A research roundup of recent papers relevant to wound care

This section brings together information found online and published in other journals about wound healing research. The aim of this roundup is to provide an overview, rather than a detailed summary and critique of the papers selected.

FORCES DRIVING EPITHELIAL WOUND HEALING


Professor Wayne Brodland and his team develop computational models for studying the mechanical interactions between cells. In this project, his team of international researchers found that the way wounds heal is more complex than previously thought. A fundamental feature of multicellular organisms is their ability to self-repair wounds through the movement of epithelial cells into the damaged area. This collective cellular movement is commonly attributed to a combination of cell crawling and ‘purse-string’ contraction of a supracellular actomyosin ring. The researchers showed by direct experimental measurement that these two mechanisms are insufficient to explain force patterns observed during wound closure. During early stages of the process, leading actin protrusions generate traction forces that point away from the wound, showing that wound closure is initially driven by cell crawling. During later stages, the researchers observed unanticipated patterns of traction forces pointing towards the wound. Such patterns have strong force components that are both radial and tangential to the wound.

Implications for Practice

This paper helping us to understand how cells move in a wound that is healing. The next steps are to look at what changes in the non-healing wound and assess if this can be addressed topically to facilitate or speed wound healing. As this is a computational model it remains to be seen if the later can be achieved. If it can, the research could have implications for understanding how cancer spreads, as well as why certain birth defects occur.

THE INFLUENCE MANUFACTURERS HAVE ON NEGATIVE-PRESSURE WOUND THERAPY RESEARCH


Studies investigating the effects of negative pressure wound therapy using the Chariker-Jeter system and the vacuum-assisted closure system often have outcomes that favour one particular system. This study examines whether manufacturer involvement could be related to the outcomes of these scientific studies. The authors carried out a literature review to identify any cohort of studies that compared these two forms of negative pressure wound therapy. Clinical outcomes studies, basic research studies, and published conference abstracts were included. All article abstracts and conclusions were given to five surgeons, who were blinded to the titles and authors. They were asked to record what they considered the take-home message of each article (i.e. which system is superior). After categorising each study according to the system favoured, the level of manufacturer involvement in each study was evaluated. The relationship between the outcome of a study and the level of manufacturer involvement was then investigated. Of the 24 studies found to match the inclusion criteria, 22 were considered to favour a particular system (the other 2 were categorised as impartial). Of the 24 studies, 19 had some form of manufacturer involvement. Of the 19 that had some form of manufacturer involvement, 18 had outcomes deemed beneficial to the involved manufacturer and one was deemed impartial.

Implications for Practice

This study suggests that manufacturer involvement in studies (regardless of level) correlates with the outcomes being beneficial to the involved manufacturer in almost all cases. Potential reasons for this and implications are discussed. It highlights the need for clinicians to have relevant knowledge and skills to review all data presented in the papers to made a rounded decision about the efficacy and robustness of the data prior to implementing any results.
DEVELOPING A PRESSURE ULCER RISK FACTOR MINIMUM DATA SET AND RISK ASSESSMENT FRAMEWORK


This study’s aim was to agree a draft pressure ulcer risk factor Minimum Data Set to underpin the development of a new evidenced-based Risk Assessment Framework. The rationale for the study stemmed from a recent systematic review that identified the need for this. The article reports phase two — a consensus study that used a modified nominal group technique based on the Research and Development/University of California at Los Angeles appropriateness method. This incorporated an expert group, review of the evidence and the views of a Patient and Public Involvement service user group. Data were collected between December 2010 and December 2011. The findings of the study propose that the risk factors and assessment items of the Minimum Data Set include immobility, pressure ulcer and skin status, perfusion, diabetes, skin moisture, sensory perception and nutrition. In addition, a draft Risk Assessment Framework incorporating all Minimum Data Set items was developed, comprising a two-stage assessment process (screening and detailed full assessment) and decision pathways. They conclude that the draft Risk Assessment Framework will undergo further design and pre-testing with nurses to assess and improve its usability. It will then be evaluated in clinical practice to assess its validity and reliability.

Implications for Practice
There are limitations associated with development methodologies and content validity for risk assessment scales and a lack of agreement of the risk factors required to adequately identify risk. A recent systematic review highlighted the need to agree a pressure ulcer risk factor Minimum Data Set to facilitate meta-analysis and underpin risk assessment. The Minimum Data Set could be used by healthcare professionals to record key pressure ulcer risk factors, facilitating clinical risk assessment, case mix adjustment, multivariable analyses and future meta-analysis. The draft pressure ulcer Risk Assessment Framework is being further evaluated to assess its reliability and validity in preparation for eventual long-term implementation in clinical practice.

ADAPTIVE COMPRESSION THERAPY FOR VENOUS LEG ULCERS: A CLINICALLY EFFECTIVE, PATIENT-CENTRED APPROACH


This article reports the results of a prospective, randomised, 12-week study performed to evaluate the efficacy and tolerability of two compression systems for venous leg ulcers (VLUs); a new adaptive compression therapy (ACT) system, combining intermittent and sustained pneumatic compression (n = 38) and a conventional four-layer bandage system (n = 52). Primary outcomes were ulcer healing and safety. Secondary outcomes were comfort, compliance, ulcer pain, patient-perceived product performance and quality of life. The results show similar healing rates 31.6% for ACT versus 42.3% for four layer, P = 0.30. Adverse events and patient-rated comfort were also similar. Average daily usage for the dual system was 10.5 hours using the sustained mode and 1.8 hours in the intermittent mode, representing its use during 71% of waking hours. Ulcer pain was similar (P = 0.68). Performance was subjectively assessed as better for adaptive compression and significantly higher for exudate management (P = 0.04), skin protection (P < 0.001), ease of removal (P = 0.007), bathing (P < 0.0001) and sleep comfort (P = 0.0405). The adjusted final quality-of-life score was 0.1025 higher for adaptive compression (P = 0.0375). Subjects with healed ulcers attained higher final scores than unhealed subjects (P = 0.0004). The adaptive compression system used in the study was the ACTitouch system; it is a segmented pneumatic compression device, which is designed to mimic the action of the calf muscle pump.

Implications for Practice
This study provides evidence that ACT showed comparably efficacious healing rates to four-layer bandaging in the study group venous leg ulceration and was better accepted and achieved higher patient-reported quality-of-life scores in venous leg ulcer patients. The study was funded by Tactile Medical, the device manufacturer. The device is not yet available on drug tariff in the UK. It would be interesting to see if the results would differ if the authors had chosen to compare it to compression hoisery kits/garments that apply sustained graduated compression.