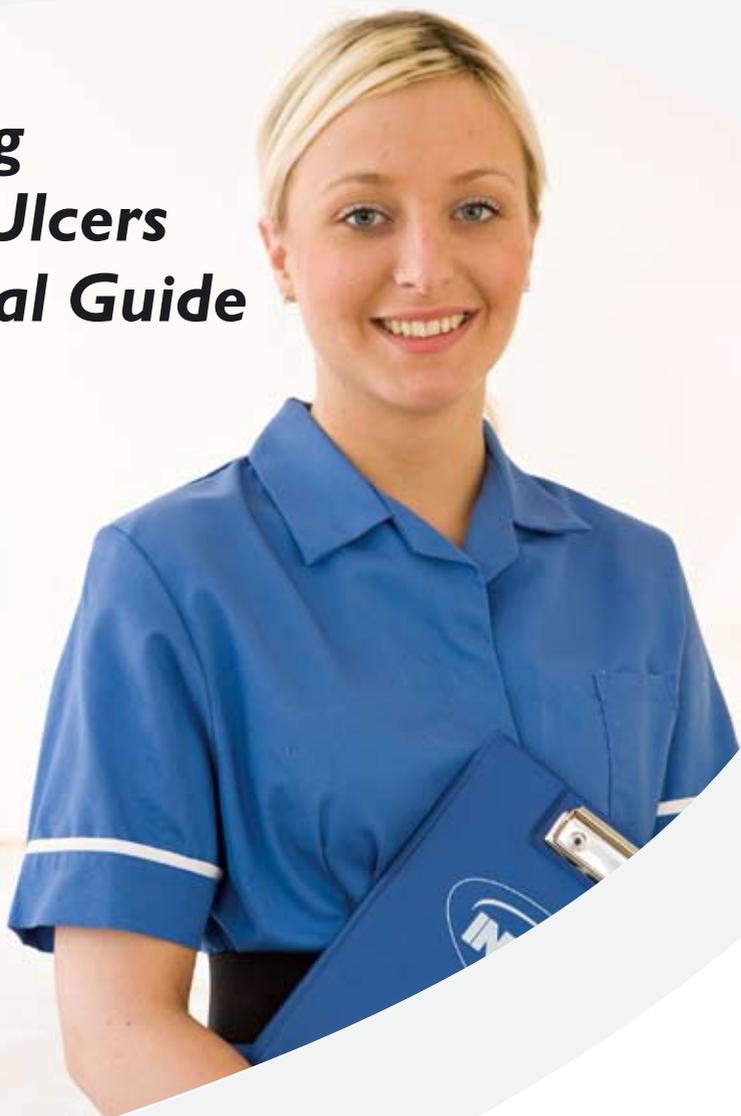


Preventing Pressure Ulcers – A Clinical Guide



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Introduction

This booklet is produced by Invacare® for clinicians working with individuals at risk of developing pressure ulcers.

Between 4 - 10 % of patients admitted to acute British hospitals will develop a pressure ulcer (2005 NICE). Figures across Europe vary greatly due to differing calculation methods (Dassen, T. Tannen, A & Lahmann, N, 2006). However reports indicate the prevalence to be anything from...

- 5.3 % to 18.6 % in Hospitals
- 7.9 % to 33.2 % in Nursing Homes
- 4.9 % to 29.1 % in Home Care situations

(Haalboom, J, 2005).

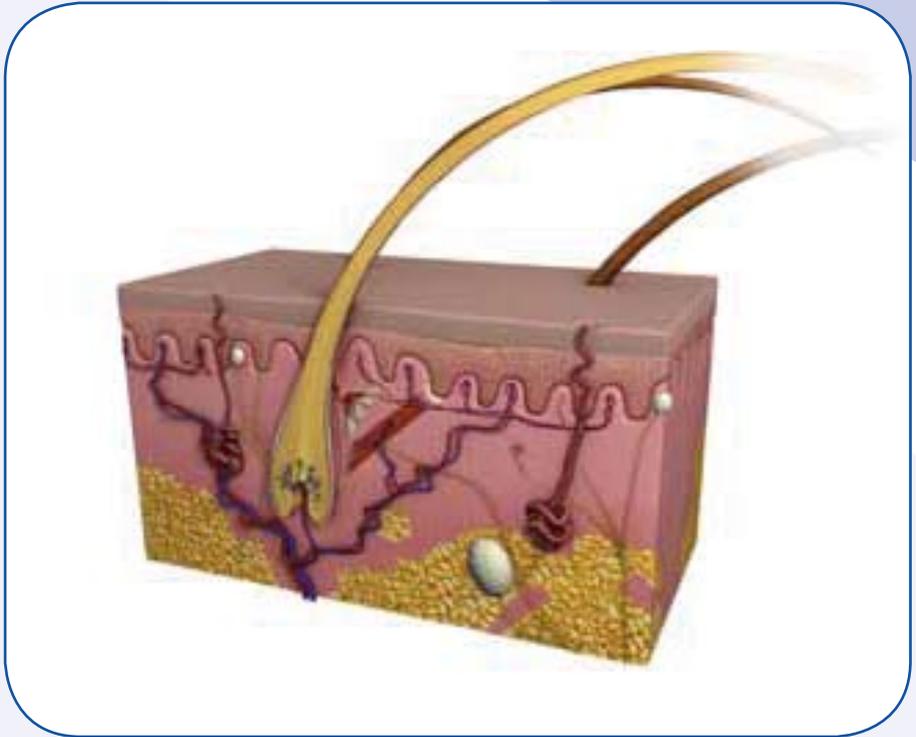
In America pressure ulcers have been estimated to cost as much as \$60, 000 per patient to treat (Edlich and Winters et al, 2004).

Professional staff have an important role in reducing the risk of pressure ulcers through best practice by enhancing quality of care.

This booklet is only a guide. It is not intended to replace independent clinical judgement, professional educational programmes, national or local guidelines, procedures or protocols.

➤ The Skin

The skin is the largest organ of the body measuring approximately 2 m² (Moore and Dalley 1992, and Tortoria & Anagnostikakos et al 1998).



The skin provides many important functions...

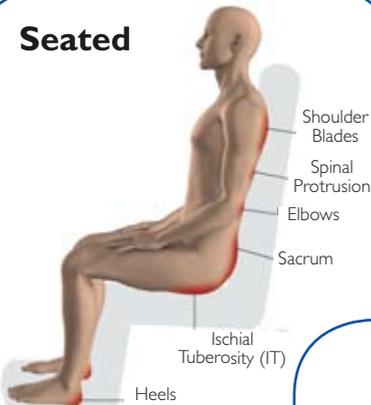
- Protection from injury
- Stores 40 - 80 % of the body's water.
(Bale & Camerson et al 2006)
- Helps to regulate body temperature.
- The subcutaneous fat layer helps to insulate the body.
- Synthesises vitamin D under the action of ultra violet light.

➤ Pressure Ulcers

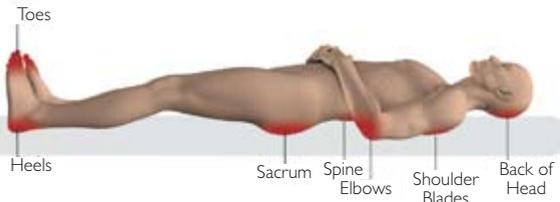
The EPUAP (European Pressure Ulcer Advisory Panel 1999) defines pressure ulcers as "...an area of localised damage to the skin and underlying tissue caused by pressure, shear or friction and or a combination of these."

Pressure ulcers can occur on any part of the body, but are commonly found in areas with bony prominences, also termed pressure points.

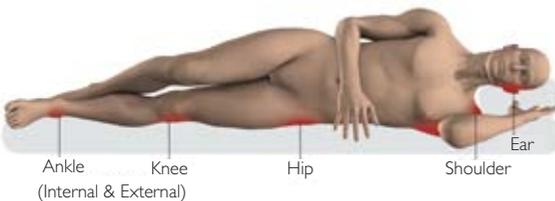
Seated



Lying on Back



Lying on Side



➤ Pressure Ulcer Development

Pressure ulcers develop as a response to external forces causing localised ischemia (a restriction in blood supply) (Bouten et al 2005). Individuals at risk are exposed to a combination of extrinsic and intrinsic factors, unique to that individual.

➤ **Extrinsic factors**

- Pressure
- Friction
- Shear
- Moisture

(Edlich & Winters et al 2004)

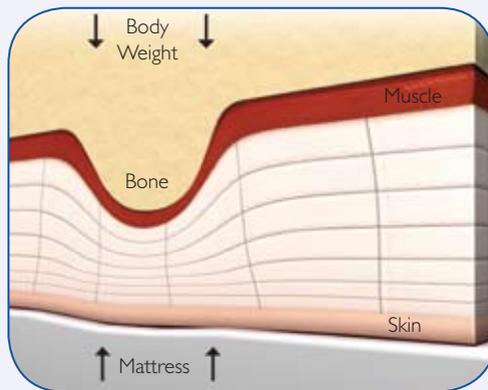
➤ **Intrinsic factors**

- Reduced mobility
- Impaired sensation
- Acute, chronic or terminal illness
- Pyrexia (high temperature)
- Some types of medication (e.g. steroids)
- Old age
- Level of consciousness & cognitive status
- Dehydration
- Incontinence/other moisture sources
- History of pressure ulcers
- Cognitive status
- Pain effecting the desire to reposition (Collier, 2004)
- Vascular disease
- Malnutrition

Other factors thought to increase the risk of pressure ulcer development are smoking and emotional stress (Bergstrom, 2005).

➤ Pressure

Pressure is a perpendicular force applied vertically to the skin's surface (Bliss 1993). This loading force compresses tissues, restricts the microcirculatory blood vessels, reduces oxygen and nutrient supply to the tissues and interrupts lymphatic drainage (Polliack et al 1997) leading to tissue death. Such lesions tend to be round and neater than those caused by shear or friction (Hampton & Collins 2004, and Dealey 1999). Localised pressure can result in damage from high pressure for short intense periods or from lower pressure for prolonged periods (Bell 2005).



➤ **Responses to Pressure**

Experiments have shown that when someone leans on a sheet of plate glass blanching of the skin can be seen. The blanched skin looks paler than the normal skin tone due to a lack of blood in the tissues under the epidermal layer. On release of the pressure the blanched area flushes with fresh blood causing a temporary erythema known as reactive hyperaemia. This is red in appearance in light skin and bluish/purple for darker skin. Reactive hyperemia is the body's natural reaction to pressure. Providing the pressure remains removed, this erythema will fade and the skin will return to its normal appearance.

➤ **Pressure Relief**

The longer someone is subjected to unrelieved external forces, the greater the risk they have of developing a pressure ulcer, and the lower the level of pressure their tissue can tolerate (Swain, I, 2005).

If the pressure is of sufficient intensity, or applied for a sufficiently long period of time, erythema may be present. Erythema that does not fade over time, after the removal of pressure is considered to be a pressure ulcer. A grade I Pressure Ulcer is defined by European Pressure Ulcer Advisory Panel (EPUAP) as “Non-blanchable erythema of intact skin” (EPUAP 1998).

➤ **Shear**

Shear is a parallel force acting on the skin (Bliss 1993) causing the tissues to be stretched, rupturing the capillary blood vessels with local tissue death. This can occur when gravity pulls the patient towards the foot-end of the bed or when they are dragged up the bed, where the skin is stretched causing a separation of the skin's layers.

The edges of these ulcers tend to have ragged, uneven wound edges often with surrounding epidermal scuffing. Bruising may also be a feature.

➤ **Friction**

Friction occurs when one surface is rubbed against another. This can occur to the patient when slipping down, or if they are inappropriately dragged up the bed. The friction can result in scuffing of the skin, friction burns, or blister formation.

➤ Tissue Tolerance

Tissue Tolerance is the ability of the skin and supporting structures to withstand the mechanical forces of pressure, shear and friction.

It is commonly quoted that a safe level of pressure is 32 mm Hg which is determined to be the capillary closing pressure (Landis 1930). However, many experts now believe that there is no predictable link between internal pressure and the external interface pressures (Bader & Oomens 2005). It should be noted that the average interface pressure in sitting is often much greater than 32 mm Hg.

The degree of vulnerability to pressure varies from person to person. This is because...

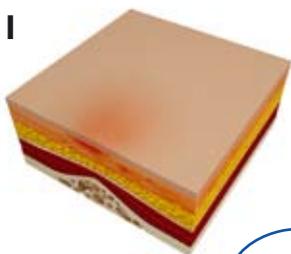
- The combination of extrinsic and intrinsic factors that can increase the risk of pressure ulcer development are unique to each individual (Bridel 1993)
- Collagen levels vary from person to person with decreasing effectiveness with age. Collagen protects the microcirculation by helping to maintain the pressures inside and outside the cells preventing cell bursting (Bridel 1993).
- Autoregulatory processes are initiated when external pressure is sensed leading to increased internal capillary pressure, reduced blood flow and reactive hyperaemia to counteract the pressure loading. These mechanisms can fail when the external pressure exceeds the person's diastolic pressure (Bridel, 1993 and Nixon 2001).

The response of tissue to external forces varies greatly, depending on a large number of factors. For this reason, it is not possible to establish a universal 'safe level of pressure'.

➤ Pressure Ulcer Grading Tools

EPUAP recommends a four category grading system (EPUAP 1998) for skin damage in pressure ulcers.

Grade 1



"Intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its colour may differ from the surrounding area."

European Pressure Ulcer Advisory Panel, 1998

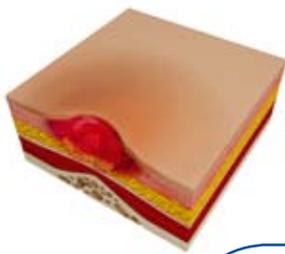
"Partial skin loss involving epidermis, dermis or both. The pressure sore is superficial and presents clinically as an abrasion or blister."

European Pressure Ulcer Advisory Panel, 1998

Grade 2



Grade 3



"Full thickness skin loss involving damage to or necrosis of subcutaneous tissue that may extend down to, but not through underlying fascia. The pressure sores present clinically as a deep crater with or without undermining of adjacent tissue."

European Pressure Ulcer Advisory Panel, 1998

"Extensive destruction, tissue necrosis, or damage to muscle, bone or supporting structures with or without full thickness skin loss."

European Pressure Ulcer Advisory Panel, 1998

Grade 4



N.B. Grading should not be used in reverse. Although an ulcer might be a grade 2 and deteriorate to a 3 or 4, the reverse cannot be applied as the ulcer heals. This is because the grading system describes the structures and tissue level of damage. Healing does not replace the same structures but replaces the lost tissue with granulation tissue which does not contain lost elements such as nerves, sweat glands and organised blood vessels.

➤ Risk Assessment

Several Risk Assessment Tools including Norton (Norton, 1962), Waterlow (Waterlow, 2005) and Braden (Braden & Bergstrom, 1989) have been devised as aide memoires to help identify risk.

Risk assessment tools are designed to act as an “aid memoire” and help communication (NICE 2005). They are **not** intended to be used prescriptively for equipment selection or replace clinical judgement (Cullum, 2001). Clinical judgement should always be the overriding factor in prevention and treatment planning (NICE 2005 and Cullum, 2001).

➤ **Norton Scale Assessment**

Scoring System key: Total of 16 or below – At Risk

A Physical Condition		B Mental Condition		C Activity		D Mobility		E Incontinent	
Good	4	Alert	4	Ambulant	4	Full	4	Not	4
Fair	3	Apathetic	3	Walks with help	3	Slightly limited	3	Occasionally	3
Poor	2	Confused	2	Chairbound	2	Very Limited	2	Usually urinary	2
Very bad	1	Stuporous	1	Bedfast	1	Immobile	1	Doubly	1

Instructions for use:

1. Assess the patient's condition and score accordingly (1-4) under each heading (A-E).
2. Total the scores together
3. A total score of 16 or below indicates a patient is AT RISK and preventative measures should be taken.
The lower the total, the greater the risk.
4. Assess the patient regularly.

The five basic categories are: Physical Condition, Mental Condition, Activity, Mobility and Incontinence. Each category is scored on a scale 1-4 (where 1 donates least favorable and 4 denotes most favorable) with overall scores ranging from a maximum of 20 to a minimum of 5.

Norton, et al 1962

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 ABOVE AVERAGE BMI = 25 - 29.9 OBESE BMI > 30 BELOW AVERAGE BMI < 20 BMI = WT (KG) / HT (M ²)	0 HEALTHY TISSUE PAPER DRY 1 OEDEMATOUS CLAMMY, PYREXIA DISCOLOURED GRADE 1 2 BROKEN / SPOTS GRADE 2 - 4	0 MALE 1 FEMALE 1 14 - 49 1 50 - 64 1 65 - 74 2 75 - 80 3 81+	1 A - HAS PATIENT LOST WEIGHT RECENTLY 1 YES: GO TO B NO: GO TO C 2 UNSURE: GO TO C AND SCORE 2 3 4 C - PATIENT EATING PROPERLY OR LACK OF APPETITE 5 *'NO' = 0; 'YES' SCORE = 1 B - WEIGHT LOSS SCORE 0.5 - 5 KG = 1 0.5 - 10 KG = 2 10 - 15 KG = 3 > 15 KG = 4 UNSURE = 2 NUTRITION SCORE IF > 2 REFER FOR NUTRITION ASSESSMENT / INTERVENTION
CONTINENCE	◆ MOBILITY	◆ SPECIAL RISKS	◆
COMPLETE / CATHETERISED URINE INCONT. FEACAL INCONT. URINARY & FEACAL INCONTINENCE	0 FULLY RESTLESS/FIDGETY 1 APATHETIC 2 RESTRICTED 3 TRACTION 4 5 CHAIRBOUND EG. WHEELCHAIR	0 TISSUE MALNUTRITUION 1 TERMINAL CACHEXIA 2 MULTIPLE ORGAN FAILURE 3 SINGLE ORGAN FAILURE (RESP, RENAL, CARDIAC) 4 PERIPHERAL VASCULAR DISEASE 5 ANAEMIA (HB < 8) SMOKING	8 NEUROLOGICAL DEFICIT 8 DIABETES, MS, CVA 8 MOTOR/SENSORY PARAPLEGIA (MAX OF 6) 5 MAJOR SURGERY OR TRAUMA 5 ORTHOPAEDIC/SPINAL
10+ AT RISK			5
15+ HIGH RISK			5
20+ VERY HIGH RISK			8
# Scores can be discounted after 48 hours provided patient is recovering normally.		MEDICATION - CYTOTOXICS, LONG TERM/HIGH DOSE STEROIDS, ANTI-INFLAMMATORY MAX OF 4	

Remember tissue damage may start prior to admission, in casualty. A seated patient is at risk. Assessment (see above) 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.

PREVENTION	
PRESSURE REDUCING AIDS SPECIAL MATTRESS/BEDS:	10+ OVERLAYS OR SPECIALIST FOAM MATTRESSES 15+ ALTERNATING PRESSURE OVERLAYS, MATTRESSES AND BED SYSTEMS 20+ BED SYSTEMS: FLUIDISED BEAD, LOW AIR LOSS AN ALTERNATING PRESSURE MATTRESSES NOTE: PREVENTATIVE AIDS COVER A WIDE SPECTRUM OF SPECIALIST FEATURES. EFFICACY SHOULD BE JUDGED, IF POSSIBLE, ON THE BASIS OF INDEPENDANT EVIDENCE.
CUSHIONS:	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). 10+ 100 MM FOAM CUSHION 15+ SPECIALIST GEL AND/OR FOAM CUSHION 20+ SPECIALISED CUSHION, ADJUSTABLE TO INDIVIDUAL PERSON.
BED CLOTHING:	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.
NURSING CARE	
GENERAL	HAND WASHING, FREQUENT CHANGES OF POSITION, LYING, SITTING. USE OF PILLOWS
PAIN NUTRITION PATIENT HANDLING	APPROPRIATE PAIN CONTROL HIGH PROTEIN, VITAMINS AND MINERALS CORRECT LIFTING TECHNIQUE - HOISTS - MONKEY POLES TRANSFER DEVICES
PATIENT COMFORT AIDS OPERATING TABLE THEATRE / A&E TROLLEY SKIN CARE:	REAL SHEEPSKIN - BED CRADLE 100 MM (4") COVER PLUS ADEQUATE PROTECTION GENERAL HYGIENE, NO RUBBING, COVER WITH AN APPROPRIATE DRESSING.

WOUND GUIDELINES	
ASSESSMENT	ODOUR, EXUDATE, MEASURE/PHOTO-GRAPH POSITION
WOUND CLASSIFICATION - EPUAP	
GRADE 1	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.
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
DRESSING GUIDE	USE LOCAL DRESSINGS FORMULARY AND/OR WWW.WORLDWIDEWOUNDS
IF TREATMENT IS REQUIRED, FIRST REMOVE PRESSURE	

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. Reproduced with permission of Judy Waterlow MBE SRN RCNT
www.judy-waterlow.co.uk

Braden Scale

SENSORY PERCEPTION	1. Completely Limited	2. Very Limited	3. Slightly Limited	4. No Impairment
Ability to respond meaningfully to pressure-related discomfort	Unresponsive (does not moan, flinch, or gasp) to painful stimuli, due to diminished level of consciousness or sedation. Or limited ability to feel pain over most of the body	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 most of the body	Responds to verbal commands, but cannot always communicate discomfort or the need to be turned OR has some sensory impairment which limits ability to feel pain or discomfort in 1 or 2 extremities.	Responds to verbal commands. Has no sensory deficit which would limit ability to feel or voice pain or discomfort.
MOISTURE	1. Constantly Moist	2. Very Moist	3. Occasionally Moist	4. Rarely Moist
Degree to which skin is exposed to moisture	Skin is kept moist almost constantly by perspiration, urine, etc. Dampness is detected every time patient is moved or turned.	Skin is often but not always moist. Linen must be changed at least once a shift.	Skin is occasionally moist, requiring an extra linen change approximately once a day.	Skin is usually dry, linen only requires changing at routine intervals.
ACTIVITY	1. Bedfast	2. Chairfast	3. Walks Occasionally	4. Walks Frequently
Degree of physical activity	Confined to bed.	Ability to walk severely limited or non-existent. Cannot bear own weight and/or must be assisted into chair or wheelchair.	Walks occasionally during the day but for very short distances, with or without assistance. Spends majority of each shift in bed or chair.	Walks outside room at least twice a day and inside room at least once every two hours during waking hours.
MOBILITY	1. Completely Immobile	2. Very Limited	3. Slightly Limited	4. No Limitation
Ability to change and control body position	Does not make even slight changes in body or extremity position without assistance.	Makes occasional slight changes in body or extremity position but unable to make frequent or significant changes independently.	Makes frequent though slight changes in body or extremity position independently.	Makes major and frequent changes in position without assistance.
NUTRITION	1. Very Poor	2. Probably Inadequate	3. Adequate	4. Excellent
Usual food intake pattern	Never eats a complete meal. Rarely eats more than a 1/3 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 and/or maintained on clear liquids or I.V.'s for more than 5 days.	Rarely eats a complete meal and generally eats only about 1/2 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.	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 if offered. OR is on a tube feeding or TPN regime which probably meets most of nutritional needs.	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.
FRICION AND SHEAR	1. Problem	2. Potential Problem	3. No Apparent Problem	
	Requires moderate to maximum assistance in moving. Complete lifting without sliding against sheets is impossible. Frequently slides down in bed or chair, requiring frequent repositioning with maximum assistance. Spasticity, contractures or agitation lead to almost constant friction.	Moves 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.	Moves in 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.	

Instructions for use:

1. Assess the patient's condition using the 6 categories.

2. Total the scores together

3. A score of 16 or below indicates the patient is AT RISK of pressure sore development.

4. The lower the score the higher the risk

5. Assessment should be performed regularly.

➤ Reducing the Risk

Although not an exhaustive list; the following are considered important in reducing the risk of developing a pressure ulcer...

➤ **Immobility, Movement and Repositioning**

The disruption in blood supply caused by pressure results in pain signals. These pain signals motivate an individual to regularly reposition themselves, resulting in a restoration of blood supply. However if an individual's sensation and/or ability to move is impaired, they will not have this natural reaction to pressure.

For individuals who are at risk of developing pressure ulcers, regular repositioning to redistribute the pressure is advocated by many experts in tissue viability (Maylor 2004).

A plan of care incorporating repositioning should be based on skin inspection and the length of time pressure points take to react to pressure and pressure relief.

If a dynamic mattress is used, repositioning must still be given for comfort, joint movement, mealtimes, nursing and medical interventions, etc...

➤ **Seating**

When sitting in a 'neutral' position with feet firmly on the floor, approximately 19 % of body weight is supported by the feet and 75 % of body weight is supported by the buttocks and sacrum (Collins 2001). If individuals are unable to self adjust in the chair or stand up to relieve pressure, the tissue becomes at greater risk of developing a pressure ulcer.

Selecting the right type of seat is very important as inappropriate seating may increase the risk of pressure ulcer development.

Too Wide - A seat that is too wide will allow the individual to sit off centre in the seat. This can often be seen when the person struggles to transfer. Sitting off centre in the chair can encourage the individual to put more weight through one ischial tuberosity than the other, in order to make use of the arm rest which is furthest away. As well as resulting in a scoliotic posture, this sitting position can increase the risk of pressure ulcers to the ischial tuberosity which is supporting most of the weight.



Too Narrow - A narrow seat can cause pressure to the hips, which can in turn increase the risk of pressure ulcer development.



Arm Rests Too High - An arm rest which is too high will cause high pressure under the elbows and may make it difficult to eat and drink.



Too Low - A seat that is too low will not support the thighs and will increase pressure to the ischial tuberosities and coccyx.



Correct - correct arm rest height and seat width. A correctly-sized seat provides good pressure care, good sitting posture and allows the individual to move in the seat.



➤ Temperature

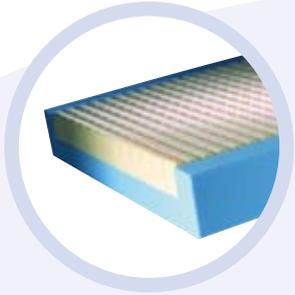
When the body's tissue is under pressure the supply of oxygen (and other vital nutrients) is reduced. However, it is believed that raising the body's temperature by 1° Celsius can increase metabolic damage by up to 13% (Stekelenberg, Oomens et al 2005). This increases the difference between the supply and demand of oxygen and essential nutrients, which in turn can increase the risk of tissue breakdown.

Temperatures above 33° Celsius can cause local perspiration, which in turn can cause maceration and skin damage (Lachenbruch 2005).

Local skin temperature can rise when the skin is trapped against a support surface. For this reason, choice of cover materials on cushions and mattresses is very important.

➤ Pressure Redistribution Products

➤ **Mattresses**



There are a large number of cushions and mattresses available which are designed to help reduce the risk of pressure ulcers by reducing the effects of external forces on skin and tissue. Removing pressure from vulnerable areas allows improved vascular and lymphatic circulation reducing tissue ischaemia (EPUAP 1998).

The majority of mattresses are static systems made of foam, visco elastic, fibre or air.

Powered systems are also available in four different types

1. Alternating pressure air mattresses and cushions in which sets of air cells are alternately inflated and deflated to stimulate reactive hyperaemia
2. Hybrid static/powered systems. The patented Invacare® Softform Premier Active mattress functions as a very high risk static mattress, but can also be powered by a pump unit inflating a set of aircells to provide additional alternating therapy when required.
3. Powered low-airloss mattresses help reduce heat and moisture build up, and redistribute pressure by providing a continuous loss of air through microscopic pores in the surface of the mattress.
4. Combined alternating and low air loss systems.



➤ Cushions



1. **Foam** - Standard foam has some ability to contour to an individual's shape. The performance of foam is often greatly improved by modifying the foam e.g. castellations to improve its ability to contour and manage shear forces.

2. **Visco Elastic Foam** – Memory foam is heat-sensitive, and contours to the individual's shape, making it a good pressure relieving material when used correctly. However it can be less stable, making it less suitable for individuals with a poor sitting balance.



3. **Pre-Moulded Foam** - Pre-moulding foam into an anatomical shape is also very effective at improving a cushion's performance as a pressure redistribution product. Shaped cushions also have the benefit of prompting good posture and aiding stability.

4. **Gel** - Silicon and other types of gel/paste are sometimes used in pressure redistribution cushions. The semi-solid state of gel allows it to contour to an individual's shape much more effectively than foam alone. However gel alone is likely to bottom out. i.e. move away from bony prominences. For this reason, gel is most commonly used on top of a foam base.

5. **Air** - Air based cushions can vary greatly in effectiveness, depending upon their design. However, a well designed air cushion can provide very good pressure redistribution. Some types of air cushions can be less stable than other cushion types, and therefore are not always appropriate for individuals with a poor sitting balance.

➤ **Factors To Consider When Choosing a Mattress or Cushion:**

- Level of risk
- Existing tissue damage
- Location of any existing pressure ulcers
- General skin condition
- General health status
- Client acceptance of a product
- Ability of the individual to reposition themselves
- Ease of use and maintenance

➤ **Conclusion**

The prevention and management of pressure ulcers should focus on identifying the combination of risk factors present and planning preventative measures based on the clinical judgment of professional care staff. Ideally the prevention/treatment plan should be agreed, and actioned by a multidisciplinary team.

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Glossary of Terms

- **Ischaemia** – localised deficiency of blood supply. In the case of Tissue Viability, ischaemia usually refers to occlusion due to pressure.
- **Tissue Tolerance** – The ability of the skin to tolerate pressure.
- **Occlusion** – to close, referring to the blockage or closure of blood flow through a vessel.
- **Reperfusion** – the restoration of (in this case) blood into the vessels following a period of occlusion.
- **Reperfusion Injury** – relates to the risk of injury from repeated (rapid) reperfusion.
- **Reactive Hyperaemia** – Temporary red flushing that naturally appears on the skin following the removal of pressure.
- **Endothelial Cells** – the cells which line the inside of blood vessels (also lines the heart and lymphatic vessels).
- **Collagen** – A protein found in the skin, tendons, bone and ligaments. Although it is relatively inelastic it does have high tensile strength which is fundamental in pressure ulcer prevention.
- **Micro-circulation** - denoting the smallest part of the circulatory system (i.e the capillaries) responsible for the delivery of nutrients and oxygen and removal of toxins to the tissues.
- **Capillaries** - extremely narrow blood vessels, forming networks in most tissues. The vessel wall of the capillary is only one cell thick, enabling the exchange of oxygen and carbon dioxide.
- **Extrinsic Factors** – factors that may contribute to a pressure ulcer, occurring as a result of external factors (e.g. poor support surface, shear & friction forces, temperature)..
- **Intrinsic factors** – factors that may contribute to the development of a pressure ulcer, occurring as a result of factors specific to an individual, e.g. immobility, old age, illness, skin maceration or malnutrition.

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