INESSS
LE SAVOIR PREND FORME

JANUARY 2024
UPDATE

Wound Care: Assessment, Management, and Optimal Treatment Use

English summary

Une production de l'Institut national d'excellence en santé et en services sociaux (INESSS)

Québec

SUMMARY

Wound Care: Assessment, Management, and Optimal Treatment Use

Introduction

A wound occurs as a result of injury, trauma, or in the presence of an underlying cause that cannot be prevented or controlled - e.g., diabetes, atherosclerotic vascular disease, bed rest. In order to restore the structure and functions of the skin, the healing process is initiated in the wound in four successive phases. If this process stagnates in the inflammatory phase due to elements intrinsic to the individual or to the wound, the wound may become complex and chronic, especially if the care provided is not optimal.

Given the multiple issues involved in wound management, combined with the variety of treatments, dressings, devices, and tools developed by various organizations and available to health care professionals, the INESSS was asked to develop recommendations and clinical tools according to its usual methodological process, in order to:

- Support various health care professionals who provide outreach or second-line care and services in the assessment and optimal management of chronic and acute wounds based on the type of tissue in the wound;
- Encourage nurse clinicians in their scope of practice in wound care activity, in which they are fully autonomous; and
- Promote the full implementation of nurses' prescriptive authority in this area.

Methodology

A systematic search of the scientific literature was conducted, in collaboration with a scientific information specialist (librarian), in the MEDLINE, Embase, EBM Reviews and CINAHL databases. A manual search of the grey literature associated with the subject theme was also carried out by consulting, among others, the websites of scientific societies specialized in the field. A manual grey literature search was again carried out in June 2023 for the addition of the traumatic wound section. Document selection, extraction and methodological quality assessment were performed independently by two scientific professionals. The references of the selected publications were also consulted to identify other relevant literature, including systematic reviews that support the recommendations published in the clinical practice guidelines. For the narrative review on the differential characteristics of wound dressings, documents were first selected from the systematic search described above. An additional search was then conducted using PubMed, Google search engine, and Google Scholar by a single scientific professional. For information on products and dressings available in Canada, as well as indications for payment in Quebec, *Health Canada's Medical Supplies and Equipment Guide and Benefit List* and the Régie de l'assurance maladie du Québec's drug lists were also consulted. The analysis and synthesis of the information collected was carried out by one

professional and validated by a second. To fully understand the framework and scope of practice of the various health professionals who share dedicated wound care activities, the websites of professional orders were consulted. To gather the perspective of stakeholders, an advisory committee made up of clinicians with various specialties and expertise, as well as a follow-up committee made up of representatives from various professional orders, medical federations and Quebec associations were created. Finally, the overall quality of the data, its acceptability and applicability were assessed, first with representatives of the follow-up committee, and then with external readers who were specialists in the field of interest as well as future users who had not participated in the research.

Results

Based on the analysis of all the information collected and the iterative process with Advisory Committee members, the following findings and messages were identified as key to supporting the enhancement and harmonization of clinical practice and the experience of care and service for people with wounds, both chronic and acute. These findings, and the resulting recommendations, were used to develop the tools described below.

Assessment of the Person

A holistic assessment of the individual with a wound includes a health assessment, the location of the wound and events surrounding its onset, the presence of pain, and the identification of physical and psychosocial factors that may compromise wound healing. This assessment is essential to identify quickly urgent clinical situations associated with the risk of bacteremia and amputation. It also helps to clarify the etiology and determine the therapeutic care goals based on the wound's healing potential. In addition, for an acute wound caused by trauma (e.g., laceration, burn, bite), the assessment enables us to quickly identify severe trauma-related injuries, debris, foreign bodies, or perforations of body cavities, and to adapt, if necessary, the first aid that will be provided. This initial assessment also detects signs of abuse, maltreatment, or violence, and determines whether the injury is accidental or intentional, so that appropriate action can be taken. Depending on the circumstances of the accident, the health assessment also provides information on the person's anti-tetanus, anti-rabies, or hepatitis B vaccination status, so that clinical management can be rapidly adapted if necessary. The following aspects are part of the assessment.

Tissue Blood Flow Status

In the presence of localized wounds on the lower and upper extremities, it is essential to identify inadequate tissue blood flow, as the clinical approach is different in the presence of compromised vascular supply. The assessment of tissue blood flow appears to be challenging for some, as it requires up-to-date training to both perform a proper vascular assessment and to properly interpret the results. Vascular supply to the lower limbs is initially assessed by two methods at the bedside, palpable pulses at the pial and tibial arteries and ankle-arm systolic pressure index. Vascular supply to the upper limbs is

assessed by checking for abnormal clinical signs. If there is any doubt, or if the values are abnormal, consultation with an experienced colleague, or a medical specialist remains a safe practice, particularly in light of ethical obligations regarding competence, in order to prevent harm resulting from the provision of health care.

Risk and Causal Factors

Although the development of chronic wounds is generally related to uncontrolled comorbidities, medical conditions such as smoking, malnutrition, dehydration, and immunosuppression are important contributors to wound chronicity. In common with acute wounds, age is also a risk factor for skin fragility, risks of fall, and immobilization of the individual. Other factors, including current and past use of certain medications to treat other health conditions, psychosocial and environmental aspects, lifestyle habits, neuropathy, or predispositions contribute to wound development and delayed healing. Depending on the circumstances of the incident, certain acute wounds may also be more susceptible to infection. The risk of infection - e.g., bacterial, rabies, tetanus, and the risk of transmission of blood-borne infections - is therefore an important element to document, so that management can be adapted rapidly if necessary.

Etiology

The location, discharge amount, and characteristic wound features in conjunction with the presence of co-morbidities and risk or causal factors help define the origin of the wound, especially when it is chronic. However, the classic signs of a wound can be misinterpreted if the assessment of the overall health of the person is incomplete. All possible causes of documented clinical symptoms and signs should generally be investigated before initiating a wound management plan. For acute wounds such as tears, lacerations, burns and closed surgical wounds, their origin is determined primarily by the circumstances surrounding their occurrence.

Healing Potential

Determining realistic treatment goals is the cornerstone of proper wound management. These goals allow for the selection of appropriate interventions based on the healing potential of the wound. Healing potential is defined as:

- Healable wound if it has the capacity to heal, and if all of the individual's medical, psychosocial, and environmental conditions are controlled;
- Maintenance wound if it also has the capacity to heal, but not all of the individual's medical, psychosocial, and environmental conditions are controlled, which usually results in healing delay;
- Non-healable wounds that are often seen in end-of-life care and neoplastic wounds. For wounds where care is not curative, comfort care is preferred.

Assessment of the Wound

The intrinsic wound characteristics and the surrounding skin partially define the type of debridement, whether antiseptic or antimicrobial agents should be applied, and the type of dressing to be used. It may be necessary to clean the wound before its assessment in order to grasp the specifics of the wound. Appearance, dimensions, type of tissue in the wound bed, amount and type of exudate, odor, and the presence of infection, foreign bodies, bleeding, or hematoma are some examples to document during the assessment. At this stage, the wound may show atypical characteristics. If the situation is beyond the professional's expertise, it is his or her responsibility to call in an experienced colleague or refer the person to a specialist or specialized team. These clinical benchmarks also help to assess the evolution of the wound during follow-up. Numerous tools are mentioned in the literature and exist in certain health care institutions, which can serve as references.

Symptoms and Signs of an Infected Wound

In the presence of an infected wound, certain interventions should be avoided, while others should be given priority. Several symptoms and signs characterize local infection, deep soft tissue infection and systemic infection. However, the expected clinical landmarks of local infection may be masked by neuropathy, compromised arterial function, or immunosuppression. If infection is suspected in the wound, searching for bone contact may be one of the first interventions to be performed.

Although biofilm is difficult to distinguish by clinical signs, it limits the effect of some antiseptic and antimicrobial agents in an infected or high-risk wound. It is therefore important to recognize the presence of biofilm in the wound before selecting a product that will reach the intended clinical objective.

Laboratory and Paraclinical Testing

The cause or reason for delayed wound healing can sometimes be revealed through biomedical and paraclinical testing. Laboratory tests are particularly useful in confirming the presence of atherosclerotic vascular disease and assessing its severity when palpable pulses or ankle-brachial systolic pressure index are abnormal or ambiguous during clinical evaluation. In contrast, the use of laboratory tests to identify local infection is less relevant, as clinical signs are usually sufficient, except in the case of neuropathy. Neuropathy is identified by paraclinical examination. Malnutrition, on the other hand, is primarily screened with the use of questionnaires from which laboratory testings are used to complement the assessment of the person’s overall health. In the case of a traumatic wound, the use of medical imaging may also be relevant, particularly when the incident involves foreign matter (e.g., glass) or when it is impossible to determine the depth of the wound.

Treatment Plan

The preferred wound treatment includes interventions in the wound bed to control moisture and microbial load, taking into consideration the vascular supply. This is complemented by the control of risk and causative factors if present, optimization of nutrition and hydration, and pain management, all of which help to control the wound healing process. Timely actions can prevent complications, enhance one's quality of life and use resources efficiently.

Contrary to old beliefs that it is best to dry the wound, moist wound healing is desirable in a wound with adequate tissue blood flow. If tissue vascular supply is inadequate, moist wound healing is generally to be avoided.

Without substituting for critical thinking and clinical judgment, wound bed assessment and treatment include the following:

- clearing the wound, if it is in a hairy part of the body (e.g., scalp), to facilitate assessment and cleaning.

- by a variety of techniques, e.g., by pulling the hair apart, using a depilatory cream, or cutting it with scissors, clippers or a razor, if deemed necessary;

- this can increase the risk of infection, when applicable.

- cleaning that is appropriate to tissue type with a neutral solution to remove debris, exudate, and devitalized tissue, among other things.
  - aqueduct water and physiological saline solution are equally effective and safe. Of note, water from a well can be used if it meets safety standards but its usage is not preferred; it may contain contaminants that are harmful to the healing process;
- debridement, if the wounds are healable or in maintenance, if relevant, using an optimal and safe method according to the wound's characteristics. This procedure is, unless otherwise indicated, followed by an effective flush with a neutral solution. Although there are several debridement methods, the use of conservative sharp surgical debridement is generally preferred.
  - Since debridement can be a harmful activity for the individual being treated, it is essential to have the necessary skills to perform it. Similarly, this procedure cannot be performed without first assessing the tissue blood flow of the limb where the wound is located;
- the application of an antiseptic or antimicrobial solution, chosen according to the targeted effect sought - e.g., antimicrobial spectrum, bactericidal, or bacteriostatic effect, biofilm performance -, followed by rinsing with a neutral solution unless otherwise indicated.
  - for an optimal choice between the various solutions available, knowledge of the characteristics of each one is essential to obtain the expected benefits;

- topical or systemic antibiotic therapy is generally not recommended, unless advised by a specialist, or after drainage of an uncomplicated abscess.
- closure of traumatic wounds, where the decision is based on a careful analysis of the aesthetic benefits and infectious risk, taking into account the individual's risk factors, the professional's level of competence, and the availability of technical facilities:
- there is currently no scientific data to guide clinical decision-making regarding the time beyond which a wound cannot be closed by primary intention healing;
- the choice of closure technique - e.g., tissue/surgical glues, adhesive skin closure strips, staples and sutures (absorbable and non-absorbable) - is generally made on the basis of wound type, depth, and location, aesthetic importance and risk of infection. For superficial wounds and lacerations, the use of skin glue should be used rather than sutures, especially in children. If necessary, the use of absorbable sutures is recommended.

- the application of an optimal dressing according to therapeutic objectives and the individual's characteristics, wound appearance, and location.
  - the general guideline is to use semi-occlusive dressings, which reduce change frequency. However, it is preferable to leave necrosis with inadequate tissue blood flow and dry black heel necrosis to the ambient air; semi-occlusive and occlusive dressings should be avoided in this context;
  - some dressings may add, maintain, or absorb moisture to support optimal wound humidity balance and provide an environment conducive to autolytic debridement (by natural process). However, their use is not recommended in dry necrosis with inadequate blood flow in the wound;
  - there is a range of antimicrobial dressings with various characteristics within the same category. The choice of an optimal dressing should be based ideally on preventing infection, controlling the microbial load, limiting biofilm development, or optimizing humidity balance and controlling wound discharge;
  - the rapid evolution of technology, and the large number of available dressings and products increase the challenge for many healthcare professionals, and supply managers within institutions.
  - post-exposure prophylaxis (PEP) adapted to the circumstances of the incident, the penetrating nature of the vulnating agent and the level of risk of infection, which varies, in particular, according to the location of the wound and the individual's health status:
  - Antibiotic PEP, which can be considered in the event of a bite or in situations where there is a high risk of infection;
  - Anti-tetanus PEP, for wounds at high risk of *Clostridium tetani* infection;

- Anti-rabies PEP, depending on the risk of exposure to a potentially rabid animal;
- PPE (vaccines with or without immunoglobulins) against hepatitis B virus (HBV) and human immunodeficiency virus (HIV), which can be considered in the event of a human bite.

Optimal wound management also requires additional care depending on the type of ulcer being treated and includes correction of inadequate tissue blood flow, use of compression therapy, and pressure redistribution devices, leg elevation, mobility, and lifestyle changes.

When the wound is slow to heal despite optimal treatment, reassessment of both the treatment plan and the origin of the wound is necessary. This reassessment, at intervals deemed clinically relevant, is possible by comparing wound dimensions from one visit to the next, ideally using the same data collection method.

Challenges and Solutions Raised by the Work

In addition to identifying all of the clinical aspects and recommendations from the systematic review of practice guidelines to support practice improvement and harmonization, the following challenges and solutions were identified from the consultations:

- Competencies - For professionals with less exposure to wounds, competencies to perform certain wound-related activities are a challenge. Inappropriate interventions, as well as inaction on a deteriorating wound, can be detrimental and lead to complications such as hospitalization or amputation. Thus, up-to-date training is one of the cornerstones of optimal care delivery. In order to maintain or acquire expertise, upgrading and maintaining competencies, basic training, as well as peer practice and continuing education, are keys to face this challenge.
- Collaboration and inter-professional work - Wound care is an activity shared by several health care professionals - e.g., nursing assistant, nurse prescriber, stomatologist, nurse practitioner specialist, physician, physiotherapist, dietitian/nutritionist, occupational therapist, podiatrist. The range of interventions varies according to the parameters set by the area of practice of each of the professions involved. By focusing on professional autonomy, inter-professional collaboration and interdisciplinary delivery, the impact on intervention time, costs, and recovery time can only be beneficial to all parties involved.
- Standardization in wound assessment and follow-up - There are several essential items to document during wound assessment for ongoing care and follow-up. Some hospitals have a data collection form specific to their setting. In order to harmonize practices across Quebec, whether in an institutional or ambulatory setting, and to facilitate follow-up throughout the care continuum, the possibility of having a standardized form was identified by stakeholders consulted as an important requirement.

- Reimbursement requirements and issues that complicate access to new generations of wound dressings - Quebec is the only province in Canada where dressings are reimbursed with the same requirements as drugs, these terms originating from the implementation of Quebec's health insurance system. Due to the lack of comparative studies and the low level of scientific evidence in the data submitted by manufacturers for review for listing purposes, it is difficult to make decisions regarding the therapeutic value of many dressings and indications. As a result, some categories of dressings are not listed on the Régie de l'assurance maladie du Québec (RAMQ) drug formulary. Successive ministerial guidelines have also historically excluded the possibility of creating new common names, thus preventing the expansion of product categories for wound care.

Given the substantial number of products that have market authorization in Canada, and the absence of certain categories of dressings from the RAMQ lists, health care institutions must make choices based on their circumstances, clientele, prices and knowledge of the products and their characteristics. Normally, products and drugs must be listed on the *Medications List - Institutions* in order for a care setting to develop its application form. Due to the issues identified above, hospitals are purchasing a variety of dressings despite the fact that they are not listed on the institutional formulary. Access is also limited by local or regional tenders based on price and other factors. Procurement of wound supplies in hospitals does not necessarily go through pharmacies; the supply department is often responsible for this. Moreover, the dressings offered to the person as a continuation of hospital treatment varies from one institution to another.

Unfortunately, issues of dressing availability and coverage sometimes lead to the use of a less optimal dressing for certain wounds. These situations can lead to increased dressing use, increased costs and increased "nursing time" required, as well as material and financial resources related to hospital readmissions or additional medical visits. To ensure care continuity and to enhance the experience of care and services for the affected individual, a review of assessment procedures, reimbursement measures for dressings and pressure bandages, and distribution seems to be an avenue to explore.

Recommendations and Clinical Tools

At the end of the work and following an iterative process with Advisory Committee members, in which scientific data, information, and recommendations from the literature consulted, contextual factors and the perspective of the various stakeholders consulted were triangulated, a series of recommendations were formulated. These recommendations, which are at the core of the report, are also summarized in a clinical toolkit derived from the work and intended primarily for clinicians with less expertise in wound care. The wound care clinical tools are:

- Decision Support Tool: *Assessing the wound and determining its healing potential*;
- Decision Support Tool: *Optimal treatment plan based on etiology, vascular supply, infection risk, tissue type and amount of wound exudate*;

- Quick reference guide: *Dressing specifics*;
- A series of decision-making support tools based on wound etiology - burn, skin tear, surgical wound, traumatic wound, diabetic foot ulcer, venous ulcer, arterial ulcer, pressure injury and moisture associated skin damages.

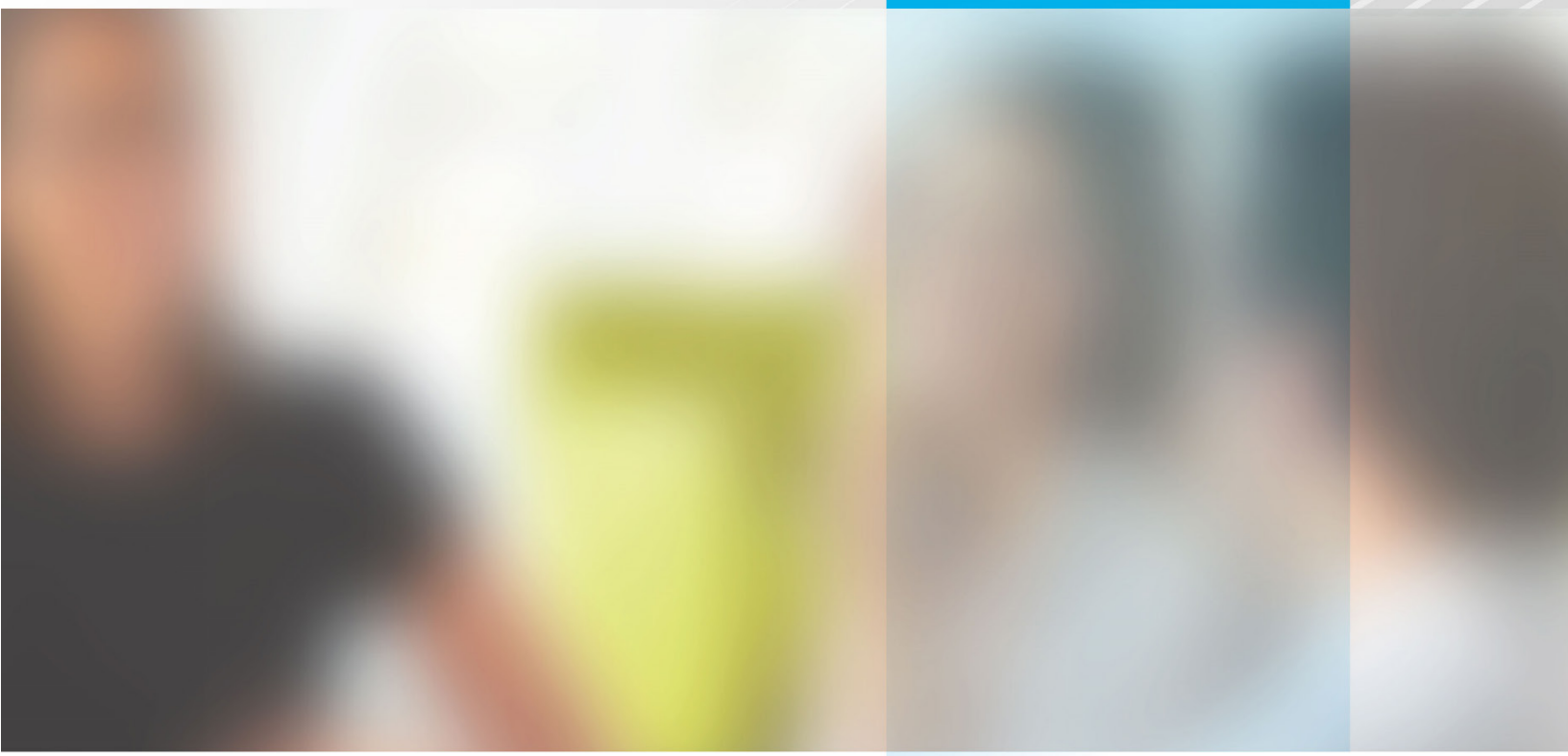
Conclusion

A wound optimally treated has the best chance of evolving favorably, limiting the number of clinical follow-up visits required and reducing the adverse impact on the affected individual's functioning and quality of life. Conversely, non-optimal or detrimental management has a significant impact on the quality of life of the individual and their loved ones, which can lead to amputation or death. The increasing complexity of a wound has a significant impact on the use of resources, including the repeated use of clinicians and multiple visits to specialized complex wound clinics, hospitals or emergency rooms, and the use of several possibly inappropriate dressings for months or even years, with a costly end result. Without substituting for clinical judgment, the tools developed in this research should support practice by increasing the comfort of less experienced clinicians in treating wounds. Thus, safe, quality care adapted to the clinical situation encountered, as well as a reduction in the number of low-value interventions, are emphasized in the tools. The purpose of this work is also to promote care continuity by supporting inter-professional collaboration and interdisciplinary care delivery. Enhancing and harmonizing practice, however, will depend on:

- implementation of clinical tools associated with this report;
- adherence to these changes and adoption of the recommendations by the health care professionals targeted;
- promotion of the tools and appropriate clinical support by nursing managers within the network, the autonomy of nurses in carrying out wound care activities according to their scope of practice in this field, and the full deployment of nurses' authorization to prescribe in this area;
- establishment of winning conditions as well as the principles of transversality across the continuum of care and services, and effective communication in the various care environments for inter-professional work in various care settings;
- and anticipated improvements in access, and reimbursement of dressings - improvements that will require an assessment review, and reimbursement processes, and an expansion of the categories of dressings covered, including innovative solutions in this area.

Update

The relevance of updating the recommendations will be assessed in four years from the date of publication according to the advancement of scientific data and the evolution of clinical practices, significant changes in the criteria for reimbursement of dressings under the public drug plan, and according to the needs of the Institute or the health and social services network regarding future research in wound management.



Siège social

2535, boulevard Laurier, 5e étage
Québec (Québec) G1V 4M3
418 643-1339

Bureau de Montréal

2021, avenue Union, 12e étage, bureau 1200
Montréal (Québec) H3A 2S9
514 873-2563
inesss.qc.ca

Institut national d'excellence en santé et en services sociaux
Québec