

Wounds digest

In this section, a brief synopsis is presented of a range of recently published articles that may be of interest to healthcare professionals working in the wound care setting. The aim of this round-up is to provide an overview, rather than a detailed summary and critique, of the research papers selected. Full references are provided should you wish to look at any of the papers in more detail.

1 The sorptivity and durability of gelling fibre dressings tested in a simulated sacral pressure ulcer system

Readability	✓	✓	✓	✓	
Relevance to daily practice	✓	✓	✓	✓	
Novelty factor	✓	✓	✓		

- Factors that have been identified as affecting wound-dressing performances, include exudate viscosity, flow resistance due to gravity and bodyweight loads, and the level of which is related to the body position.
- The authors focussed their attentions on two dressing properties, namely sorptivity (a dressing's ability to transfer exudate away from the wound bed through capillary) and durability (a dressing's ability to maintain their integrity over time and during their removal). In order to effectively measure these properties, the development of new laboratory tests was required.
- A computer-controlled phantom was developed to compare the performances of Exufiber (Mölnlycke Health Care) and an alternative market-leading dressing on an exuding sacral pressure ulcer. Weight tests were used to determine sorptivity, while durability was measured through tensile tests of the dressings.
- The Exufiber dressing was found to offer three times higher sorptivity and better durability than the alternative dressing. In addition, the Exufiber dressing was found to offer approx. five times greater strain energy than the alternative before failure occurred.
- In conclusion, this research opens the door for further quantitative, standardised testing of dressings in all aspects of exudate management.

Lustig A, Alves P, Call E et al (2020) The sorptivity and durability of gelling fibre dressings tested in a simulated sacral pressure ulcer system. *Int Wound J* doi: 10.1111/iwj.13515. Online ahead of print

2 Can photons pass through primary coatings used to treat cutaneous wounds?

Readability	✓	✓	✓	✓	
Relevance to daily practice	✓	✓	✓	✓	
Novelty factor	✓	✓	✓		

- The authors set out to determine whether or not the transmittance spectrum of primary dressings, which is commonly used in the treatment of cutaneous wounds, means that they should be removed during photobiomodulation.
- Seventeen dressings were spectroscopic analysed using a spectrophotometer. A piece of each dressing was enclosed in a quartz cuvette and the transmittance of each dressing

was measured from 350–950 nm. A transmittance table was then created based on the main wavelengths used in photobiomodulation.

- Six dressings were found to have a transmittance greater than 50% in most of the spectral range. These were: Supriderme, Membracel, Cuticell Contact, UrgoTul, Tegaderm, and Opsite Flexigrid. The results suggested that these dressings may remain on wounds during irradiation.
- When lasers or LED lights are used to treat wounds, it may not always be necessary to remove the primary dressing. There are hopes that this research will increase the effectiveness of both photobiomodulation and primary dressings in the future, as well as decrease patient discomfort.

Barbosa da Silva S, Salani R, de Cássia Ferreira R et al (2020) Can photons pass through primary coatings used to treat cutaneous wounds? *Adv Skin Wound Care* doi: 10.1097/01.ASW.0000721440.25562.a3. Online ahead of print

3 Dehydrated human amnion chorion membrane as treatment for pediatric burns

Readability	✓	✓	✓	✓	
Relevance to daily practice	✓	✓	✓		
Novelty factor	✓	✓	✓	✓	

- A lack of adequate care when treating burns in the paediatric population can cause lifelong functional loss and disfigurement. A focus on alternative skin substitutes, such as allografts, has gained traction in recent times when treating burns, given that the use of split-thickness skin autografts, which are the current standard of care for deep partial and full-thickness burns, is associated with considerable morbidity.
- This article involves a case series of 30 children with different types of burns that were treated with dehydrated human amnion chorion membrane (dHACM). Treatment with dHACM was found to have a highly effective healing rate, which was comparable to split-thickness skin grafts with less rate of hypertrophic scar and contracture.
- Although dHACM has a higher upfront cost than split-thickness skin autografts, the treatment of patients presenting with small- to moderate-sized burns with dHACM decreases downstream costs, while avoiding the need and associated cost of transferring patients to higher level centres of care.
- The authors found that dHACM provides an effective alternative to split-thickness skin grafting when treating partial and full-thickness paediatric burns.

Ahuja N, Jin R, Powers C et al (2020) Dehydrated human amnion chorion membrane as treatment for pediatric burns. *Adv Wound Care (New Rochelle)* 9(11): 602–11

4 Effectiveness of ultrasonic debridement on reduction of bacteria and biofilm in patients with chronic wounds: a scoping review

Readability	✓	✓	✓		
Relevance to daily practice	✓	✓	✓	✓	
Novelty factor	✓	✓	✓		

- Infection control and removal of the biofilm in chronic wounds are crucial in chronic wounds due to these hard-to-heal wounds having a high risk of infection and at risk of the formation biofilms.
- Ultrasonic debridement has been developed in recent years aimed at reducing infection and promoting chronic wound healing. The authors undertook a scoping review to evaluate the effectiveness of ultrasonic debridement when treating these wounds. A database search identified 1,021 articles, with nine papers eligible for inclusion.
- Non-contact devices were found to be effective in the healing of chronic wounds due to their ability to reduce the inflammatory response, but they did not significantly change bacterial load.
- On the other hand, ultrasonic debridement devices that require direct contact with the wound were found to promote wound healing by reducing biofilm or bacterial load.
- It was found that the optimum settings for ultrasonic debridement using a non-contact device were relatively steady, but the settings for devices that require direct contact were found to be relatively diverse.

Kataoka Y, Kunimitsu M, Nakagami G et al (2020) Effectiveness of ultrasonic debridement on reduction of bacteria and biofilm in patients with chronic wounds: a scoping review. *Int Wound J* doi: 10.1111/iwj.13509. Online ahead of print

5 Use of the ankle-brachial index combined with the percentage of mean arterial pressure at the ankle to improve the prediction of all-cause mortality in type 2 diabetes mellitus: an observational study

Readability	✓	✓	✓	✓	
Relevance to daily practice	✓	✓	✓		
Novelty factor	✓	✓	✓	✓	

- The ankle-brachial index (ABI) is a simple noninvasive method to screen peripheral artery disease (PAD). The authors hypothesised that by using ABI in conjunction with the percentage of mean arterial pressure (%MAP), this would improve the prediction of mortality.
- For this study, data from patients with type 2 diabetes who had undergone ABI and %MAP measurements at the authors' hospital were retrospectively collected. The cohort was split

into four groups according to their ABI and %MAP values, after which the indices were examined to determine whether or not they were associated with mortality.

- The authors called upon 5,569 patients to the study and during the follow-up period (median was 22.9 months), 266 of the enrolled patients died, equating to 4.8%. Mortality prediction was found to be significantly more effective through the combination of ABI and %MAP.
- The study concluded that the use of %MAP alongside ABI can significantly improve the prediction of all-cause mortality in those with type 2 diabetes.

Li Y-H, Sheu WH-H, Lee I-Te (2020) Use of the ankle-brachial index combined with the percentage of mean arterial pressure at the ankle to improve the prediction of all-cause mortality in type 2 diabetes mellitus: an observational study. *Cardiovasc Diabetol* 19(1): 173

6 Evaluation of a novel three-dimensional wound measurement device for assessment of diabetic foot ulcers

Readability	✓	✓	✓	✓	
Relevance to daily practice	✓	✓	✓		
Novelty factor	✓	✓	✓	✓	

- Despite the fact that initial wound measurement and regular monitoring of diabetic foot ulcers (DFUs) is crucial to establish a treatment plan, there is currently no standardised, universally accepted, assessment method to characterise DFUs in a quick, reliable and quantitative way. Therefore, the authors set out to assess a novel topographic imaging system used in the assessment of DFUs.
- It was the WoundVue system that was assessed for this study, with 57 diabetic foot wounds seen from patients in a multidisciplinary foot clinic included. These wounds were photographed from two different angles and distances by using the WoundVue camera, with wound area, volume, and maximum depth all measured. Of these, 31 had their area calculated by using the established Visitrak™ system, with results from both systems examined.
- The average percentage differences by using the WoundVue from different angles for assessment of different sizes and shapes of wounds were: 2.9% (95% confidence interval [CI]: 0.3-5.4), 12.9% (95% CI: 9.6-35.7), and 6.2% (95% CI: 2.3-14.7) for area, maximum depth, and volume, respectively.
- To the authors' knowledge, this is the first human trial evaluating this novel 3D wound measurement device, which has the potential to be a valuable adjunct in diabetic foot wound care going forward.

Pena G, Kuang B, Szpak Z et al (2020) Evaluation of a novel three-dimensional wound measurement device for assessment of diabetic foot ulcers. *Adv Wound Care (New Rochelle)* 9(11): 623-31