

Training module

Local treatment of established pressure ulcers

The different categories, and their treatment, management of infection and pain

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1 | Pressure ulcers: classification and assessment

Need for a classification system capable of assessing the severity of the wound and its course and guiding the choice of the most appropriate treatment as a function of category.

➤ **Description of the pressure ulcer and assessment of its severity, from the initial stage of its management throughout its course, guide the therapeutic decisions and care protocols implemented by nursing staff.**

- **However, it is necessary to make a distinction between anatomical and clinical classifications, which describe a the category of a pressure ulcer on the basis of the depth of tissue involvement, and classifications based on the type of tissues composing the pressure ulcer, the most widely used of which is the wound colour scale.**

- **However, it must never be forgotten that a pressure ulcer is an accessible wound, which is visible, palpable and explorable, and that notions such as the presence of slough, bone contact on exploration, local infection or fistulisation must imperatively supplement assessment of the wound on the basis of the chosen classification system.**

Local treatment of established pressure ulcers

1 | Pressure ulcers: classification and assessment

▶ Anatomical and clinical assessment of stage

- ▶ **Category 1** of a pressure ulcer corresponds to intact skin with non-blanchable erythema (redness) of a localised area usually over a bony prominence.

In darkly pigmented skin, a change in local colour that does not fade on pressure, sometimes blue or purplish, with oedema or sometimes painful induration, should be investigated.

- ▶ **Category 2** corresponds to partial thickness tissue loss affecting the epidermis and the superficial part of the dermis.

It presents as a dermal abrasion but, before this stage, it may present as a serum-filled blister, particularly over the heel given the thickness of the epidermal stratum corneum in this region, more resistant to breaking than any other region of the skin.

- ▶ **Category 3** corresponds to full thickness tissue loss of the skin and subcutaneous fat layer. The depth of pressure ulcer is variable depending on its location and hence the thickness of the thickness of the adipose tissue.

It does not affect the muscles or the underlying tissues such as tendons and bursae.

- ▶ **Category 4** is a deep wound due to full thickness necrosis of the subcutaneous adipose tissue down to the fascia of the muscles or the tendons or ligaments, which they may reach or go beyond.



One of the limitations of this pressure ulcer classification system using four categories of severity depending on depth resides in the need to be able to define the whole wound, something that is rarely the case for a deep category 3 or 4 pressure ulcer as long as all the necrotic tissue has not been removed. Consequently, inadequate or absent desloughing constitutes the main obstacle to anatomical assessment of the pressure ulcer's depth, particularly at its initial stage (known as the unstageable category).

In addition, this wound classification system is no longer applicable to describe the different stages in the course of tissue reconstruction.

Local treatment of established pressure ulcers

1 | Pressure ulcers: classification and assessment

► Classification during course monitoring: colour assessment



Black necrotic plaque



Slough



Granulation



Epithelialisation

- Colour assessment of a pressure ulcer is based on the predominance of the tissues composing it and their course under treatment, from the necrotic stage (black), the slough stage (yellow), during or awaiting granulation (red) or in the epithelialisation phase (pink).

Although prone to assessment discrepancies between examiners, this simple scale can be supplemented by a quantitative percentage-based approach to describe the course of the type of tissue constituting the pressure ulcer between successive assessments as a function of the local treatment initiated.

2 | Treatment of pressure ulcers on the basis of category



Category 4 sacral pressure ulcer
Desloughing of necrosis ongoing.

- In addition to superficial pressure ulcers, which require immediate protection and offloading, deep established pressure ulcers (category 3 and 4) require specific nursing management on the basis of the type of tissues exposed, the presence of any local infection, the morphological characteristics of certain wounds (presence of sloughing, cavity or fistular wound) or their location.

One of the major characteristics of a deep pressure ulcer is the typical succession of phases over the course of time: necrosis requiring careful and progressive desloughing to remove necrotic sloughy tissue then slough to allow the granulation phase to develop in the cavity, followed by epithelialisation.

Treatment of established pressure ulcers must be both local (protocols at the different stages, choice of appropriate dressing) and systemic (stepping up of preventive measures, metabolic and nutritional corrective measures).

▶ Treatment of category 1 pressure erythema (redness)



Category 1 pressure ulcer complicated by superficial abrasions.

- Persistent erythema (redness) of the skin that does not blanch under pressure requires urgent offloading of the pressure zone to eliminate the cause and prevent it developing into a deep established pressure ulcer.

Massage is formally contraindicated since there is a risk of causing the lesions to spread to the subcutaneous layers as a result of a shear effect.

Local treatment is based on the use of semi-permeable polyurethane film dressings or extra-thin transparent hydrocolloid dressings to protect the wound from its environment, including the risk of maceration and physical aggression due to friction.

For sacral pressure ulcers, reinforcement of hygiene measures in the event of concomitant incontinence remains a priority to prevent maceration and worsening of this lesion to stage category 2.

| Prevention and treatment of pressure ulcers in adults and the elderly.

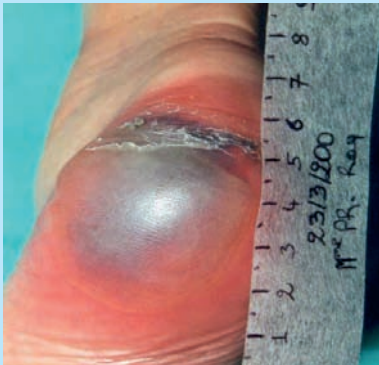
➤ ANAES consensus conference, November 2001

➤ www.has-sante.fr/prevention-et-traitement-des-escarres

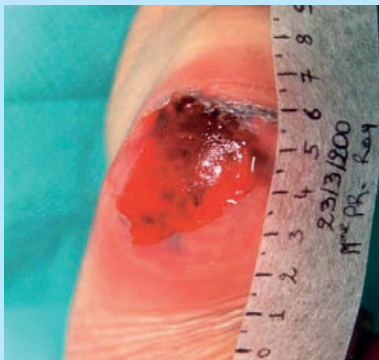
Local treatment of established pressure ulcers

2 | Treatment of pressure ulcers on the basis of category

► Treatment of blisters in category 2 pressure ulcers



Blood and serum-filled blister, heel



Underlying necrosis responsible for the blood suffusion

- In the event of a serum-filled blister, the collection of fluid compresses the underlying dermis. Hence the need to drain the blister contents by piercing it in order to reduce its roof (de-roofing), which will be left in place until it dries out and is naturally eliminated to be replaced by reconstituted neo-epidermis.

Contact layer dressing to avoid adherence to the blister

- **In the event of blood-filled blisters**

The blood suffusion colouring the contents of the blister may be secondary to the development of underlying necrosis. The roof of the blister should be excised in this case to enable more accurate assessment of the wound, then covered with an extra-thin hydrocolloid dressing or interface, depending on the condition of the skin around the wound.

► Immediate treatment of dermal abrasion



Dermal abrasion and dermatitis related to incontinence

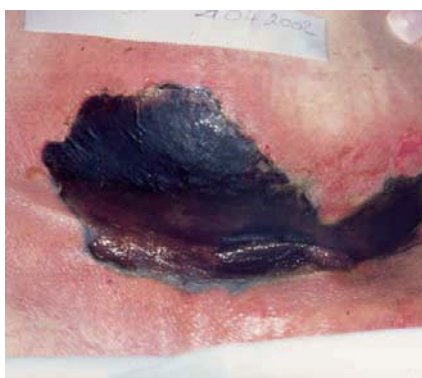
- Protection against aggressive factors (maceration, friction) and moist-wound healing: extra-thin hydrocolloid dressing to be changed only when saturated or when it spontaneously becomes detached.

In the event of damage to the skin around the wound requiring treatment and monitoring, extra-thin, non-adhesive foam dressings or contact layers.

Local treatment of established pressure ulcers

2 | Treatment of pressure ulcers on the basis of category

► Treatment of established pressure ulcers: desloughing



Dry necrotic plaque in the sacral ischial region



Moist necrotic sloughy tissue, heel



Large category 4 pressure ulcer. Moist necrosis and slough.

► Given the conditions in which they develop, deep pressure ulcers are usually the result of two intrinsically linked factors: pressure and shear of deep tissues.

Consequently, the resulting ischaemia and necrosis predominantly affect the deep subcutaneous tissues, particularly since muscle and fat are much more sensitive to the consequences of prolonged pressure (anoxia) than the skin due to their strictly aerobic metabolism («iceberg” principle).

Hence, in the event of an established pressure ulcer and following superficial ulceration revealing only the tip of the iceberg, a vast expanse of necrotic deep tissue presenting as dry, black plaque at the surface and moister deeper down, constitutes the whole pressure ulcer.

Only by eliminating this thick layer of necrosis is it possible to define the depth and real limits of this complex wound and its relationships with the adjacent tissues (bones, joints, bursae) along with any infectious complications (abscess formation, fistulisation).

Necrotic tissue is eliminated by desloughing using protocols tailored to the type of tissues exposed.

Depending on how quickly it is managed, the location and the treatments already undertaken, necrosis may present as dry plaque adhering to the adjacent healthy tissues or present a groove of peripheral elimination demarcating it from healthy tissue, or be composed of moist necrotic tissue or tan-coloured necrotic sloughy tissue close to the base of the ulcer.

► Desloughing is a compulsory step to allow the pressure ulcer to heal. In addition, it reduces the risks of secondary infection of moist necrotic debris. It has only one contraindication in the event of a pressure ulcer on the heel: the existence of peripheral arterial disease with an ABPI < 0.8. Use of simple dry dressings, no mechanical desloughing, specialised consultation and vascular investigation to discuss revascularisation.

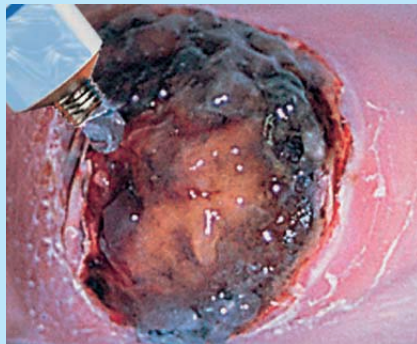
Local treatment of established pressure ulcers

2 | Treatment of pressure ulcers on the basis of category

- **Dry necrosis** should be gradually softened using hydrogels. Amorphous, cohesive gels composed of a polysaccharide polymer dispersed in aqueous phase, hydrogels are applied directly to the dry necrosis under an occlusive film to stop them drying out. With applications repeated every 1 to 2 days on average, softening the dry fraction of the necrosis thereby aids mechanical desloughing of necrosis between each application.



Dry necrotic plaque with elimination groove, heel



Application of hydrogel (Urgo Hydrogel®)



Softening of necrosis

- **Moist necrosis** should be treated by mechanical or instrumental desloughing using a scalpel, tissue forceps, scissors or a pressurised jet.

In the event of peripheral detachment due to the development of a necrosis elimination groove, instrumental desloughing can be performed from this groove in parallel with the wound surface, working in successive steps depending on the resistance of the tissues and presence of pain.

If the necrosis is not demarcated, the tissues should be trimmed from the centre of the necrotic zone, working tangentially to prevent any underlying tissue damage or bleeding. This should only be performed by a clinician trained in the method of sharp debridement.

Autolytic desloughing of a wound defines the physiological mechanism of spontaneous elimination of necrotic sloughy tissues by the body itself under the effect of leukocyte proteases and the activity of bacterial enzymes (Gram-negative microorganisms, mainly).

This is a slow physiological mechanism that does not affect desloughing of necrotic sloughy tissue at the interface with healthy tissues but nonetheless contributes to formation of the necrosis elimination groove.



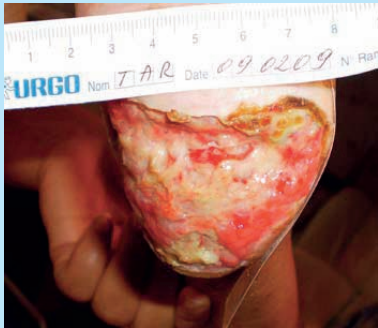
**Moist necrosis, heel
Peripheral detachment groove**



Instrumental desloughing.

Local treatment of established pressure ulcers

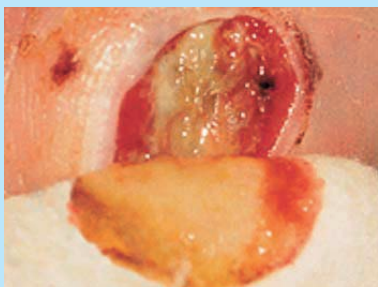
2 | Treatment of pressure ulcers on the basis of category



Sloughy pressure (ulcer) heel



Moist patches of slough



Changing a dressing
Absorption and drainage of
sloughy tissues

> Desloughing of sloughy pressure ulcers

Once necrosis has been eliminated, the pressure ulcer presents as a cavity wound covered or coated with yellowish-brown or yellow slough, with a bunched, fibrillar texture resistant to traction, or in patches, and requiring instrumental desloughing along with the use of specific dressings, depending on the extent of adherence of the slough to the wound and its degree of hydration.

- Mechanical or instrumental desloughing should be performed using round-tipped scissors to detach the slough without damaging the tissue. The procedure may also use tissue forceps and a scalpel to separate a patch of slough or break it up.

A curette should only be used to remove soft slough and may require prior medically prescribed local anaesthesia using xylocaine gel or lidocaine/prilocaine cream applied at least half an hour before the procedure under an occlusive dressing. Analgesic premedication may also prove necessary to make the procedure easier and more comfortable for the patient. This should only be performed by a clinician trained in the method of sharp debridement.

> In the event of moist slough coatings

Desloughing should be completed by the use of dressings such as hydro-desloughing dressings. They accelerate the elimination of residual slough due to their high exudate-absorbing properties and capacity to gel on contact with slough and drain sloughy waste. They are also available in rope form, which means they can be used to treat complex cavity and fistular wounds.

Thanks to their haemostatic properties, alginates should be favoured in the event of pressure ulcers that bleed, either spontaneously or following mechanical desloughing.

In the case of superficial sloughy coatings, hydrocolloid dressings generate a moist environment that is often sufficient to detach the last slough residues, as is the case for hydrofibre hydro-desloughing dressings in the case of exuding wounds.

> Maggot therapy

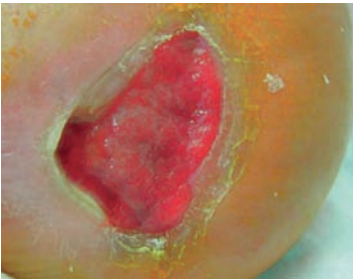
The use of fly maggots contained in hermetically-sealed sterile bags (biobags) has been the subject of several therapeutic trials in wound desloughing.

The maggots produce digestive enzymes that liquefy the slough into fragments that the maggots reabsorb during their cycle in order to grow.

Local treatment of established pressure ulcers

2 | Treatment of pressure ulcers on the basis of category

▶ Treatment of ulcerated and desloughed pressure ulcers



- ▶ Once pressure ulcer desloughing is complete, the wound is empty, awaiting granulation. A number of dressings can be used at this stage, depending on the exuding potential of the wound, its location and its morphology.



Granulation of a fistulised sacral pressure ulcer



Sacral pressure ulcer
Granulation tissue



Application of an MMP-inhibiting dressing (UrgoStart)

▶ In the event of very irregular wounds

Continuation of dressings such as hydro-deloughing dressings enables continuous absorption and drainage of serous and sloughy exudates in order to avoid their stagnation and prevent secondary infection. Foam dressings suitable for filling cavity wounds are another alternative.

▶ In the event of exuding pressure ulcers

Foam dressings are indicated due to their good absorption capacity and extensive range of sizes and forms suitable for different anatomical locations and their availability with or without peripheral adhesivity. Hydrofibre dressings require the use of a secondary dressing.

▶ In the event of low or moderately exuding pressure ulcers

Standard hydrocolloid dressings generate a hydrocolloid gel that fills the wound and creates a favourable climate for healing, at the same time offering complete protection of the pressure ulcer due to their waterproof backing. The different sizes and forms available (sacrum, heel), mean that this category of products is favoured in difficult situations in the absence of any wound infection or intolerance of the skin around the wound.

- ▶ In the event of inadequate granulation despite effective desloughing and the absence of local infection, a diagnosis of local protease hyperactivity must be considered, warranting the use of a matrix metalloproteinase (MMP) inhibiting dressing.

Local treatment of established pressure ulcers

2 | Treatment of pressure ulcers on the basis of category

▶ Pressure ulcers at the epithelialisation stage



Extra-thin hydrocellular dressing (UrgoTul® Lite Border)

▶ These ulcers require a dressing that protects granulation, does not adhere to the wound and therefore prevents hypergranulation due to repeated trauma, and promotes epithelialisation in a moist environment.

- Extra-thin hydrocolloid dressings effectively protect pelvic pressure ulcers from incontinence, with dressing changes every 8 days or when the dressing becomes detached by itself.
- Extra-thin foam dressings are indicated in this type of pressure ulcer in the event of a low level of residual exudate discharge.
- Lipidocolloid contact layer dressings can be used to cover wounds in awkward anatomical locations.

▶ Clinical variants



▶ Treatment of hyper-granulation

The growth of granulation tissue above the skin plane is a cause of delayed healing because it obstructs epithelialisation. Hyper-granulation requires short-term treatment with medically prescribed local corticosteroid therapy, covered by an interface until granulation is reduced.

▶ Treatment of malodorous pressure ulcers

Charcoal dressings are indicated due to their odour-adsorbing properties. However, malodorous wounds above all require investigation of the cause: inadequate desloughing, local infection, including infection with anaerobic microorganisms.

3 | Treatment of infected pressure ulcers



Cavity wound.
Greyish colour of slough.
Bacterial colonisation.



Infected pressure ulcer over the Achilles tendon.
Suspect colour of slough and extensive inflammatory reaction of the margins.



Infected ischial pressure ulcer.
Purulent and foul-smelling liquefaction of necrosis.
Tight, oedematous arch at the lower left part.
Suspected abscess.

➤ It is primarily at the sloughy necrosis stage or in the presence of situations encouraging the trapping of bacteria, such as zones of sloughing or cavity or deep extensions, that the wound presents the highest risk of secondary infection, extension towards underlying bone and the sub-fascial structures (bursae) and septicaemic dissemination, with a poor prognosis given the context.

This underlines the importance of desloughing to allow monitoring of the extent of the wound and ensure necrotic waste is eliminated as quickly as possible, with the use of dressings with a high absorption and slough and bacterial residue draining capacity (alginates).

In this context, occlusive dressings are contraindicated, as are local antibiotics given the associated risk of bacterial selection pressure.

A diagnosis of pressure ulcer infection is, above all, clinical, based on a change in the thickness of exudates, their suspect colour, combined with an increase in odour and the development of extensive erythema around the margins. In this context, the development of systemic signs (torpor, confusion in an elderly patient) may precede toxic and infectious signs (tachycardia, fever) and require systemic antibiotic therapy along with stepping up of local desloughing.

Local samples (puncture liquids, biopsy), along with blood cultures, will guide the antibiotic treatment to be administered, initially probabilistic and then adjusted to the sensitivity of the microorganism according to the antibiogram.

4 | Pressure ulcers and surgery



Surgical necrosectomy of a pressure ulcer on the heel.

➤ Surgical treatment of pressure ulcers primarily concerns accidental pressure ulcers and neurological pressure ulcers.

Conversely, surgery is not indicated in multifactorial pressure ulcers in elderly patients with multiple conditions given the trauma involved in the procedure and the postoperative period and the fact that both patients and their families tend to be less motivated to overcome the challenge of surgery.

Pressure ulcer surgery is primarily indicated in the event of extensive necrosis (necrosectomy) and complex wounds, to excise the ulcer down to healthy tissue, when underlying structures are involved, especially if the ulcer is infected (bursitis) and in the event of bone involvement with osteitis (trochanter).

The excised ulcer is covered either as part of the same surgical procedure, mobilising muscle and skin flaps to pad the region, or at a later date, following directed healing by negative pressure therapy (NPT), with a secondary skin graft.

| Pressure ulcer surgery.

➤ L'escarre, issue 40, December 2008

5 | Pain and pressure ulcers

➤ **A pressure ulcer involves tissue destruction affecting numerous innervated structures. It causes an intense inflammatory reaction with release of algogenic mediators, requiring lengthy desloughing treatments, mobilisation during wound care and repeated dressing changes, although their interaction with the wound is now the least aggressive possible.**

All these factors mean that pressure ulcers are potentially painful wounds, assessment of which is made complex given the context in which they usually occur: the elderly.

▶ **Assessment of pressure ulcer pain comes up against two difficulties:**

➤ **The difficulty of recognising pain** for nursing staff, explaining why this is very probably underestimated. Although assessment scales exist, careful observation of patients is necessary to detect warning clinical signs, such as complaints expressed by gestures or verbally, efforts to find an unusual painless position, facial expressions suggestive of pain during wound care or the recent development of behavioural disturbances, all indicative of a painful component of the pressure ulcer or wound care procedures.

This assessment is particularly difficult in the geriatric setting given that the intensity of pain may be masked by a sensory deficit, confusion or dementia.

➤ **Understanding its mechanism.**

Pressure ulcer pain is usually due to excessive nociception, hyperalgia due to the local release of pain mediators (bradykinin, prostaglandins, histamine), expressed either chronically or acutely during dressing changes or desloughing procedures.

More rarely, pain is neurogenic, due to abnormal nerve function, recognisable by its paroxysmal expression, in the form of burning or crushing sensations, and its resistance to even strong analgesics.

Local treatment of established pressure ulcers

5 | Pain and pressure ulcers

▶ Treatment of pressure ulcer pain

- ▶ In addition to appropriate management in terms of mobilisation and position, acute pain due to excessive nociception during wound care requires the prescription of analgesic treatment, according to WHO's three-step ladder for pain relief: step 1, primarily represented by paracetamol since this drug is without side effects in the elderly, step 2, primarily represented by codeine, on its own or combined with paracetamol, and step 3 using strong opiates (morphine) and agonists.
- ▶ Acute pain during wound care requires preventive analgesic treatment administered before the procedure, as a function of how long it takes the drug to work and its duration of action.
- ▶ While level 1 and 2 analgesics are often inadequate, immediate-release oral morphine in capsule or oral suspension form leads to an analgesic effect being obtained within 15 minutes, lasting for four hours, avoiding the need for sometimes painful subcutaneous injections.
- ▶ In the event of chronic pain, slow-release morphine, either in oral form or in the form of skin patches, significantly facilitates treatment.
- ▶ Local topical morphine in a hydrogel vehicle has been the subject of a few publications but requires preparation by a hospital pharmacy.
- ▶ Local analgesic treatment before desloughing using lidocaine and its derivatives (gel, ointment) was covered in the desloughing chapter.
- ▶ An equimolar mixture of oxygen and nitrous oxide, provides short-term analgesia (half an hour) and may be used during painful wound care procedures. Inhalation of the mixture via a mask requires trained personnel and the presence of a physician, along with the cooperation of the patient, who must maintain verbal contact with the team throughout inhalation.
- ▶ Neurogenic pain presents the specific characteristic of not responding to morphine and requires a specialised opinion in order to decide whether to introduce anti-epileptic (clonazepam, gabapentin) or antidepressant treatments, which have to be very carefully managed in elderly patients.
- ▶ Finally, choosing the right dressing appropriate to the pressure ulcer healing stage plays a major role in terms of how apprehensive patients are about wound care procedures and the pain involved in dressing changes.
- ▶ Consequently, choosing a dressing that does not adhere to the wound, that is non-adhesive in the event of damaged skin around the wound, that interacts with the exudates to generate a soft interfacial contact gel, that promotes hydration and gelling of necrosis adhering to healthy tissues, represent a few examples of local wound management to alleviate the painful component.

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Notes

A series of horizontal dotted lines for taking notes.

SKIN Wounds

Innovation

Listening Evidences

SOLUTIONS

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