

# Clinical outcomes using a low friction and shear garment in the care home setting

This article discusses an evaluation of Parafricta® (APA Parafricta) undergarments and bootees undertaken in nursing care homes with 25 patients who had developed pressure ulcers of up to grade 2. The objective was to determine the effectiveness of the low friction garments in conjunction with current treatment. The results support the conclusion that low friction garments can assist in both the prevention and management of up to category 2 pressure ulceration for those who are unable to reposition themselves. All garments were provided by APA Parafricta, Hampshire, but no further financial support was provided.

Jackie Stephen-Haynes, Rosie Callaghan

## KEY WORDS

Pressure ulcers  
Low friction garments  
Shear  
Nursing care homes

The National Patient Safety Agency (NPSA) contributes to improved patient care by identifying priorities such as the promotion and maintenance of skin integrity, which is one of the most important roles for clinicians in all care settings ([www.npsa.nhs.uk/nrls](http://www.npsa.nhs.uk/nrls)). The impact of wound care, both financially and on the patient's quality of life is significant. In the UK it is estimated that up to 200,000 people have a chronic wound at a cost of £2–3 billion per year, which accounts for 3% of the annual NHS expenditure (2005/6 prices) (Posnett and Franks, 2007).

Jackie Stephen-Haynes is Professor in Tissue Viability, Professional Development Unit, Birmingham City University and Consultant Nurse, Worcestershire Health and Care NHS Trust; Rosie Callaghan is Tissue Viability Nurse, Worcestershire Health and Care NHS Trust

There has been an increasing trend towards the prevention, management and reporting of pressure ulceration in the UK. Indeed, prevention of pressure ulcers has become increasingly high on the political agenda since the publication of the National Institute of Health and Clinical Excellence (NICE) guidelines (2005), the release of the European Pressure Ulcer Advisory Panel (EPUAP, 2009) document and 'Your skin matters', which is one of the eight *High Impact Actions for Nursing and Midwifery* (Department of Health [DH], 2010a).

The current trend towards pressure ulcers as preventable is fully supported by the government, with the focus on 'harm free' care ([www.harmfreecare.org](http://www.harmfreecare.org)) and the implementation of the Quality, Innovation, Productivity and Prevention (QIPP) agenda (DH, 2010b).

## Impact

The DH (2010c) estimates that a category 3 pressure ulcer costs between £363,000–543,000 per patient to treat, rising to £447,000–668,000 for a category 4 ulcer. The majority of care for patients with these chronic wounds is carried out in the community setting by GPs and community nurses (Drew et al, 2007). The target reduction for pressure ulcers by 2014 is identified in the DH's 'nurse sensitive outcome indicators' (DH, 2010d):

- ▶▶ 80% reduction in category 3 and 4 pressure ulcers developed in a care setting

- ▶▶ 30% reduction in category 3 and 4 pressure ulcers developed outside a care setting.

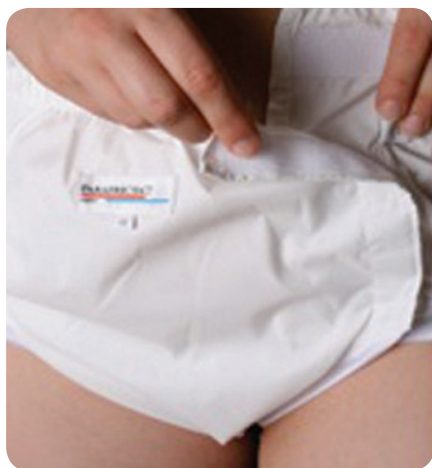
The reduction target for reducing pressure ulcers is now a major work stream in Safety Express (DH, 2011) and Commissioning for Quality and Innovation (CQUINN) targets have been set in relation to pressure ulcers by commissioners of acute and primary care services (DH 2010e). The objective of Safety Express is to set ambitious improvement goals and to increase the proportion of patients who complete their episodes of care 'harm free' (DH 2011). These tools for reporting and investigating tissue viability-related pressure ulcers should be used in conjunction with the NPSA's National Framework for Reporting Serious Incidents (NPSA, 2010).

## Human skin

The skin is the largest organ of the body (Sibbald et al, 2009) and when intact provides protection against invading microorganisms, ultraviolet (UV) light, extremes of temperature and chemical toxins. The effects of ageing and the environment over time mean that the skin gradually becomes less able to perform these essential functions.

## Structure

The epidermis is composed of keratinocytes, which make up the stratum corneum and provide



**Figure 1.** The Parafricta® undergarment being fastened in place.

a major barrier to chemical and microbial invasion. The turnover time of keratinocytes in the epidermis is reduced by 50% during the later years of life (Sibbald et al, 2009), therefore, healing will be delayed due to the declining production of new cells.

Beneath the epidermis lies the dermis, which is composed of connective tissue and other components such as blood vessels, lymphatics, macrophages, endothelial cells and fibroblasts. During the ageing process there is a 20% loss in the thickness of the dermal layer and as the fatty layer becomes thinner the cushioning action produced by the fatty deposits is reduced, meaning certain areas such as the face, neck and hands will become more susceptible to damage (Butcher and White, 2007).

### Impact of pressure ulceration

The impact of pressure ulceration on patients was researched by Hopkins et al (2006), who identified three key themes:

- ▶▶ Pain
- ▶▶ Restricted life
- ▶▶ How to cope.

Similarly, Spilsbury et al (2007) examined the impact of pressure ulceration on patients and reported the following:

- ▶▶ Ninety-one percent (n = 21) of patients indicated that the pressure ulcer and its treatment affected their lives emotionally, mentally, physically and socially

- ▶▶ Concerns raised by patients included pain (91%), appearance, smell and fluid leakage
- ▶▶ Patients received varying quality of care
- ▶▶ Concerns regarding the level of comfort of dressings
- ▶▶ Patients were largely dependent on others to treat, manage and care for their ulcer
- ▶▶ The pain, discomfort and distress of pressure ulcers was not always acknowledged by clinicians
- ▶▶ Pressure ulcers could be pivotal in preventing full recovery from coexisting conditions and were perceived to increase hospital stays and resulted in ongoing treatment.

### Factors contributing to pressure ulcers

Pressure, shear, friction and microclimate (the temperature at the skin's surface and humidity or skin surface moisture at the body/support surface interface) are the most significant physical forces responsible for pressure ulceration (International Review, 2010).

There is an established and significant relationship between friction and shearing forces and the development of pressure ulcers. Shear forces occur when a part of the body is moved but the surface of the skin remains fixed. This occurs when a seated patient slides down a chair, for example, or when the head of a bed is raised more than 30° and the patient slides down. As the amount of shear increases, the amount of pressure required to cause ulcers is reduced (Fisher et al, 2004). Therefore, shearing is potentially the greatest risk due to the speed at which damage can occur (Conner and Clack, 1993).

Pressure ulcers commonly occur in those who cannot reposition themselves to relieve pressure on bony prominences (Robertson et al, 1990). The ability to reposition is often diminished in the very old, the malnourished and those with acute illness (Robertson et al, 1990). In elderly patients, a reduced amount of elastin in the skin predisposes them to the adverse effects of shear,

increasing the risk in this group. If the risk potential for these forces are identified and removed, the possibility of pressure damage will be decreased. Dressing materials that reduce shear force may prevent ulceration and facilitate healing (O'Hura et al, 2005).

### Parafricta

Parafricta® (APA Parafricta) is a fabric with low friction properties, which is designed to reduce the impact of shear and friction. The fabric is smoother than silk and easy to launder at 80° Celsius. It has a low coefficient of friction and high tensile strength that is close to that of steel (Smith and Ingram, 2010). The material is available in a range of products, including bootees, undergarments, sheets and pillowcases. Laundering is performed 'as required' dependent on a patient's continence status, etc. Although the garments are laundered at high temperatures, this does not affect the fabric, which maintains its shape and texture. There is no limit on the number of times a garment can be rewashed. The bootees and undergarments are available on prescription in the UK (Figures 1 and 2).

### Evidence for the use of Parafricta undergarments and bootees

Various studies have focussed on the efficacy of Parafricta garments.

Bree-Aslan and Hampton (2008) reported on an 85-year-old man with a category 4 pressure ulcer on his heel. He was being nursed on a dynamic air mattress while in bed and wearing a soft fibre bootie. He had an individually measured wheelchair



**Figure 2.** The Parafricta® bootie attached with Velcro fasteners.

for when sitting out of bed. His medical history included non-insulin dependent diabetes mellitus and a degree of mixed arterial and venous insufficiency. The wound measured 3.5 x 3.3cm (with a total surface area of 11.5cm<sup>2</sup>). The wound bed was covered in thick slough and there was marked erythema and some further discolouration to the surrounding tissues.

The Parafriacta bootee was applied over the foot to see if friction and shearing forces could be prevented from causing further tissue damage. After one week, there was marked improvement in the wound bed and no further damage to the surrounding tissues.

Kerr (2008) undertook a single case study on a 70-year-old man with poor mobility and moisture damage to the sacrum. The skin over his buttocks was reddened, macerated and excoriated following a recent bout of incontinence. Sudocrem® (Forest Laboratories) was applied to the skin, which improved its general condition but did not improve the excoriation and redness, which had been present for 12 weeks. Within 13 days of wearing the Parafriacta Undergarment there was reduced inflammation, improvement in excoriation and signs of closure.

Hampton et al (2009) used high-frequency ultrasound (HFU) to analyse oedema as the result of pressure ulceration in 25 nursing home residents with reddened heels or sacra. The patients were provided with Parafriacta bootees and undergarments for four weeks as well as appropriate pressure-reducing equipment. Three outcomes were measured

- ▶▶ The feel of the skin or 'bogginess'
- ▶▶ Reduction in redness shown by photography
- ▶▶ Reduction in inflammation of the epidermis as demonstrated by HFU.

While the feel of the skin and images can be open to interpretation, the HFU is an objective measure

for assessing the lower layers of the skin. The results showed that all of the patients experienced tissue improvement, including clinical improvement of oedema, reduction of redness, prevention of pressure ulcers and reduction of inflammation of the epidermis on HFU. The researchers concluded that the reduction in the 'bogginess' of the skin demonstrated a reduction in the oedema and inflammation under the epidermis due to the effect of the Parafriacta products.

Smith and Ingram (2010) undertook a large scale evaluation in a hospital setting with 204 patients in a control cohort and 165 patients using Parafriacta. There was a 16% reduction in number of patients who developed pressure ulceration (p=0.0286) and 41% more patients who were admitted with pressure ulceration improved or healed in the Parafriacta group (p=0.0065).

**Method**

The study detailed in this document evaluated the use of Parafriacta undergarments and bootees in 25 patients residing in nursing care homes across a primary care organisation. The inclusion criteria were:

- ▶▶ Patients at-risk of or with a pressure ulcer of category 2 or less (EPUAP, 2009)
- ▶▶ Aged 18 years or over and had agreed to take part
- ▶▶ Residing in a care home.

The Parafriacta garments were used in accordance with the manufacturers' guidance, with standard procedures for laundering followed in all care homes.

All patients were treated with the standard approach to the prevention and management of pressure ulcers as outlined by the NICE guidance (2005), EPUAP (2009) and the Institute for Healthcare Improvement (IHI) (2011). The data was kept anonymously to protect patient confidentiality (NMC, 2008) and to meet the information governance requirements for sharing information with commercial organisations in accordance with local guidance.

**Outcome measures and results**

**Patient data**

The number of patients with intact skin was five although they were at risk of pressure ulceration through friction due to the repetitive movements caused by their condition, such as Parkinson's disease. The number of patients with an existing pressure ulcer was 20 — of these, 10 had a category 1 ulcer, and 10 had a category 2 ulcer (Figure 3).

**Contributing factors**

Contributing factors in the client group included age (n=6), polypharmacy, such as steroid usage (n=1), and multiple disease processes, including cardiovascular accident (CVA) (n=6), Parkinson's disease (n=6), dementia (n=3), multiple sclerosis (n=3) (Figure 4). The eighteen patients who were diagnosed with an illness that causes repetitive movements or spasms, were at-risk of friction, especially to the heel area, and a concomitant risk of pressure ulcer development. It was also noted that those who had experienced a CVA used their 'good' heel to re-position themselves, giving rise to the development of pressure ulceration due to the friction caused by this repetitive movement and the constant rubbing.

Also noted as a contributory factor in approximately two-thirds of the patients was the additional moisture or 'bogginess' of the patients' heels

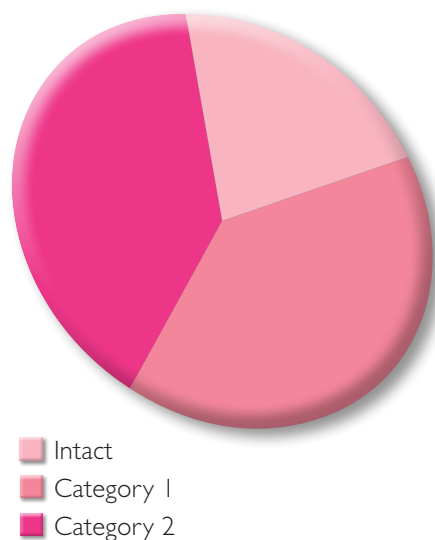
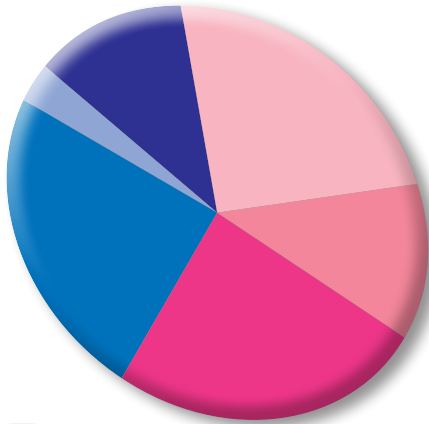


Figure 3. Breakdown of patient's skin damage.

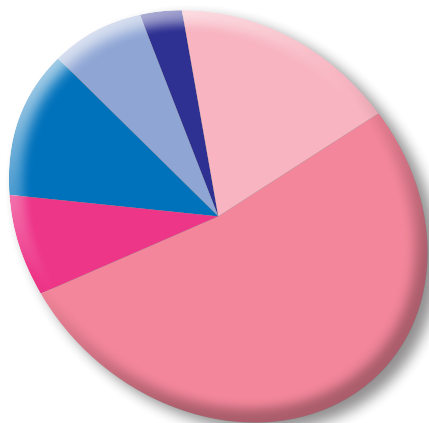


- Age
- Multiple sclerosis
- Cardiovascular accident
- Parkinson's disease
- Steroid usage
- Dementia

**Figure 4. Contributing factors to pressure ulcer development among the patient group.**

caused by oedema and/or sweat, which if neglected could lead to the development of pressure ulceration. This relates to the research by Hampton et al (2009) and suggests that as well as observing the skin, clinicians should also regularly feel the skin.

One client, who originally presented with a category 4 ulcer (EPUAP, 2009), had a healing wound, which



- Unknown
- Patient movement
- Steroid skin
- Spasms
- Frail/thin skin
- Using foot to aid movement

**Figure 5. Breakdown of causes of friction**

had fully granulated and developed epithelialisation tissue but was subject to shear and friction, which threatened further healing. This patient was provided with Parafriacta bootees, which prevented rubbing on the wound bed and allowed epithelialisation to take place over a two-week period (previous treatment had been ongoing for four weeks without success).

**Friction**

The causes of friction or friction damage were broken down into:

- ▶▶ Unknown (n=4)
- ▶▶ Repetitive movements (n=13)
- ▶▶ Steroid skin (n=2) (long-term steroid use may result in very thin skin, which is much more prone to damage from shear and friction)
- ▶▶ Spasm (n=3)
- ▶▶ Frail/thin skin (n=2)
- ▶▶ Using the feet to aid movement (n=1) (Figure 5).

**Ease of use**

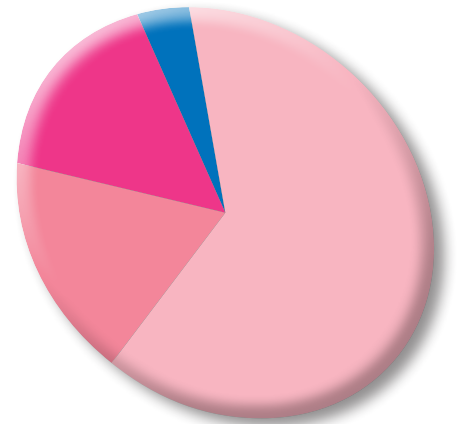
Clinicians were asked about ease of use. The garments were found to be very easy to use in 64% of patients (n=16), easy to use in 16% (n=4), fairly easy to use in 16% (n=4), and difficult to use in 4% (n=1) (Figure 6).

Despite the concern expressed by some staff about the 'slipperiness' of the undergarment material and the potential for patients sliding down chairs or beds, this did not occur in practice. However, the issue of preventing patients from sliding off surfaces did raise the issue of the appropriate use of bed bases, knee bracing and the correct height of chairs. As is the case in most establishments, chair heights do not reflect the varied patient group and beds are often used without knee brakes.

Four of the five clinicians who found the garments fairly easy or difficult were using undergarments that were initially manufactured as a 'pull-up', but are now supplied with Velcro closures, making them easier to fit.

**Remaining in place**

Of the clinicians, 48% found it very easy to keep the garments in place (n=12),



- Very easy
- Easy
- Fairly easy
- Difficult

**Figure 6. Garments' ease of use.**

16% found it easy (n=4), 20% found it fairly easy (N=5) and 16% (N= 4) found it not easy (Figure 7).

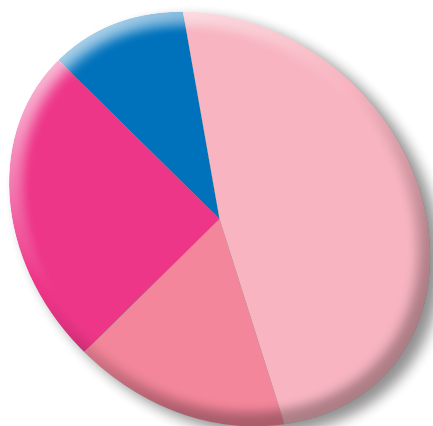
The change to Velcro-fastened undergarments makes the fitting easier and also helped the garment to stay in place. The ability to choose between Velcro-fastened or pull-up garments also allows for assessment of the patient for suitability (for example, more mobile patients may prefer pull-ups to promote independence).

The bootee is also available in slip-on or Velcro formats. The bootee appeared to remain in place more efficiently using the Velcro closure rather than the slip-on, which some clinicians found tended to ride off when subjected to repeated movement.

**Prevention of friction**

Of the clinicians, 88% (n=22) reported that the products prevented friction and were pleased with the positive impact on clinical outcomes, although 12% (n=3) found that it did not reduce friction (Figure 8).

As mentioned above, one patient had experienced a CVA and used his good leg to manoeuvre himself around the bed. The presence of red blanching, very soft and 'boggy' skin was drawn to the attention of the trained staff by a healthcare assistant, and a Parafriacta



- Very easy
- Easy
- Fairly easy
- Not easy

Figure 7. Breakdown of how easy it was to keep the garments in place.

bootee was used following holistic assessment and the issue resolved. This emphasises the importance of holistic assessment and the consideration of pressure, shear, friction and moisture control as a possible cause of pressure ulceration.

Clinicians also commented on the practice of applying a film dressing to reduce friction and how Parafricta may provide a cost saving as it can be re-used when laundered up to high temperatures, although this would need to be fully researched. Parafricta also keeps its shape and does not strip the skin on removal.

**Patient comfort**

Of the clinicians, 100% (n=25) reported that clients found the Parafricta undergarments either very comfortable (76%; n=19) or comfortable (24%; n=6) (Figure 9). The Parafricta material is thin, mouldable, warm to wear, soft and smooth to touch.

**Skin improvement**

Of the clinicians, 76% (n=19) recorded a skin improvement (meaning less redness moisture and skin irritation), 16% (n=4) recorded no skin improvement and 8% (n=2) recorded the skin as 'the same' (Figure 10). Clinicians reported a reduction

in redness and oedema using visual inspection and feeling the affected area.

Where shear and friction was the cause of the ulceration and this was addressed, the pressure ulcers demonstrated improvement and healing.

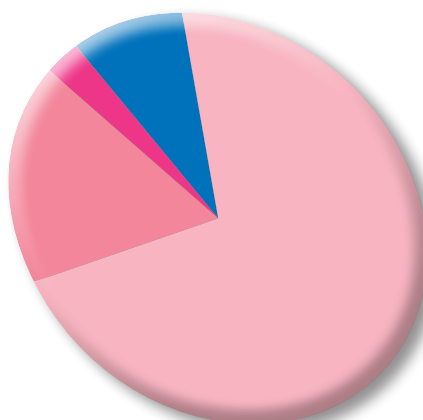
**Additional comments**

In addition to the data collection, the clinicians were also invited to comment on the Parafricta garments. The comments below relate to ease of use, effectiveness and some of the challenges encountered in using the Parafricta products:

- » 'Challenging to use with incontinence, but made us consider the issue of incontinence'
- » 'Velcro bootees really work'
- » 'Easy to use'
- » 'Patient liked it, but it kept coming off. This has been resolved with Velcro application'
- » 'Thought patients would slip but they didn't'
- » 'Good idea, appears to do the job'.

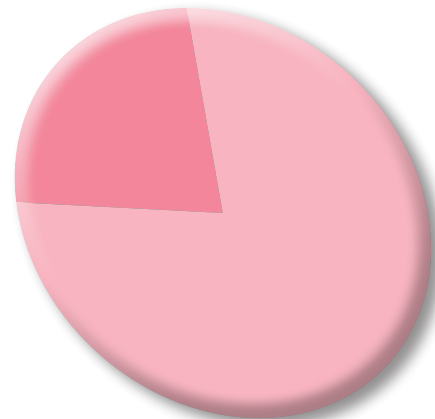
**Discussion**

Many elderly patients present with a range of complex health conditions and polypharmacy. Of the 25 who took part in this study, 18 were diagnosed with an illness that causes repetitive movements or spasms and were at risk of friction.



- Very effective
- Effective
- Some effectiveness
- Ineffective

Figure 8. Breakdown of how effective the products were at preventing friction.



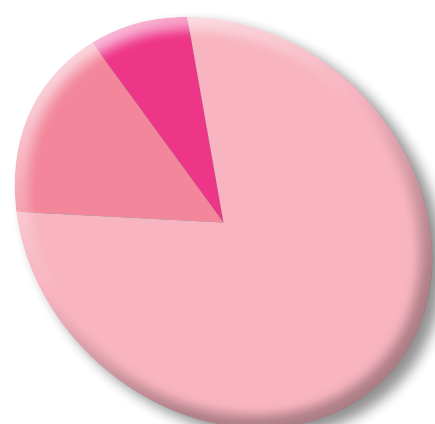
- Very comfortable
- Comfortable

Figure 9. Breakdown of how comfortable the products were.

Parafricta was implemented in addition to the current evidence-based pressure ulcer prevention and management. Overall, staff reported an improvement in the skin with less redness, less oedema and a reduction in friction.

**Conclusion**

The current healthcare environment has prompted clinicians to carefully consider both the clinical and financial outcomes of all aspects of tissue viability. This is particularly pertinent in relation to pressure ulcer management where the emphasis on prevention has risen up the DH's agenda.



- Yes
- No
- Same

Figure 10. Breakdown of the proportion of patients whose skin improved.

Essential skin care can assist in achieving healthy, well-moisturised intact skin and trying to help clinicians to think creatively about protecting patients' skin is important. Whilst a policy of vigilance needs to be adopted for elderly and fragile skin, the low friction Parafricta garment range is an additional resource that can aid the management of this patient group.

The limitations to this study include its size, but it is the first study to investigate the use of Parafricta on patients within the care home setting and the consistency of the results indicate that they might be replicated in other care home settings. **WUK**

## References

Bree-Aslan C, Hampton S (2008) Parafricta and the prevention of shearing forces: heel ulcers. *Nurs Residential Care* 10(1): 626–8

Butcher M, White R (2007) *Skin Care in Wound Management*. Wounds UK, London

Conner L, Clack J (1993) *In vivo* (CT scan) comparison of vertical shear in human tissue caused by various support surfaces. *Decubitus* 6(2): 20–3, 26–28

Department of Health (2010a) *High Impact Actions for Nursing and Midwifery*. NHS Institute of Innovation and Improvement. Available online at: [www.institute.nhs.uk/building\\_capability/hia\\_supporting\\_info/staying\\_safe\\_preventing\\_falls.html](http://www.institute.nhs.uk/building_capability/hia_supporting_info/staying_safe_preventing_falls.html) [accessed 11 October, 2011]

Department of Health (2010b) *The NHS Quality, Innovation, Productivity and Prevention Challenge: An introduction for clinicians*. DH, London. Available online at: [www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_113806](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_113806) [accessed 11 October, 2011]

Department of Health (2010c) Pressure ulcer productivity calculator. DH, London. Available online at: [www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH\\_116669](http://www.dh.gov.uk/en/Publicationsandstatistics/Publications/PublicationsPolicyAndGuidance/DH_116669) [accessed 11 October, 2011]

Department of Health (2010d) *Nurse Sensitive Outcome Indicators*. DH, London. Available online at: [www.dh.gov.uk/en/Aboutus/Chiefprofessionalofficers/Chiefnursingofficer/Energisforexcellence/DH\\_120765](http://www.dh.gov.uk/en/Aboutus/Chiefprofessionalofficers/Chiefnursingofficer/Energisforexcellence/DH_120765) (accessed 11 October, 2011)

Department of Health (2010e) *Using the Commissioning for Quality and Innovation (CQUIN) Payment Framework: an addendum to the 2008 policy guidance for 2010/11*. DH, London. Available online at: <http://tinyurl.com/33yylsr> [accessed 25 October, 2011]

Department of Health (2011) *Safety Express*. DH, London. Available online at: [www.patientsafetyfirst.nhs.uk/Content.aspx?path=/interventions/relatedprogrammes/safety-express/](http://www.patientsafetyfirst.nhs.uk/Content.aspx?path=/interventions/relatedprogrammes/safety-express/) [accessed 25 October, 2011]

[www.patientsafetyfirst.nhs.uk/Content.aspx?path=/interventions/relatedprogrammes/safety-express/](http://www.patientsafetyfirst.nhs.uk/Content.aspx?path=/interventions/relatedprogrammes/safety-express/) [accessed 25 October, 2011]

Drew P, Posnett J, Rusling L (2007) The cost of wound care for a local population in England. *Int Wound J* 4(2): 149–55

European Pressure Ulcer Advisory Panel and National Pressure Ulcer Advisory Panel (2009) *Pressure ulcer prevention: A quick reference guide*. Washington DC: National Pressure Ulcer Advisory Panel. Available online at: [www.epuap.org/guidelines/Final\\_Quick\\_Prevention.pdf](http://www.epuap.org/guidelines/Final_Quick_Prevention.pdf) [accessed 11 October, 2011]

Fisher AR, Wells G, Harrison MB (2004) Factors associated with pressure ulcers in adults in acute care hospitals. *Holist Nurs Pract* 18(5): 242–53

Hampton S, Young S, Bree-Aslan C, Colbourn A (2009) Parafricta™ Material. Can it reduce the potential for pressure damage? *J Community Nurs* 24(3): 28–31

Hopkins A, Dealey C, Bale S, Defloor T, Worboys F (2006) Patient stories of living with a pressure ulcer. *J Adv Nurs* 56(4): 345–53

Institute for Healthcare Improvement (2011) *What is a Bundle?* IHI, London. Available online at: [www.ihl.org/IHI/Topics/CriticalCare/IntensiveCare/ImprovementStories](http://www.ihl.org/IHI/Topics/CriticalCare/IntensiveCare/ImprovementStories) [accessed 11 October, 2011]

International Review (2010) *Pressure Ulcer Prevention: pressure, shear, friction and microclimate in context. A consensus document*. London: Wounds International

Kerr A (2008) Reducing shear and friction: Parafricta undergarments. *Nurs Residential Care* 10(1): 626–28

National Institute for Health and Clinical Excellence (2005) *The Prevention and Treatment of Pressure Ulcers*. NICE, London. Available online at: [www.nice.org.uk/80/nicemedia/pdf/CG029publicinfo.pdf](http://www.nice.org.uk/80/nicemedia/pdf/CG029publicinfo.pdf) [accessed 11 October, 2011]

Nursing and Midwifery Council (2008) *Code of Professional Conduct*. NMC, London

National Patient Safety Agency (2010) NHS to adopt zero tolerance to pressure ulcers. NPSA, London. Available online at: [www.npsa.nhs.uk/corporate/news/nhs-to-adopt-zero-tolerance-approach-to-pressure-ulcers/](http://www.npsa.nhs.uk/corporate/news/nhs-to-adopt-zero-tolerance-approach-to-pressure-ulcers/) [accessed 11 October, 2011]

National Patient Safety Agency (2010) *National Framework for Reporting and Learning from Serious Incidents Requiring Investigation*. NPSA, London. Available online at: [www.nrls.npsa.nhs.uk/report-a-patient-safety-incident/patient-safety-direct/serious-incident-reporting-and-learning-framework-sirl](http://www.nrls.npsa.nhs.uk/report-a-patient-safety-incident/patient-safety-direct/serious-incident-reporting-and-learning-framework-sirl) [accessed 11 October, 2011]

Ohura N, Ichioka S, Nakatsuka T, Shibata M (2005) Evaluating dressing materials for the prevention of shear force in the treatment of pressure ulcers. *J Wound Care* 14(9): 401–14

## Key points

- ▶▶ The current healthcare environment has prompted clinicians to consider both the clinical and financial outcomes of all aspects of tissue viability.
- ▶▶ Essential skin care can achieve healthy, intact skin and trying to help clinicians to think creatively about protecting patients' skin is important.
- ▶▶ This is the first study to investigate the use of Parafricta on patients within the care home setting and the consistency of the results indicate that they might be replicated in other care home settings.
- ▶▶ While vigilance needs to be exercised in elderly and fragile skin, this low friction garment range can aid the management of this patient group.

Posnett J, Franks P (2007) The costs of skin breakdown and ulceration in the UK. In: Pownall M. (Ed). *Skin Breakdown: The Silent Epidemic*. Smith & Nephew Foundation, Hull: 6–12.

Robertson J, Swain I, Gaywood I (1990) The importance of pressure sores in total health care. In: Bader DL (Ed). *Pressure Sores, Clinical Practice and Scientific Approach*. Macmillan Press, London

Safety Express (2011) *Guide to Programme Delivery*. Available online at: [www.patientsafetyfirst.nhs.uk/ashx/Asset.ashx?path=/SafetyThermometer/SafetyExpress\\_Guide\\_24\\_January\\_2011.pdf](http://www.patientsafetyfirst.nhs.uk/ashx/Asset.ashx?path=/SafetyThermometer/SafetyExpress_Guide_24_January_2011.pdf) [accessed 11 October, 2011]

Sibbald RG, Krasner DL, Lutz JB (2009) *The SCALE Expert Panel: Skin Changes At Life's End. Final Consensus Document*. *Adv Skin Wound Care* 23(5): 225–36

Smith G, Ingram A (2010) Clinical and cost effectiveness evaluation of low friction and shear garments. *J Wound Care* 19(12): 535–42

Spilsbury K, Nelson A, Cullum N, Iglesias C, Nixon J, Mason S (2007) Pressure ulcers and their treatment and effects on quality of life: hospital inpatient perspectives. *J Adv Nurs* 57(5): 494–504