

ACI

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Pressure Ulcer Prevention & Management

Tissue Viability

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Aims

To examine the issues surrounding falls

Objectives

- To have an understand of what a pressure ulcer is and to be aware of the why pressure ulcers occur and the risk factors
- To be familiar with the function of the skin
- To be able to describe the extrinsic and intrinsic factor regarding pressure ulcers
- To be aware of the different risk assessment formats
- To have understanding the assessment of a pressure ulcer
- To be familiar with the factors that delay wound healing
- To be able to describe how to reduce and relieve pressure

What is a Pressure Ulcer?

A pressure ulcer is localized injury to the skin and/or underlying tissue, usually over a bony prominence, because of pressure, or pressure in combination with shear. Several contributing or compounding factors are also associated with pressure ulcers; the significance of these factors has yet to be elucidated. **European Pressure Ulcer Advisory Panel EPUAP**

Pressure ulcers are also commonly referred to as bed sores, pressure damage, pressure injuries and decubitus ulcers.

European pilot survey undertaken by the European Pressure Ulcer Advisory Panel (EPUAP), which included 5947 patients located in Belgium, Italy, Portugal, Sweden, and the United Kingdom, found an overall prevalence of 18.1%, although there was some variation between countries.

What is Pressure and Shear?

Pressure is defined as the amount of force applied perpendicular to a surface per unit area of application. Pressure has been recognised as the most important extrinsic factor involved in the development of pressure ulcers for many years. The pressure at the junction between the skin and a support surface is often called 'interface pressure'. **Pressure Ulcer Prevention – International Review.**

A shear force or shear stress can be defined as, 'Unaligned forces pushing one part of a body in one direction, and another part of the body in the opposite direction' **Dartex**

Why Do Pressure Ulcers Occur?

When skin and underlining tissue are compressed against bone and a surface for a duration of time pressure ulcers can occur. This is due to blood is not able to circulate causing an inadequate supply of

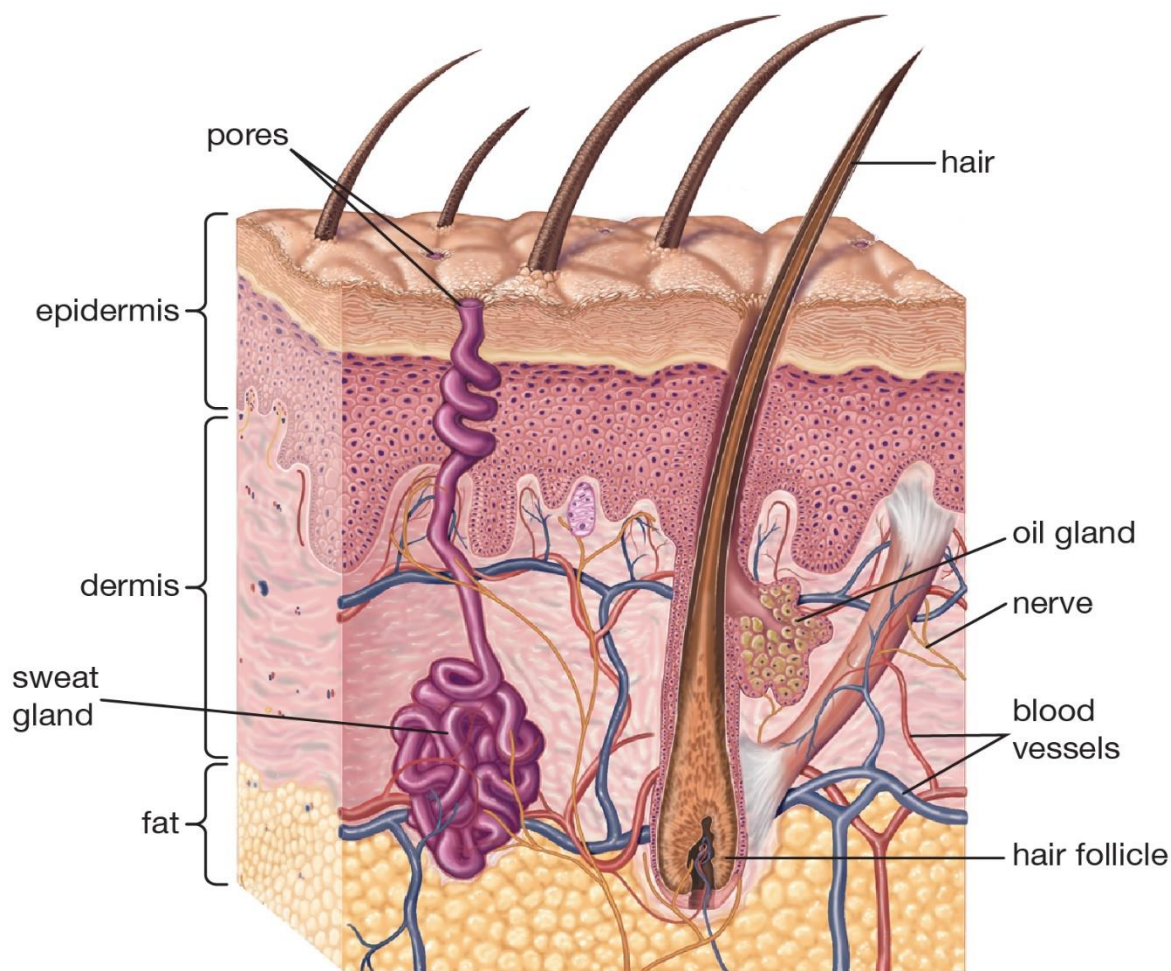
oxygen and other nutrients reaching the tissues. If this continues cells will die leading to death of the tissues, this is known as pressure damage. How long this take will differ in each individual, but it is thought it can be as little as one hour.

The average mean capillary pressure equals about 17 mm Hg and any external pressures exceeding this will cause capillary obstruction. Tissues that are dependent on these capillaries are deprived of their blood supply. Eventually the ischaemic tissues will die. **Judy Waterlow.** Page | 3

Tissue damage can also occur when interface pressures are high due to support surfaces, e.g., bed sheets, plaster casts or clothing. There are also reported cases of pressure ulcer formation due to medical device use e.g., naso gastric tube, nasal cannulae, pulse oximetry probe.

The Skin

The skin is the largest organ of the body comprising 15% of the body weight. It varies in thickness from 0.2 – 4.0 mm depending where on the body. It consists of 3 main layers – the outer epidermis, inner dermis and the subcutaneous tissue.



The skin has many functions:

- Protection
- Act as a barrier to infection
- Pain receptors
- Maintenance of body temperature
- Production of vitamin D in response to sunlight
- Production of melanin
- Communication through touch and physical appearance

If the patient is dehydrated it causes the skin to produce more oil to replace the lack of water. This can result in the skin to become irritated and have dry patches leaving it more vulnerable to damage.

It is still unclear the relationship between malnutrition and pressure ulcers, but it is known that the effects of malnutrition results in wounds healing slower.

Risk Factors

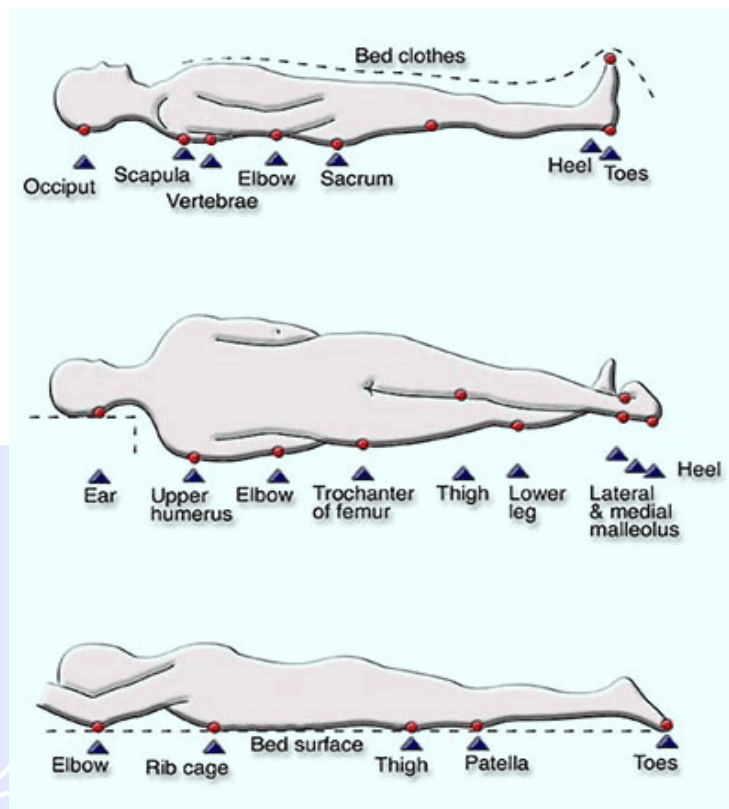
Pressure Ulcer Risk Factors Include:

- Pressure
- Shearing
- Friction
- Level of Mobility
- Sensory Impairment
- Continence
- Level of Consciousness
- Acute, Chronic and Terminal Illness
- Comorbidity
- Posture
- Cognition, Psychological Status
- Previous Pressure Damage
- Extremes of Age
- Nutrition and Hydration Status
- Moisture to The Skin

All these factors should be reassessed on an ongoing basis

Extrinsic Factors That Increase the Risk of Pressure Ulcers

Pressure – where the skin and underlying tissues are directly compressed between bone and another hard surface e.g., bed or chair, the external pressure deprives tissues of blood supply by obstructing the capillaries. Tissue becomes ischaemic and can become necrotic. (Waterlow, 1999)
(David, 1986)



Shear – is when the body part attempts to move but the skin surface remains static against the support surface, e.g. being dragged up the bed, or slips down in the bed.

Friction – a component of shearing which causes stripping of the skin leading to superficial ulceration.

Moisture – excessive moisture is considered to be a risk factor in pressure ulcer development. It can cause maceration which makes the skin more susceptible to shear, friction and infection. Moisture can lead to tissues sticking to support surfaces and can damage the skin and reduce its protective function e.g., urine, faeces, perspiration, wound exudate etc.

Skin exposure to the effects of incontinence can cause irritation and breakdown to the skin resulting in it being very vulnerable to breakdown.

Intrinsic Factors That Increase the Risk of Pressure Ulcers

Mobility/activity – the level of ability to reposition themselves may be restricted by cognitive function, level of consciousness, medication, underlying medical condition e.g. diabetes, Stroke, dementia, acute, chronic and terminal illness, weight, pain and extremes of age.

If a patient is alert, they will be able to respond to the effect of pressure allowing them to make small frequency body movement to elevate the pressure resulting in blood circulation. If the patient is unable to move themselves or cannot feel the effects of pressure, they will be unable to make these essential body movements.

Skin/tissue condition: Adversely affected by age, dehydration, malnutrition, medication such as systemic or topical steroids, hypoxia and skin moisture and or oedema. Previous skin trauma such as surgical scars or previous pressure ulcers increases the risk of future pressure damage. (NICE 2005)

Sensory Functioning: The loss of protective response is a major factor in pressure damage. The inability for some people to feel discomfort or pain e.g., dementia, CVA, Multiple Sclerosis, Peripheral neuropathy, diabetes, may decrease the usual response of changing position.

Vascularity: Pressure damage is an ischaemic injury. This may be affected by conditions such as hypotension, peripheral vascular disease, diabetes.

Skin Assessment

NICE guideline states that “people admitted to hospital or a care home with nursing have a pressure ulcer risk assessment within 6 hours of admission. “June 2015

The NICE guidelines go on to say that “Acting on the results of the risk assessments allows healthcare professionals to offer preventative treatment to people at risk, helping to reduce the number of people developing a pressure ulcer and ensuring patient safety.”

NICE guidance does not override individual responsibility of health professionals to make decisions appropriate to the needs of the individual patient.

The three most common risk assessments for pressure ulcers are the Waterlow Score, the Braden Scale and the Norton Scale. Whichever assessment you use remember this is an aide memoir and must not replace clinical judgement. Risk assessment is a continuous process and needs to be reviewed whenever circumstances change.

It is your responsibility to know the risk assessment policy for pressure ulcers at your place of work.

WATERLOW PRESSURE ULCER PREVENTION/TREATMENT POLICY

RING SCORES IN TABLE, ADD TOTAL. MORE THAN 1 SCORE/CATEGORY CAN BE USED

BUILD/WEIGHT FOR HEIGHT	◆	SKIN TYPE VISUAL RISK AREAS	◆	SEX	AGE	◆	MALNUTRITION SCREENING TOOL (MST) (Nutrition Vol.15, No.6 1999 - Australia)		
AVERAGE BMI = 20-24.9	0	HEALTHY	0	MALE	14 - 49	1	A - HAS PATIENT LOST WEIGHT RECENTLY YES - GO TO B NO - GO TO C UNSURE - GO TO C AND SCORE 2	B - WEIGHT LOSS SCORE 0.5 - 5kg = 1 5 - 10kg = 2 10 - 15kg = 3 > 15kg = 4 unsure = 2	
ABOVE AVERAGE BMI = 25-29.9	1	DRY	1	FEMALE	50 - 64	2	C - PATIENT EATING POORLY OR LACK OF APPETITE 'NO' = 0; 'YES' SCORE = 1		
OBESE BMI > 30	2	OEDEMATOUS	1		65 - 74	3	NUTRITION SCORE If > 2 refer for nutrition assessment / intervention		
BELOW AVERAGE BMI < 20	3	CLAMMY, PYREXIA	1		75 - 80	4			
BMI = Wt(Kg)/Ht (m) ²		DISCOLOURED GRADE 1	2		81 +	5			
		BROKEN/SPOTS GRADE 2-4	3						
CONTINENCE		MOBILITY		SPECIAL RISKS					
COMPLETE/ CATHETERISED	0	FULLY RESTLESS/FIDGETY	0	TISSUE MALNUTRITION		NEUROLOGICAL DEFICIT			
URINE INCONT.	1	APATHETIC	1	TERMINAL CACHEXIA	8	DIABETES, MS, CVA	4-6		
FAECAL INCONT.	2	RESTRICTED	2	MULTIPLE ORGAN FAILURE	8	MOTOR/SENSORY PARAPLEGIA (MAX OF 6)	4-6		
URINARY + FAECAL INCONTINENCE	3	BEDBOUND e.g. TRACTION CHAIRBOUND e.g. WHEELCHAIR	3	SINGLE ORGAN FAILURE (RESP, RENAL, CARDIAC,)	5	MAJOR SURGERY or TRAUMA			
SCORE									
			10+ AT RISK						
15+ HIGH RISK			PERIPHERAL VASCULAR DISEASE		5	ORTHOPAEDIC/SPINAL			
			ANAEMIA (Hb < 8)		2	ON TABLE > 2 HR#			
20+ VERY HIGH RISK			SMOKING		1	ON TABLE > 6 HR#			
			MEDICATION - CYTOTOXICS, LONG TERM/HIGH DOSE STEROIDS, ANTI-INFLAMMATORY						

Scores can be discounted after 48 hours provided patient is recovering normally

© J Waterlow 1985 Revised 2005*
Obtainable from the Nook, Stoke Road, Henlade TAUNTON TA3 5LX
* The 2005 revision incorporates the research undertaken by Queensland Health. www.judy-waterlow.co.uk

REMEMBER TISSUE DAMAGE MAY START PRIOR TO ADMISSION, IN CASUALTY. A SEATED PATIENT IS AT RISK ASSESSMENT (See Over) IF THE PATIENT FALLS INTO ANY OF THE RISK CATEGORIES, THEN PREVENTATIVE NURSING IS REQUIRED A COMBINATION OF GOOD NURSING TECHNIQUES AND PREVENTATIVE AIDS WILL BE NECESSARY ALL ACTIONS MUST BE DOCUMENTED

<p>PREVENTION PRESSURE REDUCING AIDS</p> <p>Special</p> <p>Mattress/beds:</p> <p>10+ Overlays or specialist foam mattresses. 15+ Alternating pressure overlays, mattresses and bed systems 20+ Bed systems: Fluidised bead, low air loss and alternating pressure mattresses Note: Preventative aids cover a wide spectrum of specialist features. Efficacy should be judged, if possible, on the basis of independent evidence.</p> <p>Cushions:</p> <p>No person should sit in a wheelchair without some form of cushioning. If nothing else is available - use the person's own pillow. (Consider infection risk)</p> <p>10+ 100mm foam cushion 15+ Specialist Gell and/or foam cushion 20+ Specialised cushion, adjustable to individual person.</p> <p>Bed clothing:</p> <p>Avoid plastic draw sheets, inco pads and tightly tucked in sheet/sheet covers, especially when using specialist bed and mattress overlay systems Use duvet - plus vapour permeable membrane.</p> <p>NURSING CARE</p> <p>General HAND WASHING, frequent changes of position, lying, sitting. Use of pillows Pain Appropriate pain control Nutrition High protein, vitamins and minerals Patient Handling Correct lifting technique - hoists - monkey poles Transfer devices Patient Comfort Aids Real Sheepskin - bed cradle Operating Table Theatre/A&E Trolley 100mm(4ins) cover plus adequate protection</p>	<p>Skin Care General hygiene, NO rubbing, cover with an appropriate dressing</p> <p style="text-align: center;">WOUND GUIDELINES</p> <p>Assessment odour, exudate, measure/photograph position</p> <p style="text-align: center;">WOUND CLASSIFICATION - EPUAP</p> <p>GRADE 1 Discolouration of intact skin not affected by light finger pressure (non-blanching erythema) This may be difficult to identify in darkly pigmented skin</p> <p>GRADE 2 Partial thickness skin loss or damage involving epidermis and/or dermis The pressure ulcer is superficial and presents clinically as an abrasion, blister or shallow crater</p> <p>GRADE 3 Full thickness skin loss involving damage of subcutaneous tissue but not extending to the underlying fascia The pressure ulcer presents clinically as a deep crater with or without undermining of adjacent tissue</p> <p>GRADE 4 Full thickness skin loss with extensive destruction and necrosis extending to underlying tissue.</p> <p>Dressing Guide Use Local dressings formulary and/or www.worldwidewounds</p> <p style="text-align: center;">IF TREATMENT IS REQUIRED, FIRST REMOVE PRESSURE</p>
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BRADEN SCALE FOR PREDICTING PRESSURE SORE RISK					
Patient's Name:		Evaluator's Name:		Date of Assessment:	
Sensory perception Ability to respond meaningfully to pressure-related discomfort	1. Completely limited: Unresponsive (does not moan, flinch, or grasp) to painful stimuli, due to diminished level of consciousness or sedation, OR Limited ability to feel pain over most of body surface	2. Very limited: Responds only to painful stimuli. Cannot communicate discomfort except by moaning or restlessness, OR Has a sensory impairment which limits the ability to feel pain or discomfort over ½ of body.	3. Slightly limited: Responds to verbal commands but cannot always communicate discomfort or need to be turned, OR Has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.	4. No impairment: Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain or discomfort.	
Moisture Degree to which skin is exposed to moisture	1. Constantly moist: Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.	2. Moist: Skin is often but not always moist. Linen must be changed at least once a shift.	3. Occasionally moist: Skin is occasionally moist, requiring an extra linen change approximately once a day.	4. Rarely moist: Skin is usually dry; linen requires changing only at routine intervals.	
Activity Degree of physical activity	1. Bedfast: Confined to bed.	2. Chairfast: Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair.	3. Walks occasionally: Walks occasionally during day but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	4. Walks frequently: Walks outside the room at least twice a day and inside room at least once every 2 hours during waking hours.	
Mobility Ability to change and control body position	1. Completely Immobile: Does not make even slight changes in body or extremity position without assistance.	2. Very limited: Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.	3. Slightly limited: Makes frequent though slight changes in body extremity position independently.	4. No limitations: Makes major and frequent changes in position without assistance.	
Nutrition Usual food intake pattern	1. Very poor: Never eats a complete meal. Rarely eats more than ½ of any food offered. Eats 2 servings or less of protein (meat or dairy products) per day. Takes fluids poorly. Does not take a liquid dietary supplement, OR Is NPO ¹ and/or maintained on clear liquids or IV ² for more than 5 days.	2. Probably Inadequate: Rarely eats a complete meal and generally eats only about ½ of any food offered. Protein intake includes only 3 servings of meat or dairy products per day. Occasionally will take a dietary supplement, OR Receives less than optimum amount of liquid diet or tube feeding.	3. Adequate: Eats over half of most meals. Eats a total of 4 servings of protein (meat, dairy products) each day. Occasionally will refuse a meal, but will usually take a supplement of offered, OR Is on a tube feeding or TPN ³ regimen, which probably meets most of nutritional needs.	4. Excellent: Eats most of every meal. Never refuses a meal. Usually eats a total of 4 or more servings of meat and dairy products. Occasionally eats between meals. Does not require supplementation.	
Friction and Shear	1. Problem: Requires	2. Potential problem: Moves	3. No apparent problem: Moves in		

	moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequent slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures, or agitation leads to almost constant friction.	feebly or requires minimum assistance. During a move, skin probably slides to some extent against sheets, chair, restraints, or other devices. Maintains relatively good position in chair or bed most of the time but occasionally slides down.	bed and in chair independently and has sufficient muscle strength to lift up completely during move. Maintains good position in bed or chair at all times.		
Adopted 1997	TOTAL SCORE:				

- 1 Nothing by Mouth
- 2 Intravenously
- 3 Total Parenteral Nutrition

The Norton Pressure Sore Risk-Assessment Scale Scoring System

To evaluate the Norton Rating for a certain patient, look at the tables below and add up the values beside each parameter which apply to the patient. The total sum is the Norton Rating (NR) for that patient and may vary from 20 (minimum risk) to 5 (maximum risk).

(Indicatively, a Norton Rating below 9 means Very High Risk, 10 to 13 means High Risk, 14 to 17 medium risk and above 18 means low risk)

Physical Condition	Good	4
	Fair	3
	Poor	2
	Very Bad	1
Mental Condition	Alert	4
	Apathetic	3
	Confused	2
	Sporous	1
Activity	Ambulant	4
	Walks with help	3
	Chairbound	2
	Bedfast	1
Mobility	Full	4
	Slightly Impaired	3
	Very Limited	2
	Immobile	1

Incontinence	None	4	
	Occasional	3	
	Usually Urinary	2	
	Urinary and Fecal	1	

Greater than 18	Low Risk
Between 18 and 14	Medium Risk
Between 14 and 10	High Risk
Lesser than 10	Very High risk

The patient identified as being at risk should have daily skin inspections, or as frequently as the wound requires dressing. Evaluation must be documented. Mapping of any ulcers must be recorded on the body map and wound assessment chart.

The body map must also be used to record and monitor unusual/persistent bruising, skin tears, puncture marks, wounds and reported as per Safeguarding policy, photographed and a care plan implemented.

What is a Wound?

Wound types

- **Acute wound** – surgical, traumatic, burns
- **Chronic wounds** – leg ulcer, pressure ulcer, malignant wounds, diabetic foot ulcers.

Wounds can be Classified by:

- The type of injury
- Wound depth and tissue loss
- Clinical appearance of the wound

Wound Depth and Tissue Loss

- **Superficial** – involve only the epidermis
- **Partial thickness** – involve the epidermis and the dermis
- **Full thickness** – involve the dermis, subcutaneous fat and sometimes bone

Wound Grading

There are four recognised grades of pressure ulcers in the EPUAP Wound Classification system

GRADE 1: Discolouration of intact skin not affected by light finger pressure (non-blanching erythema). This may be difficult to identify in darkly pigmented skin.



Method of assessing non-blanching erythema

1. If there is an area of discolouration, apply light finger pressure to the area for 10 seconds
2. Release the pressure
3. If the area is white and then returns to its original colour, the area has a good blood supply, it is healthy and the patient has reactive hyperaemia
4. If on release of pressure the area is the same colour as before pressure was applied, it is an indication of the beginning of pressure ulcer development and preventive strategies should be employed

GRADE 2: Partial-thickness skin loss or damage involving epidermis and/or dermis. The pressure ulcer is superficial and presents clinically as an abrasion, blister or shallow crater



GRADE 3: Full thickness skin loss involving damage of subcutaneous tissue but not extending to the underlying fascia. The pressure ulcer presents clinically as a deep crater with or without undermining of adjacent tissue.

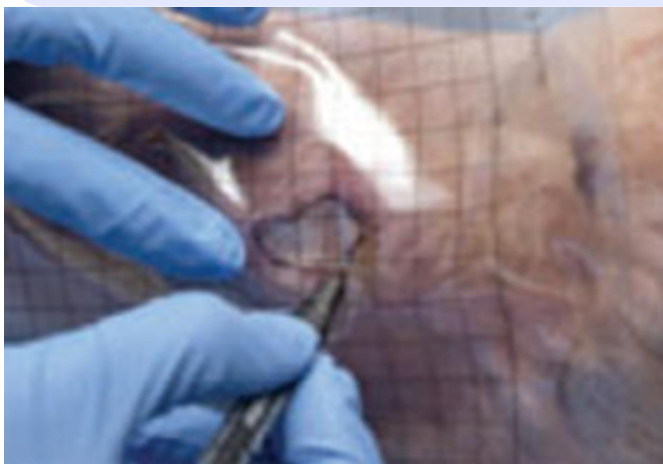


GRADE 4: Full thickness skin loss with extensive destruction and necrosis extending to underlying tissue.



Pressure Ulcer Assessment

Measurement forms an important part of documentation and can be achieved simply by the use of a tracing map.



Assessment of the wound should include:

- The general appearance of the wound
- The size of the wound
- The shape of the wound
- The depth of the wound
- The amount, type and colour of exudate
- Wound related pain
- The condition of the surrounding skin
- The presence of infection
- Undermining/Tracking, Sinus or Fistula
- Odour

All of this information should be recorded on a wound care assessment chart with the size and shape recorded as a traced diagram or photography if appropriate. Also, the grade using EPUAP. It is important that a date be set for the re-evaluation of the wound and that any changes in dressing policy following re-assessment are recorded. Document all pressure ulcers graded 2 and above as a clinical incident

Initial and ongoing ulcer assessment is the responsibility of a registered healthcare professional

Factors That Delay Wound Healing?

Poor Circulation

Maybe due to:

- Local Pressure
- Vascular Disease
- Diabetes Mellitus

Poor Nutrition/Malnutrition

Nutrition has a significant impact on wound healing. Protein, vitamin c and zinc are nutrients vital to support the healing process.

Drug Therapy

Anti – inflammatory drugs suppress initial inflammatory process. Systemic and topical corticosteroids can suppress the multiplication of fibroblasts and the immune system.

Immune Response

Allergy to topical applications e.g. Iodine, may delay healing. Common irritants / allergens associated with wound care include lanolin, topical antibiotics, emulsifiers, rubber or fragranced products. Simple bland preparations are recommended for patients with known skin allergies.

Age

Cell replication is slower and the skin's resistance to injury decreases with increasing age.

Obesity

Adipose tissue has poor vascularity. Obese patients are more at risk of postoperative wound problems following surgery such as increased infection and wound breakdown.

Psychological

Stress and anxiety increase certain hormone levels which may suppress the inflammatory phase and effect healing in both acute and chronic wounds. Reducing stress has been demonstrated to reduce postoperative wound infection.

Infection

Local or systemic infection inhibits healing. Resistance to infection is related to physiological ability and the patient's physical health. Bacterial toxins are potent inhibitors of healing – some with devastating effects. When observing a pressure ulcer, the healthcare professional should always be vigilant to the signs of infection.

Moisture

A moist environment allows the optimum environment for healing. Dehydration will delay epithelialisation. A wound surface that has been exposed to the air for a lengthy period suffers cellular dehydration, tissue necrosis and increase in wound depth.

Most modern dressings have been designed to allow “moist” healing without maceration of the surrounding skin.

Temperature

The optimum temperature for cellular activity and division is 37 degrees celsius. Frequent dressing changes and application of cold solution and leaving the wound exposed can decrease the local temperature.

Chemical

Inappropriate use of chemicals, e.g. Eusol, dyes or antiseptics can damage the wound and retard healing. This practice should be discouraged.

Mechanical

Unnecessarily disturbing the wound bed can damage the developing granulating tissue. Inappropriate dressing can also damage granulating tissue.

Presence of Tumour

Malignancy can inhibit healing – advice should be sought on fungating wounds and treatment based on symptomatic control.

Local Factors

Poor surgical technique such as poor choice of suturing materials. Poor assessment or some wound care practices may cause delayed or non-healing of a wound. Inappropriate choice of dressing, the use of fibre shredding materials e.g. Cotton wool or gauze swabs. Tight bandaging on an ischaemic or diabetic limb can all lead to deterioration of the wound.

General Factors

Poor assessment of the cause of the wound can lead to inappropriate treatment which in turn will lead to poor healing. Any deterioration in patient's health will affect wound healing. Poor nutrition or underlying medical conditions will affect healing e.g. Diabetes, uraemia, anaemia, liver and renal damage, stroke etc.

Reducing/Relieving Pressure

Pressure relief is the main strategy and includes:

- Positioning and repositioning
- The use of specialist equipment

Positioning and repositioning involves changing the position of the patient regularly. This help to relieve pressure on one particular part or parts of the body. The healthcare professional should also be mindful that it maintains the patients comfort and dignity.

PRESSURE RELIEVING EQUIPMENT DOES NOT REPLACE THE NEED FOR REPOSITIONING.

Choice of Pressure Relieving Device Should Be Based On:

- Patient's choice
- Risk assessment
- Skin assessment
- General health
- Lifestyle & abilities
- Care needs
- Acceptability & comfort
- Availability of carers
- Patient weight
- Cost considerations
- Surfaces used e.g. Bed, chair etc
- Used as part of the risk assessment taking into account that equipment can be downgraded as well as upgraded

The decision on what pressure relieving device to use should be taken in line with the organisations policies and procedures. Advice can be also be sort from the tissue viability nurse.

References

European Pressure Ulcer Advisory Panel (EPUAP)

NICE Guidelines on Pressure Ulcers June 2015

Waterlow Score

Braden Scale

The Norton Pressure Sore, Risk-Assessment Scale Scoring System

International Review – Pressure Ulcer Prevention 2010

International Guideline – Pressure Ulcer Treatment Technical Report 2009



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