Pressure Ulcers

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Overview

- Epidemiology
- Definition, Pathophysiology & Grades of Pressure Ulceration
- Definition, Pathophysiology of Moisture Associated Tissue Damage
- Medical Device Related Pressure Damage
- Risk Assessment & Risk Assessment Tools
- SSKIN Bundle

Pressure Ulcer Prevalence

EPUAP (2002)

Pan European Prevalence Study

Sample Size = 5,000 pts

Standard Data collection tool

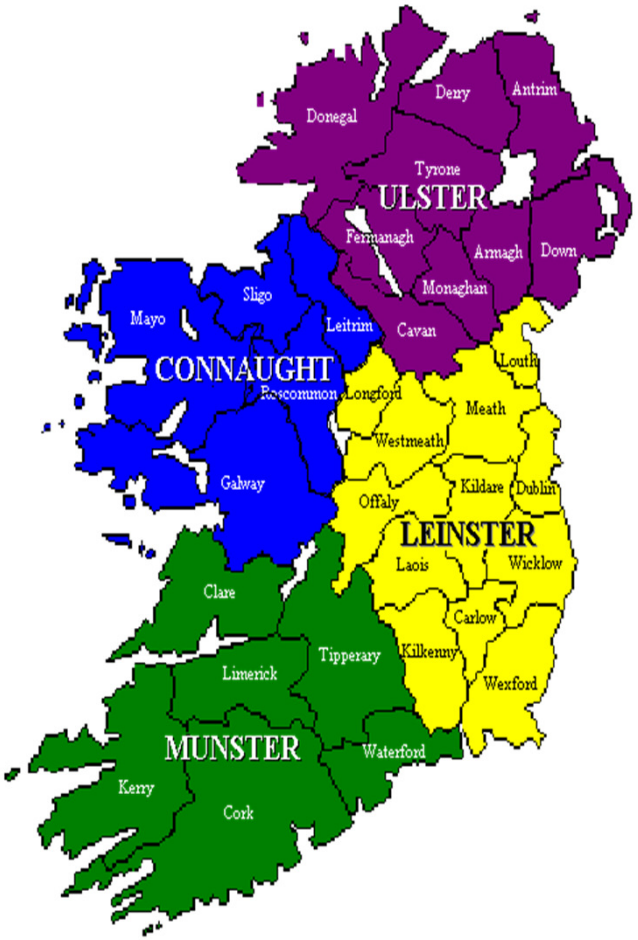
Prevalence Rate = 18%

Range 8.3% in Italy to 22.9% in Sweden

Irish Prevalence Rates

- Moore & Pitman 2000
- Sheerin et al 2005
- Gallagher et al 2008
- Gethin et al, Mc Dermot - Scales et al 2009
- Moore & Cowman 2012

  The mean prevalence is 16% (Moore *et al* 2013), **varying from 4%** (Mc Dermott- Scales 2009) **to 37%** (Sheerin *et al* 2005)



The problem

- Global mortality rates from 187 countries found a 32.5 % increase in deaths directly attributable to pressure ulcers from 1990 - 2010

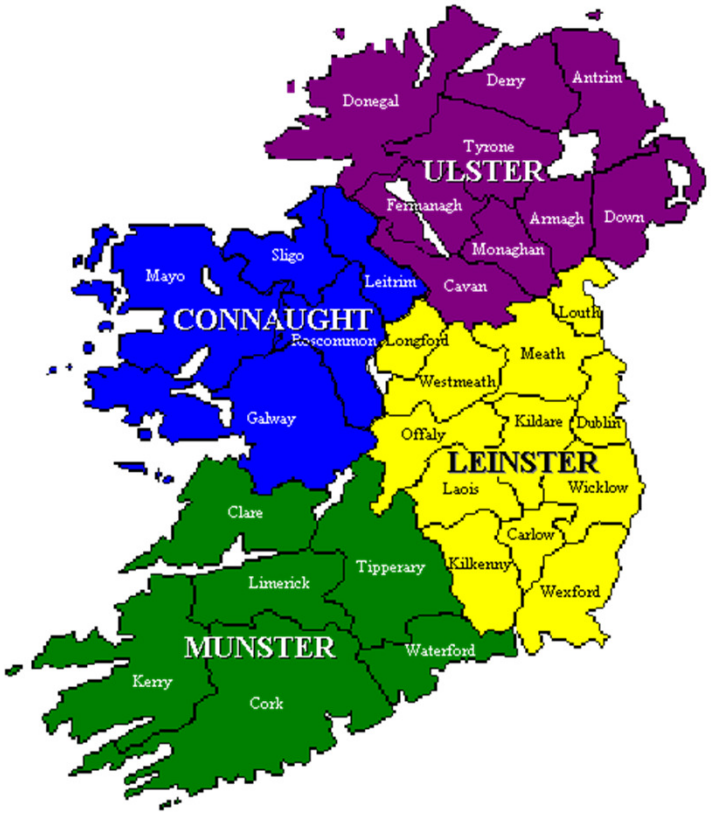
  (Lozano et al, 2010)

- In Ireland there have been six published studies which have explored pressure ulcer prevalence - -

  (Gallagher et al, 2008, Gethin et al, 2005, McDermot-Scales et al, 2009, Moore & Cowman 2012, Moore &Pitman 2000, Sheerin et al 2005

Irish Incidence Rates

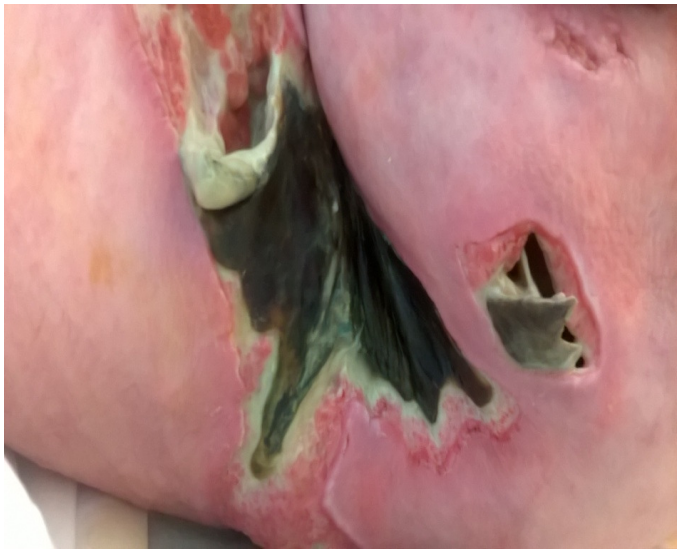
- Moore & Pitman 2000
- Sheerin et al 2005
- Gethin et al 2005
- Gallagher et al 2008
- O'Brien & Cowman 2011
- Moore et al 2011



Mean incidence is 11% (Moore et al 2013) **varying from 8%** (Moore & Pitman 2000) **to 14.4%** (Gallagher et al 2008)

Definition

"A pressure ulcer is defined as a localised injury to the skin and / or the underlying tissue usually over a bony prominence, as a result of **pressure**, or pressure in combination with **shear**"

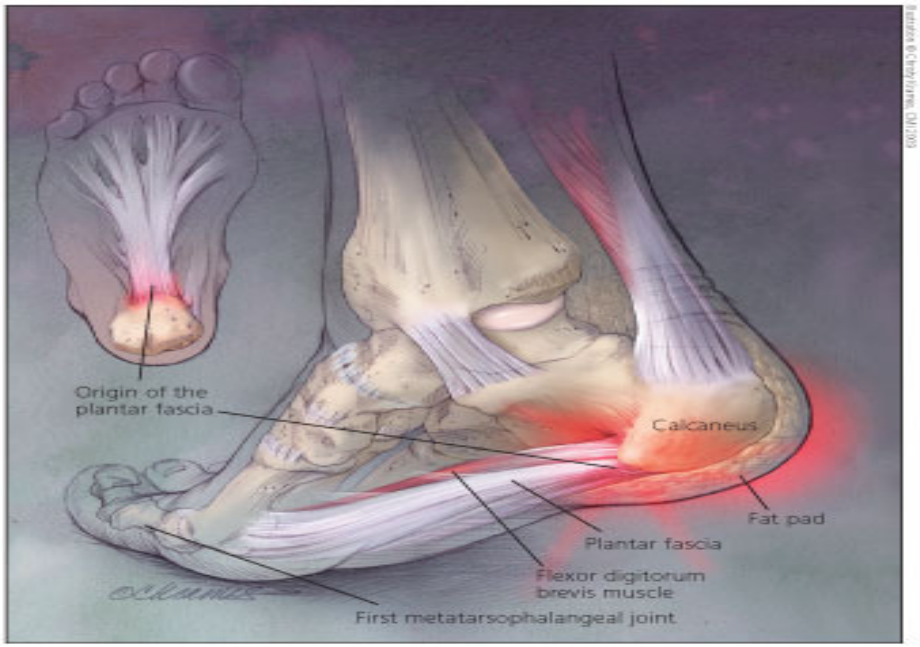


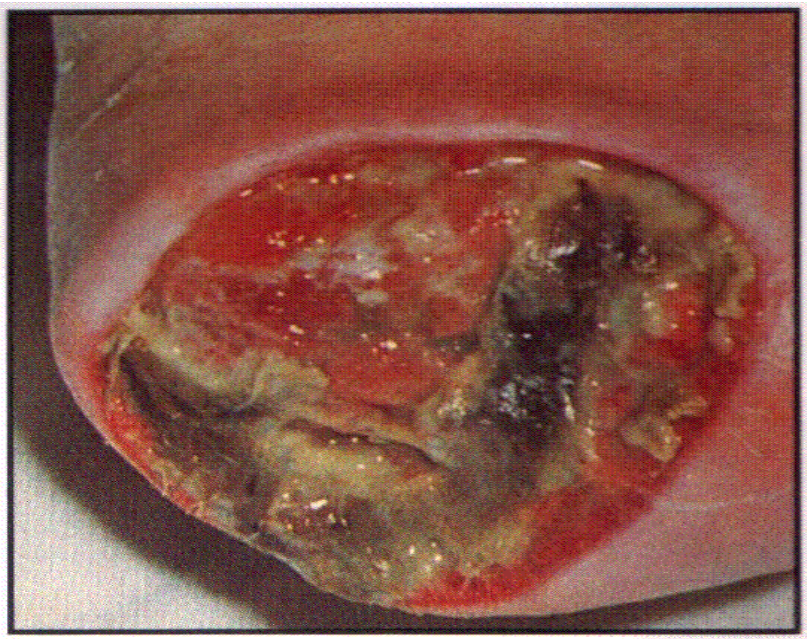
(EPUAP/NPUAP/PPPIA 2014)

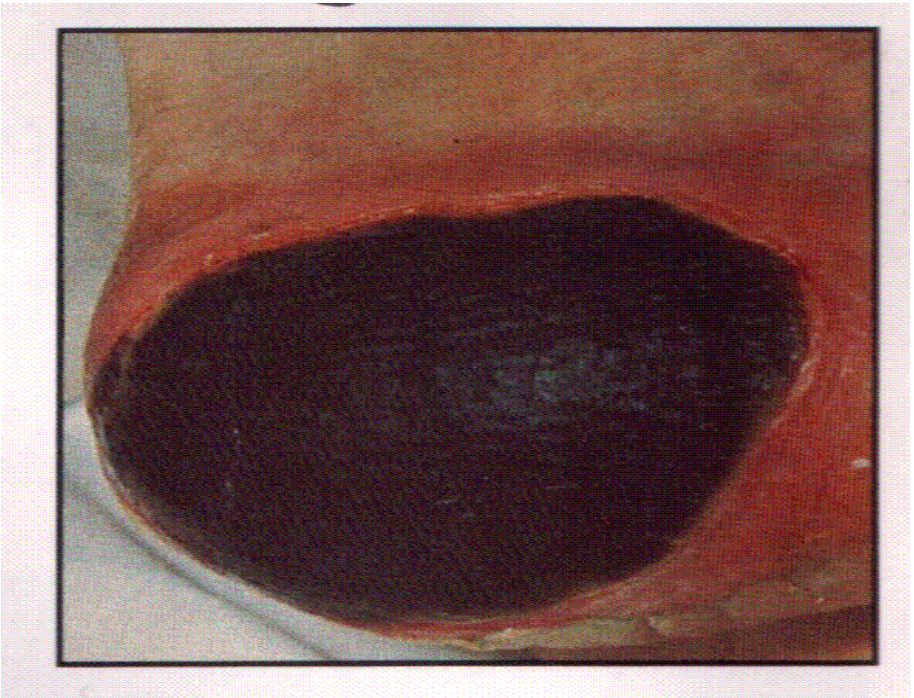
Contributory factors

Both immobility and diminished activity are considered as primary risk factors

(Bergstrom *et al,* 1992)

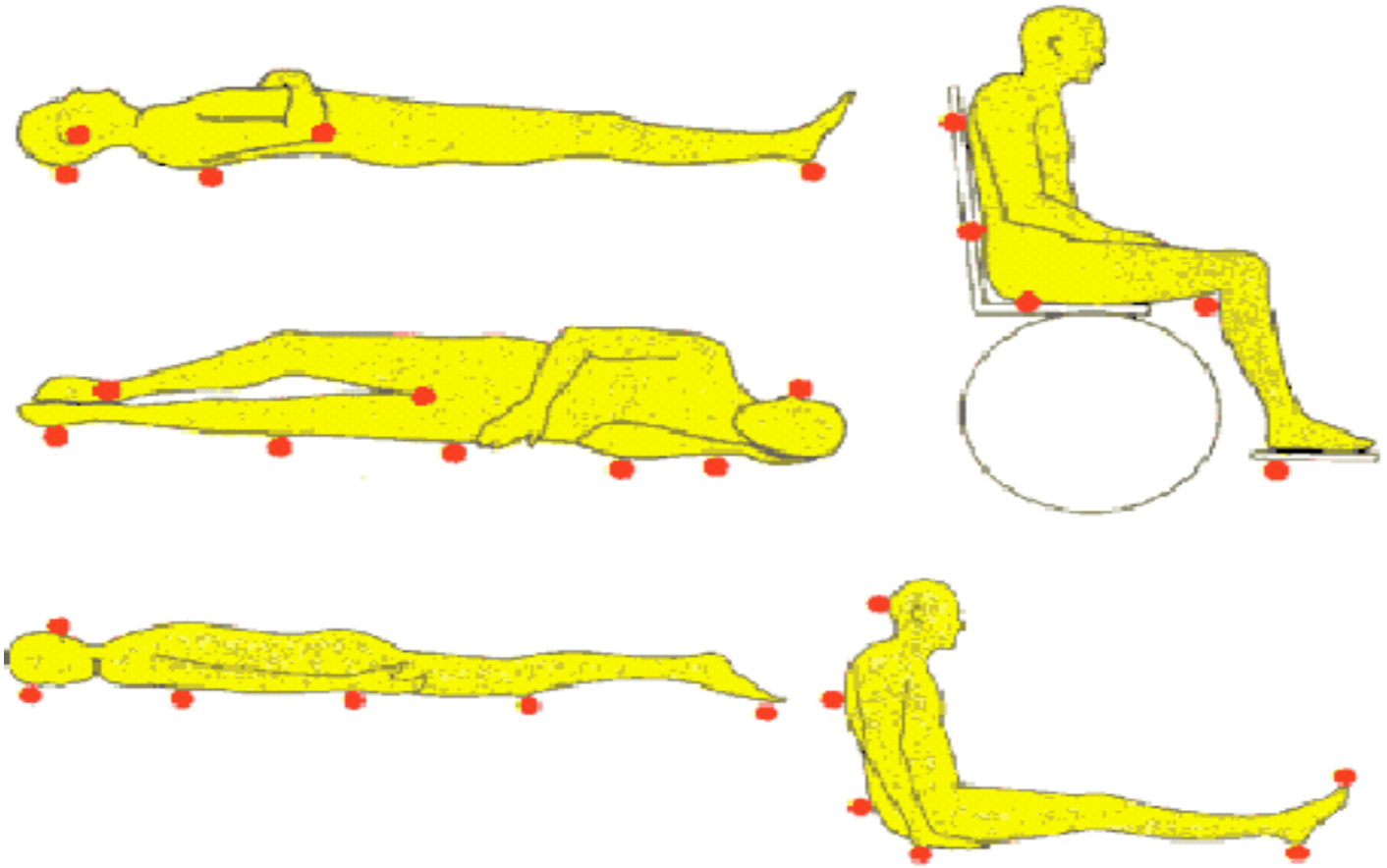

Origin of the plantar fascia
Calcaneus
Fat pad
Plantar fascia
Flexor digitorum brevis muscle
First metatarsophalangeal joint





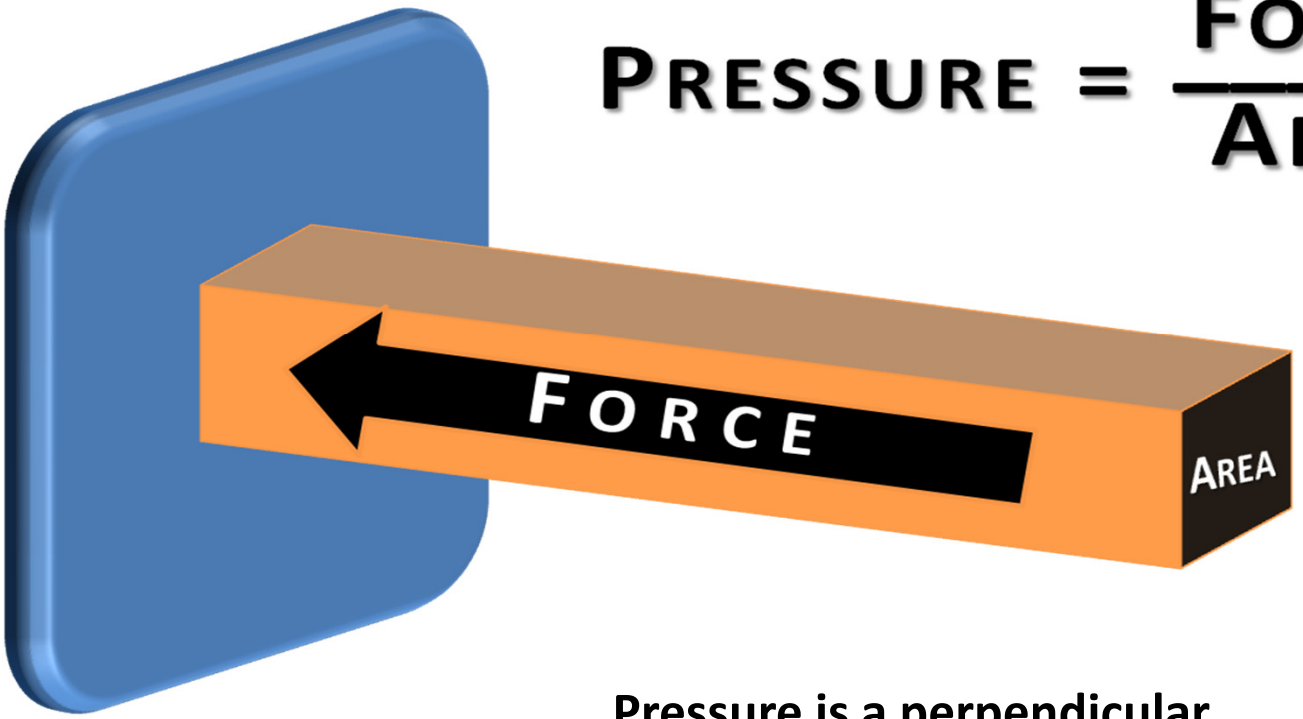
Sites of Pressure Ulceration

CUH
Ospidéal Ollscoile Chorcaí
Cork University Hospital



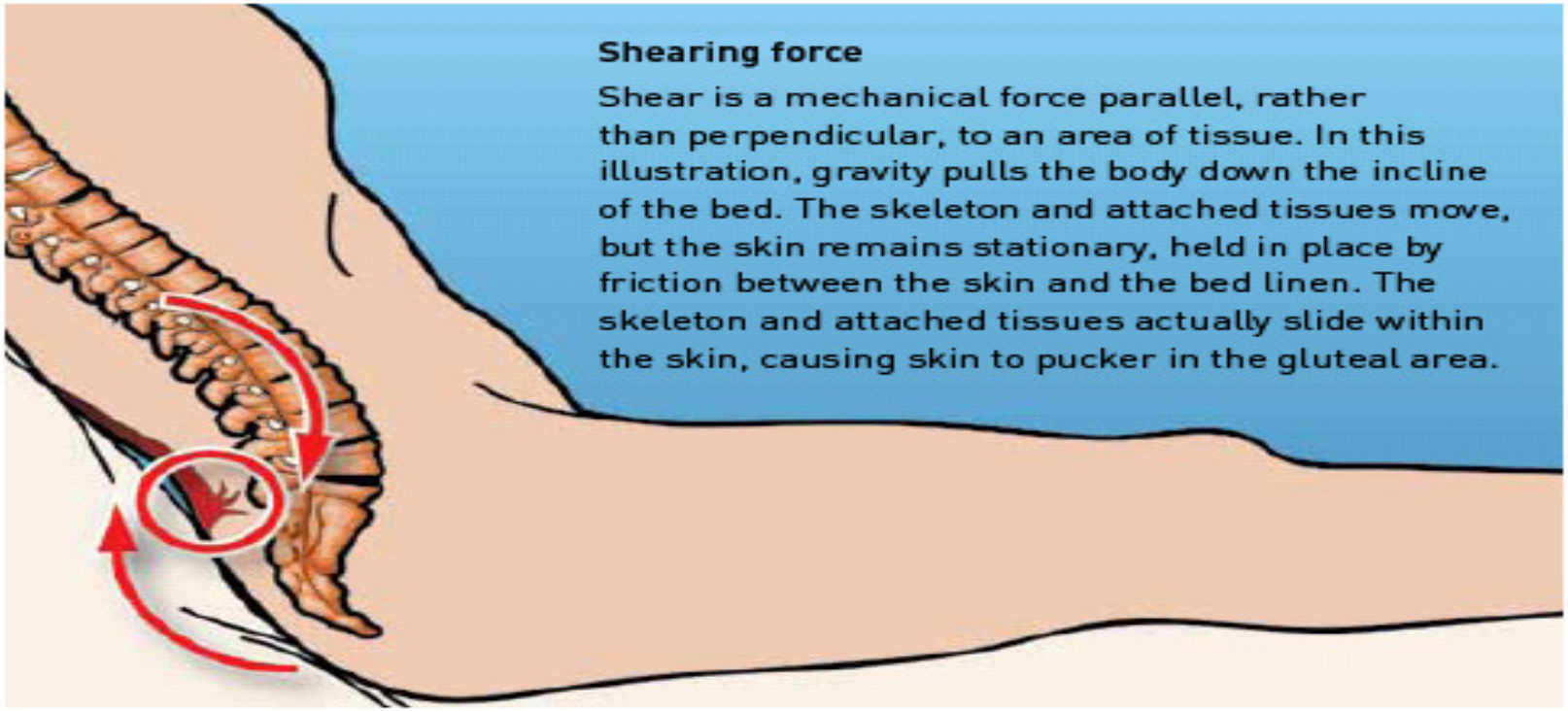
Pathophysiology - PRESSURE

$$\text{PRESSURE} = \frac{\text{FORCE}}{\text{AREA}}$$



Pressure is a perpendicular load exerted on a unit of area

SHEAR = mechanical stress



The amount of pressure needed to produce occlusion with resultant ischemia is cut in half when sufficient shearing occurs

Intensity and Duration of Pressure

Low intensity and long duration is as capable of producing tissue injury as high pressure for shorter duration

Prolonged pressure

Tissue Necrosis + Reperfusion Injury

- Fluid forced out of interstitial spaces causing cell to cell contact
- Cell membrane ruptures with release of toxic material
- Damage to lymphatic impedes removal of toxic substances = tissue necrosis

Tolerance of Skin & Supporting Structures

- Influenced by Collagen content and
  auto - regulation mechanism of microcirculation

- Collagen content of the dermis alters with disease, age, spinal cord injury & steroid use.

Physiology & Pressure Ulcer Healing

- **REGENERATION**

  Identical replication of cells in humans is possible in a limited number of cell types, e.g. epithelial, liver

- **REPAIR**

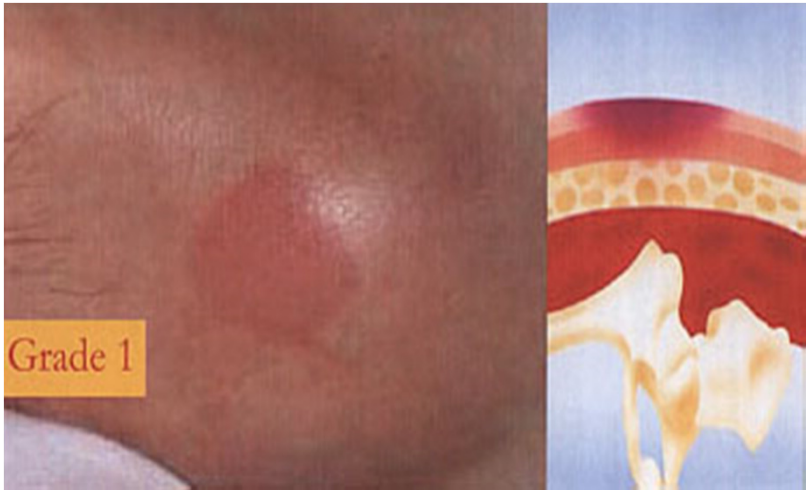
  Main mechanism by which healing occurs in humans whereby loss of tissue integrity is replaced by connective tissue. Important to remember in a Grade 1V Pressure Ulcer where there is muscle loss, this will be replaced by connective tissue & not muscle.

Grading of Pressure Ulcers

Ulceration is an observable alteration of intact skin whose indicators, when compared with an adjacent or opposite area on the body, may include changes in one or more of the following:

- **Skin Temperature** – warmth or coolness
- **Tissue Consistency** – firm or boggy.
- **And/or Sensation** –pain or itchy.

EPUAP Grading System



Scottish Adapted European Pressure Ulcer Advisory Panel (EPUAP)
Grading Tool

Grade 1

Non-blanchable erythema (redness) of intact skin.

Discolouration of the skin, warmth, oedema, induration or hardness may also be used as indicators, particularly on individuals with darker skin

Grade 2

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

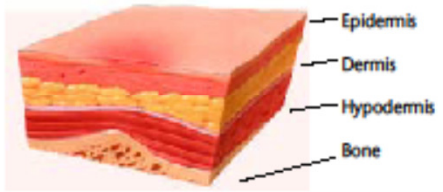
Grade 3

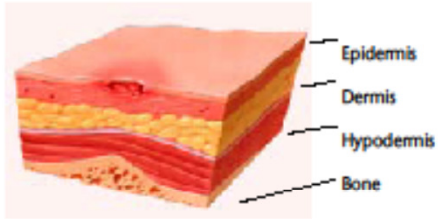
Full thickness skin loss involving damage to or necrosis of subcutaneous tissue that may extend down to, but not through underlying fascia

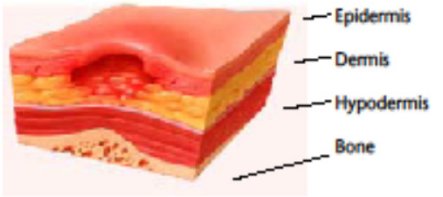
Grade 4

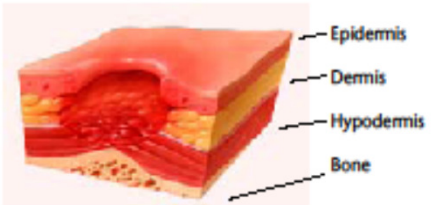
Extensive destruction, tissue necrosis, or damage to muscle, bone, or supporting structures with or without full thickness skin loss

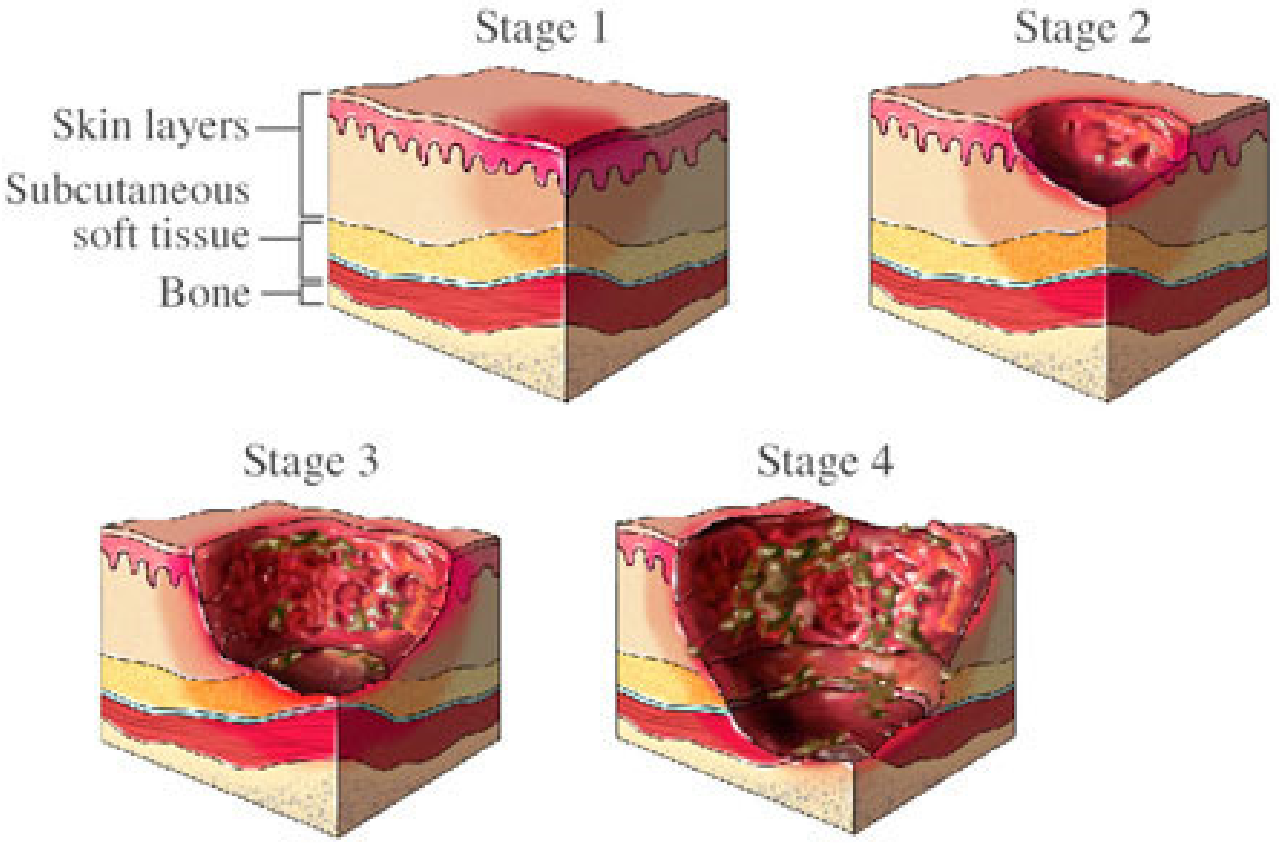
Progression of a pressure ulcer



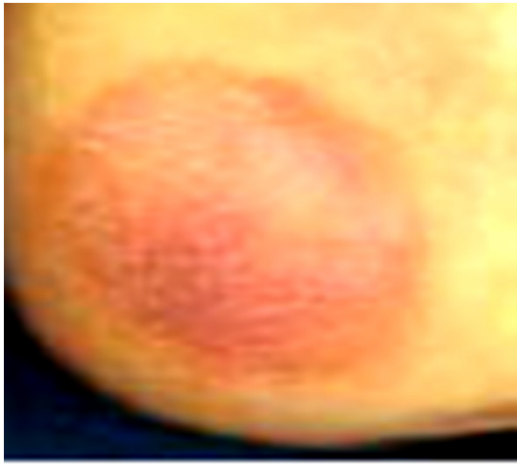







Stage 1
Stage 2
Skin layers
Subcutaneous soft tissue
Bone
Stage 3
Stage 4

Stage 1 Pressure Ulcer



Appears as a defined area of persistent redness (Non-Blanching) in lightly pigmented skin. Intact & usually presents over a bony prominence

In darker skin tones, it may appear with persistent red, blue or purple hues

Stage II Pressure Ulcer

Partial-thickness skin loss involving epidermis, dermis or both.

The ulcer is superficial and presents clinically as an abrasion, blister or shallow crater

Stage lll Pressure Ulcer

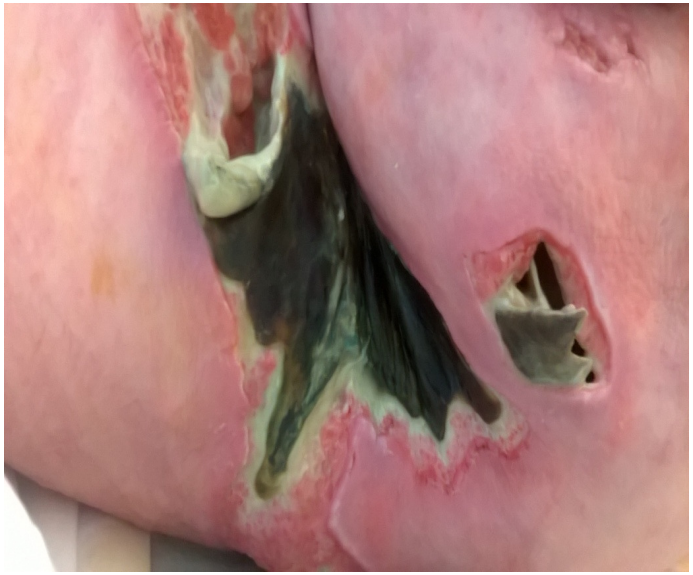
Full-thickness skin loss involving damage to, or necrosis of, subcutaneous tissue that may extend down to, **but not through**, underlying fascia.

The ulcer may present clinically as a deep crater with or without undermining of adjacent tissue.

Stage IV Pressure Ulcer

Full-thickness skin loss with extensive destruction, tissue necrosis, or damage to muscle, bone or supporting structures (tendon, joint or capsule)

Undermining and sinus tracts also may be associated with stage 1V pressure ulcers



Debate: 2 New Descriptors (EPUAP 2014)

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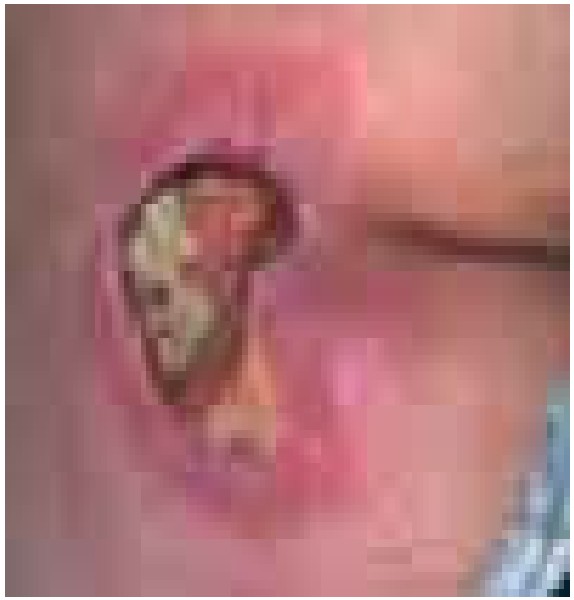
Deep Tissue Damage

Unstageable

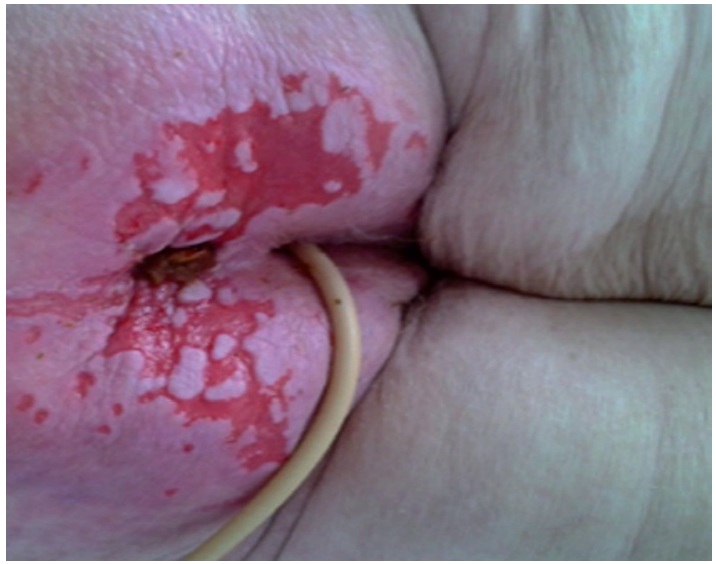
Sacral Pressure Ulcers

Kennedy Terminal Ulcer



- Pear shaped
- Associated with end of life
- Where all measures are in place for prevention of PU's, yet PU's occur

Moisture Associated Lesions



Key risk factor: Incontinence

Type of incontinence:

- Faecal incontinence (diarrhoea/formed stool)
- Urinary incontinence
- Double incontinence (faecal and urinary)

Frequency of Incontinence:

- Frequent episodes of incontinence (especially faecal)
- Use of occlusive containment products
- Poor skin condition (e.g due to aging/steroid use/diabetes).

Additional Risk Factors

- Compromised mobility
- Diminished cognitive awareness
- Inability to perform personal hygiene
- Pain
- Raised body temperature (pyrexia)
  - Medications (antibiotics, immunosuppressant)
  - Poor nutritional status
  - Critical illness

Prevention

- The presence of any urinary and/or faecal incontinence, even in the absence of other risk factors, should trigger implementation of an appropriate IAD prevention protocol to minimise/prevent exposure to urine and stool and protect skin

- Assessment for IAD should be incorporated into a general skin assessment and performed as part of a pressure ulcer prevention/continence care programme

Skin assessment of an at risk incontinent patient

Inspect skin:

- Perineum
- Perigenital areas
- Buttocks
- Gluteal fold, thighs
- Lower back
- Lower abdomen skin folds (groin, under large abdominal pannus, etc);

Inspect for:

- Maceration
- Erythema
- Lesions (e.g. vesicles, papules, pustules)
- Erosion or denudation
- Fungal or bacterial skin infection

Document findings & appropriate actions required in healthcare records

Moisture Lesion vs Pressure Ulcer

	Moisture Lesion	Pressure Ulcer
History	Urinary and/or faecal incontinence	Exposure to pressure or shear
Symptoms	Pain, burning, itching, tingling	Pain
Location	Perineum, perigenital area; buttocks; gluteal fold; medial & posterior aspects of upper thighs; lower back; may extend over bony prominence	Usually over a bony prominence or associated with location of a medical device
Shape/edges	Diffuse with poorly defined edges/may be blotchy	Distinct edges or margins
Presentation /Depth	Intact skin with erythema (blanchable /non-blanchable), with/without superficial, partial-thickness skin loss	Varies from intact skin with non-blanchable erythema to full-thickness skin loss. Base of wound may contain nonviable tissue
Other:	+/- Secondary superficial skin infection(e.g. candidiasis)	+/- Secondary soft tissue infection

Assessment

- Clinical observation and visual inspection.

  No bedside technologies aid the assessment and diagnosis of IAD

- If the aetiology of erythema is **unclear**, implement a standard bundle of interventions for the management of both IAD and pressure ulcer prevention & assess for anticipated response

Intervention

- **Manage** incontinence to identify and treat reversible causes (e.g. urinary tract infection, constipation, diuretics) to reduce, or ideally eliminate skin contact with urine and/or faeces.

- **Implement** a structured skin care regimen to protect the skin exposed to urine and/or faeces and help restore an effective skin barrier function.

Medical Device Related Pressure Ulcer

Definition:

A Medical Device Related (MDR) Pressure Ulcer is defined as a localized injury to the skin or underlying tissue as a result of sustained pressure from a medical device.

(NDNQI, 2016, Source ONMSD Wound Care Guidelines *Draft* January 2017)

Causes of MDR Pressure Ulcers

- Prolonged contact & Pressure
- Rigidity & inelasticity of device
- Difficulty adjusting/securing
- Wrong device size or selection
- Oedema
- Lack of awareness of skin care needs with devices in place
- Shear & friction

MDR PU

Patients at risk:

- Impaired sensory perception
- Impaired ability to communicate discomfort
- Compromised vascularity

34.5% of Hospital Acquired Pressure Ulcers occur in patient's with medical devices (Black Cuddigan et al, 2010)

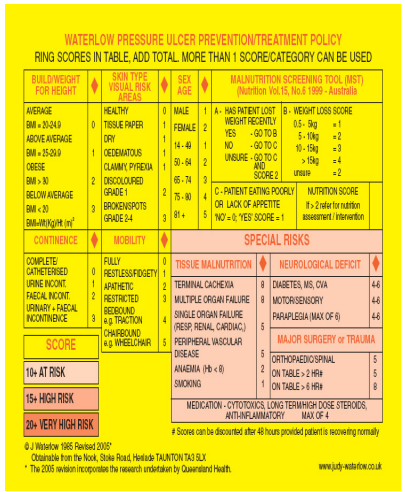
Patients with medical devices are **2.4 times** more likely to develop PU's of any kind (White, 2005)

Risk Assessment

Who is at risk?

Structured approach to risk assessment

(NPUAP/EPUAP 2014)



"A Pressure Ulcer risk assessment was conducted within 6 hours of admission/transfer to the unit/ward and was dated, timed and signed by the assessing staff member "…… METRICS

Risk assessment
is the first step
in planning
pressure ulcer
prevention strategies……
….. Prevention interventions may then be planned, implemented & evaluated
(Moore & Cowman 2014)

However…….

However……. No one tool has 100% Sensitivity & Specificity

- 9 x international prevalence studies - 48% of pt with existing PU, & 48% of HAPU were assessed as low/ no risk (Vangilder et al 2008)
- Irish study - 72% of pt with PU were deemed not at risk/ low risk (Braden). 10% had Grade 4. (Jordan O Brien & Moore 2004)
- Exploring the individual components of Braden scale showed that 68% of PU occurred in those that were **bed/ chair fast** & 64% occurred in those who were completely **immobile** limited mobility (Jordan O Brien & Moore 2004)

IMMOBILITY

CLINICAL JUDGEMENT ESSENTIAL

(Michael's Story)

Influencing Risk

External

- Surfaces
- Tubing /aids/devices
- Staff ratio
- Staff knowledge
- Patient knowledge
- Care settings – activity
- Care packages

Intrinsic

- Perfusion & oxygenation
- Poor nutrition
- Increased skin moisture
- ↑Body Temp
- Advanced age
- Sensory perception
- Haematological measures
- General health status
- History P
- (NPUAP/EPUAP/PPPIA 2014)

Individualised Care Plan

Pressure ulcer prevention is based on the principle that prevention strategies are planned , based on the individual risk factors that the patient presents with

(Moore 2004)

SSKIN Care Bundle

The skin care bundle is a powerful tool as it defines and ties best practices together. The bundle also highlights the process of preventing pressure ulcers in a manner visible to all. This helps minimise variation in practice

SSKIN

CUH
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Cork University Hospital

Feidhmeannacht na Seirbhíse Sláinte
Health Service Executive

SSKIN BUNDLE

Pressure Ulcer Prevention Care Plan
Commence when
Waterlow Score ≥ 10

Addressograph

Frequency of care delivery (circle as appropriate) 1hrly 2hrly 3hrly 4hrly												
Date												
Time (24 Hour Clock)												
SURFACE	See advice re surfaces on LMHG Guideline on Pressure Ulcer Prevention (on T Drive). Indicate each day if Foam ☐ or Pressure Relieving Mattress ☐ (tick)											
Mattress appropriate & functioning correctly:												
Appropriate seating												
Heel protectors												
SKIN INSPECTION	Inspect skin at boney prominence every 2 – 4 hours. Existing Pressure Ulceration: Y/N (Circle). Stage* & site of existing ulceration recorded in wound assessment chart Y / N (Circle)											
Pressure areas checked												
New Redness State Site:												
KEEP MOVING	Frequency of repositioning is determined by skin inspection. If red at least 2 hourly.											
B R Side												
E L Side												
D Back												
CHAIR												
Standing / Mobilising												
INCONTINENCE	Incontinence Related Skin Care regimen Implemented (on T Drive, Tissue Viability Folder) Y / N											
Dry and clean												
Peri-anal skin healthy												
NUTRITION	Fluid Balance Chart / Food Chart in progress Y/N (circle and continue). Otherwise record below											
Meal / snack taken												
Drink taken												
Supplements taken												
Signature												
Grade: S/N = Staff Nurse,												
HCA = Health Care Attendant												
OT = Occupational Therapist												
D = Dietician												
P = Physiotherapist												
S =Student,												
SALT												

KEY: Care Delivered : √ = YES X = NO (if NO Document & Explain in Nursing notes)

RED SKIN – RELIEVE PRESSUE - REVERSE DAMAGE
Patient Pressure Ulcer Prevention Information booklet given ☐

Category/ Stage: *Please refer to the International NPUAP/ EPUAP Pressure Ulcer Classification system*

Pressure Ulcers to Zero

5/2/2017

Surface:

Evidence on Support Surfaces for Pressure Ulcer Prevention

- People lying on ordinary foam mattresses more likely to get PUs than those lying on a higher-specification foam mattress.

- People who used sheepskin overlays on their mattress developed fewer PU.

- While alternating-pressure mattresses may be more cost effective than alternating-pressure overlays, merits of higher-specification constant low-pressure and alternating-pressure support surfaces for preventing pressure ulcers is unclear.

McInnes et al 2015
Cochrane Database of Systematic Reviews

SKIN

- Skin turgor, oedema, dry & flaky, erythematous (red)
- Weight loss, skin folds (flaps), loss of muscle
- Weight gain
- Moisture capacity
- Temperature
- Colour

Keep Moving

Repositioning

Rationale: Extended periods of lying or sitting on a particular part of the body and failure to redistribute the pressure on the body surface can result in sustained deformation of the soft tissues, ischaemia and tissue damage

- Use moving & handling aids to reduce friction & shear
- If hoist is used, remove the slings once transfer is complete, make sure they are well fitting
- Avoid lying on any tubes/medical devices
- If a PU already exists...the individual must not be directly on the PU, either lying or sitting
- Restrict sitting to 60 minutes 3 times daily if PU exists...balance with emotional/physical/lifestyle needs

Heels

- Heel suspension devices to offload pressure (consider foot drop)
- Used according to manufacturers guidelines
- Pillows placed from knee to Achilles (back of ankle) with knee slightly flexed
- Assess the skin on heels each day by use of a hand held mirror if necessary
- Moisturise daily

Incontinence/Moisture

- Clean & dry, pH balanced skin cleanser (4.0-7.0)
- Do not massage or rub the skin too vigorously (in the presence of inflammation +/- damaged blood vessels or fragile skin
- Cleanse the skin properly after each episode of incontinence, To catheterise or not? Consider risks associated with medical devices
- Barrier creams for skin protection...increased moisture/humidity increases the risk of skin breakdown
- Self assessment & inspection routinely
- Avoid Sudocream

Nutrition

What may be considered an adequate diet may actually be inadequate in the context of an underlying illness

(Myers et al 1990)

NB

Adequate Hydration

Nutrition

- Inadequate nutritional intake & poor nutrition correlate with PU development, PU severity and protracted wound healing
- Dehydration a common but under acknowledged contribution to those at risk of PU development
- Inflammation/Infection can significantly increase the risk of malnutrition by increasing metabolism
- Weight & weight history, ability to eat independently, adequacy of total nutrient intake (30-35 kcalories/kg body weight if at risk or with a PU)
- Nutritional supplementation (Cubitan, Fortisip.. Multivitamins, Plenty fluids...)

Review of Nutrition & Hydration in Public Hospital 2015

"Malnutrition, in this case under nutrition, can broadly be defined as a state of insufficient uptake of nutrients which can result in weight loss & has a measurable adverse effect on body composition, function and clinical outcome"

The use of the MUST Screening Tool

5/2/2017

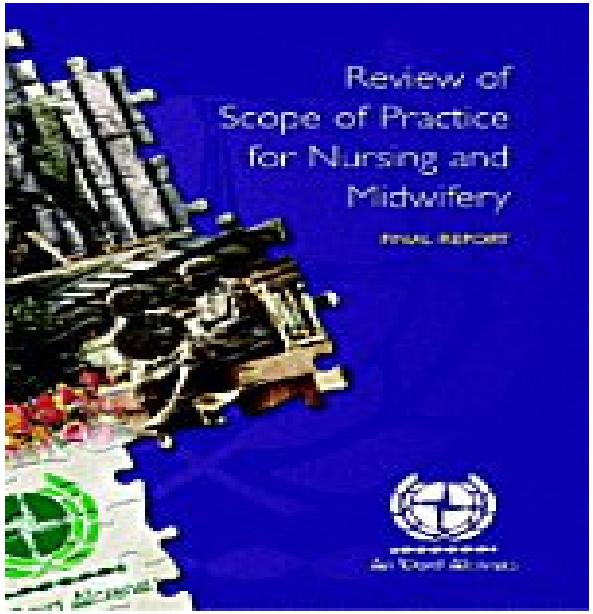
Avoidable Pressure Ulcer

Provider of the care did not do one of the following:

- Evaluate clinical condition & PU risk
- Plan & implement interventions consistent with patient needs & goals and recognised standards
- Monitor & evaluate the impact of interventions OR
- Revise the interventions as appropriate

Scope of Practice

Document...Document...



Do no harm!!