

Pressure ulcers – prevention and treatment

A Coloplast quick guide



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Pressure ulcers – prevention and treatment

Although the quality of pressure ulcer prevention and treatment has increased considerably over the past years, pressure ulcers remain a frequently occurring problem in health care. Especially old people and people that are confined to chair or bed are susceptible to pressure ulcers. In recent years, new international guidelines have been published.

This quick guide is intended for educational and informational purposes only. It contains some of the most important advice for prevention and treatment of pressure ulcers, and will be helpful to health care professionals who are not dealing with pressure ulcers every day.

Please note that in this quick guide we have described only very general guidelines. For a full description of the optimal treatment of pressure ulcers at the different stages, please refer to your national guidelines and to the 'Pressure ulcer treatment – Quick reference guide' published by the NPUAP-EPUAP in 2009 (www.epuap.org).

For more extensive guidance on prevention of pressure ulcers, please refer to 'Pressure ulcer prevention – Quick reference guide' published by the NPUAP-EPUAP in 2010 (www.epuap.org).

Good advice and useful tools for pressure ulcer prevention are also available at the Braden-homepage (www.braden.com)

Coloplast A/S, March 2012.

What is a pressure ulcer?

International NPUAP-EPUAP pressure ulcer definition:

A pressure ulcer (decubitus ulcer) is a localised injury to the skin and/or underlying tissue usually over a bony prominence and is the result of pressure, or pressure in combination with shear.¹

Pressure ulcers are a major cause of morbidity and mortality, especially for persons with impaired sensation, prolonged immobility, or advanced age.



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How do pressure ulcers arise?

A pressure ulcer is defined as a degenerative change caused by biological tissue (skin and underlying tissue) being exposed to pressure and shearing forces. The pressure prevents the blood from circulating properly, and causes cell death, tissue necrosis and the development of ulcers.

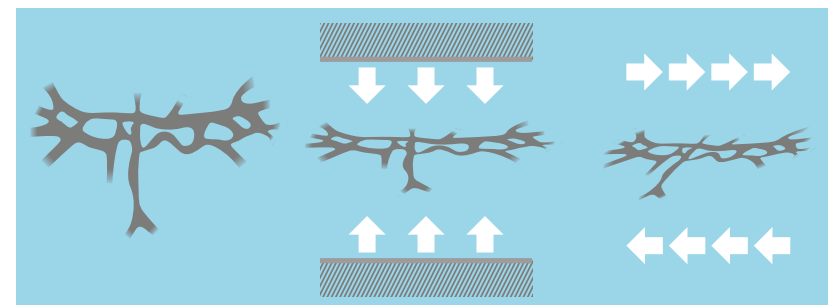


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The effect of compressive forces and shear forces on tissues and blood supply



Without load

Compressive forces

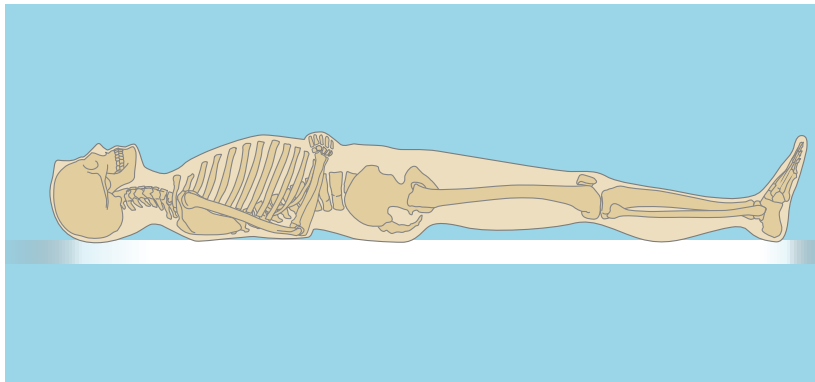
Shear forces

Who gets pressure ulcers?

Despite current interest and advances in medicine, surgery, nursing care, and self-care education, pressure ulcers remain a major cause of morbidity and mortality. This is particularly true for persons with impaired sensation, prolonged immobility, or advanced age.²

People aged over 75 are more prone to developing pressure ulcers.³ However, because people and skin age at different rates, younger patients can also have frail skin. If somebody with frail skin remains in one position for too long without shifting their weight, they are at risk of pressure ulcers. Wheelchair users or people confined to a bed (for example, after surgery or an injury), are especially at risk.

The most common places for pressure ulcers are over a bony prominence, such as elbows, heels, hips, ankles, shoulders, back, and the back of the head.



Prevalence of pressure ulcers

National prevalence studies have been conducted in several countries. Recently, 5947 patients were surveyed in 25 hospitals in five European countries. The pressure ulcer prevalence (Stage 1–4) was 18.1%, if Stage 1 ulcers were excluded it was 10.5%. The sacrum and heels were the most affected locations. Only 9.7% of the patients in need of prevention received fully adequate preventive care.⁴ Also, prevalence surveys in U.S., among patients in acute care hospitals, indicated a pressure ulcer prevalence ranging from 10.1% to 17%.⁴



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Ischium, NPUAP copyright & used with permission



Ankle, NPUAP copyright & used with permission



Heel, NPUAP copyright & used with permission

Risk factors

The following factors increase the risk for pressure ulcers^{3,5}

- Being bed or chair bound
- Old age (>75 years)
- Unable to move body or parts of body without help
- Chronic conditions, such as diabetes or vascular disease, which affect blood circulation
- Mental disability from conditions such as Alzheimer's disease
- Fragile skin
- Urinary and bowel incontinence
- Malnourishment

In their international pressure ulcer prevention guidelines the NPUAP & EPUAP recommend to use a structured approach to risk assessment to identify individuals at risk of developing pressure ulcers.¹ One of the most widely used risk assessment tools worldwide is the Braden Scale for Predicting Pressure Sore Risk®, developed by Barbara Braden and Nancy Bergstrom in 1988.⁷ Therefore the Braden scale will be used as an example of a risk assessment tool in the following chapters.

The Braden scale for predicting pressure ulcer risk

The Braden scale is a clinically validated tool that allows nurses and other healthcare providers to reliably score a person's level of risk for developing pressure ulcers by examining six criteria:

- Sensory Perception – ability to respond meaningfully to pressure-related discomfort (1–4)
- Moisture – degree to which skin is exposed to moisture (1–4)
- Activity – degree of physical activity (1–4)
- Mobility – ability to change and control body position (1–4)
- Nutrition – usual food intake pattern (1–4)
- Friction and Shear – amount of assistance needed to move, degree of sliding on beds or chairs (1–3)

The lowest possible total score is 6 and the highest is 23. The lower score, the higher risk of developing pressure ulcers. People with scores of 15-18 are at risk of developing pressure ulcers if other major risk factors are present. People with scores of 9 and below are at very high risk of developing pressure ulcers.⁷⁻⁹

The Braden scale should always be used in conjunction with nursing judgment. Each subscale score serves as a flag for assessments that need to be explored further, and a guide to the types of interventions that may be required. The lower the subscale scores and total scores, the more 'intense' the nursing interventions should become.⁶

An official copy of the Braden scale can be downloaded from www.bradenscale.com/images/bradenscale.pdf

NOTE: these are general guidelines. There may be specific pressure ulcer screening systems at use in your country or at your work place, which must be followed.

Prevention of pressure ulcers

A person that is bed bound or cannot move due to paralysis, diabetes, circulation problems, incontinence, or mental disabilities, should be frequently checked for pressure ulcers. Special attention should be paid to the areas over a bony prominence where pressure ulcers often form.

Look for reddened areas that, when pressed, do not turn white, and for blisters, sores, or craters.

In addition, take the following steps^{5,9}

- Change the patient's position no less than every 2 hours to relieve pressure, for example, by using a turning schedule
- Use items that can help reduce pressure: pressure-reducing pillows, foam padding, pressure reducing mattresses etc.
- Meals must contain the required amount of calories and proteins
- Provide adequate vitamins and minerals
- Provide and encourage adequate daily fluid intake for hydration
- Daily exercise
- Keep the skin clean and dry
- After urinating or having a bowel movement, clean the area and dry it well. Use creams to help protect the skin

- Do NOT massage the area of the ulcer, as massaging can damage tissue under the skin
- Ring-shaped cushions are NOT recommended. They interfere with blood flow to that area and cause complications

Prevention protocols by risk level

The cornerstone of pressure ulcer prevention is identifying and minimizing risk factors with the use of a validated risk assessment tool. If you use the Braden scale there is a protocol that can be referred to for each risk level:⁵

Preventive measures when 'at risk'/'moderate risk' (15–18/13–14)³

- Frequent turning (turning schedule if moderate risk)
- Maximal remobilisation
- Pressure-reduction support surface
- Lateral positioning (if moderate risk)
- Heel protection (offload the heel completely and distribute weight along the calf with slightly flexed knee¹)
- Manage moisture, nutrition, and friction and shear
- Pressure-reduction support surface if bed or chair bound

Additional preventive measures when 'at high risk' (10–12)³

- Increased frequency of turning
- Supplement with small position shifts

Additional preventive measures when at 'very high risk' (9 or below)³

- Use pressure-relieving surface if the patient has intractable pain (severe pain can be worsened by turning)
- Note: low air loss beds do not substitute for turning schedules

'Protocols by at risk level' and suggestion for a turning schedule can be downloaded from www.bradenscale.com/products.htm

International NPUAP- EPUAP pressure ulcer classification system

A pressure ulcer starts as reddened skin that gets worse over time. It forms a blister, then an open sore, and finally a crater.

Pressure ulcers are categorised by how severe they are, from Stage I (earliest signs) to Stage IV (worst). Pressure ulcers are classified according to the degree of tissue damage observed. In 2009 the EPUAP-NPUAP advisory panel agreed upon four levels of injury:¹⁰

Category/Stage I:



Buttocks, Stage I,
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Non-blanchable redness of intact skin

Intact skin with non-blanchable erythema of a localised area usually over a bony prominence. Discoloration of the skin, warmth, oedema, hardness or pain may also be present. Darkly pigmented skin may not have visible blanching.

Further description: The area may be painful, firm, soft, warmer or cooler as compared to adjacent tissue. Category/Stage I may be difficult to detect in individuals with dark skin tones. May indicate 'at risk' persons.

Category/Stage II:



Buttocks, Stage II,
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Partial thickness skin loss or blister

Partial thickness loss of dermis presenting as a shallow open ulcer with a red-pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled or sero-sanguinous filled blister.

Further description: Presents as a shiny or dry shallow ulcer without slough or bruising. This category/stage should not be used to describe skin tears, tape burns, incontinence associated dermatitis, maceration or excoriation.

Category/Stage III:



Ischium, Stage III,
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Full thickness skin loss (fat visible)

Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Some slough may be present. May include undermining and tunnelling.

Further description: The depth of a Category/Stage III pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have (adipose) subcutaneous tissue and Category/Stage III ulcers can be shallow. In contrast, areas of significant adiposity can develop extremely deep Category/Stage III pressure ulcers. Bone/tendon is not visible or directly palpable.

Treatment of pressure ulcers

Category/Stage IV:



Sacral Coccyx, Stage IV, NPUAP copyright & used with permission

Full thickness tissue loss (muscle/bone visible)

Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present. Often include undermining and tunneling.

Further description: The depth of a Category/Stage IV pressure ulcer varies by anatomical location. The bridge of the nose, ear, occiput and malleolus do not have (adipose) subcutaneous tissue and these ulcers can be shallow. Category/Stage IV ulcers can extend into muscle and/or supporting structures (for example, fascia, tendon or joint capsule) making osteomyelitis or osteitis likely to occur. Exposed bone/muscle is visible or directly palpable.

For optimal treatment of pressure ulcers there are 4 main concerns:

1. Underlying pathology of the pressure ulcer must be treated if possible
2. Pressure must be relieved or removed by appropriate measures to prevent further injury
3. Nutrition is important for healing of pressure ulcers:
 - Provide sufficient calories
 - Provide adequate protein for positive nitrogen balance
 - Provide and encourage adequate daily fluid intake for hydration
 - Provide adequate vitamins and minerals
4. Wound care must be optimized:
 - If there is black or yellow necrosis in the wound, consider debridement to remove the dead tissue in the wound bed*
 - Cleanse the pressure ulcer and surrounding skin and remove debris at each dressing change to avoid contamination
 - Use appropriate moist wound healing dressings

* Select the debridement method(s) most appropriate to the individual's condition. Potential methods include sharp (surgical) techniques, autolysis (gel, occlusive/semi-occlusive dressing etc.), enzymatic debridement (gel), mechanical debridement, and bio-surgical debridement (maggot therapy).

These are only general guidelines. For a full description of the optimal treatment of pressure ulcers at the different stages, please refer to your national guidelines and to the 'Pressure ulcer treatment - Quick reference guide' published by the NPUAP-EPUAP in 2009. <http://www.epuap.org/epuap-guidelines/>

Dressing selection

Wound dressings are a central component of pressure ulcer care. Dressing selection should be based on the tissue in the ulcer bed and the condition of the skin around the ulcer bed.

Suitable wound dressings for pressure ulcers are moist wound healing dressings with good absorption and exudate management properties.

Dressings for deep wounds

Fill deep wounds with dressing materials, e.g. alginate filler. Be careful to document the number of dressings that are used to fill large wounds and ensure that all dressings are removed at the next dressing change.

Dressings for infected wounds

Assess pressure ulcers carefully for signs of infection and delays in healing.

An adhesive antimicrobial moist wound healing dressing, e.g. a silver foam, or a silver alginate dressing in combination with an adhesive secondary dressing can help prevent or resolve wound infection.

Dressings for sacral pressure ulcers

Pressure ulcers in the sacral area of patients that are incontinent have a risk of getting contaminated by urine or faeces and thereby infected. Therefore, it is important to keep the wound and peri-ulcer area clean and use a semi-occlusive dressing to protect the wound from contamination from excretions.

Evaluating progress towards healing

A 2-week period is recommended for evaluating progress toward healing. However, weekly assessments provide an opportunity for the health care professional to detect early complications and the need for changes in the treatment plan.

The treatment needs of a pressure ulcer change over time. Treatment strategies should be continuously re-evaluated based on the current status of the ulcer.

Wound infection

All wounds contain bacteria. Even if the wound is healing normally, a limited amount of bacteria will be present. If the bacteria count rises, the wound may become infected. Bacterial overload in a wound can lead to a serious infection that requires antibiotic treatment.

If the wound is not healing it may be a sign of infection. In the wound, the following symptoms indicate infection:

- Odour
- Increased exudate
- Absent or abnormal granulation tissue
- Increased pain



Pressure ulcer on ankle, NPUAP copyright & used with permission

If a wound is at risk of infection or has become infected, an adhesive, antimicrobial silver foam dressing can be helpful, or alternatively a silver alginate dressing in combination with an adhesive dressing.

Additional clinical symptoms may arise if the infection spreads to the healthy tissue surrounding the wound. Depending on the type of bacteria, the wound exudate may become more pus-like, and the peri-ulcer skin may be tender, red and painful. The patient may also have a fever. If the infection spreads beyond the wound, antibiotics should be used at the discretion of a physician.



Sacrococcygeal pressure ulcer, NPUAP copyright & used with permission

Coloplast solutions for pressure ulcers

Non-infected pressure ulcers

Suitable wound dressings for pressure ulcers that are not infected are adhesive moist wound healing dressings with superior absorption and exudate management properties



Biatain® Silicone

– superior absorption general purposes

- Conforms to the wound bed for superior absorption – even under body pressure
- Soft and flexible dressing silicone adhesive for easy removal with minimal damage or irritation to the skin



Biatain Adhesive

– superior absorption for wounds that need extra adhesion

- Unique 3D polyurethane foam that conforms closely to the wound bed for superior absorption – even under body pressure
- Available in sacral shape to ensure close fit to body and skin for prevention of contamination and leakage



Alione®

– superior absorption for highly exuding wounds

- Hydrocapillary pad with super absorbent particles locks away exudate from wound bed and surrounding skin

Deep wounds

Deep wounds can be filled with dressing materials, such as SeaSorb® soft alginate filler and covered with an adhesive dressing



SeaSorb Soft

– superior absorption for slough and cavity filling

- Highly absorbent alginate dressing for moderately to heavily exuding wounds of any size and shape. Faster wound healing by conforming to any wound shape and by debridement of slough

If the wound is dry or necrotic with a need for enzymatic debridement, you can use a gel such as Purilon® Gel and cover with an adhesive dressing



Purilon Gel

– faster wound healing by effective and gentle debridement

- Fast and effective debridement
- High cohesion – the gel stays in place

Infected pressure ulcers and pressure ulcers at risk of infection



Biatain® Ag Adhesive – superior absorption for infected wounds that need extra adhesion

- Unique 3D polyurethane foam that conforms closely to the wound bed for superior absorption – also under body pressure
- Continuous broad antimicrobial effect during entire wear time
- Reduction of odour from the wound
- Available in sacral shape to ensure close fit to body and skin for prevention of contamination and leakage



Biatain Silicone Ag – superior absorption infected woundst

- Soft and flexible dressing silicone adhesive for easy removal with minimal damage or irritation to the skin
- Continuous broad antimicrobial effect during entire wear time
- Reduction of odour from the wound



Physiotulle® Ag

Physiotulle Ag is a silver-containing, non-occlusive, hydrocolloid-based wound contact layer

Infected deep wounds

Infected deep wounds or deep wounds at risk of infection can be filled with antimicrobial dressing materials, such as SeaSorb® Ag alginate filler and covered with an adhesive dressing. If the infection spreads beyond the wound, antibiotics should be used at the discretion of a physician.



SeaSorb Ag – superior absorption for slough and cavity filling on infected wounds

- Highly absorbent antimicrobial alginate dressing for moderately to heavily exuding infected wounds or wounds at risk of infection. Faster wound healing by conforming to any wound shape and by debridement of slough
- Designed to fight cavity wound infection
- Effect on a broad range of bacteria¹⁶

Biatain® – superior absorption for faster healing

Superior absorption for
non-infected wounds*

Biatain Silicone



	Item no.	National code
7½x7½	33434	
10x10	33435	
12½x12½	33436	
15x15	33437	
17½x17½	33438	

Biatain Soft-Hold



	Item no.	National code
5x7	3473	
10x10	3470	
10x20	3472	
15x15	3475	

Biatain Silicone Lite



	Item no.	National code
7½x7½	33444	
10x10	33445	
12½x12½	33446	

Biatain Adhesive



	Item no.	National code
7½x7½	3462	
10x10	3430	
12½x12½	3420	
15x15	3421	
18x18	3423	
18x28	3426	
17x17	3483	
Sacral jun.		
23x23	3485	
Sacral		
Ø17	3486	
Contour		
19x20 Heel	3488	



Biatain Non-Adhesive



	Item no.	National code
5x7	6105	
10x10	3410	
10x20	3412	
15x15	3413	
20x20	3416	
5x8 Cavity	3451	

Superior absorption for
infected wounds

Biatain Silicone Ag



	Item no.	National code
7½x7½	39636	
10x10	39637	
12½x12½	39638	

Superior absorption for
painful wounds

Biatain Ibu Non-Adhesive



	Item no.	National code
5x7	4105	
10x10	4110	
10x20	4112	
15x15	4115	
20x20	4120	

Biatain Ag Non-Adhesive



	Item no.	National code
5x7	5105	
10x10	9622	
10x20	9623	
15x15	9625	
20x20	9626	
5x8 Cavity	9628	

Biatain Ibu Soft-Hold



	Item no.	National code
10x10	4140	
10x20	4142	

Biatain Ag Adhesive




	Item no.	National code
7½x7½	9631	
12½x12½	9632	
15x15	3464	
18x18	9635	
23x23	9641	
Sacral		
19x20	9643	
Heel		




* Can be used for all types of exuding wounds.

Other Coloplast products for pressure ulcers


SeaSorb® Soft

	Item no.	National code
	10x10	3710
	15x15	3715
	3x44	3740


SeaSorb Ag

	Item no.	National code
	10x10	3760
	15x15	3765
	3x44	3780

Alione®

	Item no.	National code
	10x10	4630
	12½x12½	4632
	12½x20	4645
	15x15	4635
	20x20	4639

Purilon® Gel

	Item no.	National code
	15 gr	3900
	25 gr	3903

Physiotulle® Ag

	Item no.	National code
	10x10	3926

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After 30 years in wound care, we at Coloplast believe that absorption is the key to better healing. Our Biatain® portfolio brings superior absorption to daily wound care needs, making Biatain the simple choice for faster healing.

Ostomy Care
Urology & Continence Care
Wound & Skin Care

Coloplast develops products and services that make life easier for people with very personal and private medical conditions. Working closely with the people who use our products, we create solutions that are sensitive to their special needs. We call this intimate healthcare. Our business includes ostomy care, urology and continence care and wound and skin care. We operate globally and employ more than 7,000 people.

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