

WOUND CARE

**Chronic leg ulcers:
current gold
standard and a
novel treatment**

PAGE 19

**Under pressure:
Providing evidence
for pressure ulcer
prevention**

PAGE 4

**Accel Heal®
electroceutical
therapy for
complex wounds**

PAGE 6

Lindsay Leg Clubs: how social infrastructure can improve wound healing

Anna Galazka discusses Lindsay Leg Clubs, which can provide older people with chronic wounds with a social support network.

Maintaining healthy skin in older people

Madeleine Flanagan discusses how older people can maintain healthy skin and prevent damage and impaired wound healing through the use of emollients.

contributors:



Professor Michael Clark
Commercial Director

Welsh Wound Innovation Centre



Sarah Fiori
Senior Quality Lead

NHS Vale of York CCG



Simon Bayliff
Vice President, R&D

Woundchek Laboratories



Welcome...

Editorial foreword



Welcome to issue 24 of Innov-age, focusing on the topic of Wound Care.

As we get older, our skin becomes more fragile and wounds become harder to heal. Wounds can often become chronic, and can have a major impact on the quality of life for older people, leading to both physical effects, such as infection and scarring, and psychological effects, such as embarrassment, a lack of confidence and loneliness.

In this issue, Dr Ross Atkinson and Dr Jacqueline Lavallée from the Wounds Research Group at the University of Manchester discuss the evidence relating to the two main methods of preventing pressure ulcers; the use of support surfaces and repositioning of the patient.

Anna Galazka discusses Lindsay Leg Clubs, a social support system for elderly people suffering from chronic wounds, to allow them to share experiences and socialise with a strong

support network, and find ways to better manage their wounds.

Ingrid Skjæveland introduces soluble beta-glucan as a wound therapy, and discusses how this can be used to treat wounds and to restart the healing process in slow-healing and chronic wounds.

Liz Ovens introduces Accel-Heal®, an electroceutical therapy for complex wounds, which uses sub-sensory electrical stimulation to reduce inflammation and 'kick-start' the wound healing process in non-healing and chronic wounds.

Sarah Fiori discusses a recent evaluation of the Mercury Advance Hybrid Mattress at a care home in the NHS Vale of York CCG, and how this, combined with 'React to Red' training, compares to traditional alternating air mattresses in preventing pressure ulcers.

Simon Bayliff introduces WOUNDCHEK™ Bacterial Status and WOUNDCHEK™ Protease Status, point-of-care tests that enable the diagnosis of infection and inflammation in wounds, even before any clinical signs of infection are present.

Also in this issue, Madeleine Flanagan discusses the importance of maintaining healthy skin as we age, and how the use of moisturisers and emollients can

be used to protect older skin and prevent damage. Dr Elena Garcia and Dr Sonia Ho discuss the RAFT Institute's Smart Matrix®, an advanced wound care product that has the potential to heal full thickness wounds without a skin graft. Sarah Fiori and Mel Johnson discuss how the implementation of React to Red training through Safety Huddles in care homes impacts on staff motivation and the promotion of a safer care environment. Professor Michael Clark discusses the measurement of performance of special pressure redistributing mattresses, and how the Welsh Wound Innovation Centre is working towards establishing a comprehensive mattress test facility.

This issue of Innov-age demonstrates some of the most exciting innovations and new technology within the field of wound care, and how improving education and awareness of skin integrity in the elderly can have a huge impact on their skin health and the prevention of wounds.

Jackie

Jackie Oldham

Honorary Director,
Edward Centre for Healthcare
Management Research

Edward Centre for Healthcare
Management Research,
Citylabs,
Nelson Street,
Manchester,
M13 9NQ

www.innov-age.org
info@innov-age.org
0161 276 4473

**To subscribe for free, contribute or
for any enquires please contact
the team or visit our website we
look forward to hearing from you.**

Editorial Team

Jackie Oldham, Charlotte Haseler,
Richard Deed, Peter Bullock,
Maryam Khan.

Contributors

Anna Galazka, Sonia Ho,
Elena Garcia, Ingrid Skjæveland,
Liz Ovens, Madeleine Flanagan,
Michael Clark, Ross Atkinson,
Jacqueline Lavallée, Sarah Fiori,
Mel Johnson, Simon Bayliff.

Innov-age® is the official magazine of the Edward
Centre for Healthcare Management Research,
part of the Edward Healthcare group of companies.



Published in the UK by Edward Centre for Healthcare
Management Research, part of the Edward Healthcare
group of companies. Innov-age is produced in
association with TRUSTECH, MIMIT and MAHSC.



© 2019 Edward Centre for Healthcare Management
Research, part of the Edward Healthcare group
of companies.

The contents of this publication are protected by
copyright. All rights reserved. No part of this
publication may be reproduced, stored in any
retrieval system or transmitted in any way form or
by any means without the written permission of the
publisher. The views expressed in this publication are
not necessarily those of the publisher or editorial
team. While the publisher and editorial team have
taken every care with regard to accuracy of content
they cannot be held responsible for any errors or
omissions contained therein.

Designed and printed by
Corner House Design and Print Limited
0161 777 6000 www.cornerhousedesign.co.uk

ISSN 2052-5753 (Print)

page

2

Editorial Foreword

4

**Under pressure: Providing evidence for
pressure ulcer prevention**

6

**Accel-Heal® electroceutical therapy for
complex wounds**

9

**Reactivate the body's own healing
system, using soluble beta-glucan**

11

**Point of care diagnostic tests for
chronic wounds**

13

**Improving pressure ulcer prevention
through rigorous mattress testing**

14

News & Events

16

**Lindsay Leg Clubs: how social
infrastructure can improve wound healing**

17

**The implementation of React to Red
through safety huddles in care homes**

19

**Chronic leg ulcers: current gold standard
and a novel treatment**

20

**Evaluation of the Mercury Advance Hybrid
Mattress at Minster Grange Care Home**

21

Maintaining healthy skin in older people

23

Spotlight on... Anna Galazka

24

Next Issue – Medicines Management

Under pressure: Providing evidence for pressure ulcer prevention

Ross Atkinson and Jacqueline Lavallée are part of the Wounds Research Group at The University of Manchester. Ross has a PhD in physiology and worked for six years in the NHS as a researcher and Research Programme Manager before joining the Wounds Research Group in 2016. Jacqueline is a Research Associate and Trainee Health Psychologist, working with elderly patients with complex needs for four years before completing her PhD, which focused on preventing pressure ulcers in care homes using a care bundle.

Pressure ulcers (also known as 'decubitus ulcers' or 'bed sores') are wounds caused by pressure and shear forces acting on the skin, for example due to prolonged sitting or lying. People who are confined to their bed, or those who have difficulty in moving around unaided (for example some older people or those who have a spinal cord injury), have a higher chance of developing pressure ulcers. Most pressure ulcers develop on bony prominences, such as the lower back, hip or heel. Depending on its severity, a pressure ulcer can range from intact skin with discolouration to, at worst, a very deep wound which exposes bone, is painful and prone to infection. In 2016 the National Pressure Ulcer Advisory Panel (NPUAP) published a revised staging system to help clinicians grade pressure ulcer severity (Edsberg et al, 2016).

The prevention of pressure ulcers is a high priority for the NHS as **these wounds are largely regarded as an indicator of poor quality care, are avoidable, and can take months to heal**. There are a number of ways in which care teams can intervene to help reduce the number of people developing pressure ulcers. However, the evidence in support of some interventions is of low quality and so it is unclear about how effective they are in the prevention of pressure ulcers. Furthermore, despite much research focusing on the detailed physiological and biomechanical mechanisms underlying pressure ulceration, the NHS is in need of evidence which helps guide decision making as to what is likely to work in the clinical setting – especially given that the health service is currently under enormous pressure to deliver a good standard of care.

This article describes the evidence relating to the two main interventions for preventing pressure ulcers: the use of support surfaces (such as mattresses and cushions); and repositioning (turning) of the patient. Although simple in principle, uncertainty around the evidence from randomised controlled trials (RCTs) for these interventions and how clinical decision makers can make use of the evidence available is highlighted. The evidence relating to care bundles for pressure ulcer prevention is also described.

Support surfaces for pressure ulcer prevention

Current guidance of the National Institute for Health and Care Excellence (NICE) recommends that clinicians use: a high-specification foam mattress for adults who are admitted to secondary care or who are assessed as being at high risk of developing a pressure ulcer in primary and community care settings; and a high-specification foam or equivalent pressure redistributing cushion for adults who use a wheelchair or sit for prolonged periods (NICE, 2014). The evidence for support surfaces for beds is explored below.

NICE guidance refers to the Cochrane review by McInnes et al. (last updated in 2015) which found that high-specification foam alternatives to standard hospital mattresses may reduce the incidence of pressure ulcers in people at risk by approximately 60% (risk ratio 0.40; 95% confidence interval 0.21 to 0.74) (McInnes et al, 2015). This was based on four RCTs which altogether included 2016 participants. More recent work has updated this review and employed contemporary methods for classifying support surfaces (Shi et al, 2018). Data were analysed using 'network meta-analysis' (incorporating a GRADE assessment of the evidence (Guyatt et al, 2008)) and each type of support surface was ranked in order of effectiveness. The findings suggest that **"when compared with standard hospital support surfaces, powered active air surfaces (i.e. alternating-pressure air surfaces) and powered hybrid air surfaces (which can work like alternating-pressure air surfaces or can relieve pressure similar to high-specification foam mattresses) probably reduce the incidence of pressure ulcers by 58% and 79% on average, respectively"** (Shi et al, 2018). The evidence was considered to be of moderate certainty for these comparisons (i.e. the 'true' effect is likely to be close to the estimate of the effect, but there is a possibility that it is substantially different). Uncertainties remain around the effectiveness of other types of support surfaces (e.g. Australian medical sheepskin). In light of such uncertainties, patients' preferences, clinicians' experience and costs could



Jacqueline F. Lavallée PhD
Research Associate and Trainee Health Psychologist
University of Manchester



Ross A. Atkinson PhD
Research Fellow
University of Manchester



be considered when choosing which of those types of support surface to use.

Patient repositioning for preventing pressure ulcers

Repositioning is regarded as an essential component of pressure ulcer prevention to encourage blood flow to the affected area. The NICE (2014) guidelines advise that those at high risk of developing a pressure ulcer should be encouraged/assisted to change position at least every six or four hours, respectively.

A Cochrane review of three RCTs (two trials compared the 30° and 90° tilt positions using similar repositioning frequencies and one trial compared alternative repositioning frequencies) was conducted with a total of 502 adult participants across different healthcare settings (Gillespie et al, 2014). Gillespie and colleagues classified the included studies as being at a high or unclear risk of bias, and consequently found that **whilst repositioning is important in the prevention of pressure ulcers, there is insufficient evidence to conclude that repositioning at a greater frequency in a particular position is more effective** (pooled risk ratio 0.62; 95% confidence interval 0.10 to 3.97). Thus, there is a need for high-quality trials to evaluate the effects of frequency of repositioning and the position itself on the prevention of pressure ulcers.

Care bundles for pressure ulcer prevention

Care bundles are a set of three to five evidence-informed practices intended to be performed collectively and reliably to improve the quality of care. Bundles are being increasingly used in the healthcare setting. A systematic review was undertaken to determine the effects of care bundles on patient outcomes and the behaviour of healthcare workers in relation to fidelity with care bundles.

Very low-quality evidence from controlled before-after studies suggests that care bundles may reduce the risk of negative outcomes when compared with usual care (Lavallée et al, 2017).

Pressure ulcer prevention care bundles have been found to be acceptable to care home staff (Lavallée et al, submitted manuscript), hospital staff (Roberts et al, 2016) and patients (Roberts et al, 2017). However, more high-quality research is required to evaluate the effectiveness of care bundles in preventing pressure ulcers.

Conclusions

It is important to understand that clinical recommendations may change over time as the evidence base grows and improves in its quality. Systematic reviews of RCTs of interventions aim to summarise the best available evidence on questions about intervention effectiveness, presenting findings in the context of evidence quality or certainty. Researchers must strive to ensure that studies are of the best possible quality; unfortunately it is no mean feat to undertake high-quality intervention trials but investigators

should be spurred on by the benefits that they can bring to the evidence base. Furthermore, investigators should be guided by initiatives such as the James Lind Priority Setting Partnership when deciding which areas are of greatest importance to patients, carers and healthcare professionals (Cullum et al, 2016).

Learning points

- Powered active air surfaces probably reduce pressure ulcer incidence but a trial of these compared with non-powered reactive (high-specification) foam surfaces may be justified in this area.
- Although repositioning is a necessary aspect of pressure ulcer prevention and treatment, generally there is uncertainty about the best approaches to use. Understanding of UK practices and priority setting about the key questions in this area may be important.
- More research is needed to understand whether care bundles could be beneficial in the prevention of pressure ulcers.

Acknowledgements

We would like to thank Jo Dumville, Chunhu Shi and Nicky Cullum for their help and advice with this article. Cochrane Wounds is based within the Division of Nursing, Midwifery and Social Work at The University of Manchester.

References

- Cullum N, Buckley H, Dumville J, Hall J, Lamb K, Madden M, Morley R, O'Meara S, Gonçalves PS, Soares M, Stubbs N (2016) Wounds research for patient benefit: a 5-year programme of research. Programme Grants for Applied Research, 4:13.
- Edsberg, LE, Black JM, Goldberg M, McNichol L, Moore L, Sieggreen M (2016) Revised National Pressure Ulcer Advisory Panel pressure injury staging system: revised pressure injury staging system. Journal of Wound, Ostomy, and Continence Nursing, 43(6), p.585.
- Gillespie BM, Chaboyer WP, McInnes E, Kent B, Whitty JA, Thalib L (2014) Repositioning for pressure ulcer prevention in adults. Cochrane Database of Systematic Reviews Issue 4. Art. No.: CD009958.
- Guyatt GH, Oxman AD, Vist GE, Kunz R, Falck-Ytter Y, Alonso-Coello P, Schünemann HJ, GRADE Working Group (2008) GRADE: an emerging consensus on rating quality of evidence and strength of recommendations. BMJ, 336(7650): 924-6.
- Lavallée JF, Gray TA, Dumville J, Cullum N. Preventing pressure ulcers in nursing homes using a care bundle: A feasibility study. BMJ Open (under review).
- Lavallée JF, Gray TA, Dumville J, Russell W, Cullum N (2017) The effects of care bundles on patient outcomes: a systematic review and meta-analysis. Implementation Science, 12(1), p.142.
- McInnes E, Jammali-Blasi A, Bell-Syer SEM, Dumville JC, Middleton V, Cullum N (2015) Support surfaces for pressure ulcer prevention. Cochrane Database of Systematic Reviews Issue 9. Art. No.: CD001735.
- National Institute for Health and Care Excellence (NICE) (2014) Pressure ulcers: Prevention and management [CG179]. Retrieved from <https://www.nice.org.uk/guidance/cg179>.
- Roberts S, McInnes E, Wallis M, Bucknall T, Banks M, Chaboyer W (2016). Nurses' perceptions of a pressure ulcer prevention care bundle: a qualitative descriptive study. BMC nursing, 15(1), p.64.
- Roberts S, Wallis M, McInnes E, Bucknall T, Banks M, Ball L, Chaboyer W (2017). Patients' Perceptions of a Pressure Ulcer Prevention Care Bundle in Hospital: A Qualitative Descriptive Study to Guide Evidence-Based Practice. Worldviews on Evidence-Based Nursing, 14(5), pp.385-393.
- Shi C, Dumville JC, Cullum N (2018). Support surfaces for pressure ulcer prevention: A network meta-analysis. PLoS ONE, 13(2), e0192707.

Accel-Heal® electroceutical therapy for complex wounds

An innovative new technology helping to improve quality of life and reduce the burden of care for patients living with non-healing, painful chronic wounds

Liz Ovens qualified as a General Nurse in 1979 and gained experience in medicine, psychiatry, general surgery nursing and district nursing. She then specialised in wound care, particularly in relation to leg ulcer management and pressure ulcer prevention and management, and became the lead tissue viability nurse (TVN) in a north London NHS Community Trust. Currently working as an independent TVN, she has worked extensively across the country providing education to healthcare professionals in all aspects of tissue viability, and providing expert opinion reports for medico-legal cases.

Venous Leg Ulcers (VLUs)

VLUs are caused by a failure in the venous system of the lower limb/s to return blood sufficiently to the heart, resulting in skin changes and ultimately wounding. Risk factors include age, thrombo-embolism, obesity and family history. The treatment is lifetime management, including compression therapy (external pressure applied to the lower limb), lifestyle changes and surgery if appropriate. The prevalence of VLUs is 1.5% of the adult population in the UK (Guest et al, 2015a) and likely to increase annually (Guest et al, 2017a). VLUs have a significant effect on patients' quality of life (Hareendran et al, 2005; Herber et al, 2017), posing huge financial pressures on the National Health Service (NHS) with the mean cost of an unhealed VLU estimated to be £13,455 per annum (Guest et al, 2017b).

Management of VLUs is mainly nurse-led in the United Kingdom, accounting for a large proportion of district nurses' (DNs) time (Simon et al, 2004). Clinical outcomes are often poor in this patient group (Guest et al, 2012) despite following best practice.

Inflammation and chronic wounds

Wound healing involves a complex physiological process. Chronic wounds, such as VLUs, are described as those that fail to pass through a normal and timely sequence of repair and the result of some untoward event (Cutting, 2015). They are held in a persistent inflammatory phase often caused by biofilm (a group of bacteria adhering to the wound surface) (Wolcott et al, 2008), found to be present in 78% of non-healing wounds (Malone et al, 2017). Chronic inflammation prevents the wound progressing through the normal phases of healing and results in spontaneous pain and an increase in wound sensitivity. Pain often dominates the patients' lives and limits their functioning. Chronic inflammation also causes increased harmful exudate, with increased risk of infection.

Electroceutical therapy

An innovative treatment using electroceutical therapy (Accel-Heal®) is available in the UK for the management of hard-to-heal wounds including VLUs. Electrical stimulation and electroceuticals have been available in wound management for

many years in various formats and applications and have demonstrated positive outcomes in reducing inflammation, pain and exudate and healing of wounds (Tradej et al, 2010; Herberger et al, 2012; Thakral et al, 2013; Griffin, 2013; Guest et al, 2015; Turner and Ovens, 2017).

The research into how electroceutical therapy reduces inflammation continues, and a study conducted by The University of Manchester, with the Wellcome Trust Centre for Cell-Matrix Research, investigated the link between inflammation and the overexpression of certain genes. Comparing the data from this study with other studies, the researchers were able to confirm that the S100 genes, S100A7, S100A8 and S100A9, are upregulated in acute and chronic wounds, and that the application of Accel-Heal® significantly affected the expression of these genes.

The study concluded that the reduction in the expression of the S100A7, S100A8 and S100A9 genes by the treatment could improve wound healing by dampening these pathways in chronic wounds (Lallyett et al, 2018).

Accel-Heal®

Accel-Heal® is a one-off, 12-day treatment which delivers sub-sensory electrical energy, similar to levels found in the body, to the wound. The low level of electrical energy, the specific dosage delivered and the specific mode of action differentiates electroceutical therapy from the traditional understanding of electrical stimulation and are important factors in demonstrating clinical efficacy and cost effectiveness (Guest et al, 2015a; Turner and Ovens, 2017).



Figure 1:
Accel-Heal®
electroceutical
medical device



The treatment is delivered by six small (7cm x 4cm x 2cm) portable devices (see Figure 1), which are simply applied one after another over the 12 day period. The treatment is designed with ease of clinical application and patient comfort in mind and is used alongside standard treatment, including compression therapy. Two electrodes pads are placed on opposite sides of the wound (see Figure 2), which are then attached to the device.



Figure 2: Electrode pads in-situ

The treatment is not designed to heal the wound within the 12 day treatment, but "kick-starts" the wound healing physiological process. Electroceutical therapy has been demonstrated to reduce inflammation with subsequent pain and exudate reduction, and subsequently restores cell proliferation and collagen deposition (Kambouris et al, 2014; Kloth, 2014).

Evidence has demonstrated consistent results regarding healing of chronic, non-healing wounds with a mean healing time of 83% within 20 weeks of Accel-Heal® treatment (Guest et al, 2015b; Turner and Owens, 2017; Owens, 2018). In all the studies, the first, and highly significant, outcome was a marked reduction in pain; often experienced within hours of application of the treatment and possibly as a result of the impact the treatment has on inflammation. This reduction in pain was also shown to improve compliance to compression therapy in patients initially not able to tolerate it. Exudate was also significantly reduced. Healing of wounds and reduction in exudate reduced the number of dressing changes and nursing

Box 1: Patient feedback following Accel-Heal® treatment

“I can't believe the difference”

“The thought of being free from ulcer is wonderful”

“I stay asleep” “No longer painful”

“Can go away with my family now. It will be just wonderful”

“Transition has only been a few months so for over a year it wasn't getting better but it wasn't getting worse”

time, resulting in a significant economic benefit to the NHS (Guest et al, 2015b; Turner and Owens, 2017; Owens, 2018).

Several case studies have also confirmed the benefits of using the treatment in clinical practice (Tradej et al, 2010; Griffin, 2013; Greaves, 2014; Owens, 2014; Owens, 2015) and quality of life is greatly improved for patients (Turner and Owens, 2018) (see Box 1).

Pathway

With innovation at the forefront of the NHS five year plan (NHS, 2015), a pathway for using Accel-Heal® (see Figure 3) has been developed following the development of new guidelines for management of VLU's (Wounds UK, 2016). It explains the importance of holistic assessment and working in partnership with the patient to decide treatment options following national and local guidelines, and recommends four purposes for using Accel-Heal® treatment (see Box 2).

Box 2: Purposes for using Accel-Heal® in the management of patients with VLU's

- 1. Failure of the wound to reduce in size by 20-30% in 4-6 weeks (Harding et al, 2016) despite following best practice including compression therapy.**
- 2. Intolerance of compression therapy by the patient due to the presence of pain.**
- 3. Compression therapy is tolerated but the patient has a recurrent ulcer, co-morbidities such as diabetes and/or a previous history of hard-to-heal ulcer/s.**
- 4. The pain is unmanaged despite having compression therapy.**

Conclusion

Chronic wounds and VLU's pose huge challenges to healthcare professionals and cause pain and misery for patients. The use of innovative technologies in wound management is advancing and is supported by the NHS (NHS, 2015). Electroceutical therapy in wound care is a relatively new concept to effectively reduce chronic inflammation, bioburden, pain and exudate, and restore cell proliferation and collagen deposition (Junker et al, 2008; Herberger et al, 2012; Thakral et al, 2013). Accel-Heal® is an easy to use, disposable 12-day treatment which delivers a precise dose of minute electrical energy through the skin surface. Studies have demonstrated consistent results with excellent feedback from clinicians and patients (Guest et al, 2015b; Turner and Owens, 2017; Turner and Owens, 2018; Owens, 2018).

Using the treatment as an adjunct to standard therapy, at the appropriate time in the patient's care, will improve patients' quality of life and reduce the economic burden to the NHS.

continued on next page

Clinical pathway for using Accel-Heal® Electroceutical treatment for the management of venous leg ulcers.

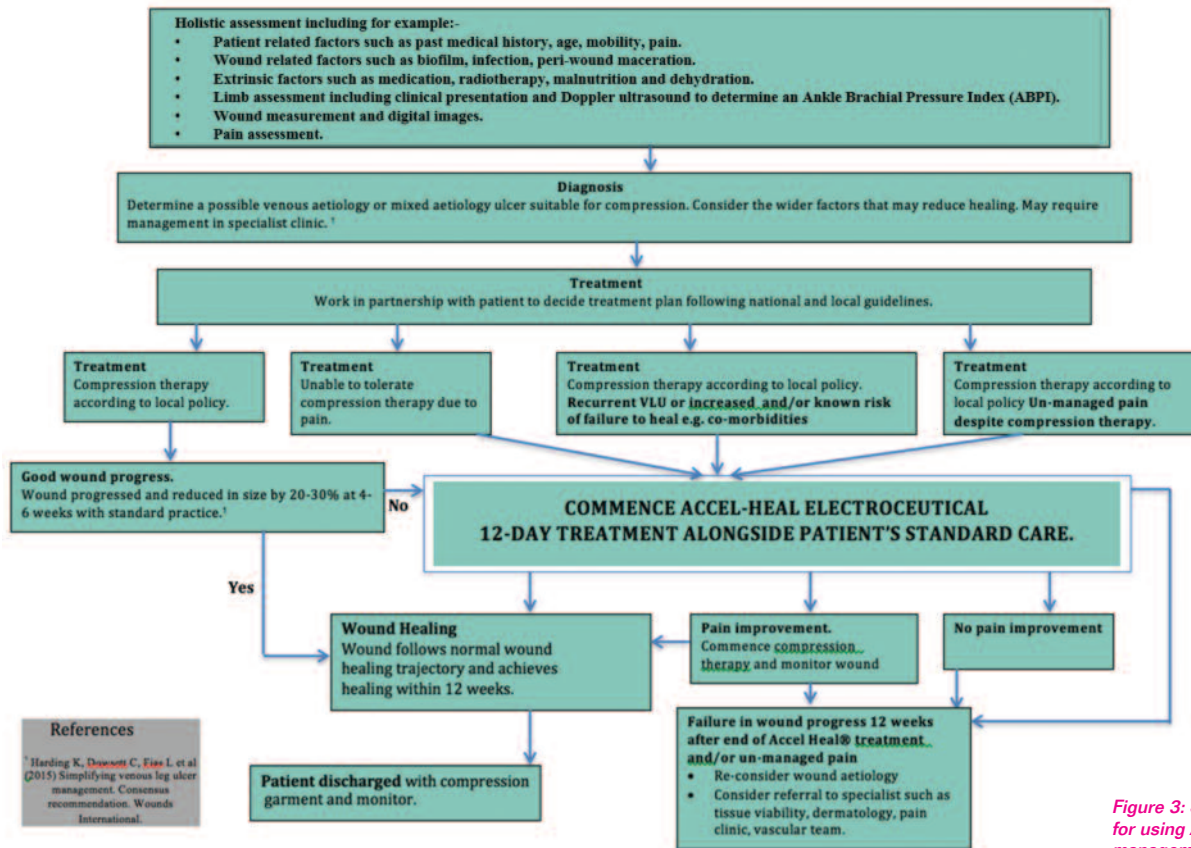


Figure 3: Suggested pathway for using Accel-Heal® for the management of VLUs

Learning points

- VLUs cause significant impact on patients' quality of life, posing huge economic pressures to the NHS.
- Chronic inflammation prevents the wound progressing through the normal phases of healing and results in spontaneous pain and an increase in wound sensitivity.
- Accel-Heal® is a cost effective, easy to use, disposable 12-day treatment which delivers a specific dose of minute electrical energy through the skin surface to effectively replace the dysfunctional electrical energy and "kick start" the wound to heal normally.

References:

- Cutting K, Vowden P, Weigand C (2015). Wound inflammation and the role of a multifunctional polymeric dressing. *Wounds International*, 6 (2), pp.41-46
- Greaves T (2014) Improving patient quality of life with innovative electroceutical technology: a case series. *Wounds UK*, 10 (4), pp. 81-88.
- Griffin J (2013). Improving outcomes through innovation: An evaluation of Accel-Heal® in chronic wounds. *Wounds UK*, 9 (4), pp.118-121.
- Guest J, Taylor R, Vowden K, Vowden P (2012). Relative cost effectiveness of a skin protectant in managing venous leg ulcers: a systematic review. *Journal of Wound Care*, 21 (8), pp. 389-98
- Guest J, Ayoub N, McIlwraith T, Uchegbu I, Gerrish A, Weidlich D, Vowden K, Vowden P (2015a). Health economic burden that wounds impose on the National Health Service in the UK. *BMJ open*, 5 e009283. doi:10.1136/bmjopen-2015-009283.
- Guest J, Ayoub N, Greaves T (2015b). Clinical outcomes and cost-effectiveness of an externally applied electroceutical device in managing venous leg ulcers in clinical practice in the UK. *Journal of Wound Care*, 24 (12), pp. 572 – 580.
- Guest JF, Fuller GW, Vowden P (2017a). The health economic burden that acute and chronic wounds impose on an average clinical commissioning group/health board in the UK. *J Wound Care*, 26 (6), pp. 292-303.
- Harding K, Dowsett C, Fias L, Jelnes R, Mosti G, Oien R, Partsch H, Reeder S, Senet P, Soriano JV, Vanscheidt W (2015) Simplifying venous leg ulcer management, Consensus recommendations. *Wounds International*. Available online <http://www.woundsinternational.com/consensus-documents/view/simplifying-venous-leg-ulcer-management> (accessed 15/06/18).
- Hareendran A, Bradbury A, Budd J, Geroulakas G, Hobbs R, Kenkre J, Symonds T (2005). Measuring the impact of venous leg ulcers on quality of life. *Journal of Wound Care*, 14 (2), pp.53-57
- Herber O, Schnepf W, Reiger M (2007) A systematic review on the impact of leg ulceration on patient's quality of life. *Biomed Central Ltd*. <http://hqlq.biomedcentral.com/articles/10.1186/1477-7525-5-44> (accessed 12/06/18).
- Herberger K, Debus E, Larena-Avellaneda A, Blome C, Augustin M (2012). Effectiveness, tolerability and safety of wounds with an electrical stimulation device: results of a retrospective register study. *Wounds*, 24:76
- Junger M, Arnold A, Zuder D, Stahl HW, Heising S (2008). Local therapy and treatment costs of chronic, venous leg ulcers with electrical stimulation (Dermapulse): a prospective, placebo controlled, double blind trial. *Wound Repair Regen*, 16, pp. 480-487.
- Kloth L (2014) Electrical stimulation technologies for wound healing. *Advances in Wound Care*, 3 (2), pp. 81-90.
- Kambouris M, Zagoriti Z, Lagoumintzis G, Poulas K (2014) From therapeutic Electrotherapy to Electroceuticals: Formats, Applications and Prospects of Electrostimulation. *Annual Research & Review in Biology*, 4 (20), pp. 3054-3070.
- Lallyett C, Nielson RH, Hardman M, Kjaer M, Kadler K (2013). Changes in gene expression in the skin following microcurrent treatment. Poster presentation, Collagen Gordon Research Conference
- Lallyett C, Yeung CC, Nielson RH, Zeef LAH, Chapman-Jones D, Kjaer M, Kadler KE (2018). Changes in S100 Proteins Identified in Healthy Skin following Electrical Stimulation: Relevance for Wound Healing. *Advances in Skin & Wound Care*, 31 (7) pp. 322-327.
- Malone M, Bjarnsholt T, McBain A, James GA, Stoodley P, Leaper D, Tachi M, Schultz G, Swanson T, Wolcott RD (2017). The prevalence of biofilms in chronic wounds: a systematic review and meta-analysis of published data. *Journal of Wound Care*, 26 (1), pp. 20-25.
- National Health Service (NHS) (2014). Five Year Forward View. Available online <https://www.england.nhs.uk/wp-content/uploads/2014/10/5yfv-web.pdf> (accessed 18th June 2018).
- National Health Service (NHS) (2015) Innovation into Action. Supporting delivery of the NHS Five Year Forward Plan. Available online <https://www.england.nhs.uk/wp-content/uploads/2015/10/nhs-innovation-into-action.pdf> (accessed 18th June 2018).
- NHS (2016a) Commissioning for Quality and Innovation (CQUIN). Guidance 2017-2019.
- NHS (2016b) Leading change, adding value: a framework for nursing, midwifery and care staff. Available online <https://www.england.nhs.uk/wp-content/uploads/2017/06/leading-change-adding-value-summary.pdf> (accessed 12/06/18).
- NHS (2017) Getting it Right First Time (GIRFT). Available online <http://gettingitrightfirsttime.co.uk> (Accessed 12/06/18).
- Ovens L (2014) Electroceutical therapy to manage complex leg ulcers: a case series of three patients. *Wounds UK*, 10(2), pp.78 -83.
- Ovens L (2015) Getting it right for patients and budgets. *Wounds UK*, 11 (3), pp 96-10
- Ovens L (2018) Results and impact of a clinical evaluation using Accel-Heal® electroceutical treatment in a community NHS Trust (Awaiting publication). Data on file.
- Read N, Zhao M (2014). The electrical response to injury: molecular mechanism and wound healing. *Advances in Wound Care*, 3(2), pp.184-201.
- Simon D, Dix F, McCollum C (2004). Management of venous leg ulcers. *British Medical Journal*, 328 (7452), pp.1358 – 62.
- Thackral G, LaFontaine J, Najafi B, Talal TK, Kim P, Lavery LA (2013). Electrical stimulation to accelerate wound healing. *Diabetic foot & ankle*, 4: 10.3402/dfa.v4i0.22081 available online <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3776323/> (accessed 18/06/18).
- Tradej M, Young S, Hampton S (2010). Accel Heal® - a new therapy for chronic wounds. *Journal of Community Nursing*, 24 (5), pp.16-20
- Turner N, Ovens L (2017). The results of a clinical evaluation of Accel-Heal® electroceutical treatment in a large NHS Trust. *Wounds UK*, 13 (4), pp 92-99.
- Turner N, Ovens L (2018). Clinical outcome results and quality of life improvements using Electroceutical Treatment – patients' perspectives. Poster presentation European Wound Management Association (EWMA) annual conference.
- Wounds UK (2016). Best Practice Statement; Holistic Management of venous leg ulceration. London. Available online <https://www.wounds-uk.com/resources/details/best-practice-statement-holistic-management-of-venous-leg-ulceration> (accessed 15/06/18).
- Wolcott R, Cutting K, Ruiz J (2008). Biofilms and delayed wound healing. *Advancing Your Practice: Understanding Wound Infection and the Role of Biofilms*. Association for the Advancement of Wound Care.



Ingrid Skjæveland
Scientific Product Manager

Woulgan



Reactivate the body's own healing system, using soluble beta-glucan

Ingrid Skjæveland is the Scientific Product Manager for Woulgan. She has a background in academia where she holds a Civil Engineering degree in Biotechnology (2003) and a PhD in Immunology (2008). In 2013, Ingrid switched from academia to industry where she has focused on wound care treatment and the patient's immune system in the healing of chronic wounds.

Many associate growing old with impaired hearing and sight, moving around more slowly and maybe even some aches and back pains. This is also true on a cellular level where, as we grow old, our immune cells tend to be less responsive to environmental stimuli, proliferate more slowly and sometimes even become dysfunctional (Zykova et al, 2000). This manifests itself in an impaired ability for tissue repair, resulting in slow healing wounds that frequently become chronic. With additional age-related conditions, such as vascular deficiencies and diabetes, which augment the above-mentioned effects, slowed healing and chronic wounds are greatly affecting health budgets and nursing time.

Traditionally, wound treatment consists of facilitating the immune system's own ability for repair by removing necrotic tissue, providing a balanced moist environment, controlling microbial burden and the use of compression or offloading as required, known as standard care. In many cases this is not enough, resulting in wounds persisting for months or even years. This has led to the development of new and active therapies, that are able to interact with the cells and molecules that make up the wound healing process, to be used when standard care is not working.

Activating the macrophages with Beta-Glucan in wounds

One such new wound therapy called Woulgan, incorporates a substance, Soluble Beta-glucan (SBG), which targets a key immune cell - the macrophage responsible for coordinating and orchestrating the whole wound healing process. Dysfunctional macrophages resulting from age and comorbidities such as diabetes, respond to stimulation with Beta-glucan, which restores their functionality. In practice, this means that the healing is reset in these wounds, and as the macrophages after activation with Beta-glucans are more capable of finishing the coordination

of the healing process until closure, the chance of complete healing increases.

Beta-glucans have been used for medical purposes in the Far East for more than 2000 years. These compounds have been recognised in Western medicine in the last century as a result of their ability to modulate the innate immune system, particularly through the action on white blood cells (monocytes and macrophages). Beta-glucans are long-chained polysaccharides which can be found in the cell walls of yeast and fungi. Their conserved structure harbours molecular motifs referred to as Pathogen-associated molecular patterns (PAMPs). Our immune systems have, through evolution, learned how to recognise PAMPs as danger signals for impending attack, and will upon recognition start appropriate counterattack mechanisms. PAMP recognition occurs through specialised receptors on the cell surface of the macrophages, which bind to the Beta-glucan PAMP motif. This binding activates the cell, increasing its phagocytic capabilities and the production of specific signal molecules and growth factors. When macrophages are activated by Beta-glucan, they become much more efficient in their phagocytic capabilities and bacterial killing, thus cleaning the wound of dead cells and pathogenic microbes. The activated macrophages from Beta-glucan stimulation will express a range of growth factors supporting cell proliferation, angiogenesis and deposition of the extracellular matrix. Furthermore, a selection of cytokines are also released that will signal myofibroblasts to increase wound contraction and support re-epithelialisation by epithelial cells. In terms of wound healing, this means that after activation with Beta-glucans, the resident macrophages in slow healing wounds restore some of their original functions and are more capable of finishing the coordination of the healing process, including sub processes, until closure (Figure 1).

continued on next page

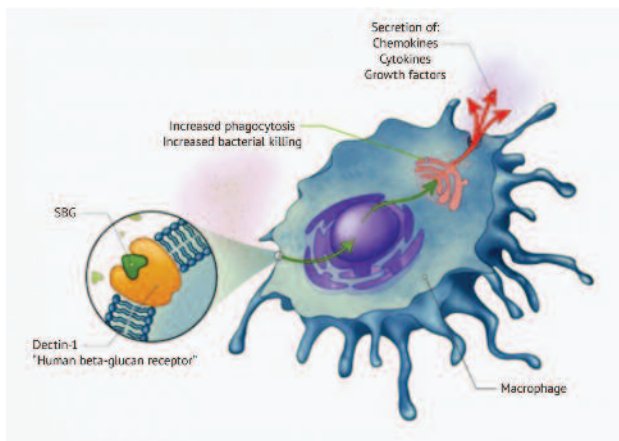


Figure 1: Solubilised Beta-glucan (SBG) harbours PAMP motifs that are recognised by cell-surface receptors called Dectin-1 on macrophages. The interaction between SBG and Dectin-1 elicits a cellular response comprised of: increased phagocytic activities, increased bacterial killing and secretion of cytokines and growth factors responsible for coordinating the healing response.

Beta-Glucans in clinical practice

The clinical benefits of using Beta-glucans in wound treatment have been documented in several publications, including a double blinded placebo controlled clinical study, showing a clear beneficial effect of SBG treatment with complete healing of unresponsive diabetic ulcers. A statistically significant effect was apparent as early as 8 weeks from the start of treatment (Zykova et al, 2014). The results from this study have been replicated in open case study evaluations in real-life clinical situations (King et al, 2017; Cutting, 2017; Hunt, 2018), confirming both clinical and cost saving benefits of using Solubilised Beta-glucan as a therapy for slow healing wounds.

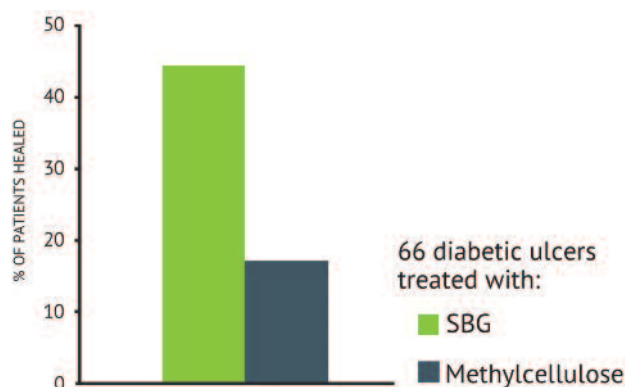


Figure 2: Results from a blinded, randomised clinical trial on 66 slow-healing diabetic foot ulcers showed a statistically significant effect in complete healing in favour of SBG treatment compared to placebo already at week 8.

How does Beta-glucan compare to other active therapies?

An advantage of using Beta-glucan to treat slow healing wounds, over for instance matrix metalloproteinase (MMP) modulators, cellular therapies or growth factor supplements, is that macrophages function at an overall level, thereby correcting multiple molecular factors in the wound bed. Thus, as a clinician, it is not necessary to know the specifics of the molecular imbalances in the wound as the activated macrophages will take care of a range of these factors. Furthermore, being a polysaccharide, Beta-glucans will not be degraded by MMPs present in the wound and are not allergenic to the patient. In addition, Beta-glucans are stable polymers which can be stored at room temperature. The product comes in an easy-to-use gel format that does not require specialist training or procedures to use, enabling both generalist nurses and patients themselves to apply it.

Clinical use of Woulgan

Woulgan is intended as a primary treatment when wound healing is slow or is expected to heal slowly in:

- Diabetic foot ulcers
- Leg ulcers
- Pressure ulcers
- Open post-operative wounds
- Partial thickness burns
- Graft and donor sites
- Abrasions and lacerations

Learning points

- Wound repair mirrors age-related dysfunction at a cellular level, which is augmented by comorbid conditions such as diabetes and vascular disease.
- Macrophages are the key cell type responsible for orchestrating the entire healing response.
- Beta-Glucan can restore dysfunctional macrophage activity and restart the healing process in slowed healing and chronic wounds, resulting in increased wound healing.

References:

- Cutting KF (2017) The cost-effectiveness of a novel soluble beta-glucan gel. *Journal of Wound Care*, 26, 228-234.
- Hunt S (2018) A clinical observation evaluation of bioactive soluble beta-glucan gel compared with standard care. *Journal of Wound Care*, 27, 228-234.
- King B, Barrett S, Cutting KF (2017) Clinical evaluation of a bioactive beta-glucan gel in the treatment of 'hard-to-heal' wounds. *Journal of Wound Care*, 26, 620-628.
- Zykova SN, Jenssen TG, Berdal M, Olsen R, Myklebust R, Seljelid R (2000) Altered cytokine and nitric oxide secretion in vitro by macrophages from diabetic type II-like db/db mice. *Diabetes*, 49, 1451-1458.
- Zykova SN, Balandina KA, Vorokhobina NV, Kuznetsova AV, Engstad R, Zykova TA (2014) Macrophage stimulating agent soluble yeast β -1,3/1,6-glucan as a topical treatment of diabetic foot and leg ulcers: a randomized, double blind, placebo-controlled phase II study. *Journal of Diabetes Investigation*, 5, 392-399.



Simon Bayliff
Vice President, R&D
Woundchek Laboratories



Point of care diagnostic tests for chronic wounds

Simon Bayliff is Vice President of Research and Development at Woundchek Laboratories, and has over thirty years' experience in the development and commercialisation of medical devices and in vitro diagnostics.

Wounds that are proving difficult to heal, i.e. chronic non-healing wounds, including aetiologies such as venous leg ulcers (VLU), diabetic foot ulcers (DFU) and pressure ulcers (PU), impose a significant health economic burden in the UK. This is due, in part, to a lack of a differential diagnosis in many cases to identify the underlying cause. New biomarkers have been developed into point of care diagnostic tests (WOUNDCHek™ Bacterial Status and WOUNDCHek™ Protease Status) to help address this problem.

Over a 12-month period (2012/13), only 43% of chronic wounds in the UK healed, at a cost of around £3 billion (Guest et al, 2015). Significant morbidity and mortality are also associated with chronic wounds. A study highlighted that 17% of diabetic foot ulcers received an amputation (Guest et al, 2018) with approximately 20 lower limb amputations occurring daily in the UK (PHE, 2016). Prognosis following amputation is not good, with one-year mortality reportedly at 13-40% and five-year as high as 39-80% (Singh et al, 2005), worse than most malignancies.

Data published on the management of DFU (Guest et al, 2018a) and VLU (Guest et al, 2018b) identified that patients received a wide variety of topical treatments with a mean length of treatment increasing from 1-2 months initially up to 3-4 months for the sixth sequential treatment used. This frequent switching of therapy over time is due to a lack of rapid feedback to indicate whether the treatment is working or not and leads to poor outcomes. New advanced therapies are available, but they usually have a specific mode of action and are often not cost effective unless targeted towards a known cause, or when employed after chronic inflammation or infection has been addressed. More precise treatment that addresses the specific underlying cause of non-healing is required. This has led to the development of wound diagnostics that are able to assist in identifying the reasons a wound may not be progressing to healing.

Woundchek Laboratories is leading the way in wound diagnostics by commercialising the world's first point of care tests for this field. WOUNDCHek™ Bacterial Status detects bacterial protease activity (BPA), which is indicative of pathogenic behaviour of bacteria in the wound. BPA presents itself not only in symptomatic infections, but also prior to clinically observable infection, at a point where antimicrobial treatment is typically required (Lauchli et al, 2015). Studies have demonstrated that around 40% of wounds, despite being asymptomatic for infection, tested positive for BPA. A wound that is positive for BPA is less likely to heal or will heal more slowly and has a five-fold increased risk of amputation, than a wound that is negative (Serena et al, 2017).

Figure 1. Case Study
(Serena et al, 2017)

Week 0:

- No clinical signs of infection
- **Positive for BPA** (result blind to clinician)
- Treatment: Silicon non-adherent & foam dressing



Diabetic foot ulcer, right plantar.

Week 4:

- No clinical signs of infection
- **Positive for BPA** (result blind to clinician)
- Treatment: Gelling fibre dressing

Week 5:

- Patient bedridden with chills and pains. Foot swollen and increased odour
- Third digit is purple and 9x8cm area of redness on dorsal foot
- **Patient referred to surgery for amputation**

Figure 1: Case study of a wound in a blind clinical study of WOUNDCHek™ Bacterial Status test.

continued on next page

Figure 1 shows a case study of a wound in a clinical study where the clinician was blinded to the WOUNDCHEK™ Bacterial Status test result. The wound presented with no signs of infection but tested positive for BPA both initially and after four weeks. By week five the patient exhibited signs of infection and the wound rapidly deteriorated, requiring referral for amputation. A pragmatic randomised controlled trial to evaluate the clinical and economic effectiveness of testing chronic ulcers in primary care for BPA is ongoing at Pennine Care NHS Foundation Trust, supported by Innovate UK and Health Innovation Manchester.



Figure 2: WOUNDCHEK™ Bacterial Status test, with wound fluid swab

Woundchek Laboratories has also developed and commercialised the WOUNDCHEK™ Protease Status test which detects elevated (human) protease activity (EPA), a marker of uncontrolled chronic wound inflammation. A wound with EPA has a very low chance of healing without appropriate intervention (Serena et al, 2011). Approximately a quarter of chronic wounds remain stalled due to this treatable condition. Employing a test and treat pathway using WOUNDCHEK™ Protease Status to target use of protease modulating dressings can improve healing outcomes. In a comparative study of DFU (Anichini et al, 2013), 40% (4/10) of the wounds in the test and treat arm healed in 12 weeks versus only 10% (1/10) receiving standard care ($p < 0.01$). In a larger study including multiple aetiologies (Frenthoff et al, 2015), 52% (56/107) had healed or were classed as healing at 12 weeks, which was significantly higher ($p = 0.034$) than the 36% (32/90) healing or healed in the comparator group.

Both tests are CE marked and commercially available in the UK. They use a wound fluid swab and are very simple to perform, yielding qualitative results in only 15 minutes. The tests are visually read, like a pregnancy test, so no instrumentation is required, and they can be conducted at the point of care which could be in a hospital, clinic or even the patient's own home.

The use of point of care wound diagnostic tests could reduce the cost of inefficient treatment and delayed healing by being able to target the right therapy, on the right patient, at the right time and for the right length of time. The tests may also promote the prudent use of advanced therapies and antimicrobials in an era where cost efficient care and antimicrobial stewardship are global imperatives.

Learning points

- Chronic wounds are a significant economic burden on the NHS.
- Wounds are currently treated inefficiently without precise diagnosis, resulting in poor outcomes that contribute to patient morbidity and mortality.
- Point of care tests are now available to aid clinicians' diagnosis of the factors that are delaying healing to help direct appropriate therapy.

References:

- Anichini R, Tedeschi A, Bernini A, De Bellis A (2013) Detecting and treating Elevated Protease Activity (EPA) in chronic diabetic wounds. Presentation at EWMA, Copenhagen, May.
- Frenthoff E, Scheske J, Digby L (2015) Testing and treating for elevated protease activity (EPA) in wound clinics improves clinical outcome at no additional cost. Poster at Wounds UK, Harrogate, November.
- Guest J, Ayoub N, McIlwraith T, Uchegbu I, Gerrish A, Weidlich D, Vowden K, Vowden P (2015) Health economic burden that wounds impose on the NHS in the UK. *BMJ Open*, Dec 7, 5(12)
- Guest J, Fuller G, Vowden P (2018a) Diabetic foot ulcer management in clinical practice in the UK: costs and outcomes. *Int Wound J*, 15:43-52
- Guest J, Fuller G, Vowden P (2018b) Venous leg ulcer management in clinical practice in the UK: costs and outcomes. *Int Wound J*, 15(1):29-37
- Lauchli S, Swanson T, Serena T, Harding K (2015) The use of a point of care test for bacterial protease activity in chronic wounds. *Wounds Int*, 6(4):22-28
- Public Health England (2016) Diabetes Footcare Activity Profiles. Calculated from the average number of amputations per year from 2012-15.
- Serena T, Cullen B, Bayliff S, Gibson M, DeMarco D, Galbraith J, Le N, Mancinelli M, Sabo M, Samies J (2011) Protease activity levels associated with healing status of chronic wounds. Poster at Wounds Harrogate UK; November.
- Serena T, Carter M, Bayliff S, Brosnan P (2017) A rapid point of care test for bacterial protease in chronic wounds is predictive of amputation risk. Poster at Wounds UK, Birmingham, July.
- Singh N, Armstrong D, Lipsky B (2005) Preventing foot ulcers in patients with diabetes. *Jama*, 293:217-28



Michael Clark PhD
Commercial Director

Welsh Wound Innovation Centre



Improving pressure ulcer prevention through rigorous mattress testing

Professor Clark is Commercial Director of the Welsh Wound Innovation Centre and Director of the Welsh Wound Network. A zoologist by training, Professor Clark has worked in tissue viability and wound healing since 1980. He is also Professor of Wound Study at Birmingham City University, Professor Clark was Chief Executive of the Lindsay Leg Club Foundation and has been a recent President of the European Pressure Ulcer Advisory Panel. He was Editor in Chief of the Journal of Tissue Viability from 2000 to 2010 and now serves as Emeritus Editor of that publication.

The Welsh Wound Innovation Centre (WWIC) was created in 2014 to provide leadership to wound prevention and healing in Wales. WWIC is the first National Wound Healing centre worldwide and has already begun to demonstrate its value to Wales and the National Health Service (NHS) through inward investment that has created at least 80 new jobs and the performance of national wound audits, education and training.

While there are many different types of wound that people can experience, one wound that has received considerable attention within the NHS is the pressure ulcer. Pressure ulcers (often better known as bedsores) are injuries to the skin and deeper soft tissues that arise through prolonged or excessive mechanical loading of the body. For example, if a person lies or sits too long in one position, the pressures upon the skin at the points of contact with their bed or chair can become high enough to initiate skin damage. In the most severe cases the pressure ulcer will extend deep into muscle tissue and these wounds will take many months to heal, are at risk of infection and may even kill. There is limited national data on the number of people affected by pressure ulcers. In Wales, a survey of all acute and community hospitals in 2015 identified that 8.9% of all patients had pressure ulcers. While most of these were confined to the outer layers of the skin, 168 patients had pressure ulcers that extended into fat and muscle tissues. Preventing pressure ulcers often involves healthcare professionals changing the position of immobile patients at frequent intervals, often in conjunction with the use of special beds and seats that limit the amount of pressure exerted on the skin. These 'pressure-redistributing' support surfaces are commonly encountered in the NHS. Within Wales, 36.9% (2569/6957) of all hospital beds have special pressure redistributing mattresses (Clark et al, 2017).

In 2016, tissue viability nurses in Hywel Dda University Health Board (UHB) and Abertawe Bro Morgannwg UHB approached WWIC and the South-Wales Pressure Ulcer Prevention Intervention Service (PUPIS) to help evaluate hybrid mattresses. A hybrid mattress consists of a series of longitudinal cells along the mattress that contain foam and air to support the patient. However, when the mattress is connected to an electrical pump the air cells are sequentially inflated and deflated to change the points of the body that bear weight so helping to prevent pressure ulcers. While this project helped two NHS organisations make informed decisions upon their use of special mattresses, the process also highlighted that in 2016 there were no available accepted test methods against which the performance of all special mattresses could be judged despite long-standing attention to

this issue. Starting in 2001, the US led Support Surface Standards Initiative began the debate over how best to measure the technical performance of mattresses. This led in 2005 to a further international initiative to understand and measure the effects of shear (mechanical load applied to skin) in pressure ulcer formation. From these early steps the work to characterise mattress performance has evolved, and in 2018 a draft International Standard setting out the general requirements for mattress testing became available (ISO/DIS 20342-1; <https://www.iso.org/standard/67750.html>).

WWIC will now work to align mattress testing with the general requirements set out in the new standard. This will, over time, enable WWIC to develop, and ideally gain accreditation, for its support surface testing. This would provide mattress manufacturers with one of the first comprehensive mattress testing facilities in Europe, helping the NHS to identify the most effective support surfaces with which to fight the development of pressure ulcers.

The Welsh Wound Innovation Centre working in partnership to develop new pressure redistributing bed surfaces.

Learning points

- Pressure ulcers are commonly encountered within the NHS.
- No standards have been available against which the performance of special pressure redistributing mattresses can be measured.
- WWIC is working towards establishing a comprehensive mattress test facility.



References:

Clark M, Semple MJ, Ivins N, Mahoney K, Harding K (2007). National audit of pressure ulcers and incontinence-associated dermatitis in hospitals across Wales: a cross-sectional study. *BMJ Open*;7:e015616. doi: 10.1136/bmjopen-2016-015616.
ISO/DIS 20342-1 (2018). Assistive products for tissue integrity when lying down -- Part 1: General requirements. <https://www.iso.org/standard/67750.html>. Accessed on 25th October 2018.

7 million people will be 'left behind' in the next decade due to a lack of digital skills

A recent report has found that up to seven million people could be left behind, costing the economy billions of pounds, as a result of the pace of advancing digital technology.

The Government has recently pledged £1 million to boost digital skills among underrepresented groups, including the elderly, with around 28% of people over the age of 60 who are offline, and 54% of people over the age of 60 lacking five basic digital skills, including making online payments or creating content such as a text document.

The lack of basic digital literacy coupled with the increasing adoption of new technology will threaten the ability of digitally illiterate individuals to pay bills, contact their bank, book

flights, renew their passport and check their benefits.

Providing people with new digital skills would be worth £15 in 2028 for every £1 invested this year, and businesses could gain around £1.5 billion in benefits as a result of the productivity increases resulting from new digital skills.

To find out more please visit...

<https://www.telegraph.co.uk/technology/2018/09/11/lack-digital-skills-will-leave-7-million-left-behind-next-decade/>

Bingo and dancing classes could be prescribed by the NHS to cut hospital admissions

A pilot project around the benefits of “Community prescribing”, which involves activities including boxing, bingo and Bollywood dancing classes being prescribed by GPs, have been found to deliver many benefits to both GPs and patients.

The project has been found to reduce the workload of GPs by cutting the number of non-medical issues they deal with, and has also led to 20% reduction in hospital outpatient referrals in the year to July 2018, and a 4% reduction in emergency hospital admissions from the Parchmore medical centre, which pioneered the scheme and has prescribed 30,000 social sessions to date.

It is particularly helpful for vulnerable older people, who are often lonely and isolated,

providing them with both an opportunity to socialise, and to improve their general health and fitness.

The scheme is part funded by the NHS and supported by community volunteering.

To find out more please visit...

<https://www.theguardian.com/society/2018/nov/18/gps-could-prescribe-bingo-and-dancing-after-english-trials-success>

AI could be used to predict cognitive decline leading to Alzheimer's disease

Worldwide, the total number of people living with dementia is predicted to rise from 50 million to 83 million by 2030. The most common form of dementia is Alzheimer's disease, which may contribute to 60-70% of cases; however, there is currently no treatment for the disease.

However, recent work by a team of scientists has found that an artificial intelligence (AI) algorithm could be trained to accurately predict cognitive decline leading to Alzheimer's disease.

The algorithm uses a combination of learned signatures from magnetic resonance imaging (MRI), genetics and clinical data to predict whether an individual's cognitive faculties are likely to deteriorate towards Alzheimer's within the next five years.

Although Alzheimer's cannot be treated, there are a number of preventative measures that can be taken, including lifestyle changes, to delay or prevent the onset of the disease. It is hoped that the AI method can be used to predict and thus prevent Alzheimer's in individuals.

To find out more please visit...

<https://www.sciencedaily.com/releases/2018/10/181004155421.htm>

Upcoming Events...

Future of Care Conference

19th March 2019

This one day conference will present leading experts, who will discuss key trends for the future of care in focused speaker slots. Delegates will hear from experts at the forefront of shaping the industry, and there will be two dedicated panel sessions with a chance for the audience to ask questions on the issues that most affect them, to ensure a social care system fit for the future. The conference has been designed especially for care home owners, managers and decision-makers to provide them with the latest information and innovation.

To find out more, please visit <https://futureofcare.co.uk/>

British Geriatrics Society Spring Meeting 2019

10th – 12th April 2019

The BGS Spring meeting will cover the latest scientific research and best clinical practice in care of older people. Our ageing population is stimulating extensive NHS service redesign to deal with the challenge of caring for larger numbers of older people both in and out of hospitals. This conference will cover core areas of interest to all specialists responsible for the healthcare of older people in the United Kingdom.

To find out more, please visit <https://www.bgs.org.uk/events/spring-meeting-2019>

Tissue Viability Society Conference 2019

1st – 2nd May 2019

The TVS Annual Conference is a flagship event and attracts delegates from the Tissue Viability community from all over the country. The agenda will cover all areas of tissue viability including politics, research & innovation, leadership, clinical practice and multidisciplinary working, attracts both national and international speakers from many disciplines, and will cover a broad range of interesting subjects with plenary, debate and workshop sessions. Abstracts for both poster and oral sessions are invited and the TVS are delighted to receive a large number from clinicians and researchers from far and wide.

To find out more, please visit <https://tvs.org.uk/2019-conference/>

The King's Fund Digital Health and Care Congress 2019

22nd – 23rd May 2019

This annual two-day event will bring together leading NHS and social care professionals interested in how data and technology can improve the health and wellbeing of patients and the quality and efficiency of services. Join NHS and social care teams, innovators, researchers and policy-makers for an event packed with interesting content and innovative projects. You'll discover the latest national developments in digital health, design your own congress experience with a choice of deep-dive breakout sessions and have the chance to network with more than 400 delegates working in this area.

To find out more, please visit <https://www.kingsfund.org.uk/events/digital-health-and-care-congress-2019>



Anna Galazka

Early Career Researcher and University Teacher

Cardiff Business School

Lindsay Leg Clubs: how social infrastructure can improve wound healing

Anna Galazka completed her PhD in organisation studies at Cardiff Business School. She focused on the emancipatory potential of clinician-patient partnerships for dealing with the social stigma of wounds and the 'dirty work' stigma of wound healing. She conducted her research in the UK specialist outpatient wound healing context, where she learnt about the transformative power of Lindsay Leg Clubs to change lives and improve healing, especially for elderly, often isolated patients. Anna's future research interests are in understanding the possibilities and power of social innovation in the context of managing chronic conditions, such as wounds.

Thanks to developments in healthcare we now live longer, however medicine has not yet found ways of curing many of the chronic diseases that sometimes show themselves as hard-to-heal wounds on already fragile, ageing skin.

Death of a spouse, declining mobility or embarrassment caused by the wound smell mean that elderly people suffering from chronic ulcers are likely to experience social isolation. Loneliness and its negative effects on physical and mental health in older people has been recognised as a modern epidemic (Salman, 2017; BBC Sounds, 2018; Coughlan, 2018) but for people with wounds that go on and on with no end in sight, this issue can be particularly upsetting.

Wounds can have a social stigma with serious relational repercussions for the elderly. One patient mentioned that her daughter and granddaughter would not visit her at home as often as they had used to because they could not stand the smell from her wound. Another elderly patient described feeling self-conscious on a bus journey to a wound clinic when a boy stared at him throughout the journey. "I don't think I will go on the bus again", he said. The distressing sense of isolation can be heightened because wound healing is still dubbed as a Cinderella service (Sandoz, 2016; Young, 2016) that attracts relatively little interest in the medical profession.

Therefore, for some elderly patients with wounds, visits from district nurses can provide a sense of relational continuity they might seek to maintain – sometimes at a dangerous cost to their physical health. "As district nurses we used to go to people's homes and we knew that sometimes they would use something like a knitting needle (...) and poke it in there to make the wounds (...) because otherwise if we weren't going to visit them anymore because they'd healed, they might not see many people", said a lead of one Lindsay Leg Club. Lindsay Leg Club is a charity based on a social-medical model of care provision run by district and practice nurses away from the NHS premises, that offers wound care support for many elderly people in the community, including after their wounds heal.

'No man is an island' may be a cliché (Beer, 1997) but Lindsay Leg Clubs have a transformative potential to bring people together to heal better by making friends, learning from one another and being motivated by peer pressure in the company of nurses interested in leg ulcer care. As one patient-turned-secretary of a Leg Club said, it is, first and foremost, a social occasion to share a cup of tea, play bingo, or have their toe nails cut. "If a patient's head is okay, the rest heals as well", the Leg Club lead added.

There are many success stories from Leg Clubs across the country. One is of a patient who had had weeping leg ulcers that kept her indoors for four years before she was persuaded to come to her local Leg Club. "I didn't realise other people had the same problem as me", she reportedly said. After three months, her life was changed. She started going out with her daughter and getting her own groceries. She would go to every Leg Club outing. After one year, her legs were healed. "Not because we did anything different but just because she was happy, and she was more mobile", the Leg Club lead said. The patient did not develop a single ulcer until she passed away eight years later.

Social support is important in the healing and management of chronic wounds in elderly people, so it is important to make them aware of the presence of such social infrastructure in their locality.

Lindsay Leg Clubs were established in 1995 and operate across Great Britain. For more information on Leg Club locations and the possibility of getting involved as a volunteer, please visit: <https://www.legclub.org/>

Learning points

- Wounds are often a hidden debilitating condition that can reduce the quality of social life for elderly people.
- Social infrastructure has a huge potential to improve physical and mental outcomes for elderly patients with wounds.
- Lindsay Leg Clubs offer social-medical assistance for people with wounds as well as ongoing support for people whose wounds have healed, and all providers of care to elderly patients should make them aware of their local club.

References:

- BBC Sounds (2018). The Anatomy of Loneliness - Episode 1. Available at: <https://www.bbc.co.uk/programmes/m0000mj8> [Accessed: 28 October 2018].
- Beer G (1997). The making of a Cliché: 'No man is an Island'. *European Journal of English Studies*, 1(1), pp. 33–47.
- Coughlan S (2018). Loneliness threatens young as well as old. *BBC News*, 9 October. Available at: <https://www.bbc.com/news/education-45801803> [Accessed: 28 October 2018].
- Salman S (2017). The battle against loneliness among older people. *The Guardian*, 10 May. Available at: <https://www.theguardian.com/healthcare-network/2017/may/10/loneliness-older-people> [Accessed: 28 October 2018].
- Sandoz H (2016). Under pressure: why it's time to heal these wounds. Available at: <http://www.healthawareness.co.uk/wound-care/under-pressure-why-its-time-to-heal-these-wounds> [Accessed: 9 January 2018].
- Young T (2016). Introducing the Welsh Wound Innovation Centre. *Dermatological Nursing*, 15(1), p. 6.



Mel Johnson

Patient Safety Collaborative Manager

Yorkshire & Humber Academic Health Science Network



Sarah Fiori

Senior Quality Lead

NHS Vale of York CCG



The Implementation of 'React to Red' Through Safety Huddles in Care Homes in NHS Vale of York CCG

Sarah Fiori qualified in 1997 and has held a variety of nursing posts in acute and community settings. Sarah is passionate about Quality Improvement (QI) in healthcare and is a Q Fellow with the Health Foundation and Improvement Fellow with the Improvement Academy based in Yorkshire.

In her current role Sarah collaborates to shape, develop and share best practice for the benefit of patients/residents' experience.

Mel has a nursing background and joined the Improvement Academy team in 2015. She provides programme management leadership to the Patient Safety Collaborative, bringing in skills in quality improvement, engaging teams and applying behaviour change approaches to tackling safety problems. Most of her career has been spent in a quality role, working in risk and governance, project managing the Safer Patient Initiative for an acute trust, working with the NHS Institute on the social movement project and being programme manager for the Patient Safety First campaign.

Pressure ulcers are a major cause of harm and distress and affect around 700,000 people annually.

They have a huge impact on a resident's quality of life, leading to increased pain, risk of infection, depression and an increased risk of mortality. The estimated cost to the NHS and care organisations in the UK is around £6.5 billion per year. Many pressure ulcers are avoidable if best practice is followed.

'React to Red' focuses on a set of interventions known as the SSKIN bundle to support care staff in the prevention and management of pressure ulcers. Although this work centers on pressure ulcers, the education and interventions promote improvements to cross cutting themes such as mobility, nutrition and hydration which contribute to the reduction of other avoidable harms.

Safety Huddles are short (5-10 minute) conversations about a team's selected patient safety priority, they include all staff and allow for open and frank conversations on sharing learning and steps the team can take to prevent harm from happening.

The implementation of NHS England's 'React to Red' initiative combined with the Safety Huddle was introduced to Care Homes in Vale of York led by the Senior Quality Lead, Vale of York (VoY) CCG and the AHSN, Improvement Academy (IA).

The premise for the project was that combining 'React to Red' with Safety Huddles would embed and sustain improvement; promoting an improved safety culture and communication within homes. This was tested with an initial cohort of two care homes (225 Staff) for proof of concept before learning and adaptations to the project could lead to development of plans for wider scale spread.



Key Elements of a Safety Huddle:

- **Informed by QI tools and visual feedback**
 - ◊ Review of days since last harm
- **Focused** meeting about one or more agreed patient harm
 - ◊ Who are the patients most likely at risk of harm?
- **Agreed actions**
 - ◊ Set of team/individual actions (aimed at reducing risk of patient harm)
- **Multidisciplinary** frontline team invited to attend
 - ◊ Including non-clinical
- **Senior clinical leadership**
 - ◊ Non-judgemental environment and all team staff empowered to speak up
- **Daily** (Monday-Friday as minimum)
 - ◊ Predictable time and venue (appropriate to team and context)
 - ◊ Brief (5-15 minutes)
- **Celebration and recognition of milestones**

continued on next page

The initial cohort allowed the project team to gather a better understanding of the specific challenges when working within the care home setting and adapt plans to address these. The care homes had an appetite to engage and achieved 100% completion with training and competency through a train the trainer approach, working with a group of identified champions creating a critical mass to cascade the training (Figure 1). Outcome data was more of a challenge as Pressure Ulcers originating in care homes (incidence) were relatively rare events.

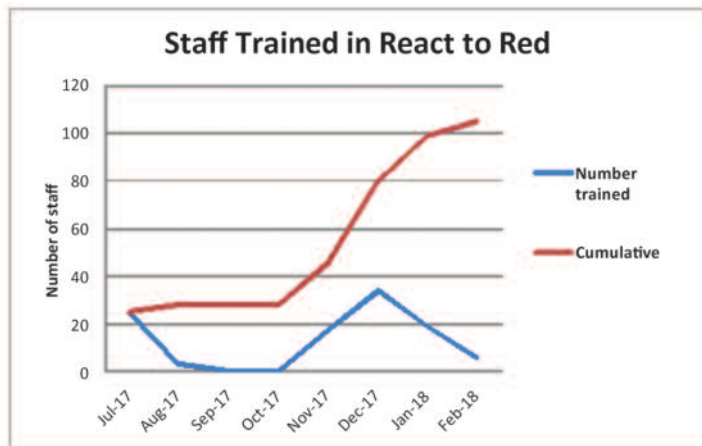


Figure 1: Numbers of staff trained in React to Red

There was learning and key challenges identified during this work particular to the care home setting. This learning is important when considering any future improvement work in this setting. The care home sector functions very differently to the NHS and thorough understanding of this is vital to ensure good engagement.

Engagement

- Drivers for QI in care homes differ to those for NHS colleagues, a key driver for social care are CQC requirements
- A good relationship between stakeholders is crucial
- Linking the work to a Care Home forum such as 'Partners in Care' allowed learning to be shared and has prepared the ground for natural spread of the work
- Relationships both within the care home and with the wider team (health care professionals, local authority) can determine success

Training

- Front line nurses and care workers generally have limited opportunities for learning and career development
- The training provided was generally welcomed, it was peripatetic and accessible for all including colleagues (e.g. house keepers, receptionists, kitchen staff and facilities management)
- Training requirements are not always prioritised. Training in skin integrity including pressure ulcer prevention was not recognised as a mandatory element for care staff and not included in annual refreshers training, so React to Red was perceived as extra work not part of core skills and knowledge

Resources

- Dedicated resource to support the work was critical in order to maintain regular contact, collect data for

measurement of improvement and provide face to face support and encouragement

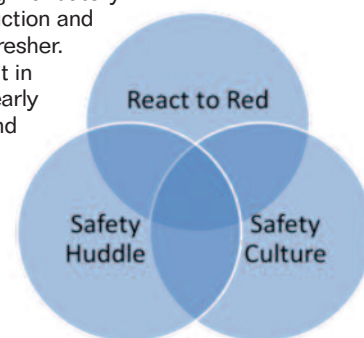
- Intense levels of support are often required at the start of the programme to build momentum, embed change and to plan for sustainability
- Care homes are individual businesses and have differing business priorities and agendas, different equipment, dressings, resources for education

Leadership/Workforce

- Care homes have a transient workforce (care staff and managers) and it can be challenging to maintain engagement and support for the work
- Clinical leadership can be difficult in some settings as senior staff can have diverse experience and skill sets which may not be predominantly health based
- Numeracy and literacy skills can also be a challenge in some care homes (particularly where English is a second language)
- The different size of homes with different client groups inevitably leads to different ways in working

The use of the Safety Huddle was found to have a positive impact on both the safety culture and embedding learning regarding 'React to Red'. The Safety Huddles motivated staff and promoted a safer care environment through recognition of achievement and the sharing of learning from incidents and good practice. The Safety Huddle has provided a structure for further improvement work with care homes and subsequently some have chosen to include other harms e.g. falls and deterioration.

Following the pilot work the React to Red programme has been extended across care homes in the NHS Vale of York CCG. Post training evaluation continues to be positive with care staff reporting the training as easy to understand, improving baseline knowledge of pressure prevention, recognition and actions to take. Many homes are making pressure ulcer prevention training mandatory for care workers at induction and as part of an annual refresher. Staff are more confident in their ability to identify early signs of skin damage and the preventative interventions required.



Learning points

- Pressure ulcers are a major cause of harm and have a huge impact on a care home resident's quality of life, however, many of these are preventable.
- 'React to Red' training supports care staff in the prevention and management of pressure ulcers, and Safety Huddles are short conversations to share learning and steps to prevent harm from happening.
- Following introduction of the 'React to Red' training programme in combination with Safety Huddles in Vale of York, a safer care environment was promoted through recognition of achievement and the sharing of learning from incidents and good practice.



Dr Elena Garcia
Acting CEO and Director of Research
The RAFT Institute



Dr Sonia Ho
Marketing and Communications Manager
The RAFT Institute



Chronic leg ulcers: current gold standard and a novel treatment

Dr Sonia Ho is a scientist with a BSc Honours in Microbiology and a PhD in Biotechnology from the University of New South Wales in Sydney, Australia. Sonia joined The RAFT Institute in 2017 as Postdoctoral Scientist working on the Bone Regeneration Programme. In 2018 she moved to the fundraising team as Marketing and Communications Manager to apply her skills in sales and marketing and her scientific knowledge to fundraise for RAFT's pioneering research.

Dr Elena Garcia is Acting CEO and Director of Research at The RAFT Institute. Elena received a PhD in Biomedical Engineering from University College London in 2012, before working as a Postdoctoral Scientist at RAFT. In 2014, she was a Visiting Research Fellow at the Queensland University of Technology in Brisbane, Australia, and in early 2015 she started the Regenerative Biomaterials Research Group at RAFT. She has published over 20 peer-reviewed articles and is co-inventor of four patents describing novel biomaterial implants, one of which is currently in clinical trials.

The RAFT Institute (RAFT, Restoration of Appearance and Function Trust) is an internationally recognised medical research charity working in the field of tissue reconstruction after physical trauma. The charity is a world-leader in creating pioneering new treatments for patients affected by wounds, burns, traumatic injuries, or post-operative or birth abnormalities. RAFT's vision is to bring forward the day when every patient who survives severe tissue trauma fully regains quality of life.

RAFT develops research programmes which are evaluated by an independent Scientific Advisory Committee. The research is undertaken by scientists and is driven by patient need rather than commercial imperative or specific interests. To maximise the potential of projects, RAFT works collaboratively with some of the world's leading medical and academic institutions. These include University College London, the Royal Free Hospital in London, the Queen Elizabeth Hospital in Birmingham, and the Mayo Clinic in the USA. Such collaborations give access to state-of-the-art equipment, mentorship and technical skills.

One of RAFT's main areas of research expertise is the skin wound healing programme. A recently developed product Smart Matrix® is an advanced wound care product that has the potential to heal full thickness wounds without a skin graft. The way Smart Matrix® works is that it provides a temporary scaffold that can be placed into the wound itself, enabling the body to rapidly close the wound. Moreover, it encourages new blood vessels to grow so the newly formed skin is supplied with oxygen and nutrients.

RAFT's Smart Matrix® has already undergone a small clinical trial in surgical wounds and results are very encouraging. Both surgeons and patients report good and excellent 'real-world' results when rating Smart Matrix® on the level of scarring, the colour match between existing skin and new skin, the pliability of skin (essential for good movement), as well as contour matching (depth of skin in the healed wound compared to that of undamaged tissue).

Building on what has been achieved with Smart Matrix®, RAFT is currently looking at re-engineering the Smart Matrix® scaffold to find a solution to effective healing and repair of chronic leg ulcers.

Chronic leg ulcers affect approximately 1% of the adult population in developed countries (Margolis et al, 2002), and it is estimated that in the UK itself, 3.5 per 1000 individuals are affected by chronic leg ulcers (Guest et al, 2015). This number increases to 20 in people over the age of 80 (Mekkes et al, 2003). Chronic leg ulcers are also a substantial financial burden on the NHS, costing up to £800 million a year (Guest et al, 2015).

The current gold standard treatment of chronic leg ulcers is a multistep procedure involving the use of sustained graduated compression therapy along with a combination of several

antibiotics and dressings (Mekkes et al, 2003; Schultz et al, 2003; Brem et al, 2004). By following the current standard treatments, about 50% of ulcers will heal within 4 months, about 20% do not heal within 2 years, and about 8% do not even heal after 5 years (Nicolaidis, 2000; Coleridge Smith, 1999). Due to these poor healing results, many patients will be admitted to the hospital for inpatient treatment, and ineffective treatment could lead to lower limb amputation. Apart from both surgical and chemical cleansing of the wound, there has not been much evidence of special dressings being used underneath the compression bandages to help promote proper healing of the wound.

RAFT's solution to this problem is to develop a one-step treatment using a novel biomaterial to repair the function and appearance of the damaged wound. RAFT aims to achieve this goal by re-engineering the Smart Matrix® scaffold to change the activity within the wound and resetting it back to a normal healing state. The already demonstrated ability of the Smart Matrix® scaffold to re-establish blood vessel formation, will also be important to help prevent the wound from staying in its chronic state. This project is in the early phase of conceptualisation and optimisation. Currently, a range of prototypes are being fabricated and tested. The next step involves selecting a prototype followed by rigorous testing in the laboratory before taking the product into the clinical phase of research.

Learning points

- Chronic leg ulcers affect a large population of adults worldwide, and this number increases significantly in people over the age of 80.
- The current standard treatments for chronic leg ulcers are not very effective and more needs to be done to develop special dressings to be used with current treatments.
- RAFT is developing a novel biomaterial to work with the wound and repair the function and appearance of the damaged wound.

References:

- Brem H, Kirsner RS, Falanga V (2004). Protocol for the successful treatment of venous ulcers. *The American Journal of Surgery*, 188, 1-8.
- Coleridge Smith P (1999). The management of chronic venous disorders of the leg: an evidence-based report of an international task force. *Phlebology*, 14, 1-126.
- Guest JF, Ayoub N, McIlwraith T, Uchegbu I, Gerrish A, Weidlich D, Vowden K, Vowden P (2015) Health economic burden that wounds impose on the National Health Service in the UK. *BMJ Open*, 5, e009283.
- Margolis DJ, Bilker W, Santanna J, Baumgarten M (2002). Venous leg ulcer: incidence and prevalence in the elderly. *Journal of the American Academy of Dermatology*, 46, 381-386.
- Mekkes J, Loots M, Van Der Wal A, Bos J (2003). Causes, investigation and treatment of leg ulceration. *British Journal of Dermatology*, 148, 388-401.
- Nicolaidis A (2000). Investigation of chronic venous insufficiency: a consensus statement. *Circulation*, 102, e126-e163.
- Schultz GS, Sibbald RG, Falanga V, Ayello EA, Dowsett C, Harding K, Romanelli M, Stacey MC, Teot L, Vanscheidt W (2003). Wound bed preparation: a systematic approach to wound management. *Wound repair and regeneration*, 11, S1-S28.



Sarah Fiori
Senior Quality Lead
NHS Vale of York CCG

Evaluation of the Mercury Advance Hybrid Mattress at Minster Grange Care Home in the NHS Vale of York CCG

Sarah Fiori qualified in 1997 and has held a variety of nursing posts in acute and community settings. Sarah worked as a Research Sister for academic and commercial trials and spent time delivering education before specialising in Tissue Viability, then moving into Patient Safety and Quality. Sarah is passionate about Quality Improvement in healthcare and is a Q Fellow with the Health Foundation and Improvement Fellow with the Improvement Academy based in Yorkshire. In her current role, Sarah collaborates to shape, develop and share best practice for the benefit of patients/residents' experience.

Introduction

The prevention of avoidable pressure ulcers in the community is one of the biggest challenges that care organisations face – a challenge which currently costs the NHS and care organisations in the UK around £6.5 billion per year (NHS England, 2017). Most pressure ulcers are avoidable if simple knowledge is provided and preventative best practice is followed (NHS England, 2017).

The Minster Grange Care Home is an 83-bed care home with nursing, providing care for Physically Frail, Dementia, Younger Physically Disabled residents, Respite Stays and End of Life Palliative Care.

In July 2017 Minster Grange Care Home engaged with the NHS Vale of York CCG to participate in the pressure ulcer prevention programme 'React to Red'. As part of this work, pressure relieving equipment was reviewed and the home manager looked to colleagues in both the local NHS Trust and nationally to explore an alternative to the traditional alternating air mattress surface that would be appropriate to the needs of residents in the care home setting. It was agreed that the Dyna-Form® Mercury Advance hybrid mattress, which was currently being used in the acute setting, would also be evaluated in the community setting.

The evaluation aimed to assess effectiveness of the Dyna-Form® Mercury Advance hybrid mattress in the care home setting with a range of residents who had nursing needs. The evaluation aimed to consider a wide range of factors to deliver clinical, financial and operational advantages.

Method

In December 2017, 32 Dyna-Form® Mercury Advance hybrid mattresses were introduced to the home. Education on the system was provided to both clinical and facilities management staff and, where appropriate, with residents. This, coupled with the key learning from the 'React to Red' training, raised awareness of the importance of skin integrity. Intelligent Air cushions were provided for those residents who were able to sit out in chairs.

Results

During the period of trial from December 2017 to June 2018, the care home had zero incidences of avoidable pressure ulcers. This was attributed to effective equipment provision and staff training.

In the first month, 3 incidences were reported and the Senior Quality Lead performed Root Cause Analysis, however, these were found to be a bruise, a moisture lesion and skin breakdown in a resident at the end of life. Although this may have been deemed to be an inappropriate reporting in two of the cases, it demonstrates a much-increased awareness of skin damage following the 'React to Red' training.

Key areas in which the care home saw further benefits, include:

- The mattress continued to provide a stable pressure relieving surface whilst the care home experienced a power cut for over 2 hours during the trial. This was seen as significantly important in a care home without a back-up generator.
- Electricity consumption within the care home was also seen to be reduced, providing a further cost benefit.
- The care home no longer required rented dynamic mattresses, so have seen significant cost savings in this area.
- The Dyna-Form® Mercury Advance is used in both the local acute and community settings, allowing patients to use the same equipment and instilling confidence across the whole health economy.
- Manual handling for staff was made safer as there was a reduced need to swap residents from one surface to another when care was stepped up or down.
- Residents reported easier transfer out of their bed due to the foam U-Core giving a stable surface.



Discussion

This was a small, focused evaluation but significant in that it demonstrated the appropriateness of the Dyna-Form® Mercury Advance hybrid in the care home setting. Surface selection is acknowledged as only one element in promoting skin integrity, and in conjunction with the 'React to Red' programme it was an ideal opportunity in time to explore the use of the hybrid mattress in the care home environment. Product selection as part of an individual's care plan must be made carefully alongside consideration of cost effective solutions.

Conclusion

In this evaluation, the Mercury Advance hybrid performed as well as, and with extra benefits and flexibility, to the traditional alternating air mattresses. Due to the flexibility of the product, it would seem logical that these findings could be transferable to other care homes.

Learning points

- Most pressure ulcers are avoidable if knowledge is provided and preventative best practice is followed.
- Introduction of Dyna-Form® Mercury Advance hybrid mattresses, which are used in the acute setting, alongside 'React to Red' training, raised awareness of the importance of skin integrity in the home and provided several benefits, including zero incidences of avoidable pressure ulcers.



Maintaining Healthy Skin in Older People

Madeleine Flanagan has been a Wound Specialist for over 30 years in a variety of hospital and community settings, and was responsible for the development of the first undergraduate wound management programmes in the UK. She is currently the Programme Director for MSc Skin Integrity and Dermatology at the University of Hertfordshire, Postgraduate Medical School and has expertise of developing inter-professional curricula to support specialist clinical practice. The postgraduate programmes that she manages have been integral in supporting the development of wound management skills for a wide range of health professionals both in the UK and overseas.

Effective skin care is an essential element of maintenance of skin integrity and promotion of skin health in the elderly but is often taken for granted. For many years, skin changes as a result of ageing were considered to be cosmetic, however it is now understood that skin ageing has a significant impact on the normal function of the skin, leading to dryness, itching, infection and skin cancers. Intrinsic ageing refers to the natural degenerative process involving faulty synthesis of collagen and elastin in the dermis and is influenced by physiological factors and occurs in both sun-exposed and non-sun exposed skin (Rabe and Mamelak, 2006). Intrinsic factors such as inherited genes are responsible for the rate at which individuals age. Extrinsic skin ageing refers to the cumulative process caused by a variety of environmental factors which include ultra-violet radiation, air pollution, nutrition and smoking (Tzellos et al, 2009; Farage et al, 2010).

Intrinsic ageing is characterised by dryness, fine wrinkles, skin atrophy and loss of elasticity (Farage et al, 2010). Whilst the effects of extrinsic ageing include skin roughness, coarse wrinkles, and uneven pigmentation (Alam and Havey, 2010). The epidermal layer in elderly skin reduces by up to 50% compared to young people, due to reduced numbers of epidermal cells. The lipid content of the epidermis is reduced as much as 65% leading to skin drying and reduced water binding capacity (Farage et al, 2010). Advancing age also decreases epidermal turnover which leads to a reduced ability to repair damage to the epidermis. The ability to recover from injury and restore epidermal barrier function once damaged is reduced in the elderly resulting in slower wound healing.

Effect of humidity on skin barrier function

Skin breakdown related to humidity can occur due to the effect of sweating, incontinence, or wound exudate. Peri-wound skin problems such as maceration and moisture related skin damage are frequently associated with chronic wounds such as venous leg ulcers and pressure ulcers.

Prolonged exposure of the skin to high levels of moisture causes re-hydration of the outer, keratinised layer of epidermal cells which swell and weaken the links between the layers of the skin (Voegeli, 2017). Irritant fluids can then

strip away the outer layer of the epidermis increasing the risk of secondary infection and further damage. Patients with pressure ulcers are prone to irritant dermatitis resulting from the combined effects of incontinence, wound secretions, sweat, and high humidity which affect the microclimate of the skin and increase the vulnerability of the soft tissues to pressure, friction and shear (Langøen, 2010).

Environmental humidity in combination with use of detergents or leaving the skin damp may also break down the skin's healthy protective barrier. Skin that has been exposed to humid conditions such as between skin folds under the breast or groin, or under occlusive wound dressings will start to break down and gradually turn white. Broken down skin has a higher pH than normal skin, and this increases the risk of bacterial and fungal infections (Ali and Yosipovitch, 2013). If wound dressings are unable to absorb exudate, leakage occurs and the skin around the wound becomes soaked in chronic wound fluid which is rich in irritant proteases (Voegeli, 2017). Chronic wound fluid due to its high protease content can cause maceration and breaks down the outer surface of the epithelium disrupting barrier function (Trengove et al, 1999).

Management of older skin

Moisturisers are commonly used by people with dry skin conditions. There is however, a lack of good quality clinical data reviewing emollient use in dry skin conditions such as eczema. The terms emollients and moisturisers are often used synonymously to describe topical substances applied to the skin to maintain or repair barrier function. Although both are lipids, emollients primarily work by occluding the epidermis preventing water loss whilst moisturisers add humectant to the skin surface to improve hydration. Common humectants are urea, propylene glycol and glycerin (Voegeli 2008).

Moisturisers come in many formulations; creams, ointments, gels, foams and lotions. Choice of emollient should be based on how dry the skin is and what sensitivities the individual might have. Generally, the more 'greasy' products provide the best emollient effect as they

continued on next page

are most effective at trapping moisture in the epidermis but creams tend to be more popular.

Complete Emollient Therapy is the term given to a regime which includes use of soap substitutes, bath additives and moisturisers. The use of soap should be avoided for skin care as it strips the epithelium of natural lipids, alters the protective acidic environment at the surface of the skin and leaves irritant residues (Watkins, 2011). Bath additives help to moisturise the skin by adding a thin layer of oil over the skin. However, there is limited evidence to support their effectiveness although some patients find them useful (Drug and Therapeutics Bulletin, 2007).

Principles of emollient use

Overall the selection of an emollient must be one the individual is willing to use. A trial of a few products, prescribed in small quantities, can help selection of the most suitable products. Many people will find the cheaper brands acceptable and effective. Emollient therapy is simple but effective, the principles of use are:

- Emollients should be applied whenever the skin feels dry, to ensure maximum effect. Twice a day is a minimum although 3-4 times a day is usually more effective.
- Generally, the less greasy products are more acceptable for use during the day and the greasier products for night time.
- Emollients should be liberally applied after bathing, showering or swimming.
- For treatment to be effective, it is important to prescribe the right amount of emollient. For someone with an overall dry skin condition, it is generally accepted that 500g will last 7-10 days.
- The prescriber must use clinical judgement and monitor to see if the individual is using their skincare product as a 'leave on emollient' and as a 'soap substitute'. As a guide, 5 grams for full coverage each of the following areas: an arm, thigh, lower leg, chest, abdomen, upper back, is a reasonable estimate. As an estimate of one pump from a pump dispenser or a dessert spoonful is roughly equivalent to 1 gram.
- Emollients should be applied to the skin using a stroking action in the direction of hair growth, avoiding circular or rubbing motions to avoid folliculitis. They should be dotted over the skin and spread to leave a thin film on the skin so that they can sink in. Generally, the use of fragrance-free products is recommended as fragrance is a known potential sensitiser in older people's skin.

- Complete emollient therapy should be continued once the skin condition has improved as this may help to prevent exacerbations in future.

Best Practice in Emollient Therapy (2012) BDNG, Wounds UK (2012)

The condition of the skin is an important indicator of an individual's general health. Maintenance of epidermal barrier function in older people is achieved by protecting the skin from environmental stressors. Emollient therapy provides moisture to the dehydrated barrier and has a protective effect against repeated exposure to irritants. Although widely available and relatively inexpensive moisturisers are often used inappropriately; it is therefore important to raise awareness about the correct method of application and to adapt skin care regimes to suit individuals and their families. The condition of the skin will improve quickly if skin care interventions are implemented appropriately and will become less dry, itchy and irritated. If there is no improvement, the most likely explanation is that more frequent applications or larger quantities of emollient are required. If no further improvement is seen then referral to a dermatologist may be helpful.

Learning Points:

- Ageing has a significant effect on the skin, and can lead to dryness, itching, infection, loss of elasticity and skin cancers if effective skin care is not carried out.
- Older people often suffer from delayed wound healing due to their reduced ability to recover from injury and restore epidermal barrier function once damaged.
- The use of emollients can aid and protect older skin and prevent age-associated damage by trapping moisture on the skin surface and enabling the skin to remain hydrated.

References:

- Alam M, Havey J (2010) Photoaging. In: Draelos ZD. *Cosmetic Dermatology. Products and procedures*. Oxford: Wiley-Blackwell: 3-13
- Ali SM, Yosipovitch G (2013) Skin pH: from basic science to basic skin care. *Acta Derm Venereol*, 93(3): 261-7
- Ersser SJ, Maguire S, Nicol NH, Penzer R, Peters J (2012) *Best Practice in Emollient Therapy: A Statement for Health Care Professionals*. 3rd Edition. British Dermatological Nursing Group.
- Drug and Therapeutics Bulletin (2007) Bath emollients for atopic eczema: why use them. *DTB*; 45: 10, 73-75.
- Farage MA, Miller KW, Maibach HI (2010) Degenerative Changes in Aging Skin. In: Farage MA, Miller KW, Maibach HI. *Textbook of Aging Skin*. Berlin: Springer Verlag: 25-35.
- Langøen A (2010) Innovations in care of the skin surrounding pressure ulcers. *Wounds International*, 1(4):9-12.
- Rabe JH, Mamelak AJ (2006) Photoaging: Mechanisms and repair. *J Am Acad Dermatol*, 55:1-19.
- Trengrove NJ, Stacey MC, Macauley S, Bennett N, Gibson J, Burslem F, Murphy G, Schultz G (1999) Analysis of the acute and chronic wound environments: the role of proteases and their inhibitors. *Wound Repair and Regeneration*, 7 (6), pp. 442-452.
- Watkins P (2011) The use of emollient therapy for ageing skin. *Nursing Older People*, 23, 5, 31-37.
- Wounds UK (2012) *Best Practice Statement: Care of the Older Person's Skin*. Wounds UK, London
- Voegeli D (2008) The effect of washing and drying practices on skin barrier function. *J Wound Ostomy Continence Nurs*, 35(1):84-90
- Voegeli D (2017) New insights on incontinence-associated dermatitis. *Independent Nurse* Accessed Nov 14th 2018 <http://www.independentnurse.co.uk/clinical-article/new-insights-on-incontinence-associated-dermatitis/155938/>
- Tzellos TG, Klagas I, Vahtsevanos K, Triaridis S, Printza A, Kyrgidis A, Karakiulakis G, Zouboulis CC, Papakonstantinou E (2009). Extrinsic ageing in the human skin is associated with alterations in the expression of hyaluronic acid and its metabolizing enzymes. *Experimental Dermatology*, 18: 1028-1035.



Anna Galazka

Early Career Researcher and University Teacher
Cardiff Business School

What is your current position and what was your career path that took you there?

I am an early career researcher and am currently working as a university teacher at Cardiff Business School in Cardiff, the UK. I did my BSc in Business Studies at Cardiff University and my MSc in Management of Learning at Maastricht University, the Netherlands. I then returned to Cardiff Business School to do my MSc in Social Science Research Methods and a PhD in organisational studies. This was when I gravitated towards researching organisational issues in healthcare. In my doctoral research, I focused on understanding the development, nature and role of clinician-patient relations in wound healing.

What challenges do you face in your current position and which has been the greatest one?

The greatest challenge for me now is striking the right balance between spending my time on teaching and consolidating my research profile as an organisational scholar interested in social innovation in the management of chronic conditions, such as non-healing wounds. As an early stage scholar, I am currently working on developing publications from my doctoral work as well as crafting ideas and looking for opportunities for further, related, post-doctoral research.

In your opinion, what are the top three issues affecting the care of older people?

In addition to the structural challenges associated with ensuring easy and timely access to medical expertise, including logistical issues of travel to and from health centres, I think there are important cultural issues affecting the care of older people. One such issue might be the need to change public attitudes towards ageing and old age as markers of passivity. This might involve creating conditions for encouraging willing older people to be more socially active, for example to

engage them in advocacy, so that they feel they play a crucial role in their community. Concerning palliative medicine in particular, while in the UK it is of a very high standard, in my home country of Poland there is still a need to clearly address the psycho-social and ethical issues associated with palliative care for the elderly in medical education.

What changes in elderly care do you anticipate in the next few years?

Given the demographic changes such as the rise in diabetes, the ageing of the population, and a proportionate reduction in the number of specialised clinicians, I hope we will continue the conversations about finding ways of encouraging friends and family members to take a more active part in the care for their elder relatives.

If you hadn't become a researcher what might you have done?

If I could go back in time and have the knowledge I have now, I would have loved to become a clinician myself.

What experience has influenced your career the most?

I've always felt at home, reading, researching and writing. It is something that has always given me a sense of satisfaction. My passion to understand the social organisation of medical work was sparked by a personal experience with the NHS.

What advice would you give to someone contemplating following in your footsteps?

I would advise anyone willing to become a researcher to keep an open mind and to let themselves be surprised by what they discover in the process of researching unfamiliar settings. Talk about your research to people and cultivate the networks around you – you never know when you might find yourself in the middle of a fascinating and socially relevant conversation.

Where do you go for advice and information?

I speak to my colleagues at Cardiff Business School and I keep in touch with my gatekeepers who facilitated my access to the wound healing clinics to undertake my doctoral research.

Who would you most like to work with?

I would love to continue working with the wound healing team who let me into their world. A number of friendly academics I have met at Cardiff have given me ideas on possible extensions of my doctoral research and I would like to work with Professor Tim Edwards, Professor Joe O'Mahoney, Professor Ismael Al-Amoudi, now in Grenoble, Dr Sarah Jenkins and Professor David Courpasson from Lyon. One day, I would also like to work with Professor Graham Scambler to further develop a realist understanding of stigma, and Professor Sharon Bolton to understand emotions in the dirty work of wound healing.

What do you enjoy doing when you are not working?

I love swimming and cycling, it clears my head. In my spare time, I like to go to the theatre, listen to jazz and learn French and Spanish.

What do you do in a typical working day?

Most of my days are spent navigating between my teaching responsibilities and deepening my research interests developed during my doctorate – reading, drafting paper and project ideas, attending relevant meetings, searching out post-doc opportunities and research grants.

If you were stranded on a desert island what would be your one luxury?

A fully charged mobile phone so that I could keep in touch with my family and friends.



Next issue



In our next issue of Innov-age we will be looking at Medicines Management.

Effective management of medicines is crucial, particularly in older people, who are often prescribed many different types of medications at the same time. Poor management of medication, for example incorrect dosage, missed doses and bad combinations of drugs can potentially be very dangerous. However, there are many solutions and methods available that can help to manage this and reduce the risk of adverse effects that may result from mismanagement of medications.

info@innov-age.org

To subscribe for free or comment on any of our features please email the team at info@innov-age.org and visit our website www.innov-age.org for more information.