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SHARP AND AUTOLYTIC DEBRIDEMENT IN THE REMOVAL OF NECROTIC TISSUE IN CHRONIC WOUNDS, INCLUDING PRESSURE ULCERS: AN INTEGRATIVE LITERATURE REVIEW

DESBRIDAMENTO CORTANTE E DESBRIDAMENTO AUTOLÍTICO NA REMOÇÃO DE TECIDO NECROSADO EM FERIDAS CRÓNICAS, INCLUINDO ÚLCERAS POR PRESSÃO: UMA REVISÃO INTEGRATIVA DA LITERATURA

DESBRIDAMIENTO CORTANTE Y DESBRIDAMIENTO AUTOLÍTICO EN LA ELIMINACIÓN DE TEJIDO NECRÓTICO EN HERIDAS CRÓNICAS, INCLUYENDO LAS ÚLCERAS POR PRESIÓN: UNA REVISIÓN INTEGRATIVA DE LA LITERATURA

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Abstract

Objective: To synthesise the available scientific evidence on the effectiveness of sharp debridement, compared with autolytic debridement, in the removal of necrotic tissue in people with chronic wounds, including pressure ulcers, within the framework of wound bed preparation. **Material and Methods:** The research question was constructed based on the PICO model: "What is the available evidence on the effectiveness of sharp debridement, compared with autolytic debridement, in the removal of necrotic tissue in people with chronic wounds, including pressure ulcers?" A literature search was conducted for articles published between 2020 and 2026 in the CINAHL Ultimate and MEDLINE Ultimate databases via EBSCOhost, and MEDLINE via PubMed. The selection process followed the PRISMA 2020 recommendations. The levels of evidence of the included articles were assessed according to the Joanna Briggs Institute guidelines. **Results:** Six studies were included. The evidence analysed describes the application of sharp and autolytic debridement across different clinical contexts, response times and wound characteristics. Only one of the studies directly compares the two techniques, and the included populations are not restricted to people with pressure ulcers, also covering people with diabetic foot ulcers and with chronic wounds of other aetiologies. **Conclusion:** The available evidence suggests that sharp debridement allows faster removal of necrotic tissue, whereas autolytic debridement is associated with less pain and greater preservation of viable tissue. The small number of direct comparative studies does not allow the superiority of either method to be established. Both are complementary rather than mutually exclusive and may be used in a combined or sequential manner, within an individualised clinical decision preceded by a safety assessment.

Keywords: Autolysis; Debridement; Nursing; Pressure Ulcer; Wound Healing.

Resumo

Objetivo: Sintetizar a evidência científica disponível sobre a eficácia do desbridamento cortante, comparativamente ao desbridamento autolítico, na remoção de tecido necrosado em pessoas com feridas crónicas, incluindo úlceras por pressão, no âmbito da preparação do leito da ferida. **Material e Métodos:** A pergunta de investigação foi construída com base no modelo PICO: "Qual a evidência disponível sobre a eficácia do desbridamento cortante, comparativamente ao desbridamento autolítico, na remoção de tecido necrosado em pessoas com feridas crónicas, incluindo úlceras por pressão?". Procedeu-se à pesquisa de artigos científicos publicados entre 2020 e 2026 nas bases de dados CINAHL Ultimate e MEDLINE Ultimate, via EBSCOhost, e MEDLINE, via PubMed. O processo de seleção seguiu as recomendações PRISMA 2020. A avaliação dos níveis de evidência dos artigos incluídos seguiu as diretrizes do Joanna Briggs Institute. **Resultados:** Foram incluídos seis estudos. A evidência analisada descreve a aplicação do desbridamento cortante e do desbridamento autolítico em diferentes contextos clínicos, tempos de resposta e características das feridas. Apenas um dos estudos compara diretamente as duas técnicas e as populações incluídas não se restringem a pessoas com úlceras por pressão, abrangendo também pessoas com úlceras do pé diabético e com feridas crónicas de outras etiologias. **Conclusão:** A evidência disponível sugere que o desbridamento cortante permite uma remoção mais rápida do tecido necrosado, enquanto o desbridamento autolítico se associa a menor dor e a maior preservação do tecido viável. O reduzido número de estudos comparativos diretos não permite estabelecer a superioridade de um método sobre o outro. Ambos se apresentam como complementares e não mutuamente exclusivos, podendo ser utilizados de forma combinada ou sequencial, no quadro de uma decisão clínica individualizada e de uma avaliação prévia de segurança.

Palavras-chave: Autólise; Cicatrização; Desbridamento; Enfermagem; Úlcera por Pressão.

Resumen

Objetivo: Sintetizar la evidencia científica disponible sobre la eficacia del desbridamiento cortante, en comparación con el desbridamiento autolítico, en la eliminación de tejido necrótico en personas con heridas crónicas, incluidas las úlceras por presión, en el marco de la preparación del lecho de la herida. **Material y Métodos:** La pregunta de investigación se construyó con base en el modelo PICO: "¿Cuál es la evidencia disponible sobre la eficacia del desbridamiento cortante, en comparación con el desbridamiento autolítico, en la eliminación de tejido necrótico en personas con heridas crónicas, incluidas las úlceras por presión?". Se realizó una búsqueda de artículos publicados entre 2020 y 2026 en las bases de datos CINAHL Ultimate y MEDLINE Ultimate, a través de EBSCOhost, y MEDLINE, a través de PubMed. El proceso de selección siguió las recomendaciones PRISMA 2020. La evaluación de los niveles de evidencia se realizó conforme a las directrices del Instituto Joanna Briggs. **Resultados:** Se incluyeron seis estudios. La evidencia analizada describe la aplicación del desbridamiento cortante y del autolítico en distintos contextos clínicos, tiempos de respuesta y características de las heridas. Solo uno de los estudios compara directamente ambas técnicas y las poblaciones incluidas no se restringen a personas con úlceras por presión, abarcando también personas con úlceras del pie diabético y con heridas crónicas de otras etiologías. **Conclusión:** La evidencia disponible sugiere que el desbridamiento cortante permite una eliminación más rápida del tejido necrótico, mientras que el autolítico se asocia a menor dolor y a mayor preservación del tejido viable. El reducido número de estudios comparativos directos no permite establecer la superioridad de un método sobre el otro. Ambos se presentan como complementarios y no mutuamente excluyentes, pudiendo utilizarse de forma combinada o secuencial, en el marco de una decisión clínica individualizada y de una evaluación previa de seguridad.

Descriptores: Autólisis; Cicatrización de Heridas; Desbridamiento; Enfermería; Úlcera por Presión.

Introduction

The skin, as the largest organ of the human body, performs essential barrier, thermoregulation and protection functions, and is often overlooked when care is not specifically focused on skin integrity[1]. One of the most frequent skin lesions is the pressure ulcer, defined as a localised injury to the skin and/or underlying tissues, usually over a bony prominence, resulting from pressure alone or from pressure combined with shear and friction forces[1]. These lesions constitute a public health problem worldwide, contributing to a reduction in the quality of life of the person and of their main caregiver and entailing high costs for health systems[2].

The most recent literature shows that chronic wounds represent a substantial clinical burden, being associated with infection, delayed healing and functional impact. Debridement is widely recognised as a primary intervention in wound bed preparation, through the removal of necrotic/devitalised tissue and the promotion of conditions favourable to healing[3].

The complexity of treating pressure ulcers is more evident in the older population, in critically ill people or in those with multiple comorbidities, in whom healing capacity may be impaired. In these contexts, wounds show a more prolonged course and greater susceptibility to infection and to biofilm formation, as well as greater resistance to conventional approaches, requiring specialised, continuous and evidence-based intervention[1,4].

In chronic wounds, the presence of devitalised tissue represents a barrier to healing, contributing to microbial proliferation, the perpetuation of inflammation and biofilm formation. This environment favours the maintenance of the wound in its inflammatory phase, increasing the activity of metalloproteinases and pro-inflammatory cytokines and compromising tissue regeneration[4].

In these contexts, debridement plays a fundamental role in the physical removal of biofilm and in the reduction of microbial burden, stimulating epithelialisation and cell migration[5,4].

Where non-viable tissue is present in the wound bed, namely necrotic tissue, it may be necessary to resort to debridement techniques in order to cleanse it. The European Wound Management Association[6] defined debridement as the act of removing necrotic tissue, crusts, haematomas, foreign bodies, debris, bone fragments, moist necrosis, infected tissue, devitalised tissue, hyperkeratosis or any other type of bioburden from the wound bed, so as to promote healing. It plays a crucial role in promoting healing, improves microcirculation, reduces the risk of infection and may improve the person's quality of life by reducing odour and the levels of exudate production[1].

Once the need to debride a pressure ulcer has been identified, this intervention should begin as early as possible. Failure to debride a wound containing necrotic tissue may compromise its healing process, prolonging it or rendering it impossible. Owing to the inability to access and determine the depth of the wound, its treatment is hindered, entailing further consequences with a negative impact on the patient's quality of life, such as a higher risk of infection, recurrent inflammation, exudate formation and unpleasant odour, which may lead to greater psychological stress[1].

The assessment and classification of pressure ulcers is a fundamental stage of the decision-making process regarding the debridement method to be used, since each of these presents advantages and disadvantages in relation to the others, and may be classified as: sharp; surgical; autolytic; mechanical; enzymatic; biological; hydrosurgical; or ultrasound-guided[1].

The removal of non-viable tissue using cutting instruments, such as blades, curettes or scissors, is termed sharp debridement[7]. This method differs from surgical debridement not only in the setting in which it is performed, since sharp debridement may be carried out by the nurse at the person's bedside, in a treatment room or at home, whereas surgical debridement takes place in the operating theatre, but above all in the extent and depth of the intervention. Sharp debridement is conservative, is confined to non-viable tissue, does not extend beyond the plane of viable tissue and does not usually require anaesthesia, and it may be interrupted and repeated in successive

sessions. Surgical debridement, in turn, involves the excision of tissue up to bleeding margins, may reach deep structures and requires anaesthesia, a surgical environment and specific medical competence[1,7]. Among the remaining methods, biological or larval debridement constitutes an alternative in selected wounds, particularly in intensive care settings, and was not the object of the present review[8].

In comparison, the autolytic method consists of promoting the natural process of removal of necrotic tissue. In order to shorten this process, occlusive dressings are applied with the aim of maintaining a moist environment, that supports the activity of endogenous enzymes and phagocytic cells, including macrophages, which facilitate the breakdown and removal of non-viable tissue[9]. Although it is a time-consuming process, it is less invasive and generally less painful, being appropriate in situations that require a more conservative approach[3].

There is evidence showing that healing is more effective in a moist environment, since this favours re-epithelialisation and accelerates tissue regeneration, reducing scar formation[9]. The development of more advanced dressing materials has been studied in the context of autolytic debridement in chronic wounds[7,10,11,12].

The selection of the debridement method should be based on a comprehensive clinical assessment, taking into account the type of tissue, depth and location, the presence of biofilm, aetiology, tissue perfusion, pain and bleeding risk. This decision should be made in accordance with the clinician's scope of practice and competence and with the setting in which the procedure is to be performed[7].

The decision to debride is part of the conceptual framework of wound bed preparation, operationalised through the TIME acronym, which comprises non-viable tissue (Tissue), the control of infection and inflammation (Infection/Inflammation), moisture balance (Moisture) and the progression of the epithelial edges (Edge), and in which the removal of devitalised tissue and the disruption of biofilm constitute the first stage[9,4]. Prior to sharp debridement, a systematised assessment is recommended, including the vascular assessment of the limb, namely through the ankle-brachial index or Doppler assessment, verification of coagulation status, the assessment and control of pain and obtaining informed consent. The use of a safety checklist, confirming the competence of the professional, the adequacy of the care setting and the existence of criteria for interrupting the procedure, contributes to reducing the risk of complications and to standardising practice[1,13].

The present integrative literature review aims to synthesise the available scientific evidence on the effectiveness of sharp debridement, compared with autolytic debridement, in the removal of necrotic tissue in people with chronic wounds, including pressure ulcers.

Materials and Methods

For the preparation of this Integrative Literature Review (ILR), six fundamental stages were considered:

1. Definition of the research question;
2. Definition of the inclusion and exclusion criteria;
3. Selection and categorisation of the information extracted from the studies;
4. Critical appraisal of the included studies;
5. Synthesis and interpretation of the findings obtained; and
6. Presentation of the review and of the knowledge produced[14].

Research Question

To formulate the research question, the PICO model was used (Table 1), which makes it possible to structure the question clearly and objectively on the basis of four components:

- P (Population) — people with chronic wounds, including pressure ulcers;
- I (Intervention) — sharp debridement;

- C (Comparison) — autolytic debridement;
- O (Outcome) — effectiveness in the removal of necrotic tissue[14].

The PICO model was chosen rather than the PICOD model, since the D component (Design) is intended to delimit the types of study to be included in the review and not the type of review to be carried out. As no restriction was established regarding the design of the primary studies, the inclusion of that component was not warranted.

The research question outlined was: "What is the available evidence on the effectiveness of sharp debridement, compared with autolytic debridement, in the removal of necrotic tissue in people with chronic wounds, including pressure ulcers?".

Table 1: Formulation of the research question.

PICO strategy components	Description
P (Population)	People with chronic wounds, including pressure ulcers.
I (Intervention)	Sharp debridement.
C (Comparison)	Autolytic debridement.
O (Outcome)	Effectiveness in the removal of necrotic tissue.

Search Strategy

The literature search was initially carried out in April 2025 and updated in April 2026, with the aim of ensuring the inclusion of more recent studies published after the initial search. The MEDLINE Ultimate and CINAHL Ultimate databases were used, via EBSCOhost, and MEDLINE, via PubMed. The search strategy was developed on the basis of a combination of Medical Subject Headings (MeSH) descriptors, keywords, truncation and the Boolean operators AND, OR and NOT, resulting in the following search equation: "sharp debridement" OR "surgical debridement" OR "autolytic debridement" OR "debridement" AND "wound" OR "tissue necrosis" OR "necrotic tissue" OR "tissue" AND "pressure wound" OR "pressure injurie*" OR "pressure ulcer*" OR "pressure injury" NOT "negative pressure".

A time limit was applied to studies published between 2020 and 2026 and a language limit to publications in Portuguese, English and Spanish. It should also be noted that the term "surgical debridement" was included in the search strategy because it is frequently used interchangeably with "sharp debridement" in the English-language literature, although it does not correspond conceptually to surgical debridement as defined in the Introduction.

Table 2: Search equation used in the MEDLINE database, via PubMed.

Search	Search equation	Results
#1 *AND*	"Sharp Debridement" [Title/Abstract] OR "Surgical Debridement" [Title/Abstract] OR "Autolytic Debridement" [Title/Abstract] OR "Debridement" [Title/Abstract] OR "Debridement" [MeSH Terms]	9783
#2 *AND*	"Tissue Necrosis" [Title/Abstract] OR "Necrotic Tissue" [Title/Abstract] OR "Tissue" [Title/Abstract] OR "Wound" [Title/Abstract] OR "Wound" [MeSH Terms]	31 256
#3 *AND*	"Pressure Injuries" [Title/Abstract] OR "Pressure Injury" [Title/Abstract] OR "Pressure Ulcer" [Title/Abstract] OR "Pressure Wound" [Title/Abstract] OR "Pressure Wound" [MeSH Terms]	5691
#4 *NOT*	"Negative Pressure" [Title]	
#1 *AND* #2 *AND* #3 *NOT* #4, with a time limit (2020–2026)		341
Languages: Portuguese, English and Spanish		215

Article Selection Process

Following the formulation of the research question, the definition of the eligibility criteria and the design of the search strategy, a systematised process of study selection was established, with the aim of identifying those of greatest relevance to the objectives of this review[14].

Initially, all the citations obtained were exported and duplicate articles were automatically removed. Selection took place in two distinct stages: in the first stage, titles and abstracts were screened, with the exclusion of studies that did not meet the previously defined criteria. In the second stage, the selected texts were read in full, with the purpose of confirming their relevance and appropriateness.

After applying the search equation, 635 articles were identified: (215) identified in the PubMed database; (420) identified in the EBSCOhost MEDLINE and CINAHL databases. The citations obtained were

exported to EndNote Web software[15], where 223 duplicate articles were automatically removed, resulting in 412 unique articles.

This process was conducted independently by two reviewers, with any disagreements resolved by consensus. Of the 412 records screened, 241 were excluded (143 by title and 98 by abstract), and 171 publications were sought for full-text reading. Of these, 74 were not retrieved owing to the lack of access to the full text. Of the 97 publications assessed for eligibility, 91 were excluded for the following reasons: not answering the research question (n = 36); falling outside the defined time frame (n = 48); and not being primary studies or literature reviews (n = 7). Six studies met all the established criteria, making up the final sample of the review. The selection process is presented schematically according to the PRISMA 2020 model[16].

In order to ensure the quality and credibility of the scientific evidence included, the selected studies were appraised on the basis of the Joanna Briggs Institute (JBI) guidelines. This approach made it possible to classify the levels of evidence and to assess the methodological robustness of the included articles, ensuring the scientific integrity of the present review[17].

The following figure schematically represents the flow diagram of the selection process of the studies included in this ILR, prepared on the basis of the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) model, as recommended in order to ensure the transparency and reproducibility of the method used[16].

In order to ensure the scientific rigour of the studies included in this ILR, the appraisal method of the Joanna Briggs Institute (JBI) was used, this being an international reference in the field of evidence-based practice. It thus made it possible to classify the studies according to their level of evidence, taking into account the type of methodological design used and its robustness. The application of this methodology enabled a structured critical analysis, ensuring greater reliability and coherence in the interpretation of the results obtained[17].

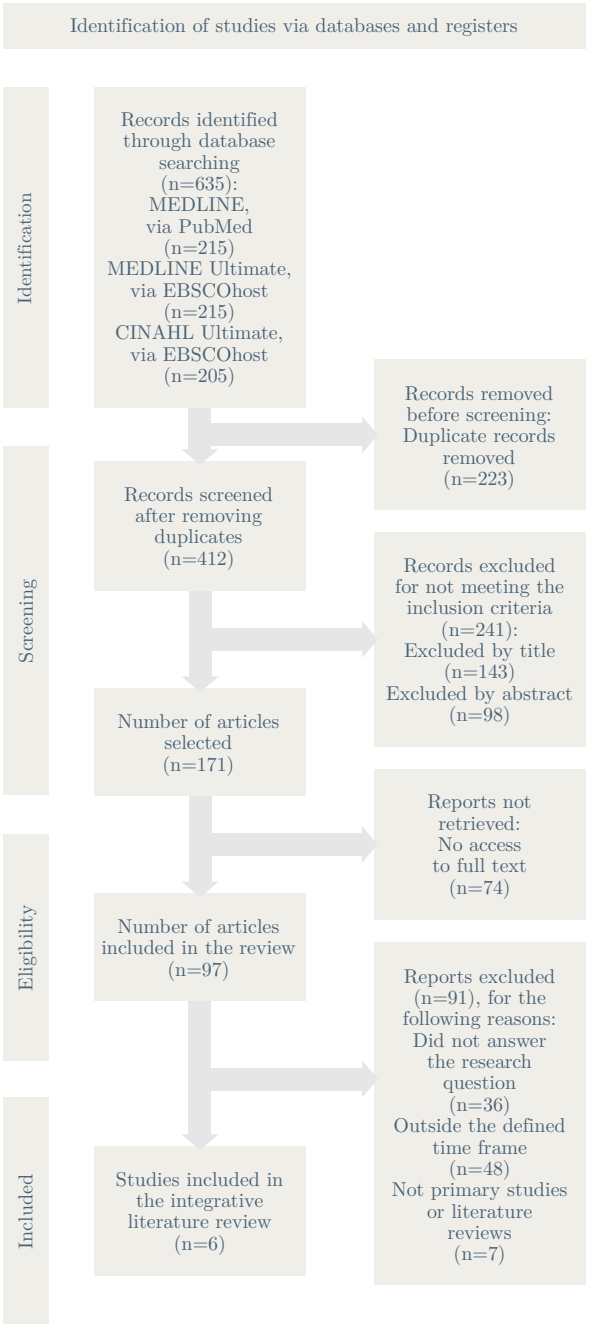


Figure 1: Flow diagram of the methodological process, based on the PRISMA 2020 model.
Note: Adapted from the PRISMA 2020 model[16].

Table 3 sets out the articles selected for the development of this ILR, together with the classification of the respective levels of evidence assigned to each study, in accordance with the criteria established by the JBI method. This arrangement allows a clear view of the methodological quality of the included studies, facilitating critical analysis and the interpretation of the results in a systematic and well-founded manner.

Table 3: Levels of evidence of the articles.

Authors	Study Design	Level of Evidence-
Verbanic *et al.* (2020)	Analytical observational study, without a control group.	Level 3.e
Nube *et al.* (2021)	Cross-sectional study.	Level 4.b
Barbosa & Paggiaro 2022)	RCT.	Level 1.c
Amadeh *et al.* (2025)	Systematic review of RCTs.	Level 1.a
Falcone *et al.* (2021)	Expert consensus document (Choosing Wisely methodology), with a prior literature search.	Level 5.b
Pargi & Gangji (2022)	Randomised controlled trial, with four parallel groups.	Level 1.c

Results

This integrative review including six studies that was analyzed considering their authors, year, country, objectives, sample characterization, interventions, and main results and conclusions. The synthesis presented in Table 4 allows us to compare the different debridement approaches identified in the literature, as well as their respective contexts of application, benefits, limitations, and clinical outcomes, with a particular focus on cutting debridement and autolytic debridement.

Discussion

The studies demonstrate that debridement represents an important intervention in wound bed preparation and in the promotion of healing, whichever technique is used. The authors are in agreement as to the importance of removing non-viable tissue, reducing bacterial burden and controlling biofilm, and of developing factors that re-establish an environment favourable to tissue repair[18,13].

Sharp debridement frequently emerges as the approach of choice in clinical settings, owing to its rapid and effective action. It is a widely used approach in the treatment of diabetic foot ulcers, being performed at most appointments and regarded as an integral part of clinical practice[3]. This type of debridement is advantageous owing to its speed and effectiveness and to the reduction of bacterial burden, being indicated in complex, extensive wounds requiring urgent intervention[13,19].

However, despite its recurrent use, the available scientific evidence is still unable to establish clearly the ideal frequency of its use, or the direct impact of that frequency on healing outcomes. Some studies even mention this gap and argue for the need for studies that clarify the relationship between the frequency of debridement and healing[3]. Accordingly, a single episode of sharp debridement is sometimes insufficient to produce immediate and significant changes in the wound microbiome, suggesting that the microbiological effects occur gradually and cumulatively[18].

Autolytic debridement is described as a more conservative and less invasive approach, making it more tolerable and associated with greater preservation of viable tissue. It proves to be a more relevant approach in more frail patients, with multiple comorbidities, or in less complex wounds. In the only included study that directly compares different methods, the group undergoing autolytic debridement showed significantly greater reductions in discomfort, pain and exudate than the group undergoing surgical debridement, even though the latter ensured faster removal of the infectious focus[19].

Although there may be no significant clinical superiority, the use of hydrogel dressings as autolytic debridement in diabetic foot ulcers showed a reduction in local inflammation, suggesting a potential benefit[12].

This type of debridement tends to have a slower action when compared with sharp debridement. Studies stress that it remains a valid option in less severe wounds or where a less aggressive approach that is more comfortable for the patient is preferred, although it is not the most appropriate when rapid removal of necrotic tissue is required[10,19].

Table 4: Results of the Integrative Literature Review.

Article 1: Frequency of sharp wound debridement in the management of diabetes-related foot ulcers: exploring current practice[3].
Authors/Date/Country: Nube, Alison & Twigg (2021). Australia.
Sample: The sample of this study consists of health professionals involved in the management of diabetic foot ulcers, recruited through clinical and professional networks, including public health services, private practice and specialised care settings.
Objective(s)/Interventions: To describe current clinical practice relating to conservative sharp debridement in diabetic foot ulcers, including how often it is performed, whether it is carried out at every appointment and which factors influence the clinical decision regarding its frequency.
Results/Conclusions: The study included 75 participants who met the inclusion criteria, mostly podiatrists, the majority of whom (83%) belonged to the public health system. All participants reported using conservative sharp wound debridement (CSWD), this being the predominant method in the treatment of diabetic foot ulcers, while other techniques were used infrequently, with the exception of hydrogels, occasionally used as adjuvants. Most professionals performed CSWD at weekly or fortnightly intervals, and 79% carried out debridement at every appointment when perfusion was adequate. Podiatrists in the public and urban sectors were found to perform debridement more frequently, whereas professionals in regional and rural areas showed a lower frequency, generally every two weeks or less. The main factors influencing the clinical decision were the presence of callus and devitalised tissue, infection and the availability of human resources, followed by logistical factors and patient access.
The authors conclude that conservative sharp debridement constitutes the main approach in the management of diabetic foot ulcers, being frequently performed at every appointment. The frequency of debridement appears to depend above all on clinical indicators of the wound, although it is also constrained by resource limitations, especially in rural and regional contexts, where care delivery tends to be less frequent..

Article 2: Comparative Efficacy of Autolytic and Collagenase-Based Enzymatic Debridement in Chronic Wound Healing: A Comprehensive Systematic Review[10].
Authors/Date/Country: Amadeh, Mohebbi, Amadeh & Jamshidbeigi (2025). Iraq.
Sample: 236 patients with chronic wounds, including different types of lesion, such as diabetic foot ulcers, pressure ulcers and burns, drawn from five randomised controlled trials included in the systematic review.
Objective(s)/Interventions: To assess and compare the effectiveness of autolytic debridement and enzymatic debridement, analysing the clinical outcomes associated with both methods, such as: reduction in wound area, formation of granulation tissue, epithelialisation, complete healing and the occurrence of adverse events.
Results/Conclusions: This systematic review included 236 patients in whom autolytic debridement was compared with enzymatic debridement in chronic wounds, including diabetic foot ulcers, pressure ulcers and other hard-to-heal wounds. Overall, the results show that both methods promote healing, but enzymatic debridement (namely with collagenase) shows better results in most of the outcomes assessed. A greater reduction in wound area was observed in four of the five studies, with significant differences in several of them, as well as greater formation of granulation tissue and a higher rate of epithelialisation. The complete healing rate was also higher in the enzymatic group in some studies.
However, some studies did not demonstrate statistically significant differences between the methods, particularly over shorter follow-up periods. Autolytic debridement showed favourable initial results in some situations, being slower but less invasive and better tolerated. In terms of adverse events, both methods were well tolerated, although the enzymatic method caused slight local irritation in some cases, without serious complications.
The evidence suggests that enzymatic debridement is superior in accelerating the healing process of chronic wounds, although autolytic debridement retains clinical relevance in selected situations, especially where a more conservative and less invasive approach is preferred.

Article 3: Hydrogel Enriched with Sodium Alginate and Vitamins A and E for Diabetic Foot Ulcer: A Randomized Controlled Trial[12].
Authors/Date/Country: Barbosa & Paggiaro (2022). Brazil.
Sample: 26 patients with diabetic foot ulcers, who were recruited and randomised into two intervention groups: control group (cleansing care and simple dressing) and experimental group (treatment with a hydrogel enriched with sodium alginate and vitamins A and E).
Objective(s)/Interventions: To assess the effectiveness of autolytic debridement promoted by a hydrogel enriched with sodium alginate and vitamins A and E in the healing of diabetic foot ulcers, comparing its effects with those of conventional dressings, through the analysis of the lesion area, healing parameters (PUSH) and changes in the wound tissue.
Results/Conclusions: No statistically significant differences were observed between the groups in the parameters assessed, although both showed improvement over time. Histological analysis demonstrated a reduction in the inflammatory infiltrate in both groups, without a significant increase in collagen production in the intervention group. The authors further note that initial differences in lesion size and the small sample size may have conditioned the results, limiting the ability to demonstrate differences between interventions.

Article 4: Microbial Predictors of Healing and Short-Term Effect of Debridement on the Microbiome of Chronic Wounds[18].
Authors/Date/Country: Verbanic, Shen, Lee, Deacon & Chen (2020). United States of America.
Sample: 20 outpatients with chronic wounds, from whom samples were collected from the wound surface before and immediately after sharp debridement, also including comparison with healthy skin.
Objective(s)/Interventions: To analyse the impact of sharp debridement on the composition of the microbiome of chronic wounds and to compare the microbiome of wounds with that of healthy skin, also assessing the association between microbial profiles and the absence of healing over 6 months.
Results/Conclusions: The study demonstrated that the microbiome of chronic wounds is dominated by genera such as *Staphylococcus*, *Pseudomonas, Proteus* and *Enterobacter*, differing from the microbiome of healthy skin. No significant immediate differences in the microbiome were observed between pre- and post-debridement samples, suggesting that acute debridement does not immediately alter the dominant bacterial composition of the wound. Nevertheless, a possible slight reduction in anaerobes was observed after the procedure.
When comparing healed with non-healed wounds, it was observed that wounds that did not heal showed a greater abundance of facultative anaerobic bacteria, notably *Enterobacter*, which was specifically associated with the absence of healing. Wounds in the process of healing, by contrast, tended to show a lower presence of these microorganisms and a higher relative proportion of strict anaerobes. The discussion suggests that communities rich in facultative anaerobes may be more resistant to the resolution of infection and associated with a poorer prognosis.

Article 5: Challenges in the management of chronic wound infections[13].
Authors/Date/Country: Falcone, Angelis, Pea, Scalise, Stefani, Tasinato, Zanetti & Paola (2021). Italy.
Sample: Consensus document prepared by a multidisciplinary panel of experts, on the basis of a PubMed/MEDLINE search restricted to the last ten years and to publications in English. The authors do not report eligibility criteria or the number of studies included, the final product being a decalogue of ten recommendations reached by full agreement of the panel.
Objective(s)/Interventions: To provide a guide to practices to be avoided in the treatment of infected chronic wounds.
Results/Conclusions: The authors describe autolytic debridement as the most conservative and painless method, resulting from a natural process of degradation of necrotic tissue by phagocytic cells and endogenous enzymes, indicated in non-infected wounds and possibly taking several days; if no significant reduction in necrotic tissue is observed, another method should be considered. As disadvantages, they point to its slowness and the possible damage to adjacent tissue. Surgical debridement, performed with cutting instruments, is presented as the current reference standard in infected chronic wounds, since it allows the complete removal of infected tissue and the collection of deep material for culture, its disadvantages being the lack of selectivity, postoperative pain and the need for anaesthesia or nerve block and for professionals with specific training.
The authors further stress that biofilm is present in approximately 90% of chronic wounds and that debridement constitutes the first step in its removal, creating a therapeutic window of approximately 72 hours for the action of antiseptics, so that wound bed preparation, framed within the TIME concept, should always be combined with antisepsis.

Article 6: Approach to Wound Bed Preparation in Superficial Soft Tissue Infections: A Comparative Study of Methods of Debridement[19].
Authors/Date/Country: Pargi & Gangji (2022). India.
Sample: One hundred patients with acute and chronic wounds, randomly allocated to four groups matched for age, sex and comorbidities: Group I — surgical (n = 25); Group II — autolytic (n = 25); Group III — mechanical (n = 24); Group IV — enzymatic (n = 25). The aetiologies included necrotising soft tissue infections, diabetic foot, venous ulcers, post-traumatic and post-burn wounds, surgical site infections and pressure ulcers, the latter representing less than 10% of the sample. Two deaths from multiorgan failure were recorded during the study.
Objective(s)/Interventions: To compare four debridement methods, namely surgical (Group I), autolytic (Group II), mechanical (Group III) and enzymatic (Group IV), as to their effectiveness in wound bed preparation, in acute and chronic wounds of various aetiologies, assessing discomfort, pain, exudate and healing time.
Results/Conclusions: The authors recognise surgical debridement as the reference method for the removal of necrotic tissue, since it ensures the fastest elimination of the infectious focus and allows a rigorous assessment of the wound. They stress, however, that it also removes new and viable tissue, entails a bleeding risk and requires anaesthesia, operating theatre conditions and monitoring, which makes it difficult to repeat and renders it unsuitable in patients with relevant comorbidities. In the ANOVA analysis, the reduction in discomfort and pain was significantly greater in the groups undergoing autolytic and mechanical debridement than in the remaining groups (days 3, 7, 14, 21 and 28; $p < 0.05$), with the same pattern being observed for the reduction in exudate (days 7, 14 and 21). The authors conclude that the autolytic, mechanical and enzymatic methods constitute safer alternatives for maintenance debridement, since they can be repeated as often as the dressing changes themselves, without requiring specific technical expertise and without significant discomfort for the patient.

The various studies converge on the idea that there is no universal method for choosing the most appropriate approach, which should be selected individually and adapted to the needs of each person. The main advantages of sharp debridement are the speed and effectiveness of the removal of necrotic tissue, and it is described as the preferred option in complex wounds, with tissue infection or with extensive necrosis[3,13,19].

Autolytic debridement, in turn, stands out for its selectivity, safety and comfort, constituting a suitable alternative in less urgent settings or in patients for whom a more invasive approach is contraindicated[10,12,19].

The two methods should not, however, be regarded as mutually exclusive. The evidence analysed suggests instead a relationship of complementarity, in which sharp debridement allows the initial removal of extensive or adherent necrotic tissue and autolytic debridement ensures the maintenance of the wound bed between procedures, through dressings that preserve the moist environment. This sequential or combined use is particularly relevant in people with clinical frailty, in whom the extent of sharp debridement should be limited, making it possible to reconcile speed of removal with comfort and the preservation of viable tissue[10,13,19].

The interpretation of these results nevertheless requires caution. Of the six included studies, only one, the study by Pargi and Gangji, establishes a direct comparison between methods[19] and, even in that case, the reference group underwent surgical debridement, under anaesthesia, and not conservative sharp debridement, the autolytic method being only one of the four arms compared; in that study, pressure ulcers accounted for less than 10% of the aetiologies included. The remaining studies analyse one of the techniques in isolation or compare autolytic debridement with enzymatic debridement. Furthermore, the populations studied are not restricted to people with pressure ulcers, also including people with diabetic foot ulcers, venous ulcers, necrotising soft tissue infections and chronic wounds of other aetiologies, and the methodological designs, outcome measures and follow-up periods are heterogeneous. It should also be noted that the English-language literature frequently uses the terms sharp debridement and surgical debridement interchangeably, not always allowing conservative sharp debridement to be distinguished from surgical debridement, which constitutes a further limitation to the comparative reading of the results. These limitations preclude any inference as to the superiority of one method over the other and justify the conduct of randomised controlled trials, with homogeneous populations of people with pressure ulcers and with standardised outcome measures.

Finally, the selection of the debridement method should take into account a holistic assessment of the type of wound and of the person, considering factors such as the amount of devitalised and necrotic tissue, the presence and extent of infection, clinical urgency, tolerance of the procedure, the resources available and the therapeutic objectives. A person-centred and evidence-based approach makes it possible to optimise clinical outcomes and to promote effective and safe healing.

Conclusion

The choice of debridement method is decisive for the progression of the wound and should be based on a comprehensive clinical assessment that considers the characteristics of the lesion, the extent and type of devitalised tissue, the presence of biofilm or infection, the general condition of the person and the therapeutic objectives defined.

The evidence analysed associates sharp debridement with faster removal of necrotic tissue, it being described above all in wounds with extensive areas of devitalised tissue. Its immediate action is related to the reduction of bacterial burden, the disruption of biofilm and wound bed preparation, creating conditions described as favourable to the progression of the healing process.

However, it is an invasive procedure, associated with potential risks such as pain, bleeding and the inadvertent removal of viable tissue. These limitations require careful assessment, particularly in people with

coagulation disorders, compromised tissue perfusion or greater clinical vulnerability.

Autolytic debridement, in turn, constitutes a conservative, selective and less invasive approach. It is based on the body's own capacity to degrade necrotic tissue, through the action of endogenous enzymes in a moist environment. This method preserves healthy tissue, is generally less painful and shows good tolerability, being particularly suitable for people with greater clinical frailty or for those who do not tolerate more aggressive procedures.

Despite these advantages, autolytic debridement has a slower action and may prove less effective in ulcers with large amounts of necrotic tissue, a high bacterial burden or a significant presence of biofilm. In such cases, the therapeutic response may take longer, requiring continuous monitoring and possible reconsideration of the therapeutic strategy.

The selection between sharp and autolytic debridement should therefore be carried out judiciously, taking into account the specific characteristics of the ulcer, the clinical condition of the person, the risk of complications, pain tolerance and the resources available.

In summary, the evidence analysed suggests that sharp debridement is associated with faster removal of necrotic tissue and that autolytic debridement constitutes a safe and better-tolerated alternative in situations requiring a more conservative approach. The small number of direct comparative studies and the heterogeneity of the populations included do not, however, allow the superiority of one method over the other to be asserted. Both should be understood as complementary and may be used in a combined or sequential manner, within an individualised clinical decision, preceded by a safety assessment and oriented towards the effectiveness and quality of the care provided.

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JF: Coordination of the study, study design, data collection, storage and analysis, review and discussion of results.
BF: Study coordination, study design, data collection, storage and analysis.
RF: Study coordination, study design, data collection, storage and analysis.
SS: Study coordination, study design, data collection, storage and analysis.
MC: Study coordination, study design, data collection, storage and analysis.
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