

Treatment of pressure ulcers in people diagnosed with COVID-19 in hospital*Tratamiento de las úlceras por presión en personas diagnosticadas de COVID-19 en el hospital**Tratamento de lesão por pressão em pessoas com diagnóstico de COVID-19 em internação hospitalar***Abstract**

This is an integrative literature review, which sought to highlight and discuss the possibilities of pressure injury treatment in people diagnosed with COVID-19 in hospital, based on scientific publications indexed in the Medical Literature and Retrieval System Online database. , between 2020 and 2021. 24 articles were obtained. Following the inclusion criteria, 09 studies were selected for analysis. Some evidence in the literature that suggests a significant increase in pressure injuries in patients who develop severe acute respiratory syndrome associated with COVID-19, which requires prolonged intubation, tracheostomies and prone position. Pressure injuries were pointed out in many cases as unavoidable. Treatment is essential for existing injuries, but preventive measures to combat the main extrinsic risk factors are fundamental and have always been available to everyone in the health team. Therefore, prevention is the culture of risk factor control and, regardless of the patient's condition, we must prevent pressure injuries.

Descriptors: COVID-19; Pressure Injury; Clinical Management; Wounds and Injuries; Nursing.

Resumén

Se trata de una revisión integrativa de la literatura, que buscó destacar y discutir las posibilidades del tratamiento de lesiones por presión en personas diagnosticadas con COVID-19 en el hospital, a partir de publicaciones científicas indexadas en la base de datos Medical Literature and Retrieval System Online, entre 2020 y 2021. Se obtuvieron 24 artículos. Siguiendo los criterios de inclusión, 09 estudios fueron seleccionados para el análisis. Algunas evidencias en la literatura que sugieren un aumento significativo de lesiones por presión en pacientes que desarrollan síndrome respiratorio agudo severo asociado a COVID-19, que requiere intubación prolongada, traqueotomías y posición prona. Las lesiones por presión se señalaron en muchos casos como inevitables. El tratamiento es fundamental para las lesiones existentes, pero las medidas preventivas para combatir los principales factores de riesgo extrínsecos son fundamentales y siempre han estado al alcance de todos los integrantes del equipo de salud. Por tanto, la prevención es la cultura del control de los factores de riesgo y, independientemente del estado del paciente, debemos prevenir las lesiones por presión.

Descritores: COVID-19; Lesión por Presión; Gestión Clínica; Heridas y Lesiones; Enfermería.

Resumo

Trata-se de revisão integrativa da literatura, que buscou evidenciar e discutir as possibilidades de tratamento de lesão por pressão em pessoas com diagnóstico de COVID-19 em internação hospitalar, a partir de publicações científicas indexadas na base de dados Medical Literature and Retrieval System Online, entre 2020 e 2021. Foram obtidos 24 artigos. Seguindo os critérios de inclusão, 09 estudos foram selecionados para análise. Algumas evidências na literatura que sugerem aumento significativo de lesão por pressão em pacientes que desenvolvem síndrome respiratória aguda grave associada à COVID-19, que requerem intubação prolongada, traqueostomias e posição prona. As lesões por pressão foram apontadas em muitos casos como inevitáveis. O tratamento é fundamental para as lesões existentes, mas as medidas preventivas de combate aos principais fatores de risco extrínsecos são fundamentais e sempre estiveram ao alcance de todos da equipe de saúde. Portanto, prevenção é a cultura de controle de fatores de risco e, independente da condição do paciente, devemos prevenir as lesões por pressão.

Descritores: COVID-19; Lesão por Pressão; Gerenciamento Clínico; Ferimentos e Lesões; Enfermagem.

Márcio Neres dos Santos¹

ORCID: 0000-0002-4413-9878

Dóris Baratz Menegon²

ORCID: 0000-0002-7623-0705

Rodrigo Madril Medeiros²

ORCID: 0000-0002-8483-6133

¹Pontifícia Universidade Católica do Rio Grande do Sul. Rio Grande do Sul, Brazil.

²Hospital das Clínicas de Porto Alegre. Rio Grande do Sul, Brazil.

How to cite this article:

Santos MN, Menegon DB, Medeiros RM. Treatment of pressure ulcers in people diagnosed with COVID-19 in hospital. Glob Acad Nurs. 2022;3(5):e328.

<https://dx.doi.org/10.5935/2675-5602.20200328>

Corresponding author:

Márcio Neres dos Santos

E-mail: nerespoa@gmail.com

Chief Editor: Caroliny dos Santos Guimaraes da Fonseca

Executive Editor: Kátia dos Santos Armada de Oliveira

Submission: 05-29-2022

Approval: 06-17-2022



Introduction

The current pandemic by the new Coronavirus (SARS-CoV-2) has brought numerous challenges for health professionals, especially for the nursing team that provides direct assistance to patients suspected or confirmed to be infected with SARS-CoV-2, that is, diagnosed with COVID-19. These must be technically prepared considering the particularities of this infection. Hospitals have different characteristics depending on the physical space, work process and organization, operational working conditions, dimensioning of nursing staff, available equipment and procedures performed. Such characteristics may confer greater risk, in the face of a pandemic situation.

Until the last week of May 2022, 30,945,384 cases of COVID-19 were confirmed in Brazil, 29,943,090 recovered cases, 335,903 in follow-up and 666,391 deaths. Transmission occurs through droplets and aerosols, contact with contaminated hands, objects and surfaces. Although most infections are asymptomatic, those with mild symptoms can gradually progress quickly to more severe conditions requiring hospitalization. The most common symptoms of COVID-19 are fever, tiredness and dry cough. Some patients may experience pain, nasal congestion, headache, conjunctivitis, sore throat, diarrhea, loss of taste or smell, skin rash, or discoloration of fingers or toes^{1,2}.

It is pointed out that the clinical cutaneous manifestations of COVID-19 may be products of the state of inflammation or result from microthromboses due to the state of hypercoagulability that occur in the most severe cases. Thus, cytokine release, endothelial dysfunction, and ischemia perpetuate other processes that are also postulated to increase the likelihood of pressure injury (PU). In addition, the skin has bioavailability of the angiotensin-converting enzyme 2 (ECA2), cell receptor of the SARS-CoV-2 virus, being a potential target³⁻⁶.

PIs increase morbidity and mortality, hospital costs and mean length of stay. In the United States of North America, it is estimated that the number of hospital days for patients who develop PI is 4 to 6 days longer compared to those without PI, increasing the cost of hospitalization by approximately US\$ 50,000 to US\$ 60,000 by admission^{7,8}.

We already have some evidence in the literature that suggests a significant increase in PI in patients who develop severe acute respiratory syndrome associated with COVID-19, which requires prolonged intubation, tracheostomies and prone position. This is related to the presence of intrinsic conditions of the patient (adverse to the maintenance of organic homeostasis) and extrinsic conditions of the care environment (adverse in the care environment), when uncontrolled, determine a high risk for the development of PI. It should be noted that PI related to medical devices are iatrogenic and represent more than 30% of all pressure injuries acquired in hospitals and may be increased in this group of patients^{4,7,9}.

Different studies have shown that the skin changes seen in COVID-19 are, in most cases, exanthematous lesions, characterized by skin eruptions described in different terminologies. Cases of pseudoerythema pernio were also

observed, characterized by spots on the fingers and toes, sometimes reddish, sometimes purplish^{3,6,10,11}.

The objective of this study was to describe the possibilities for treating pressure ulcers in people diagnosed with COVID-19 in hospital. Therefore, this study is considered relevant for the instrumentalization of care teams, since it is extremely important for them to be able to make the differential diagnosis, since some injuries in hospitalized patients diagnosed with COVID-19 evolve into vesicles with hemorrhagic content and ulcerations, that can converge in large ulcers, which can be confused with PI^{3,6}.

Methodology

The present study uses the integrative literature review as a method, which aims to gather and summarize the scientific knowledge already produced on the investigated topic, that is, it allows searching, evaluating and synthesizing the available evidence to contribute to the development of knowledge in the theme. For the elaboration of this integrative review study, the following steps were: definition of the research question and objectives; establishment of inclusion and exclusion criteria for publications (sample selection); literature search; analysis and categorization of studies, critical analysis of findings, identifying differences and conflicts; interpretation of results; and clearly report the evidence found¹².

To guide the research, based on the use of the PICO strategy, which represents an acronym for problem/interest/context, the following guiding question was formulated: What has been produced in the literature on the clinical management of pressure injuries in the hospital environment in patients with COVID-19?

The identification and selection of studies was carried out in the Medical Literature and Retrieval System Online (MEDLINE) database, in March 2022, accessed through the link provided by PubMed, which is a search engine with free access to this database. of data. The following criteria were adopted for article selection: all article categories (original, systematic review, letter to the editor, experience report, etc.); articles with abstracts and full texts available for review; those published between 2020 and 2021, and articles that contained the following descriptors in their titles and/or abstracts (MeSH - Medical Subject Headings): "Disease Managements", "COVID-19", "Pressure Injuries". The resource used in the research was the expression "exact term", associated with specific descriptors. The exclusion criteria of the articles were: studies that were at odds with the desired theme and that did not meet the reported inclusion criteria. The short period for the delimitation of the studies resulted from the date of the pandemic decree for COVID-19 by the World Health Organization in March 2020.

Chart 1 demonstrates more clearly how the process of selecting articles was.

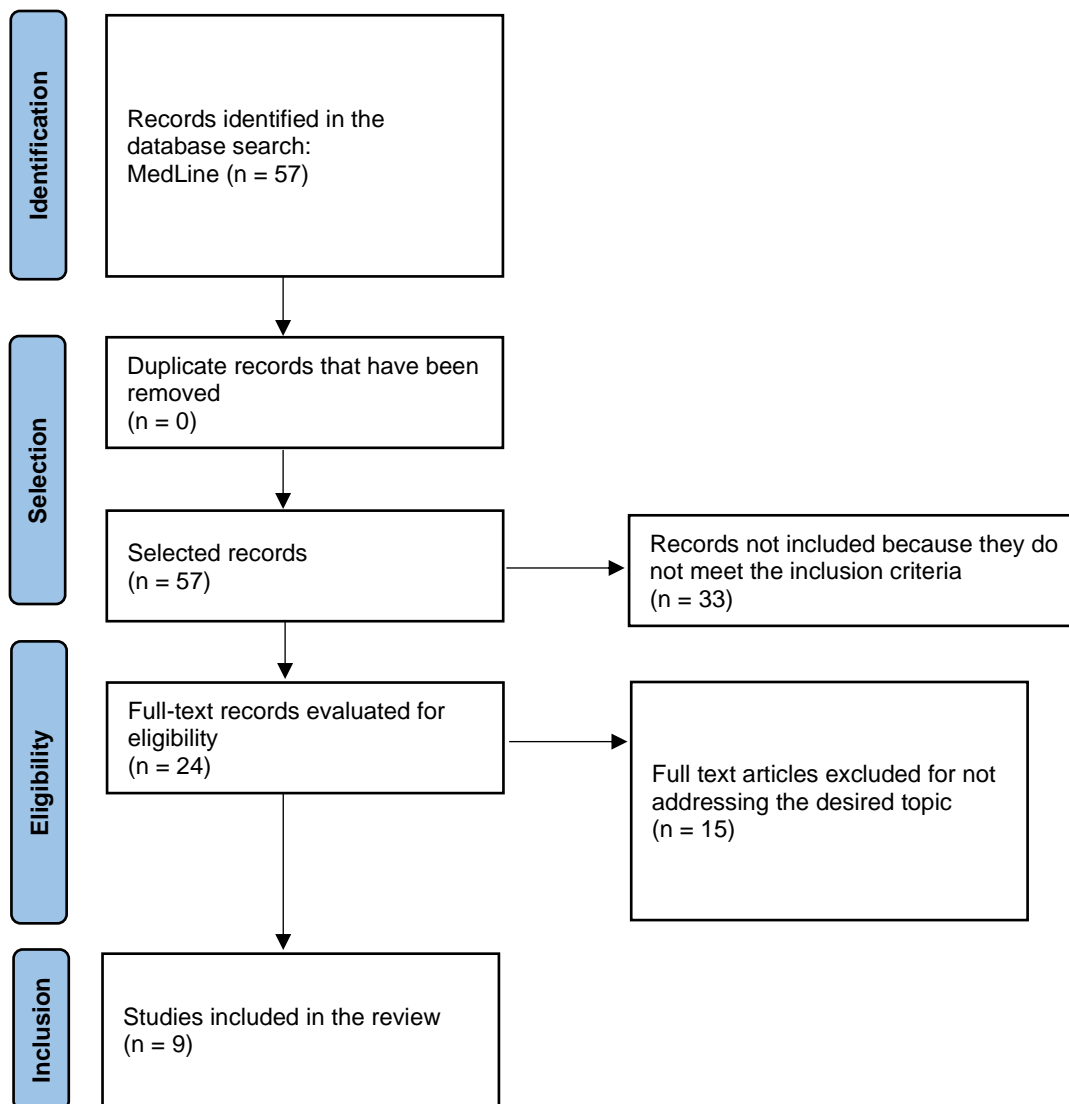
Twenty four articles were evaluated for eligibility. Following the inclusion criteria, 09 studies were selected for analysis, which are referenced in this text. A bibliometric analysis was performed to characterize the selected studies. Subsequently, the concepts addressed in each article and of



results and conclusion. After reading the selected studies in full, the analysis and organization of themes continued: revisiting concepts for optimizing PI treatment; care guidelines for PI treatment and PI treatment.

interest to the researchers were extracted. An instrument was developed to collect information in order to answer the guiding question of this review, consisting of the following items: title, authors, method, journal, year of publication, place of origin of the research, objective of the study, main

Chart 1. Selection process of articles for the study. Porto Alegre, RS, Brazil, 2022



Results and Discussion

Revisiting Concepts for Optimizing PI Treatment

During the COVID-19 pandemic, health professionals around the world are adopting some measures in relation to PI without or with little scientific evidence, since there are still gaps in pathophysiology, treatment and especially in relation to prevention. of these injuries. It is the duty of any health professional to carry out care practices based on scientific evidence, however there is also a dependence on a structure in health services, which subsidize adequate material and human resources to carry out the work processes.

PI can be defined as a localized lesion in an area of damage to the skin and underlying soft tissue, usually over a bony prominence or related to a medical device. The lesion may have intact skin or an open ulcer. Injury occurs as a result of intense pressure and/or prolonged pressure in

combination with shear. Soft tissue tolerance to pressure and shear can also be affected by microclimate, nutrition, perfusion, comorbid conditions and soft tissue conditions¹³.

The National Pressure Ulcer Advisory Panel (NPUAP) published guidelines in the years 2016 and 2019 on the PI grading system. We reinforce some considerations from these publications: 1) replacement of the term ulcer by pressure injury; 2) staging from roman numerals to arabic (for example: stage 1); 3) the definition of PI must be related to the appearance of the lesion in a bony prominence or under a medical device; 4) revised definition of stage 2 PI to clarify difference between moisture associated skin damage and pressure and/or shear injury, 5) removed suspect term from deep tissue PI and changed to deep tissue PI; 6) each staging describes the extent of tissue loss and anatomical features^{13,14}.



It is recommended that the protocols used in the prevention and treatment of PI be institutional and multidisciplinary, based on the best scientific evidence and current recommendations from the Ministry of Health and the NPUAP, addressing the main actions for the following points: prevention of PI; identification and classification of patients at risk for PI; preventive measures and early identification of PI; evaluation, treatment and evolution of PI. It is also understood that the decision to adopt any specific recommendation should be taken by the health professional, taking into account the available resources and the circumstances presented by the particular client¹³⁻¹⁷.

PI Treatment Care Guidelines

PI Evaluation

The assessment of PI should occur at dressing changes. The PI should be evaluated regarding the characteristics of the lesion (staging; type of tissue; exudate; dead space; edges) and of the adjacent skin, as well as the registration in specific forms. Different PI classification systems can be used depending on institutional culture, geographic location, resource availability, etc. The important thing is that this system is scientifically validated and is linked to the local institutional protocol. In Chart 1 we present the definitions adopted by the NPUAP Classification System^{13,14}. Chart 2 presents a suggestion of criteria for evaluating PI.

Chart 1. PI staging and tissue types. Porto Alegre, RS, Brazil, 2022

Staging	
Stage 1 - Intact skin with non-whitening erythema.	Intact skin with a localized area of nonblanching erythema that may look different on dark skin. Presence of whitening erythema or changes in sensitivity, temperature, or consistency (induration) may precede visual changes. Color changes do not include purple or brown discoloration; these may indicate deep tissue damage.
Stage 2 - Partial-thickness skin loss with dermal exposure.	Loss of skin in its partial thickness with exposure of the dermis. The wound bed is viable, pink or red in color, moist, and may also appear as an intact (filled with serous exudate) or ruptured blister. Adipose tissue and deep tissue are not visible. Granulation tissue, slough, and eschar are not present. These injuries usually result from inadequate microclimate and skin shear in the pelvic region and calcaneus. This stage should not be used to describe skin injuries associated with wetness, including incontinence-associated dermatitis (IAD), intertriginous dermatitis, skin injury associated with medical adhesives, or traumatic wounds (friction injuries, burns, abrasions).
Stage 3 - full thickness skin loss.	Full-thickness skin loss in which fat is visible, and often granulation tissue and epibolus (wound with rolled edges) are present. Sludge and/or eschar may be visible. The depth of tissue damage varies according to the anatomical location; areas with significant adiposity may develop deep lesions. Detachment and tunneling may occur. There is no exposure of fascia, muscle, tendon, ligament, cartilage and/or bone. When slough or eschar impairs the identification of the extent of tissue loss, it must be classified as a Non-Classifiable Pressure Injury.
Stage 4 - full thickness skin loss and tissue loss.	Full-thickness skin loss and tissue loss with direct exposure or palpation of fascia, muscle, tendon, ligament, cartilage, or bone. Sludge and/or eschar may be visible. Epibolus (wound with rolled edges), detachment and/or tunneling often occur. The depth varies according to the anatomical location. When slough or eschar impairs the identification of the extent of tissue loss, it must be classified as a Non-Classifiable Pressure Injury.
Non-staged pressure injury - full-thickness skin loss and non-visible tissue loss.	Full-thickness skin loss and tissue loss in which the extent of damage cannot be confirmed because it is covered by slough or eschar. Upon removal (slough or eschar), a Stage 3 or Stage 4 Pressure Injury will be apparent. Stable eschar (i.e., dry, adherent, without erythema or fluctuation) on an ischemic limb or calcaneus should not be removed.
Deep Tissue Pressure Injury - Persistent, non-blanching dark red, brown, or purple discoloration.	Intact or non-intact skin with localized and persistent area of non-blanchable dark red, brown or purple discoloration or epidermal separation showing lesion with darkened bed or blister with bloody exudate. Pain and changes in temperature often precede changes in skin color. The discoloration may look different in people with darker skin tones. This injury results from intense and/or prolonged pressure and shear at the bone-muscle interface. The wound may rapidly evolve and reveal the current extent of tissue damage or resolve without tissue loss. When necrotic tissue, subcutaneous tissue, granulation tissue, fascia, muscle or other underlying structures are visible, this indicates a pressure injury with total tissue loss (Non-Classifiable Pressure Injury or Stage 3 or Stage 4). The Deep Tissue Pressure Injury (TPPT) category should not be used to describe vascular, traumatic, neuropathic, or dermatological conditions.
Medical device-related pressure injury	Skin with presence of hyperemia to deeper abrasive lesions.
Type of tissue	
Viable	Epithelial tissue is the new pink or shiny tissue that develops from the edges or as "islands" on the surface of the lesion. Granulation tissue is bright red or pink, shiny, moist and granular or pale red and opaque (at risk). It is important to pay attention to clinical situations of hypergranulation (excess granulation tissue; friable; pale red), as it is considered an unfavorable condition.
Impracticable	The slough has a thin, mucoid and soft consistency; firmly or loosely adhered to the wound bed or edges; yellow, white or gray color. Necrosis, on the other hand, has a hard and dry consistency "eschar" or a softer "wet necrosis" of gray, black or brown color firmly adhered to the bed or edges of the lesion.

Source: Adapted from the NPUAP Classification System^{13,14} and the Multiprofessional Care Protocol: Prevention and Treatment of Pressure Injury by HC-UFTM/Ebserh¹⁷.

Chart 2. PI evaluation criteria. Porto Alegre, RS, Brazil, 2022

Types of exudate	
Serous	Thin consistency; watery and clear.
Serosanguineous	Thin, watery, reddish to pink consistency
Bloody	Thick / thin consistency and red in color.
Seropurulent	Semi-thick consistency; cloudy and yellowish or brownish in color.
Purulent	Thick consistency and greenish, brownish or yellowish color.
Amount of exudate	
None/Dry	Primary dressing has no fluid, it is dry; may be adhered to the lesion.



Small/Wet	Primary dressing has small amount of fluid/secretion.
Moderate/Wet	Primary dressing is extensively wetted, but no extravasation occurs; change frequency is normal for the type of dressing.
Large/Saturated	Dressing is extensively wet and leakage may be occurring; the perilesional skin may be macerated; dressing change is required more frequently for the type of dressing used.
Odor	
Absent	Absence of strong odor.
Present	Strong and fetid odor.
Pain intensity assessment score (faces scale; visual analogue or numeric)	
No pain – 0	Frequency: Never Only during dressing Frequent Ever
Mild pain – 1 to 2	
Moderate pain – 3 to 7	
Severe pain – 8 to 10	
Dead space	
Present	Store (dead space under intact skin); tunnel (channel that goes deep into the wound bed) and external fistula (channel between a viscera and the skin). It is essential to describe the location and depth in centimeters.
Edges	
Preserved	Integral; adhered to the lesion; light coloring; defined contour, regular or undefined.
Impaired	Hyperkeratosis; not adhered to the lesion; unglued; fibrotic; macerated; necrotic; bleeding; friable; swollen; coiled (epibole).
Adjacent skin	
Preserved	Full
Impaired	Alteration of sensitivity (pain; anesthesia; tingling; pruritus), consistency (edema; hardened), temperature (hot or cold), color (pale or reddish), texture (flaky; dry; macerated) and integrity (vesicles/blisters, erosion, skin tear, etc.).

Source: Adapted from the multidisciplinary care protocol: Prevention and treatment of pressure injuries by HC-UFTM/Ebserh¹⁷.

PI Treatment

It is recommended that the treatment of installed PI be implemented in conjunction with the preventive measures provided for in the local protocol. According to current recommendations, didactically they can be divided into topical and systemic treatments. Treatment should include cleaning and debridement procedures; application of topical therapy (primary, secondary and fixation coverages) and; and systemic intervention^{14,16-22}.

Regarding cleaning procedures, the technique for cleaning the lesion and adjacent skin aims to remove secretions, loose devitalized tissues, microorganisms and residues from topical coverings, preserving granulation tissue and minimizing risks of trauma and/or infection. The PI cleaning should use antimicrobial solutions to clean lesions with suspected or confirmed infection. In other cases, cleaning can be performed with 0.9% saline solution (SF) heated in a jet^{14,17}.

As for debridement, it is not recommended to debride stable and hard necroses in the lower limbs, especially in the calcaneus. It is important to clean the skin around the PI, avoid removing hard, dry, stable eschar on ischemic limbs and heels, unless infection is suspected. Likewise, devitalized tissues with suspected or confirmed lesion biofilm should also be debrided. Maintenance debridement should continue until the wound bed is free of devitalized tissue and covered with granulation tissue^{13,14,16}.

The professional can opt for debridement according to his clinical evaluation, and may have the following options:

- A) Mechanical – use of 0.9% SF jet or gauze.
- B) Enzymatic – use of primary topical coverage with proteolytic enzymes) or Autolytic (primary

topical coverage with facilitators of macrophage action and endogenous proteolytic activity).

C) Conservative instruments – use of scissors/scalpel. Conservative or surgical debridement should be indicated when mechanical and enzymatic or autolytic debridement are not sufficient. Dry necroses should be “scarified”, in the form of a net, (Square technique) using a scalpel or 0.12X40 needle, before applying the enzymatic or autolytic topical coverage, to facilitate the penetration of this product^{14,16,17}.

D) Surgical – preferably use grading systems such as the RYB color grading system for debridement selection: red; yellow and black, thinking about protecting the red area, cleaning the yellow area and debriding the black area^{17,19}.

The prescription and application of topical therapies should be based on the goals and self-care skills of the individual and/or their informal caregiver and based on clinical judgment, including: diameter, shape and depth of the pressure sore; need to address bacterial burden; ability to keep the wound bed moist; nature and volume of wound exudate; condition of the tissue in the wound bed, condition of the perilesional skin; presence of tunneling and/or cavitation and; ache¹⁴.

The health professional must assess the cost-effectiveness of coverage at the local level, taking into account the direct and indirect costs to the health system and to the individual with a pressure injury. Advanced dressings that promote moist healing are likely to be more cost-effective due to faster healing times and less frequent dressing changes. Coverages include: primary, secondary and fixation/support devices, as shown in Charts 3 and 4^{13,14,17-19,26}.



Chart 3. Primary coverage adopted in the treatment of PI. Porto Alegre, RS, Brazil, 2022

Stage	Characteristics	Coverages and exchange period
Stage 1	Hyperemia. Presence of areas with moderate/high exposure to shear/friction; areas with little exposure to shear/friction and areas with exposure to moisture.	-Hydrocolloid plaque - up to 7 days (before, loose edges and color change). -Essential Fatty Acid (AGE) - every 6 hours. - Skin protectors (polymeric solution; Zinc Oxide) - every 6 hours.
Stage 2	Blister or superficial lesion.	- Blister intact - Gauze + AGE. Change every 12 hours. - Superficial lesion - No/little exudate - Hydrocolloid Plaque Up to 7 days (before, if loose edges and color change) or sterile non-adherent mesh every 24 hours. - Superficial injury - moderate exudate - Sterile non-adherent mesh for up to 24 hours.
Stage 3 and Stage 4	Eschar; wet necrosis; slough; large amount of exudate; may have areas with granulation tissue; complex wounds.	- Eschar without bleeding - Papain 10%, every 12 hours; - Scar with bleeding; Mixed necrosis; Papain intolerance – Hydrogel with calcium and sodium alginate (gel), every 24 hours; - Slough - little/moderate -Papain 6%, every 12 hours. - Slough – thick layer - Papain 10%, every 12 hours. - Slough – bleeding, mixed tissue, intolerance to papain - Hydrogel with calcium and sodium alginate (gel), every 24 hours. - Large amount of exudate without infection - Calcium and sodium alginate, up to 5 days or change when saturated. Large amount of exudate with infection - Calcium and sodium alginate, every 24 hours. - Granulation tissue – with or without bleeding, sensitivity to papain - Sterile non-adherent mesh or Hydrogel with sodium and calcium alginate (gel), every 24 hours. - Complex wound – debrided – negative pressure therapy or calcium and sodium alginate for up to 5 days.
Deep tissue	Intact/non-intact skin with dark red area.	-Areas with moderate/high exposure to shear/friction - Hydrocolloid Plaque or non-sterile polyurethane transparent film, up to 7 days. - Little exposure to shear/friction –AGE, every 6 hours.
Perilesional skin		- Full -Zinc oxide ointment - Polymeric solution / - EFA, when changing dressings. - - Wounded - Polymeric solution - Sterile non-adherent mesh, when changing dressings.

Source: Adapted from the multidisciplinary care protocol: Prevention and treatment of pressure injuries by HC-UFTM/Ebserh¹⁷.

Chart 4. Secondary coverage adopted in the treatment of PI. Porto Alegre, RS, Brazil, 2022

Secondary coverage type	Characteristic of the lesion
Sterilized gases	Superficial/deep and dry/exudative lesions.
Sterilized compress	Deep and very exudative lesions.
Sterile non-adherent mesh	Bleeding injuries; edges or adjacent skin damaged.

Source: Adapted from the multidisciplinary care protocol: Prevention and treatment of pressure injuries by HC-UFTM/Ebserh¹⁷.

The PI treatment may require the use of systemic therapies with the aim of treating or controlling the client's intrinsic factors that, directly or indirectly, interfere or may interfere with the PI healing process. Drug prescriptions or coverage must take into account local protocols and the technical and legal skills of each professional category^{14,15,17,18,22-24}.

It is extremely important that professionals take ownership of the analysis of complementary exams, since they are tools that can help in the process of wound healing evaluation and guide for nutritional and metabolic adjustments^{17,23-25}.

It is recommended that the records of the evolution of the PI be carried out in a systematic way and with the frequency determined by the local protocols. The use of photographic documentation is a welcome resource for monitoring the evolution of a lesion. However, it must have written authorization from the patient/guardian; good

quality equipment; date and scale of measurement and subsequent photographs at the same distance, angle, magnification and lighting^{13,17,18}.

Conclusion

The COVID-19 pandemic has brought numerous challenges to all healthcare professionals around the world. Mainly, in the hospital context, we were practically forced to carry out measures with little or no scientific evidence, due to gaps in the pathophysiology, treatment and prevention of this disease.

The PIs were identified in many cases as inevitable. Treatment is essential for existing injuries, but preventive measures to combat the main extrinsic risk factors are fundamental and have always been available to everyone in the health team. Therefore, prevention is a culture of risk factor control and, regardless of the patient's condition, we must prevent PI.



References

1. Ministério da Saúde (BR). Painel Coronavírus [Internet]. 2022 [acesso em 29 mai 2022]. Disponível em: <https://covid.saude.gov.br/>
2. Organização Pan-Americana da Saúde (OPAS). Folha informativa COVID-19 - Escritório da OPAS e da OMS no Brasil [Internet]. Brasília (DF): OPAS; 2020 [acesso em 08 dez 2020]. Disponível em: <https://www.paho.org/pt/covid19>
3. Criado PR, Rivitti EA, Sotto MN, Valente NYS, Aoki V, Carvalho JF, et al. Vasculopatia livedoide: uma doença cutânea intrigante. *An. Bras. Dermatol.* [Internet]. 2011 Oct [cited 2021 Dec 09];86(5):961-977. Disponível em: http://www.scielo.br/scielo.php?script=sci_arttext&pid=S0365-05962011000500015&lng=en
4. Long B, Brady WJ, Koyfman A, Gottlieb M. Cardiovascular complications in COVID-19. *Am J Emerg Med.* 2020;38(7):1504–1507.
5. Schett G, Sticherling M, Neurath MF. COVID-19: risk for cytokine targeting in chronic inflammatory diseases? *Nat Rev Immunol.* 2020;20(5):271–272.
6. Casas C, et al. Classification of the cutaneous manifestations of covid-19: a rapid prospective nationwide consensus study in spain with 375 cases. Supplementary material: Photographic atlas. *British Journal of Dermatology* 2020.
7. Martel, Tanya, and Dennis P. Orgill. "Medical Device-Related Pressure Injuries During the COVID-19 Pandemic." *Journal of Wound Ostomy & Continence Nursing.* 2020;47(5):430-434.
8. Girard R, Baboi L, Ayzac L, Richard JC, Guérin C; Proseva Trial Group. The impact of patient positioning on pressure ulcers in patients with severe ARDS: results from a multicenter randomized controlled trial on prone positioning. *Intensive Care Med.* 2014;40(3):397–403.
9. The Joint Commission. Quick Safety 43: managing medical device-related pressure injuries. Disponível em: <https://www.jointcommission.org/resources/news-and-multimedia/newsletters/newsletters/quick-safety/quick-safety-43-managing-medical-devicerelated-pressure-injuries>. Acesso em: 08 de dez. de 2021.
10. Black J, Cuddigan J, Capasso V, Cox J, Delmore B, Munoz N, Pittman J. on behalf of the National Pressure Injury Advisory Panel. Unavoidable Pressure Injury during COVID-19 Crisis: A Position Paper from the National Pressure Injury Advisory Panel [Internet]. 2020 [acesso em 23 dez 2022]. Disponível em: www.npiap.com
11. Magro C, Mulvey JJ, Berlin D, Nuovo G, Salvatore S, Harp J, Baxter-Stoltzfus A Laurence J. Complement associated microvascular injury and thrombosis in the pathogenesis of severe COVID-19 infection: A report of five cases. *Transl Res.* 2020. DOI: 10.1016/j.trsl.2020.04.007
12. Ganong LH. Integrative Reviews of Nursing. *Rev Nurs Health.* 1987;10(1):1-11
13. National Pressure Ulcer Advisory Panel (NPUAP) announces a change in terminology from pressure ulcer to pressure injury and updates the stages of pressure injury [Internet]. 2016 [acesso em 08 dez 2021]. Disponível em: <https://npuap.com/>
14. European Pressure Ulcer Advisory Panel (EPUAP). National Pressure Injury Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevenção e tratamento de úlceras/lesões por pressão: guia de consulta rápida. (edição em português brasileiro). EmilyHaesler (Ed.). EPUAP/NPIAP/PPPIA; 2019.
15. Dalmedico MM, Salas D, Oliveira AM, Baran FDP, Meardi JT, Santos MC. Efficacy of prone position in acute respiratory distress syndrome: overview of systematic reviews. *Rev Esc Enferm USP.* 2017;(51):01-08.
16. Brasil. Ministério da saúde. Agência nacional de vigilância sanitária. Fundação Oswaldo Cruz. Protocolo para prevenção de úlcera por pressão [Internet]. 2013 [acesso em 08 dez 2021]. Disponível em: <http://www20.anvisa.gov.br/segurancadopaciente/index.php/publicacao>
17. Hospital de Clínicas da Universidade Federal do Triângulo Mineiro (HC-UFTM), administrado pela Empresa Brasileira de Serviços Hospitalares (Ebserh) – Ministério da Educação. Protocolo assistencial multiprofissional: Prevenção e tratamento de lesão por pressão. Serviço de Educação em Enfermagem. Uberaba-MG: HC-UFTM/Ebserh, 2018. 26p.
18. United Kingdon. National Institute for Health and Care Excellence (NICE). Pressure Ulcers: prevention and management of pressure ulcers. London; 2014.
19. Santos ICRV, Junior JLS, Ribeiro LL, Xavier RF, Almeida RB, Morato JEM. Usabilidade do sistema de classificação de feridas por cor. *Ciência, Cuidado E Saúde.* 2017;16(4).
20. Moore Z, Patton D, Avsar P, McEvoy NL, Curley G, Budri A, Nugent L, Walsh S, O'Connor T. Prevention of pressure ulcers among individuals cared for in the prone position: lessons for the COVID-19 emergency. *J Wound Care.* 2020 Jun 2;29(6):312-320.
21. Martel T, Orgill DP. Medical Device-Related Pressure Injuries During the COVID-19 Pandemic. *J Wound Ostomy Continence Nurs.* 2020 Sep/Oct;47(5):430-434.
22. Yu N, Li Z, Long X, Huang J, Cao W, Zhang Y, Yang Y, Liu Z, Liu Z, Zhang S, Wang X. Pressure injury: A non-negligible comorbidity for critical Covid-19 patients. *J Plast Reconstr Aesthet Surg.* 2021 Mar;74(3):644-710.
23. The Importance of Pressure Injury Evidence During COVID-19. *Adv Skin Wound Care.* 2020 Aug;33(8):399. doi: 10.1097/01.ASW.0000684272.94842.03. PMID: 32697471.
24. Fourie A, Ahtiala M, Black J, Hevia H, Coyer F, Gefen A, LeBlanc K, Smet S, Vollman K, Walsh Y, Beeckman D. Skin damage prevention in the prone ventilated critically ill patient: A comprehensive review and gap analysis (PRONect study). *J Tissue Viability.* 2021 Nov;30(4):466-477.
25. Chagas JA, Oliveira MN, Botechia FR, Christ H, Nascimento LR, Silva CA, Pires BC, Melo EBM. Processo de enfermagem aplicado ao paciente portador de pé diabético: relato de experiência. *Glob Acad Nurs.* 2020;1(2):e27. <https://dx.doi.org/10.5935/2675-5602.20200027>
26. Field MH, Rashbrook JP, Rodrigues JN. Hydrocolloid dressing strip over bridge of nose to relieve pain and pressure from Filtered Face Piece (FFP) masks during the coronavirus (COVID-19) pandemic. *Ann R Coll Surg Engl.* 2020 May;102(5):394-396.

