

Basic staging and colour-coding for pressure ulcer management

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The pressure ulcer, or decubitus ulcer, is a well-known and often-encountered form of skin breakdown and tissue damage amongst bedridden and immobile patients, especially those that are elderly and incontinent. These ulcers pose a significant challenge in terms of their care and can become especially difficult to manage and heal. Many chronic, deep and complicated pressure ulcers require specialised wound care products and advanced techniques, and often necessitate a referral to a highly skilled wound care practitioner. However, all nurses must have a basic understanding of the underlying risk factors, causes, mechanisms and wound care principles that are associated with the prevention and management of pressure ulcers.

Keywords: decubitus ulcer, pressure ulcer, granulating wound, tissue necrosis, eschar, debridement

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Introduction

The pressure ulcer, or decubitus ulcer, is a well-known and often-encountered form of skin breakdown and tissue damage amongst bedridden and immobile patients, especially those that are elderly and incontinent. Decubitus ulcers are the result of direct pressure on the skin and underlying tissue structures, which may be found in combination with friction and shearing, and that ultimately cause localised injury. The nurse may be confronted by these ulcers in a variety of clinical settings. Those that are found outside of the hospital, may prove to be especially challenging to monitor, manage and heal.¹⁻⁵

Causative factors

Several causative and contributing factors are associated with these ulcers. Refer to Table I. Usually, friction, shearing and direct pressure lead to skin damage, soft tissue trauma, loss of adequate tissue perfusion and pressure necrosis (see Figure 1). Due to the fragility of the patient, as is frequently associated with a poor nutritional status, chronic illness, incontinence and immobility, the resultant pressure ulcers are slow-healing, often infected, difficult to manage and cure, and may thus be classified as chronic wounds.¹⁻⁶

Table II provides a profile of the typical high-risk patient population for the development of pressure ulcers.

Table I: Causative and contributing risk factors for the development of pressure ulcers¹⁻⁶

Causative factors:

Direct pressure, especially when exerted on skin and subcutaneous tissue that overlie bony prominences.

- Friction, which causes direct trauma to the skin, especially in the presence of moisture on the skin.
- Shearing forces, which represent a combination of the above-mentioned factors, in the presence of gravitational forces being exerted on the bedridden body. Different layers of the skin and subcutaneous tissues are forced into movement across each other, resulting in tissue trauma and the breakdown of the overlying skin.

Contributing risk factors:

These are numerous and include the following major risk factors:

- Regular or continual exposure of the skin to moisture, e.g. through urinary incontinence, diaphoresis and exuding wounds and fistulas
- Faecal incontinence, causing a breakdown of the skin through exposure to moisture, as well as the worsening of the ulcer through direct contamination of the wound
- Immobility, resulting in undue pressure without any spontaneous relief
- Peripheral neuropathy and vascular incompetence, causing a state of poor tissue perfusion—worsened by direct pressure—and severe trauma in the absence of normal pressure and pain perception
- Obesity
- Oedema

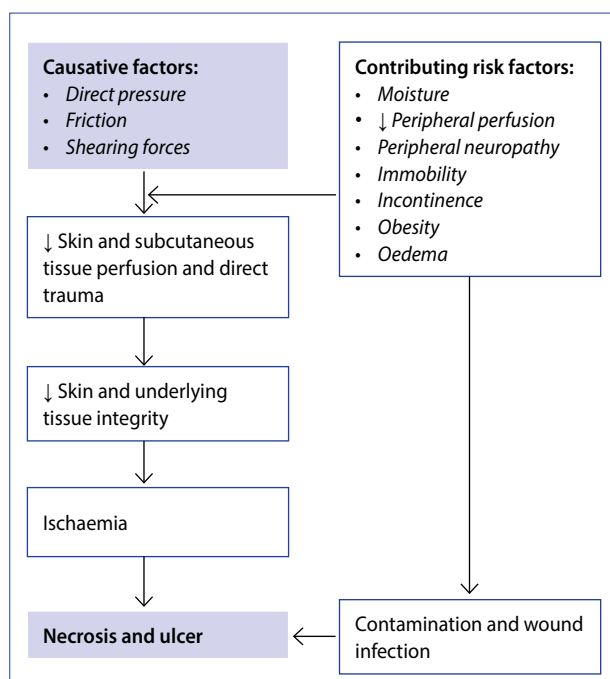


Figure 1: Pressure ulcer development¹⁻⁶

Table II: The profile of the typical high-risk patient population for pressure ulcer development¹⁻⁶

Patients that are:

- *Bedridden, immobilised and/or wheelchair bound*
- *Critically ill, severely debilitated and/or in poor physical condition*
- *Malnourished*
- *Dehydrated*
- *Oedematous*
- *Obese*
- *Incontinent*
- *Experiencing an altered mental state or loss of consciousness*
- *Presenting with any other risk factor that could jeopardise the peripheral vascular system and skin integrity (such as peripheral vascular disease, diabetes mellitus, etc.)*

Pressure ulcer management

The typical nursing unit should follow a two-pronged approach to the management of pressure ulcers, namely:

- effective prevention, and
- timely, optimised wound care.

Effective prevention

The prevention of actual decubitus ulcer formation, through careful assessment and the identification of risk factors, would invariably be the best management policy in any nursing service. However, pressure ulcers are not always totally preventable and should not necessarily be viewed as the result of ineffective or poor nursing care practices. Conversely, though, ineffective and poor nursing care practices are almost certain to result in pressure ulcer formation in patients that are at risk.^{1-3,5}

Following the initial assessment of the patient, reassessment should always be undertaken in view of the patient's

changing circumstances and physical condition. Effective monitoring should see the risk factors identified, and preventative measures instituted, in a timely manner. The latter measures include:^{1-3,5}

- Regular relief of pressure.
- Massage, but only in the absence of non-blanchable erythema.
- Maintenance of an optimal hydration and nutritional status.
- Protection of the skin against moisture, in the presence of diaphoresis or incontinence.

Timely, optimised wound care

Management begins with proper staging of the ulcer (see Figure 3). However, a few basic principles apply to all patients, regardless of the status of their wounds (or ulcers):¹⁻⁸

- Maintaining an optimal nutritional status, with adequate protein intake, with ascorbic acid and zinc supplementation having been shown to have beneficial effects on wound healing.
- Maintaining a well-balanced hydration status.
- Debridement and the removal of devitalised tissue from the wound.
- The elimination of preventable causes and risk factors.
- Providing an ideally optimised wound healing environment.

Colour-coding the wound or ulcer

Clinical assessment of the ulcer will facilitate its classification as being either pink, red, yellow or black:^{1-3,5,9}

- Pink (or blueish pink) wounds show evidence of epithelialisation on the ulcer bed or wound surface. These wounds are clean (i.e. not infected).
- Red (or reddish pink) wounds are also classified as clean wounds and show moist, red granulation tissue.
- Yellow (or yellowish cream) wounds are sloughy and may be infected. Soft, creamy or yellow pus and slough will be present in the cavity. Some classification systems refer to infected wounds, as opposed to simple sloughing wounds, as so-called greenish wounds.
- Black wounds are indicative of tissue necrosis. Hard, dehydrated, black (or blackish brown) eschar may be present as well.

Note that complicated, and especially extensive wounds, may display areas that are in different stages of healing and will therefore have different colour coding classifications at a given point in time.

Grading pressure ulcers

In addition to a thorough assessment of the patient, which will include a detailed assessment of the decubitus ulcer itself, a grading system is also used to allocate the specific ulcer to one of four stages. Refer to Figure 2 for more detail in this regard.^{1-3,5,7}

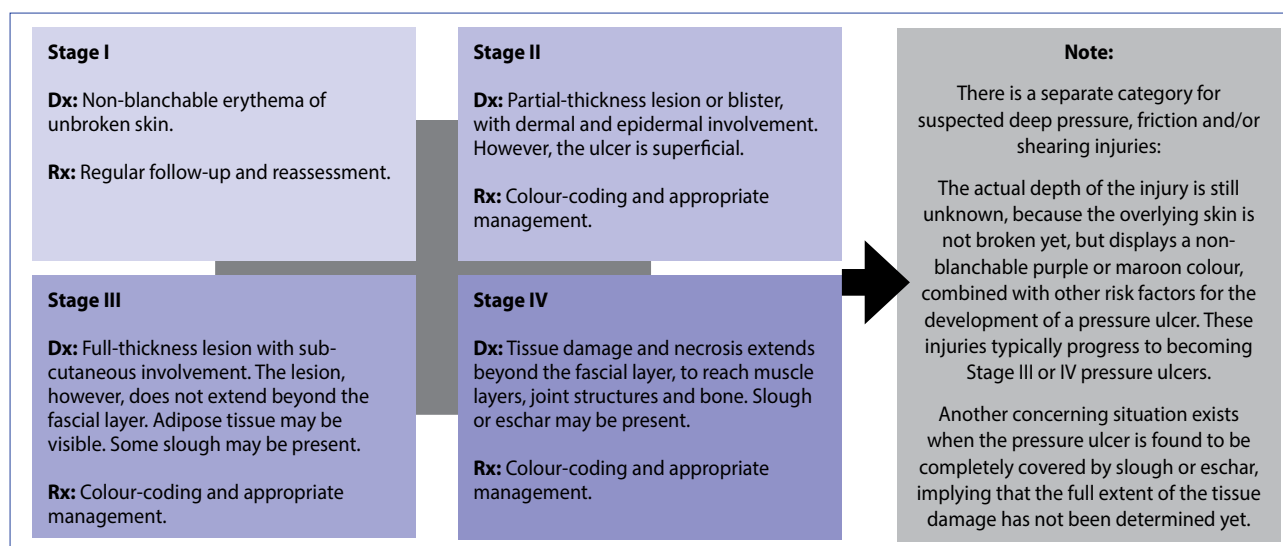


Figure 2: Staging pressure ulcers according to the degree of skin and tissue damage^{1-3,5,7}

Wound dressings

Generally, pink and red pressure ulcers are gently cleansed with sterile saline solution and covered with an occlusive film dressing. The objectives are:^{1-3,5-7}

- the protection the wound (or ulcer) from contamination, and
- to create a moist environment for the promotion of granulation and epithelialisation.

Necrotic, black ulcers will usually require some form of debridement of the devitalised tissue, especially the removal of eschar from the surface of the wound. In the case of Stage III and IV pressure ulcers, the eschar may be obscuring the presence of tunnelling or undermining with subcutaneous cavity formation (see Figure 3). The entire tunnel or cavity will require optimal wound care. The aim of the debridement should be to expose all the areas of viable tissue that may be underlying the devitalised material and to remove any tissue that may be harbouring pathogenic micro-organisms. A surgical consultation may be required in the case of extensive and advanced pressure ulcers, where the wound may be too large or too deep for conventional wound care practices alone.^{1-3,5-7}

When dealing with sloughy, yellow wounds, acceptable wound care practices have long since moved away from aggressive irrigation with antiseptic solutions, hydrogen

peroxide and even hypochlorite (these have all proven to be harmful to granulation tissue and may actually hamper wound healing), in favour of specialised wound care products. These include the hydrogels, hydrocolloid dressings, alginates, hydro-fibre dressings, and the polyurethane foam dressings.^{1-3,5-7}

The above-mentioned wound dressings may be used in conjunction with transparent film dressings, such as those that may be used for treating Stage I and superficial Stage II ulcers, as well as gentle cleansing with a sterile saline solution. In settings where cost savings are crucial, the use of wet gauze dressings (using sterile saline solution once again) may serve as an inexpensive alternative.^{3,7,9}

Table III summarises the use of these wound care products in the management and care of patients with decubitus ulcers. Their biggest advantages lie in their ability to:

- Maintain a moist wound environment.
- Rehydrate necrotic eschar.
- Facilitate the autolysis of devitalised tissue.

Because of the unique characteristics of these dressings, the wound cavity may increase in size initially, before it starts to heal.⁴

Topical antimicrobial preparations may be required for the treatment of infected ulcers, and the selection should preferably be guided by microscopy, culture and sensitivity. This may be combined with suitable antimicrobial wound dressings, such as foam dressings or alginates with silver (Ag). In the case of a localised or systemic spread of the infection, and especially where osteomyelitis or osteitis become a significant danger, systemic antibiotics will be required.^{1-3,5-7}

Conclusion

Pressure ulcers are notoriously difficult to manage and heal. The elimination of the problem, via the identification of risk

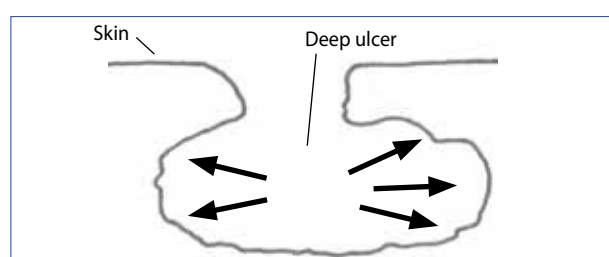


Figure 3: Diagram of a Stage III pressure ulcer with undermining (arrows). Tunnelling occurs in one direction only

Table III: Wound care products and their indications in the management of pressure ulcers (with some examples added for illustrative purposes only)^{1-3,7,9}

Advantages	Special considerations	Indications*
Category: Wet gauze dressings		
- Inexpensive and readily available - Versatile, may be used on ulcers of different sizes - May be used for mechanical debridement when left to dry on the wound surface (but may be painful and traumatic to remove)	- Frequent dressing changes required, at least once a day - Requires a top covering or additional wound dressing (e.g. a film dressing) - May dehydrate and adhere to the wound surface, causing unintentional damage to granulation tissue - May further worsen the condition when pushed or packed too tightly into wound or ulcer cavity, thus causing pressure on the wound surface	- Multiple and large wounds (ulcers) - Infected wounds, will not react with topical antibiotic preparations - May be used for packing deep wounds or ulcers with tunnelling or undermining - Stage II, III and IV pressure ulcers
Category: Transparent film dressings (e.g. Opsite®, Primapore®, Tegaderm®)		
- Transparent (to allow for observation) and waterproof - May be left in place for 5–7 days, if the dressing remains intact - May serve as a secondary wound covering, protecting the wound surface from further contamination	Does not provide any cushioning or support of the wound (cavities cannot merely be covered with a film dressing)	- Stage I (as a protective layer) and very shallow Stage II pressure ulcers, red or pink, when used on its own - As a secondary wound covering or dressing (in this setting, film dressings may help facilitate either autolytic or enzymatic debridement, depending on the primary product being used)
Category: Hydrocolloid dressings (e.g. Comfeel®, Granuflex®)		
- May be self-adhesive, semi-occlusive or occlusive - Creates a moist wound or ulcer environment and actively promotes wound healing - May be left in place for 5–7 days, if no leakage occurs	- May not be able to cope with large amounts of wound exudate - Can melt and stick to clothing or bedding	- Stage II and III ulcers, red or pink, with light to moderate exudate - Ideally suited to smaller, solitary ulcers - Some products may be suitable for Stage IV ulcers and wounds with slough or necrosis as well - Can facilitate autolytic debridement
Category: Polyurethane foam dressings (e.g. Allevyn®, Aquacel®, Biatain®, Tielle®)		
- Able to absorb exudate - Maintains as moist and warm wound or ulcer environment - Cushions the wound surface - Various shapes and sizes are available, for both shallow wounds as well as cavities (e.g. Allevyn® Cavity)	Cover dressing required	- Stage II and III, ideally only for red or pink ulcers - However, may also be considered for some Stage IV ulcers and black wounds, provided that the eschar does not completely cover the wound surface - Not recommended for yellow or infected wounds
Category: Hydrogels (e.g. Cutimed®, Granugel®, Intrasite®)		
- Amorphous, water- or glycerine-based gel - Highly absorbent - Conforms to the wound shape or surface	- Dehydrates quite easily if not covered properly - Requires suitable coverings, such as film dressings	- Stage II, III or IV ulcers, with mild to moderate drainage - Can facilitate autolytic debridement - All colour categories of ulcers
Category: Alginates (e.g. Biatain® Alginate, Curasorb®, Kaltostat®)		
- Highly absorbent (up to 20 times its own weight) - Conforms to the shape of the wound	- Requires additional cover dressings - Desiccates the wound	- Stage III or IV ulcers - Copiously exuding wounds - Can facilitate autolytic debridement - Especially indicated for yellow and black wounds

* For pressure ulcer staging, refer to Figure 2; for the colour classification of wounds or ulcers, refer to the text

factors and the prevention of ulcer formation, does seem like the most logical approach. However, pressure ulcers are not always avoidable. Early detection, classification and colour-coding will present the nursing practitioner with an easy-to-follow, step-by-step approach to effective ulcer management.

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