Evidence-based and clinical views on acute wound healing and scar formation
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Chapter 11

General discussion
General discussion

Providing evidence-based wound and scar care is challenging. Although the body of knowledge in this field is growing, especially for complex wounds, some areas, like acute wound care, are underrepresented. For this reason, in this thesis I addressed three main topics to enhance and disseminate the body of knowledge: the generation of evidence for (acute) wound care (part I); the assessment and appreciation of scar formation (part II); and the development of an evidence-based guideline for acute wounds (part III). This guideline will assist clinicians in making evidence-based decisions in their daily care of patients with acute wounds.

Evidence generation and availability (part I and part III)

Ideally, evidence-based wound care integrates patient preferences, clinical expertise and the best-available evidence in clinical decision making. Nevertheless, regardless of the strength of the evidence generated and despite attempts to facilitate the availability of this evidence, a discrepancy remains between the ideal and actual wound care.

In the course of this research period I found two types of barriers that could explain the poor integration of convincing evidence in actual wound-care practice:

1. Barriers that affect the availability of convincing evidence; and
2. Barriers that affect the acceptance of convincing evidence (including difficulties in implementing evidence-based clinical guidelines).

Barriers that affect the availability of convincing evidence

An example based on actual wound-care practice was presented in the clinical scenario (Chapter 1). This shows that sterile saline is still being used for wound cleansing even though tap water is equally effective in reducing infections in adult patients. This evidence was presented in a meta-analysis of randomised and quasi-randomised clinical trials first published in 2002, but, despite the available evidence, the practice of using sterile saline for wound cleansing persists. Research findings show that insufficient recognition of available evidence could lead to unnecessary treatments, costs and suboptimal, or even harmful, health care. Given the example above, this is also likely to be the case for wound care.

The fact that available evidence is insufficiently used could, in the first instance, be due to the ever-growing amount of evidence. It is a great challenge for busy clinicians to keep up with the current publication output (Chapter 2). Studies have shown that available evidence on wound care does not reach the practitioners involved. Regular scientific conferences for researchers and caregivers address this problem by rapidly...
disseminating (early) research findings to clinicians. Even though this does contribute to the dissemination of the research performed, in wound care this is problematic as only a few of the studies presented at wound-care conferences are subsequently published.\textsuperscript{10,11} Without full publication at a later stage, the conference visitors are left with short abstracts that are difficult to critically appraise, while clinicians who did not visit the conference remain uninformed of the wound-care findings. Despite these drawbacks, the availability and communication of new evidence is a prerequisite for its acceptance and incorporation into clinical practice. Keeping up with the available evidence will require a major change in behaviour, namely evidence-based thinking.

To facilitate this cultural change towards evidence-based thinking, the presentation of the available evidence should be alluring to clinicians. Aggregated, pre-appraised evidence (Chapter 3) and evidence-based guidelines (Chapter 10) should save time for busy clinicians as they reduce the amount of reading that is required and provide rapid insight and valuable recommendations for clinical wound-care practice. Regular journal-club meetings, better access to medical databases, and continuous training on evidence-based wound care are all attempts to present the available evidence in a manner that will be attractive to busy clinicians.

**Barriers that affect the acceptance of convincing evidence**

When clinicians actually read and appraise the available evidence, accepting the recommendations or conclusions becomes the next challenge. In wound care, in particular, expert opinion is often decisive when treating wounds, and it is considered to be a barrier to accepting the latest evidence. This mentality is nurtured by the fact that successful wound care depends not only on the treatment regime of the wound itself but also on factors such as a collaboration between disciplines to provide holistic wound care, and also on patients’ compliance or responsibility. For instance, when actively treating underlying illnesses, such as diabetes mellitus, a suboptimal dressing choice may go undetected as the wound heals gradually. Meanwhile, the clinician feel reassured that ‘his’ dressing material remains the best treatment for the patient, even though the healing is actually due to the systemic treatment.

The paradigm of Evidence-Based Medicine (EBM) could offer wound-care providers (and dressing manufacturers) a more critical attitude and provide them with strategies and tools to interpret and integrate the latest evidence instead of relying on expert opinion.\textsuperscript{12} To bridge the gap between this long-lasting culture of treating wounds based on expert opinion and evidence-based wound care, I would like to stress that clinical guidelines embrace expert opinion while also integrating the available evidence in order to answer
a clinical question or provide a recommendation that takes practical considerations into account (Chapter 10).

Also, one could argue that surgeons do not sufficiently value the importance of (acute) wound care. After treating the initial illness, attention for the subsequent wound healing may weaken. This was clear from the clinical scenario, where the healing of the donor-site wound received less attention, and only the acceptor site was mentioned in transfer communication to the general practitioner (GP). This corresponds with the minimal attention wound treatment receives in the medical and nursing curriculum. In the various chapters of this thesis I emphasise the importance of optimal wound care, as wounds have a great influence on patients, caregivers and the health-care system. Wounds often need intensive care (e.g. frequent dressing changes or cleansing), may cause wound pain, and the scar that remains after healing may differ substantially from the original appearance. Moreover, the optimal initial treatment of acute wounds prevents the development of complex wounds, which are considered to be an even greater health-care problem with prolonged healing times, increased pain, more challenging treatment strategies and higher costs. Hence, wound healing and evidence-based wound care should receive a prominent place in wound practice, with all clinicians receiving continuing education. A strong collaboration between researchers and clinicians should enable the development of evidence-based guidelines. Clinicians could keep the guidelines clinically relevant by means of critically appraised topics and clinicians or policy makers should implement the guidelines through local protocols.

**Difficulties in implementing evidence-based clinical guidelines**

Awareness is growing that guideline development alone is not enough to provide evidence-based care or to lead to the actual evidence-based behaviour of clinicians. Implementation of a guideline, particularly of a multidisciplinary one, is very complex and requires tailored implementation strategies. Various factors are known to influence the implementation of clinical guidelines, and the implementation of a guideline for ‘acute wound care’ may present additional challenges (Chapter 10).

First, the type of health-care problem may influence the adherence to a clinical guideline. For instance, better compliance was found in the case of acute rather than chronic health-care problems. Even though acute wounds form a substantial health-care problem, they cannot boast a large body of convincing evidence or strong recommendations in guidelines. This is even more poignant because seemingly uneventful acute wounds may become complex wounds. Future implementation strategies for the guideline on acute wound care should emphasise and motivate clinicians with regard to the relevance of ‘acute wound care’ as a health-care problem. This is hampered by the
difficulty that optimum wound care can range from short to intensive wound treatment, i.e. from an abrasion to a complex, necrotic wound. Regardless of the time spent on acute wound care, it is difficult to predict which wounds will heal and which will become complex acute wounds. Implementation strategies should emphasise that optimal acute wound care can avoid the development of complex wounds and their associated burden on the health-care system.

The second issue relating to this health-care problem is the interdisciplinary character of wound care. In the clinical scenario, the patient deals with seven different disciplines (a GP, an emergency room (ER) nurse, an ER doctor, a general surgeon, a plastic surgeon and/or a trauma surgeon, a nurse on the surgical ward, and a wound-care specialist) at three different locations (the GP’s office, the ER, and the surgical hospital ward). To ensure guideline adherence by all wound-care disciplines, every discipline should be involved in the development and dissemination of the guideline.

Third, the quality of a guideline may contribute to its clinical use and adherence. The use of quality-assessment tools (e.g. AGREE II) is recommended during the development and reporting of a guideline. The AGREE II instrument contains six quality-related domains (scope and purpose, stakeholder involvement, rigour of development, clarity of presentation, applicability, and editorial independence) that contribute to the inclusion of quality features in guidelines. This quality assessment tool was used during the development of the guideline on acute wounds in anticipation of the implementation process.

Several limitations of our guideline in relation to these domains should be mentioned. The scope of our guideline was restricted by financial and practical limitations. Further updates of this guideline should broaden its scope and include other relevant clinical bottlenecks, such as the treatment of burns, negative-pressure therapy, debridement and antimicrobial therapy. Monitoring or auditing criteria should be developed in order to enhance its applicability. Even though this guideline was developed independently of financial stakeholders, the health-insurance industry plays an influential part in current wound-care practice. To prevent incongruity with the wound-care materials provided by health-insurance providers, a provider took part in our guideline development.

In addition, future developments such as translation into English, pilot testing of the usefulness and adherence to the guideline, and the development of an application for smartphones would further contribute to a broad and successful dissemination.

When evidence is generated and clinicians are willing to accept this evidence, the environment has to be conducive to change. The general opinion is that new insights
proven by strong evidence should be implemented as they could be less harmful, more effective, or more in accordance with patient preferences. The introduction of new wound-care materials should be supported by strong evidence, because currently the highly profitable and unrestricted market\(^1\) for new wound-care products seldom relies on trials of their effectiveness. On the other hand, we found that strong evidence could fail to reach clinical practice when manufacturers are reluctant to change the indication criteria for a certain drug or dressing (Chapter 3). In wound-care practice, barriers to the uptake of evidence arise at different levels, for example at the level of the clinicians, the department, the pharmacy or the industry. All these barriers need to be studied in order to change local practice, which is a requirement for effective implementation.\(^{20,21}\)

Initiatives such as providing the order numbers of wound-care materials, easy-to-use flowcharts or local protocols, and information or education opportunities for innovative wound-care strategies are desirable in order to facilitate a change in practice.\(^{22}\)

Last, but definitely not least, wound care involves many different stakeholders, i.e. patients, doctors, nurses, manufacturers, and pharmacists. All stakeholders take part in and influence the chain of wound care that is actually delivered. This requires the whole chain to work continuously together and within the same paradigm of optimal wound care. Although the industry, the patients and the clinicians could have conflicts of interests, the patients’ well-being should be the top priority. Therefore, I strongly advocate that the paradigm of EBM be used by all stakeholders in order to ensure high-quality wound care. For example, not only should clinicians choose an effective wound-material, but this material also has to be provided by the industry and be made available in the hospital stores. As shown in this example, different stakeholders in wound-care provision should employ evidence-based thinking in order to practice evidence-based wound care. When a single stakeholder refuses to participate in this evidence-based chain of wound care, this stakeholder hampers the eventual evidence-based wound-care practice.\(^{23}\)

**Patient preferences and decision making (part II)**

The findings of part II include not only the accurate assessment of donor-site scars but also, and more importantly, the patients’ satisfaction when judging their scars. Because of their subjective character, pain and scarring are best assessed by the patients themselves. In our experience, clinicians often neglected patient preferences and goals, for example regarding the location or prevention of their donor-site scar, so that shared decision making rarely occurred.

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\(^1\) Wound-care products merely require trials to demonstrate safety and performance in order to obtain a CE (Conformité Européene) mark.
During the course of the investigations carried out for this thesis, I observed two specific reasons why shared decision making should be incorporated into daily wound-care practice. First, the plethora of wound-care materials requires that a proper assessment is made of the patients’ preferences with regard to factors such as the frequency of dressing changes, when to shower the wound, the need for analgesics, or the desire to prevent problematic scar formation. Second, the lifelong nature and impact of scars should be an incentive for clinicians to involve patients in medical decision making whenever possible.

Understanding that the preferences or values of the patient may differ from the clinician’s priorities is a first step. The patient might value the risks, benefits and side effects of the treatment options differently. Patient-advocacy organisations play a valuable role in exploring and promoting patients’ goals and preferences, taking into account the fact that the ‘average’ patient does not exist. To date, no advocacy organisation for patients with (acute) wounds exists. Nevertheless, patients’ preferences and values need to be explicit in order for evidence-based wound care to be practised, and alternative solutions for incorporating patients’ preferences should be pursued. Several international stakeholders, as well as some Dutch university hospitals in particular, have recently committed themselves to this leading principle that calls on patients and clinicians to work together to be co-producers of health. Qualitative research and literature reviews of patient values or experiences are useful for revealing patient preferences.

Even though our findings were limited to donor-site scars, which limits the external validity of the studies, we advocate the incorporation of patient preferences and shared decision making in acute wound care. Given the study results presented in this thesis, patient preferences should, and can, play a particular role in the decision-making process regarding the location of the donor-site wound, the promotion of wound healing, and the prevention of scarring.

**Concluding remarks and future perspectives**

Acute wound care is a complex problem that requires a multifaceted approach, consisting of high-quality research, optimum evidence-based care, and the timely implementation of better treatment options by all healthcare professionals involved. The latter is consistent with the results and experiences observed during the course of this thesis, but has been previously investigated by others. Changing a long-lasting culture is difficult and takes time. We therefore believe that extending our knowledge of (acute) wound care is vital for achieving optimal wound care.

To make this a reality, strong evidence should be generated and properly disseminated among clinicians. To overcome the long-lasting history of experience-based wound care,
EBM should be introduced into the curricula of all wound-care providers and wound-care stakeholders. Then, in order to maintain a critical attitude towards different wound-care strategies, future wound practice should involve regular journal clubs, optimal online and smartphone support, conferences, and updates of local protocols along evidence-based guidelines. As discussed above, the challenges concerning the implementation of new evidence requires a multifaceted, multidisciplinary and tailored approach. For acute wounds in particular, clinicians should be convinced of the relevance and magnitude of this health-care problem and of the consequences of suboptimal wound care. Not only clinicians, but all stakeholders, should collaborate on improving the quality of wound care, as the full cooperation of all involved is needed to provide optimal wound care. Patients, for that matter, are probably the most vital link. Therefore, future research should include patient preferences.

In conclusion, the author of this thesis appeals for an improvement in the quality of acute wound care, where the caregivers’ responsibility is not limited to presenting the evidence according to EBM. Caregivers should also make sure that all available evidence actually reaches patients and, thus, improves the quality of care. Therefore, apart from generating and presenting evidence, an equal amount of attention should be given to the integration of this evidence into daily clinical practice.
References


