

WOUND HYGIENE IN HEALTH CARE: AN ANALYSIS OF SCIENTIFIC EVIDENCE

HIGIENE DE FERIDAS NA ASSISTÊNCIA EM SAÚDE: UMA ANÁLISE DAS EVIDÊNCIAS CIENTÍFICAS

HIGIENE DE HERIDAS EN LA ATENCIÓN DE SALUD: UN ANÁLISIS DE LAS EVIDENCIAS CIENTÍFICAS

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ABSTRACT

Objective: to identify scientific evidence regarding wound hygiene practices in healthcare, focusing on the characterization of existing protocols and the main interventions reported in the literature. **Method:** a scoping review conducted according to the Joanna Briggs Institute methodology and PRISMA-ScR guidelines. The research was performed in the PubMed, Scopus, Web of Science, and CINAHL databases, covering studies published in the last five years. Results: the most frequently described interventions included the use of antimicrobial solutions for cleansing, debridement of devitalized tissue, and the use of advanced dressings. It was observed that early biofilm management and wound bed preparation are essential for therapeutic success. **Conclusion:** significant gaps were found in the standardization of these approaches, reinforcing the need to develop and validate an updated, evidence-based protocol for clinical practice, aiming to reduce complications and improve the quality of care.

Keywords: Enterostomal Therapy; Wounds and Injuries; Nursing Care; Clinical Protocols.

RESUMO

Objetivo: identificar as evidências científicas sobre as práticas de higiene de feridas na assistência à saúde, com foco na caracterização de protocolos existentes e nas principais intervenções relatadas na literatura. **Método:** revisão de escopo, conduzida conforme a metodologia do Joanna Briggs Institute e as diretrizes do PRISMA-ScR. A pesquisa foi realizada nas bases PubMed, Scopus, Web of Science e CINAHL, abrangendo estudos dos últimos cinco anos. **Resultados:** as intervenções mais frequentes incluíram a utilização de soluções antimicrobianas para limpeza, a remoção de tecido desvitalizado e o uso de curativos avançados. Observou-se que a abordagem precoce contra biofilmes e a preparação do leito da ferida são fundamentais para o sucesso terapêutico. **Conclusão:** constatou-se a existência de lacunas significativas na padronização dessas abordagens, o que reforça a necessidade de desenvolver e validar um protocolo atualizado e orientado por evidências para a prática clínica, visando reduzir complicações e melhorar a qualidade da assistência.

Palavras-chave: Estomatoterapia; Ferimentos e Lesões; Cuidados de Enfermagem; Protocolos Clínicos.

RESUMEN

Objetivo: identificar la evidencia científica sobre las prácticas de higiene de heridas en la atención sanitaria, centrándose en la caracterización de los protocolos existentes y en las principales intervenciones descritas en la literatura. **Método:** una revisión de alcance (scoping review) realizada de acuerdo con la metodología del Instituto Joanna Briggs y las directrices PRISMA-ScR. La investigación se llevó a cabo en las bases de datos PubMed, Scopus, Web of Science y CINAHL, abarcando estudios publicados en los últimos cinco años. **Resultados:** las intervenciones descritas con mayor frecuencia incluyeron el uso de soluciones antimicrobianas para la limpieza, el desbridamiento de tejido desvitalizado y el uso de apósitos avanzados. Se observó que el manejo temprano del biofilm y la preparación del lecho de la herida son fundamentales para el éxito terapéutico. **Conclusión:** se encontraron brechas significativas en la estandarización de estos enfoques, lo que refuerza la necesidad de desarrollar y validar un protocolo actualizado y basado en evidencia para la práctica clínica, con el objetivo de reducir las complicaciones y mejorar la calidad de la atención.

INTRODUCTION

Wound hygiene is an essential step in the care of skin lesions, playing a decisive role in preventing infection and promoting efficient healing. Inadequate management of these lesions can lead to serious complications, such as infections and delayed healing, thereby directly affecting the patient's quality of life and compromising treatment efficacy⁽¹⁻²⁾.

However, despite its importance, the lack of standardized hygiene practices remains a significant gap in healthcare delivery⁽³⁻⁵⁾. The Wound Infection Institute⁽⁶⁾ highlights the need for early interventions based on clinical signs and structured assessment tools, reinforcing a patient-centered approach. Additionally, the rational use of modern antiseptics and antimicrobial dressings is emphasized, with due regard for tissue safety principles. Such evidence-based practices are fundamental to preventing severe complications, such as sepsis and bacterial resistance, through the implementation of well-defined protocols⁽⁶⁾.

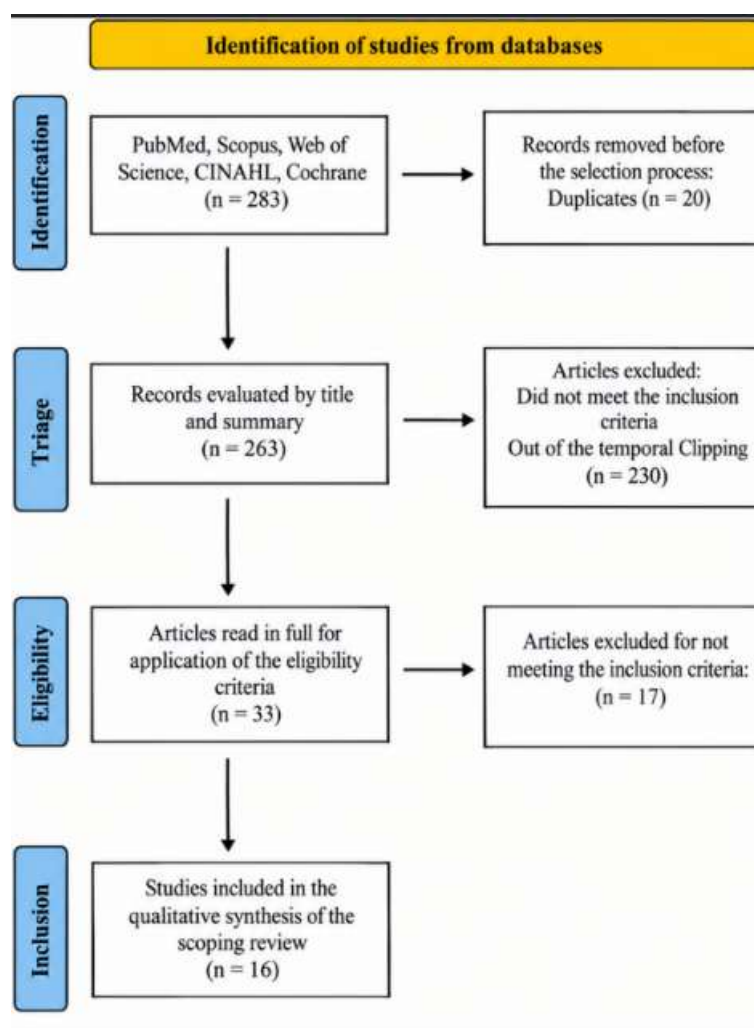
In this context, the appropriate choice of cleansing solutions and wound bed preparation are key determinants of therapeutic success⁽³⁻⁵⁾. Wound bed preparation is a fundamental concept

in chronic wound management, as it addresses both the underlying cause and the patient's specific needs, aiming to classify the wound as healable, maintenance-oriented, or non-healable (palliative)⁽⁷⁾.

From this perspective, this study is guided by the following question: What are the practices and scientific evidence regarding wound hygiene in healthcare, and how can this evidence inform the development of effective protocols? Thus, the present study aimed to identify scientific evidence regarding wound hygiene practices in healthcare, focusing on characterizing existing protocols and the main interventions reported in the literature.

METHODS

This is a scoping review conducted in accordance with the Joanna Briggs Institute (JBI) guidelines and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses extension for Scoping Reviews (PRISMA-ScR) method⁽⁸⁾. The use of this guide followed the EQUATOR Network recommendations to ensure methodological rigor in the writing and presentation of the manuscript⁽⁸⁾ (Figura 1).

Figure 1 – PRISMA Flow diagram (adapted)

The search was conducted across scientific databases using Health Sciences Descriptors (DeCS) and Medical Subject Headings (MeSH), applying a combination of controlled terms adapted for each platform. The databases consulted were: National Library of Medicine (PubMed), Cochrane Library, Elsevier Scopus (Scopus), Web of Science, and Cumulative Index to Nursing and Allied Health Literature (CINAHL). Additionally, a search for gray literature was performed to capture technical documents and non-indexed consensus statements.

The search terms used were: “Wound care hygiene protocols”; “Wound infection prevention and management”; “Antiseptic use in wound care”; “Wound dressing and infection control”; and “Evidence-based wound care practices.” The choice of English descriptors is justified by the international scope of the databases, allowing access to global guidelines from organizations such as the WOCN, CDC, and IWGDF.

Inclusion criteria covered studies published between 2021 and 2025 that presented evidence on wound management and hygiene protocols adopted by healthcare professionals,

with an emphasis on infection prevention and the optimization of healing. Selection followed a two-phase process: the first consisted of screening titles and abstracts by two independent reviewers; in the second, selected articles were read in full. Duplicate studies or those that did not meet the criteria were excluded. In the event of a discrepancy, a third reviewer was consulted.

Data were analyzed qualitatively, focusing on the identification of key interventions. The synthesis of results was organized in a narrative and descriptive manner, highlighting the efficacy and safety of the identified practices and categorizing them according to the type of intervention and level of evidence. As this was a literature review based on public domain data, submission to the Research Ethics Committee was not required.

RESULTS

Analysis of the 16 selected documents enabled the identification of guidelines, protocols, and empirical studies regarding clinical management and technologies associated with wound hygiene. A predominance of publications from 2024 was observed, accounting for 75% (n=12) of the sample^(10-13,19-21). Regarding language, all publications were in English (100%).

In terms of methodological rigor, two documents were identified as having Level 1 scientific evidence^(10,12), while the majority consisted of consensus statements and practice guidelines classified as Level 4 or 5. Chart 1 shows the complete characterization of the included studies, covering authors, objectives, identified practices, and strength of evidence.

Chart 1 – Characterization of the articles selected in this bibliographic research. Petrolina, Pernambuco, Brazil, 2025 (n=16)

Title	Author and year	Objective	Wound hygiene practices	Level of scientific evidence – Oxford Centre for Evidence-Based Medicine	Strength of Evidence
Improving outcomes for patients with hard-to-heal wounds following adoption of the Wound Hygiene Protocol: real-world evidence	Torkington-Stokes et al., (2024) ⁽⁹⁾	To evaluate the impact of the Wound Hygiene Protocol (WHP) on hard-to-heal wounds using real-world data.	Cleansing, debridement, reshaping of edges, and coverage; use of dressings for biofilm control.	Level 3	Moderate



Guideline for management of wounds in patients with lower extremity arterial disease: an executive summary	WOCN, (2024) ⁽¹⁰⁾	To provide evidence-based guidelines for wound management in patients with lower-limb arterial disease.	Wound assessment, infection control, and use of appropriate dressings.	Level 1–2	Strong
Wound hygiene surgical consensus document	Tomasz Banasiewicz et al. (2024) ⁽¹¹⁾ .	To present recommendations on the application of the wound hygiene protocol in surgical settings.	Wound cleansing, debridement, edge remodeling, and coverage, with an emphasis on continuous perioperative assessment and management to promote effective healing.	Level 5	Weak
Digital health interventions for chronic wound management: a systematic review and meta-analysis	Bai et al., (2024) ⁽¹²⁾ .	To evaluate the effectiveness of digital interventions in chronic wound management through a systematic review and meta-analysis.	Use of digital technologies, such as mobile apps and telemedicine platforms, for monitoring, guidance, and treatment adherence regarding chronic wounds, focusing on proper hygiene, dressing changes, and communication with healthcare professionals.	Level 1	Very Strong
Clinical guidance for wound management to prevent tetanus	CDC, (2024) ⁽¹³⁾ .	To provide up-to-date clinical guidance on the management of wounds at risk of developing tetanus.	Thorough wound assessment, immediate cleansing with saline solution or potable water, and removal of foreign bodies and devitalized tissue. It emphasizes the importance of hygiene during wound preparation and the assessment of vaccination history.	Level 1–2	Strong

Preparação do leito da ferida 2024: Consenso Delphi sobre o tratamento da úlcera do pé em ambientes com recursos limitados	Smart et al., (2024) ⁽¹⁴⁾ .	To develop a practical and scientifically sound application of the wound bed preparation model in resource-limited communities.	Wound bed preparation focusing on the removal of necrotic tissue, proper cleansing, and the use of accessible techniques for managing foot ulcers, especially in resource-limited settings.	Level 4–5	Moderate
A cohort study to evaluate the predictions of the Tardivo algorithm and the efficacy of antibacterial photodynamic therapy in the management of the diabetic foot.	Tardivo et al., (2022) ⁽¹⁵⁾ .	To create a simple prognostic score to evaluate the diabetic foot and predict amputation risk, based on the Wagner classification, signs of peripheral arterial disease, and ulcer location.	Proper ulcer cleansing, the use of conservative therapies such as Photodynamic Therapy (PDT) for patients with low scores, and surgical interventions for patients at high risk of amputation.	Level 3	Moderate
Necrose do dedo do pé, etiologias e manejo, uma série de casos	Isaa et al., (2024) ⁽¹⁶⁾ .	To discuss the etiologies and management of toe necrosis based on a series of clinical cases.	Wound cleaning, removal of necrotic tissue, use of appropriate dressings, and, in more severe cases, surgical intervention (such as amputation).	Level 4	Weak-Moderate
Wound care protocol: primary care provider	Ontario Health atHome, (2024) ⁽¹⁷⁾ .	To standardize wound care in primary care.	Wound bed preparation, moisture balance, bacterial control, and use of aseptic technique for all dressings.	Level 2–3	Moderate
Optimizing wound care: the importance of negative pressure wound therapy for	Fotea et al., (2023) ⁽¹⁸⁾ .	To investigate the efficacy of Negative Pressure Wound Therapy (NPWT) across different wound etiologies and locations.	Application of negative pressure therapy to promote granulation, reduce bacterial colonization and edema, and improve perfusion.	Level 3	Moderate

various etiologies and localizations					
Practical guidelines on the prevention and management of diabetes-related foot disease	IWGDF, (2023) ⁽¹⁹⁾ .	To provide evidence-based guidelines for the prevention and treatment of foot ulcers in people with diabetes.	Thorough wound cleansing with appropriate solutions, removal of necrotic tissue (debridement), use of dressings that maintain a moist environment, and constant monitoring to prevent infection.	Level 1–2	Very Strong
<i>Infecção de ferida em prática clínica: princípios de boas práticas</i>	Consenso Internacional, (2022) ⁽²⁰⁾ .	To update the international consensus on wound infection management, focusing on good clinical practices.	Implementation of protocols for the prevention and control of wound infections, emphasizing proper hygiene and the use of dressings that promote healing and prevent complications.	Level 4–5	Moderate
<i>Preparação do leito da ferida</i>	Sibbald et al., (2021) ⁽²¹⁾ .	To develop evidence-based guidelines for wound bed preparation and treatment in clinical settings.	Recommendations include the proper use of dressings, infection control, and continuous assessment of the wound bed to promote healing.	Level 2	Strong
Best practice recommendations for the prevention and management of pressure injuries	Norton et al., (2021) ⁽²²⁾ .	To establish guidelines for the prevention and management of pressure injuries.	Risk assessment, maintenance of moisture balance, use of appropriate dressings and education of the healthcare team.	Level 1–2	Very Strong
Wound hygiene protocol: documento de consenso internacional	Metcalf et al., (2020) ⁽²³⁾ .	To present an evidence-based protocol to optimize the treatment of hard-to-heal wounds, focusing on the elimination of biofilms.	A four-step protocol: cleaning, debridement, edge remodeling, and wound covering. It emphasizes early intervention against biofilms as an essential strategy to promote effective healing.	Level 5	Weak

Assessment, prevention & treatment of wound infection	PHSA, (2020) ⁽²⁴⁾ .	To prevent and treat wound infections	Adherence to hand hygiene, use of Personal Protective Equipment (PPE), aseptic technique, and selection of antimicrobials as needed.	Level 2–3	Strong
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Source: Authors (2026).

The extracted data enabled the organization of fundamental recommendations for wound care, divided into ten key domains: addressing the cause, patient-centered approach, wound curability, local assessment, debridement, infection/inflammation control, moisture

management, edge advancement, edge support, and systemic change. The guidelines emphasize classifying wounds as curable, maintenance, or palliative to determine the aggressiveness of hygiene and debridement measures. Chart 2 shows the detailed recommendations by domain.

Chart 2 - Domains and recommendations regarding wound care. Petrolina, Pernambuco, Brazil. 2025.

Domain	Key recommendations
1. Treatment of the cause	To assess arterial perfusion via palpable pulses/Doppler; identify and treat underlying causes; prioritize pressure redistribution and compression based on arterial perfusion.
2. Patient focus	To assess pain (nociceptive/neuropathic); consider lifestyle habits and daily activities; promote education using accessible language and cultural sensitivity.
3. Wound healability	To classify wounds as healable, maintenance, or non-healable based on perfusion, adherence to care, and available resources.
4. Local care – assessment	To monitor wounds with written/photographic documentation; clean using warm potable water, normal saline, or low-toxicity antiseptics.
5. Local care – debridement	For treatable wounds: surgical or conservative debridement. For maintenance/non-healable wounds: selective conservative debridement. Consider alternative techniques (autolytic, enzymatic, mechanical, biological).
6. Infection and inflammation	To treat local infections (NERDS) with topical antimicrobials; deep infections (STONEES) with systemic plus topical antimicrobials; consider anti-inflammatories when necessary.
7. Moisture management	To keep balance using hydrocolloids, alginates, foams, hydrogels, and superabsorbents; use packing as needed (moist or dry); reduce moisture in non-healable wounds.
8. Advancement of the edges	To monitor for a 20–40% reduction over 4 weeks to predict healing by 12 weeks; consider extending the timeframe if there

	are limiting factors or resource constraints; refer to specialized centers when necessary.
9. Edge support	To use adjuvant therapies according to indication and mechanism of action, with an interprofessional assessment of risks and benefits.
10. Systemic change	To implement evidence-based strategies that respect the cultural context and available local resources.

Source: Adapted from Smart *et al.*, 2024.

In summary, the results demonstrate that the wound hygiene interventions reported in the literature focus on the physical and chemical removal of barriers to healing, emphasizing biofilm management and the maintenance of the wound microenvironment. It was observed that most current guidelines prioritize the systematization of care into sequential steps and the careful selection of dressing technologies based on the tissue viability identified during local assessment.^{(10, 17, 20).}

DISCUSSION

An analysis of the evidence reveals that wound hygiene is a multifaceted component, systematized into fundamental steps such as cleansing, debridement, moisture control, and appropriate dressing. The literature converges on the need for standardized approaches adaptable to resource-limited settings⁽¹⁴⁾. In this regard, wound bed hygiene emerges as a cross-cutting strategy applicable to various clinical conditions, such as pressure injuries and vascular wounds^(19, 21).

A key pillar identified is the efficacy of a protocol structured in four steps: cleansing, debridement, wound edge remodeling, and

dressing application⁽⁹⁾. Studies demonstrate that this approach, combined with the use of antimicrobial dressings, holds strong potential for disrupting biofilms and accelerating tissue regeneration in hard-to-heal wounds^(9, 22, 23). Early implementation of these strategies is highlighted as a key factor in clinical practice, reinforcing the importance of standardized terminology within the multidisciplinary team⁽²²⁾.

Hygiene practices must be tailored to the etiology of the lesion. In the management of arterial wounds, the focus lies on rigorous assessment and moisture balance⁽¹⁰⁾, whereas for diabetic foot ulcers, IWGDF guidelines assist in classifying amputation risk⁽¹⁹⁾. For cases of digital necrosis, the literature emphasizes the triad of initial hygiene, removal of devitalized tissue, and continuous monitoring⁽¹⁶⁾. Even in urgent scenarios, such as when there is a risk of tetanus, immediate cleansing with saline solution remains a priority⁽¹³⁾.

The modernization of care is evidenced by the integration of Negative Pressure Wound Therapy, which reduces edema and stimulates granulation tissue formation⁽¹⁸⁾. Furthermore, digital health is emerging as a trend to support nursing decision-making through



telemonitoring⁽¹²⁾. However, the challenge of applicability remains: viable models for resource-limited settings demonstrate that structured hygiene can be implemented using low-cost materials, provided staff receive training⁽¹⁴⁾.

The study's limitations concern its temporal scope and the linguistic homogeneity of the articles (100% in English), which poses a challenge regarding cross-cultural adaptation to the Brazilian context. Conducting national research to validate the efficacy of these steps within the Unified Health System (SUS) is recommended.

Regarding contributions to the healthcare field, this study provides a theoretical-practical foundation that assists nurses and enterostomal therapists in making evidence-based clinical decisions. Systematizing evidence into care domains enables healthcare institutions to begin standardizing their practices, aiming to reduce hospital costs associated with prolonged treatments and, above all, to mitigate infectious complications that impact patient safety^(3-4, 20). Furthermore, by highlighting the use of digital technologies and structured protocols, the study fosters innovation in care delivery and promotes the value of a unified, high-quality clinical language.

CONCLUSIONS

The identified scientific evidence indicates that wound hygiene practices are fundamental to reducing biofilms and promoting healing, based on the protocol of cleansing,

debridement, edge remodeling, and dressing. An analysis of existing protocols revealed a trend toward digitalization and the use of advanced technologies, while also demonstrating the feasibility of structured practices in resource-limited settings.

It is concluded that there are gaps in the national standardization of these approaches, underscoring the need to develop Brazilian protocols adapted to local realities. Future research should focus on the clinical validation of these interventions across different levels of care complexity to ensure safe, evidence-based nursing practice.

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Conflict of interest statement

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Data availability statement

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Authorship criteria (author contributions)

Authorship designation must be based on ICMJE guidelines, which define an author as someone who: 1. contributes substantially to the conception and/or planning of the study; 2. to the acquisition, analysis, and/or interpretation of data; 3. as well as to the drafting and/or critical revision and final approval of the published version.

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