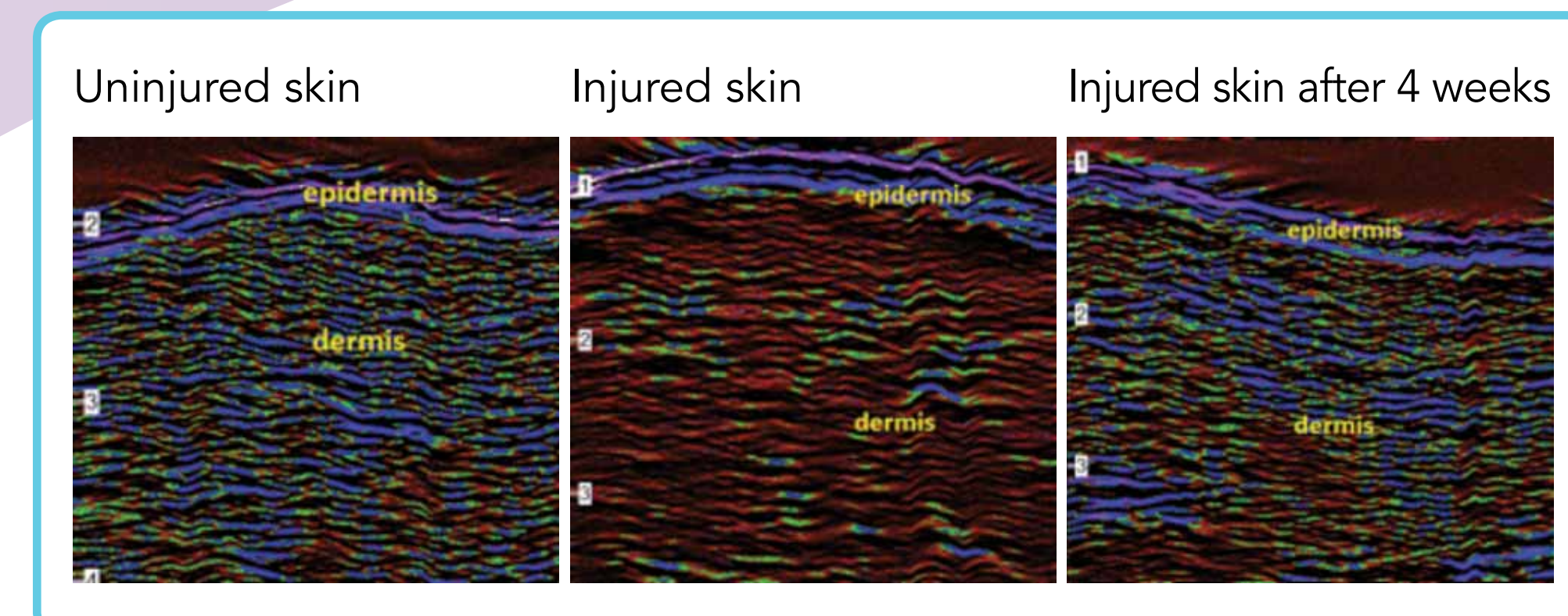


Figure 3 Ultrasound scan of the KerraPro treated heels

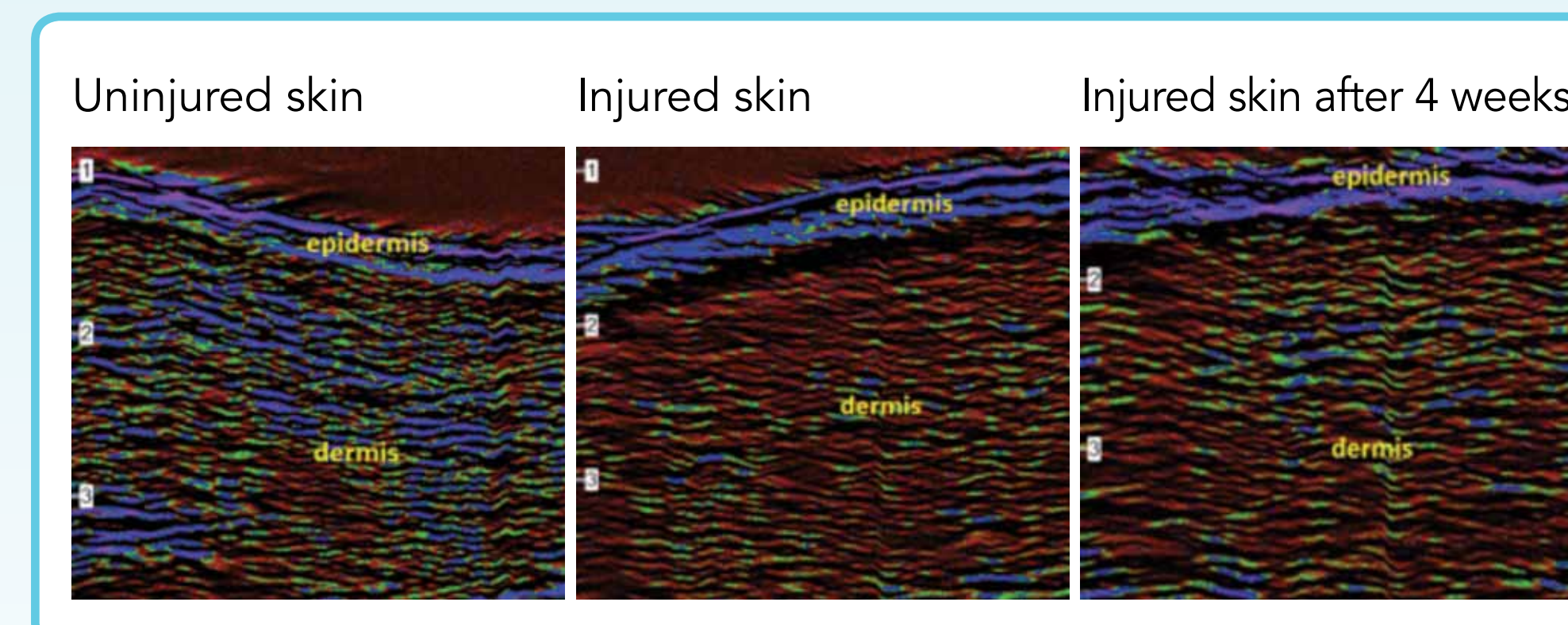


Figure 4 Ultrasound scan of the Mepilex Border treated heels

The ratio of low echogenic pixels (LEP) to total pixel (TP) count can be quantified over 5 patients and the mean ratio calculated (Figure 5).

Assessment Period	Mepilex Border Heel LEP/TP ratio ±SD	KerraPro Heel LEP/TP ratio ±SD
Injured skin		
Week 0	0.54 ± 0.07	0.59 ± 0.05
Week 4	0.44 ± 0.06	0.32 ± 0.05
Uninjured skin		
Week 0	0.24 ± 0.04	0.24 ± 0.03

Figure 5 LEP:TP ratios at time points

The mean LEP:TP ratios can be plotted over time to compare the effect of the two interventions over time (Figure 6). The KerraPro treated heels show a greater reduction in LEP:TP ratio inferring that there was a more significant reduction in dermal inflammation than that seen in the Mepilex Border treated heels.

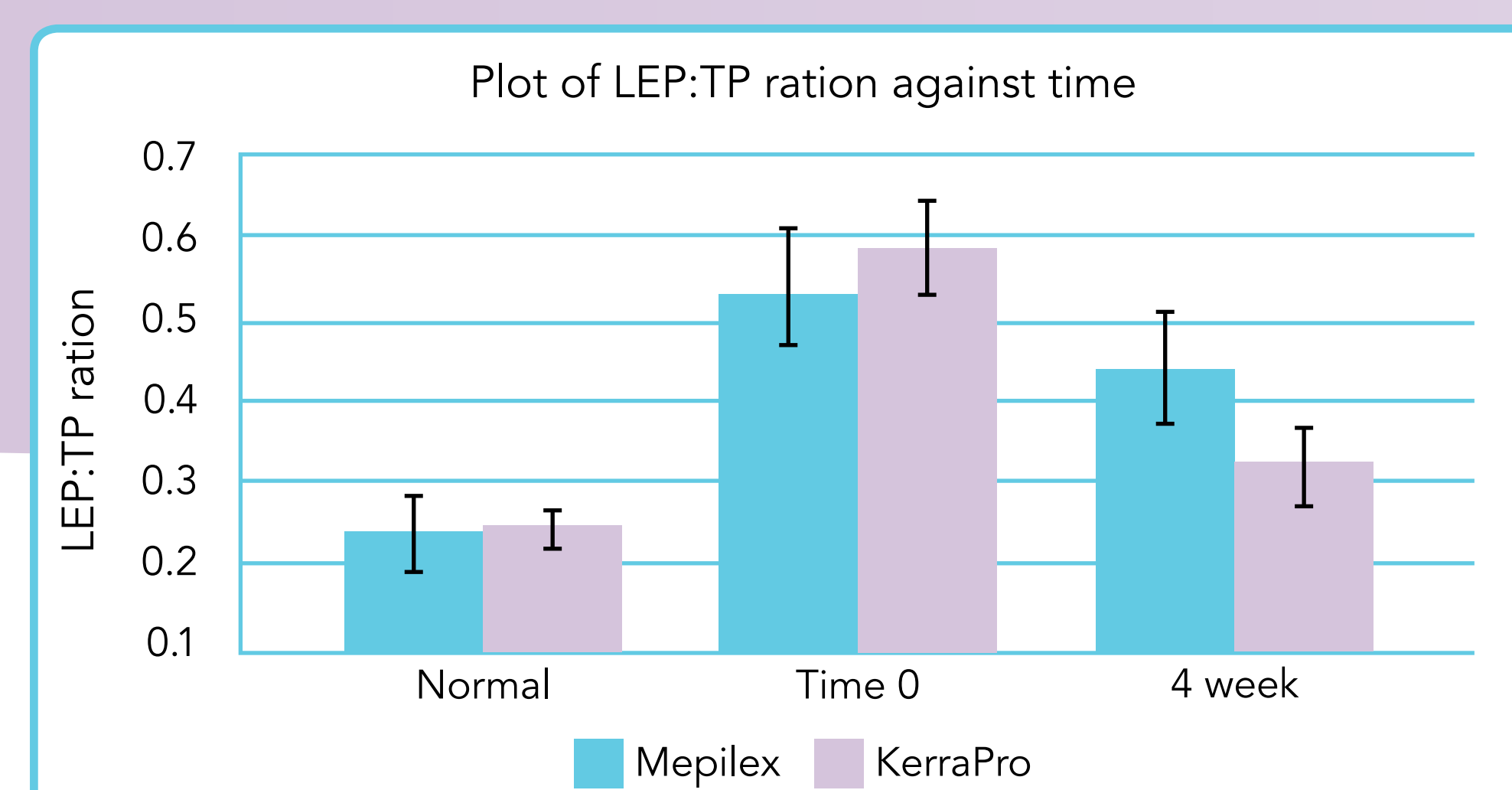


Figure 6 LEP:TP ratios KerraPro v Mepilex Border

All clinical staff commented that KerraPro Heel was easy to apply and remove, very easy to inspect the heel or wash the heel when required. All clinical staff commented that Mepilex Border Heel dressing was difficult to apply, kept sticking to gloves when trying to position and that it was

more difficult to remove. Comments were made about dressing removal being painful for patients using Mepilex Border Heel as the adhesive made a strong bond between the dressing and the skin. In all patients, 1 KerraPro Heel lasted the full study length of 4 weeks. At the end of the 4 weeks KerraPro was in perfect condition. In contrast Mepilex Border was replaced approximately every 3 days (Figure 7).

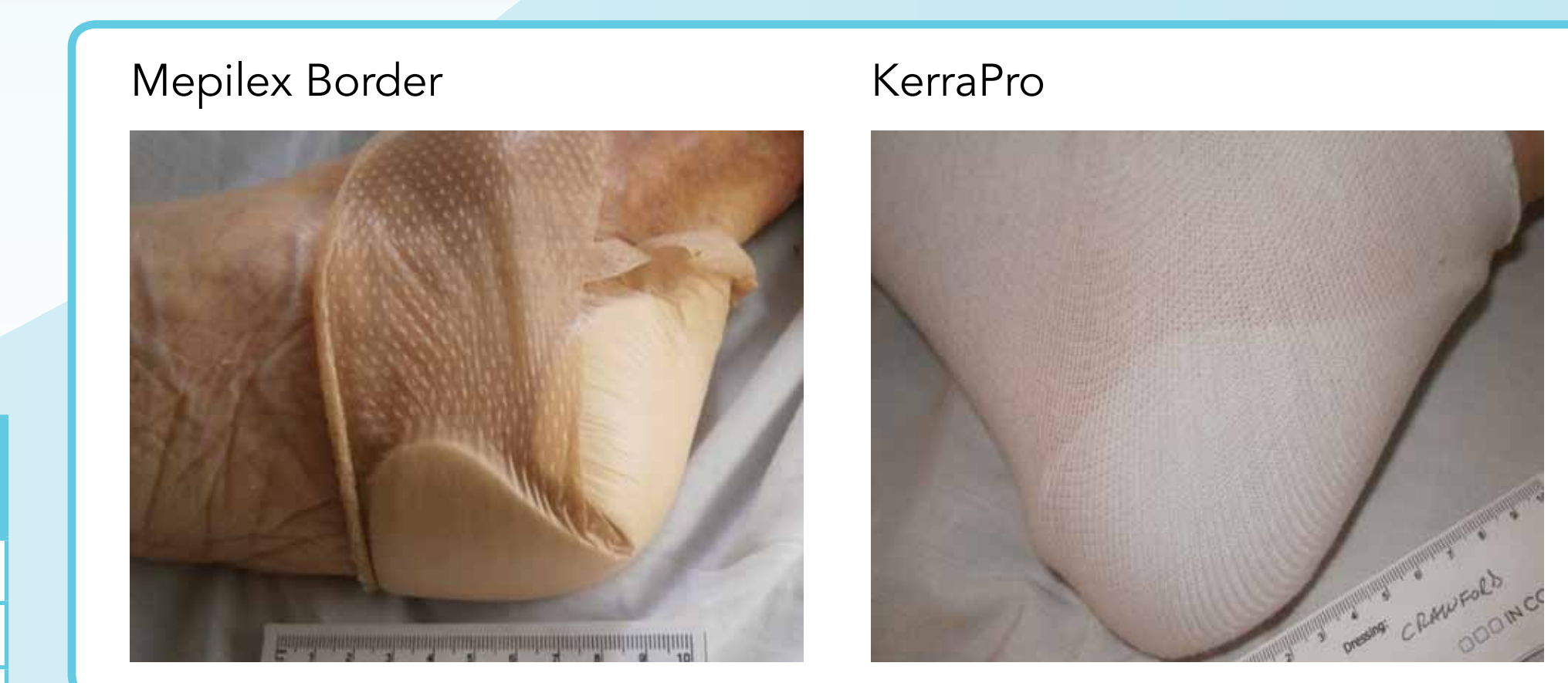


Figure 7 Products in situ

Conclusion

KerraPro Heel performed well with all heels recovering by week 2 (no non-blanching erythema present). 2 of the Mepilex Border heels had recovered by week 2 but the remaining 3 heels took a further week to resolve. Pain reduction was faster in the KerraPro treated heels. Care staff commented on KerraPro ease of use, and Mepilex Border being more difficult to apply. In this age group of patients with friable skin Mepilex Border was sometimes painful to remove because of the strong adhesive bond. Clinical staff reported using Mepilex Border on average every 3 days whereas only one KerraPro was required for the full 4 weeks. At current UK³ prices the cost of Mepilex Border Heel over the 4 week treatment period would be £36.36 and only £14.83 with KerraPro, a saving of 61%. KerraPro pressure reducing pads are made from 100% silicone, a material that is flexible and hard-wearing and can be easily cleaned dried and re-used.

References:

1. European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel. (2009) Treatment of pressure ulcers: Quick Reference Guide. Washington DC: National Pressure Ulcer Advisory Panel.
 2. Young S, Hampton S, and Tadej M (2011) Study to evaluate the effect of low-intensity pulsed electrical currents on levels of oedema in chronic non-healing wounds. Journal of Wound Care 20: 368-73
 3. England & Wales Drug Tariff. October 2014
- Mepilex® is a registered trademark of Mölnlycke Health Care AB