Wound Cleansing vs. Wound Hygiene: What Is The Difference?

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Clinicians across all care settings are frequently faced by 'healable' wounds that simply will not heal, despite the fact that, by definition, these 'healable' wounds have adequate blood supply and the causative factors can be eliminated, managed or treated with the goal being full wound closure.[1] These hard-to-heal wounds are those that do not progress through the four phases of wound healing: hemostasis, inflammation, proliferation and maturation without complications.[1] The term hard-to-heal will be utilized throughout this article to refer to wounds that are not progressing towards healing as expected.[2] Recent literature is refraining from using the term 'chronic', as it imparts a message that the wounds condition is irreversible and

non-healable.[2] Previously, literature stated that biofilm was present in 60-90% of hard-to-heal wounds, however, recent literature suggests that all hard-to-heal wounds are presumed to have biofilm, as there is no gold standard to diagnostically identify the presence of biofilm.[3]

Hard-to-heal wounds and non-viable tissue are an ideal environment for bacteria and the formation of biofilm.[4] Biofilm is an aggregate of bacteria in a matrix of extracellular material tolerant to antimicrobial treatment and the host defense.[5] Wounds burdened with biofilm typically experience a dysregulated, hyper-inflammatory response as bacteria evades the immune response and disables skin barrier function.[2] Wound biofilm can be embedded in non-viable tissue, debris and the wound dressing itself, as well as both superficial and deep tissue.[3] Although biofilm is suspected when a thick slimy clear substance is apparent in the wound bed, current science has demonstrated that biofilms cannot be seen by the naked eye.[3] Biofilm has a detrimental impact as it leads to tissue damage and delayed wound healing.[4]

Given its impact, there is a consensus on the need to remove biofilm and then prevent its reformation. How does one do this? Wound management is a complex process, as highlighted when considering all of the components of the Wound Bed Preparation Paradigm.[7] (See box.) The Wound Bed Preparation Paradigm was first published in 2000 and has gone through periodic updates, with the most recent being 2021. This paradigm was developed to optimize chronic, or hard-to-heal, wound treatment through the management of the wound to promote healing and facilitate the effectiveness of therapeutic interventions.[7] Often, the basics, such as thorough wound cleansing, are underestimated, despite the fact that wounds must be clean to heal.

Wound cleansing is defined as actively removing surface contaminants, loose debris, nonattached non-viable tissue, microorganisms, and remnants of previous dressings from the wound surface and its surrounding skin.[3]

The *Wound Bed Preparation Paradigm* can be accessed at: https://journals.lww.com/aswcjournal/fulltext/2021/04000/wound_bed_preparation_2021.4.aspx

Although fundamental, is wound cleansing alone enough to tackle biofilm? For decades, dental literature has focused on oral hygiene and inflammation caused by biofilm, defined as gingivitis. It is recognized that adequate oral hygiene encompasses measures beyond simply brushing one's teeth to prevent and manage gingivitis. Comparatively, wound hygiene was introduced to combat wound biofilm. An anti-biofilm approach needs to be implemented when wounds are unable to be prevented and are hard-to-heal, despite being considered healable. Wound hygiene aligns with the Wound Bed Preparation Paradigm, as it is a practical approach in preparing wounds for healing, specifically those determined to be hard-to-heal, through cleansing, debridement, refashioning and dressing.[8]

Not only do hard-to-heal wounds have a detrimental impact on quality of life, while increasing morbidity and mortality, they have a crippling impact on the health-care system. In addition to the impact on the workflow, the cost of wound care in Canada in 2022 was over $11 billion CAD.[9] Wound management efforts need to adopt a more proactive approach.

Discussion

For decades Canada's population has been aging and is projected to keep aging; the number and proportion of older adults has been steadily rising placing additional pressure on several sectors, including health care. In 2021, 7.3 million Canadians were over the age of 65, representing nearly 20% (or 1 in 5) of the Canadian population.[10] Also, the number of seniors over 80 years of age is growing rapidly, as the average 65-year-old Canadian can expect to live an additional 21.0 years, although the risk of developing chronic diseases increases with age.[11] As we know, increased age and comorbidities increase the risk for wounds and wound complications.[12]

It has been established in the literature that the management of complex hard-to-heal wounds primarily occurs at home, whether that is by home care services or health-care teams in long-term care settings.[13] In 2021, 7.1% of seniors in Canada lived in long-term care facilities with a number of Canadians awaiting placement.[14] Also in 2021, 8.4% of Canadians aged 65 and older used home care services.[15] The number of, and need for, long-term care beds in Canada is expected to increase as the population ages, along with the need for home care services.[14] As we can see, many senior Canadians living with complex wounds are receiving care to manage their wounds at home, whether that is their home in long-term care or the community; therefore, the following discussion will have a focus on the long-term care and home care settings.

Wound cleansing is an instrumental part of wound bed preparation to optimize the wound environment by removing debris and reducing bacterial load, preventing biofilm activity.[16] However, due to the tenacity of biofilm, wound cleansing is not enough. The removal of biofilm is of clinical importance due to its impact on delayed wound healing and hard-to-heal wounds, and will require a multifaceted anti-biofilm approach, through targeted wound hygiene.[3]

Wound hygiene was formally introduced in 2019 and has gained its own identity as an anti-biofilm approach.[8] This comprehensive four-step protocol of proactive wound healing has been proven effective in research studies and is being increasingly used across wound care as a direct result.[3] Wound hygiene encompasses cleansing the wound and peri-wound, debridement to remove non-viable tissue, foreign bodies, and biofilm, refashioning the wound to refresh the edges and dressing the wound to manage moisture.[8]

Although the importance of wound hygiene is highlighted throughout the local wound care component of the Wound Bed Preparation Paradigm, it's critical to remember the importance of all components of the holistic assessment and ensure all causes of delayed healing are identified and addressed.[17]

Implications For Practice

Wound bed preparation supports clinicians in identifying and addressing the barriers of healing to create an optimal healing environment.[3] This approach focuses on cleansing and debridement to prepare the wound bed for healing.[7] For healing to occur, biofilm must be managed, therefore wound hygiene is necessary for the local wound care component of the Wound Bed Preparation Paradigm and implemented at every episode of wound care until full healing occurs.[6] The term hygiene was selected as an intuitive term to resonate with clinicians as the expected standard, as general hygiene activities are accepted as repetitive, regular, frequent and necessary - rather than something done on

occasion.[17] Wound hygiene is a flexible strategy that can be implemented by all practitioners on some level, regardless of their expertise or specialty.[17]

A Four-step Process

This four-step process involves wound cleansing, debridement, refashioning the edges, and product selection, and is imperative for all wounds, especially hard-to-heal ones.[8]

1. **Wound Cleansing**

   Cleansing the wound and periwound skin is fundamental to decontaminate the area and prevent recolonization of the wound originating in the wound bed, or on the surrounding skin.[8] There are many practice considerations regarding cleansing, as wound hygiene was designed to be non-specific and individualized, therefore the wound cleanser and method is based upon the comprehensive assessment by the clinician.[17]

   Clean versus sterile technique: There is no consensus in cleansing techniques for hard-to-heal wounds.[3] The decision regarding the appropriate aseptic technique is made based on clinical condition, the wound etiology, the wound location, the invasiveness of the dressing procedure, the goals of care and facility or agency policy.[3] However, hard-to-heal wounds require vigorous therapeutic cleansing to dislodge loose devitalized tissue and biofilm, which is a form of mechanical debridement;[3] another example regarding how all clinicians are able to provide some level of wound hygiene. Research supports cleansing the wound with as much vigour as the individual can tolerate, as pinpoint bleeding will stimulate the release of growth factors to kickstart the formation of healthy tissue.[17]

   Clinicians must also consider current best practices, as well as the wound assessment and goals of care.[12] For example, when moist wound healing principles do not apply, cleansing products are selected to maintain a dry wound environment. There are several other considerations regarding wound cleansing. For hard-to-heal wounds, antimicrobial cleansers may have some limitations due to the tenacity of biofilm. However, when biofilm has been disrupted, for example after debridement, there is a window of opportunity for antimicrobial cleansers to take effect.[3] Research also supports the use of surfactants for wound cleansing.[17]

   Consider the risk versus benefit.[7] For example, cleanse a skin tear gently as initially it is an acute wound, and the aim is to maintain flap viability, versus a pressure injury that has developed over time, and you expect there to be biofilm. Balance the priority of new tissue growth with removal of bacteria.[7] Such factors will determine the vigour, the solution and the technique.[3] Hard-to-heal wounds require purposeful, thorough and frequent cleansing for an anti-biofilm approach, in addition to debridement and use of topical antimicrobial agents through cleansers and dressings.[16]

2. **Wound Debridement**

   Debridement involves the physical removal of biofilm, devitalized tissue and foreign debris through biological, enzymatic, mechanical, autolytic and sharp debridement methods.[12] Additionally, methods need to align with the individuals goals of care, the wound assessment,

including classification and healability, as well as available resources, the clinicians scope of practice and limitations of the environment and health-care system.[18] There are several considerations when making decisions regarding debridement, as not all wounds should be debrided by all methods. It is important to note that debridement of a wound that does not have adequate perfusion is not supported by best practice.[12] Other considerations include pain management, risk of infection, care setting, cost and availability of resources, as well as the medical status of the individual, including comorbidities.[3] An additional consideration is whether the method is selective, in targeting only non-viable tissue, or non-selective by removing non-viable tissue and potentially damaging surrounding viable tissue.[7]

Due to the increased tolerance to antimicrobials that biofilms have, debridement is a necessary intervention in managing adherent biofilm within a wound.[3] In hard-to-heal wounds, at least some form of conservative debridement of non-viable tissue is required to manage moisture, promote comfort, and prevent the wound from deterioration or infection.[7] For example, vigorous cleansing is considered a form of mechanical debridement.[8] There is often controversy and confusion regarding 'who' can debride. Wound hygiene is a flexible strategy so it can be implemented by all practitioners on some level, regardless of their expertise or specialty - even if it is as simple as vigorously cleansing a wound or collaboration with the interprofessional team to ensure hard-to-heal wounds are adequately and appropriately debrided.[18] There is always something that can be done as long as clinicians work within their scope of practice and local policy and procedure.[8]

Debridement remains essential for promoting healing, preventing and controlling infection and inflammation by reducing bacterial load, as well as facilitating proper visualization of the wound bed, allowing the clinician to properly assess and make appropriate treatment decisions.[18] Sharp debridement should not be used as the sole treatment modality, as it does not remove all biofilms and prevent the reformation, highlighting the importance of all four of the wound hygiene steps.[19]

3. Refashion the Edges

Refashioning the wound involves the removal of irregular, necrotic and crusty non-viable wound edge tissue that may be nurturing or sustaining biofilm.[8] Properly maintaining wound edges to reduce the bacterial load and remove the physical barriers of epithelial growth is recognized as an integral component of the Wound Bed Preparation Paradigm.[7] Decontaminating and refreshing of the edges, ensuring the skin edges are even with the wound bed, promotes epithelial advancement and facilitates wound contraction.[17]

4. Product Selection

Dressing the wound involves the selection and application of a product that will maintain a healthy wound environment until the next episode of care.[8] A common misconception is that product selection and application is the key to successful wound management. Remember, if the wound is hard-to-heal and not responding to standard wound care practices, it should be assumed that

tolerant microorganisms within a biofilm are present.[3] Therefore, product selection and application are insufficient without first cleansing, debriding, and refashioning the edges.[16] These activities, supplemented with appropriate antimicrobials, during a therapeutic window while biofilm is disrupted, is imperative.[5] Given that a wound with biofilm is not clinically infected, antibiotics cannot eradicate biofilms. Therefore, antimicrobials are the preferred treatment to effectively manage residual bacteria to prevent and delay the regrowth of new biofilm.[5] Another fundamental consideration is the amount of wound exudate. Moisture management is imperative as exudate supports the proliferation of biofilm.[3] It is also critical to select products to protect the periwound.[17] Consider the goals for the individual and their wound.[7] Is this wound healable, non-healable, or maintenance requiring? Is the priority addressing bacterial burden or preventing tissue toxicity? This could be a healable wound where the goal is to promote granulation, or this could be a palliative wound where the focus is on moisture control, odour and keeping it free from infection.

As demonstrated, there is no preferred product as wound hygiene was designed to be non-specific.[17] It is simply about navigating through the Wound Bed Preparation Paradigm and making decisions based on the comprehensive assessment.[7] What works for one wound may not work for the other. It is paramount to understand the assessment findings and the products available. Consider the wound size and location to choose something that will appropriately dress the wound and stay in place. Other core considerations include cost, availability and wear time.[12]

Just because a wound has a biofilm doesn't necessarily mean that it's infected or needs to be clinically treated as an infection.[3] Inflammation does not mean infection.[6] Remember, biofilm is an organization of bacteria and microorganisms that build up in a wound.[5] Generally, micro-organisms pose no threat to the host, unless the skin is damaged, such as by a wound, allowing entry into the system.[3] If a biofilm is not managed correctly, it can lead to infection.[16] However, the presence of biofilm does not mean that the wound is clinically infected.[5] Wound hygiene is a relatable concept supporting diligent wound management practices to address barriers to wound healing, such as biofilm, while aligning with antimicrobial stewardship.[17]

Conclusion

Hard-to-heal wounds contribute to morbidity, mortality and increased health-care costs.[12] Given the microscopic nature of biofilm, research supports that clinicians assume all hard-to-heal wounds that have failed to respond to standard treatment contain biofilm, especially as there is no gold standard diagnostic test to confirm the presence of wound biofilm.[16] Furthermore, the increase in antimicrobial resistance has placed an even greater emphasis on managing biofilm early, requiring standard wound care practices to adopt an anti-biofilm approach.[5] A proactive anti-biofilm approach acknowledges that there is no one-step solution to manage biofilm, however aims to reduce the burden and prevent reformation.[16]

An extensive review of the literature reveals that it is evident that reducing, removing, and preventing biofilms through wound hygiene is a logical, non-specific approach when caring for those with hard-to-heal wounds.[19] Wound hygiene can be implemented by various members of the interprofessional team in multiple care settings, dependent on factors such as skill, training, scope of practice and local regulations.[8] This flexibility allows care to take place in environments with professionals most accessible to the individual and their wound.[8] Wound hygiene is structured, yet flexible, and can be performed to some extent by clinicians with varying levels of wound care experience and training.

Failure of clinicians to understand the adverse effects of biofilms can result in suboptimal management of hard-to-heal wounds.[6] Don't underestimate your role and the importance of thorough wound hygiene through cleansing, debridement, refashioning the edges and product selection.

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