



Part A: Educational Workshop for RNs and RPNs Assessment and Management of Pressure Ulcers

Part 1: Assessment and Management of Pressure Ulcers

Based on the Registered
Nurses' Association of Ontario
Best Practice Guideline:

*Assessment and Management
of Stage I to IV Pressure Ulcers*



RNAO

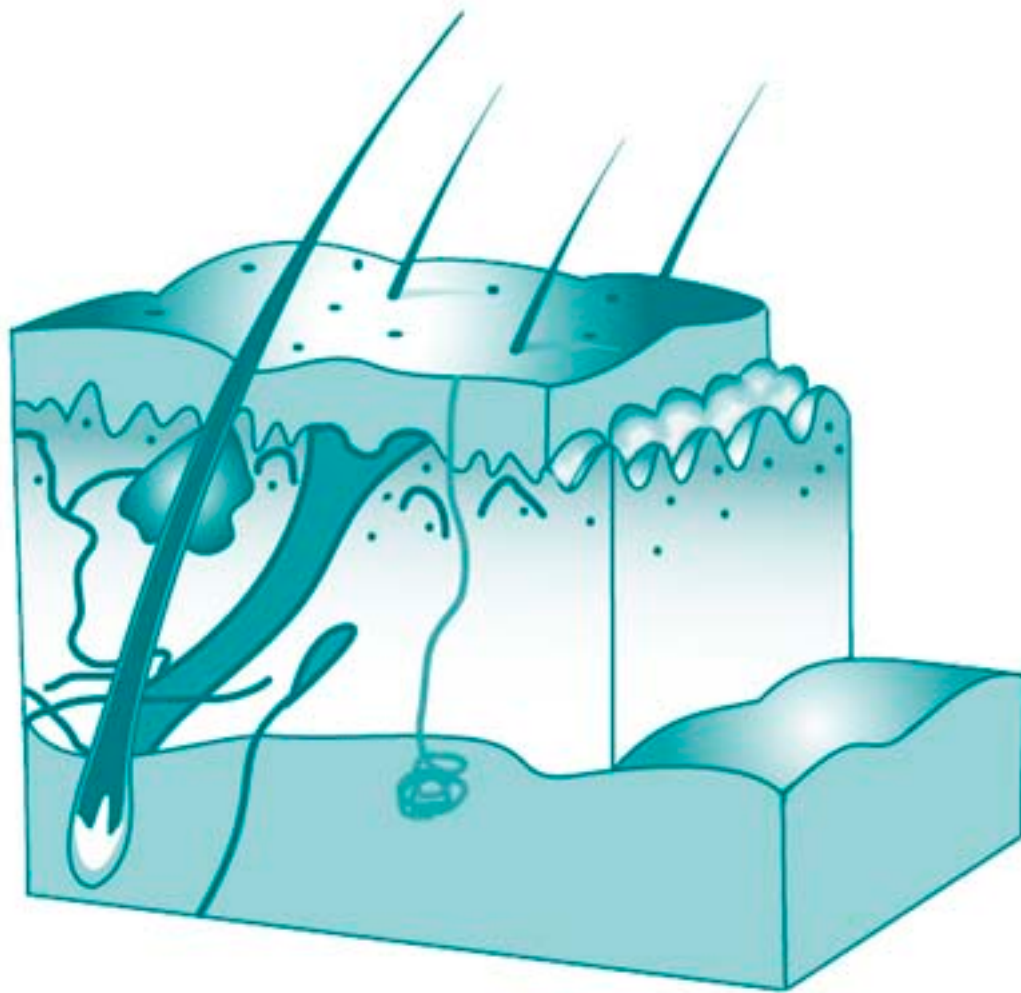
Registered Nurses' Association of Ontario
L'Association des infirmières et infirmiers
autorisés de l'Ontario

NURSING BEST PRACTICE GUIDELINES PROGRAM

Anatomy and Physiology of the Skin

The Skin

- ▶ Defines us
 - ▶ Largest organ in the body
 - ▶ Weighs 3kg
- (Molony et al., 1999)



Anatomy and Physiology of the Skin

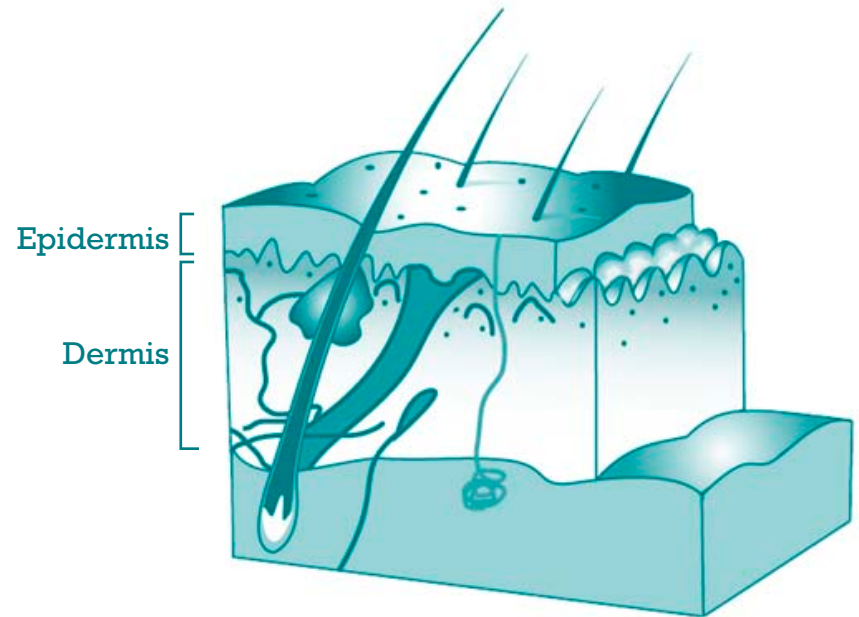
Two Layers of the Skin

Epidermis

- ▶ Outermost layer of the skin
- ▶ Stratified epithelium, contains no blood vessels, receives nourishment and oxygen by diffusion from the capillaries in the dermis
- ▶ Consists of 5 layers: horny layer, clear layer, granular layer, spiny layer, basal layer

Dermis

- ▶ Located below the epidermis
- ▶ Connective tissue of the dermis is composed of an interlocking meshwork of fibrous proteins and nonfibrous ground substance



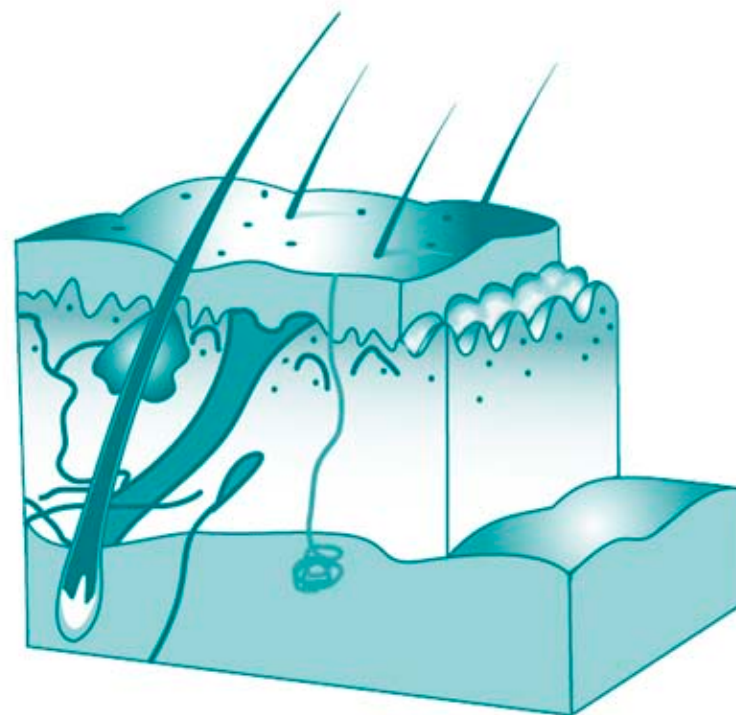
Anatomy and Physiology of the Skin

Subcutaneous Tissue

Composed of:

- ▶ Loose connective tissue
- ▶ Adipose tissue
- ▶ Elements of peripheral vasculature

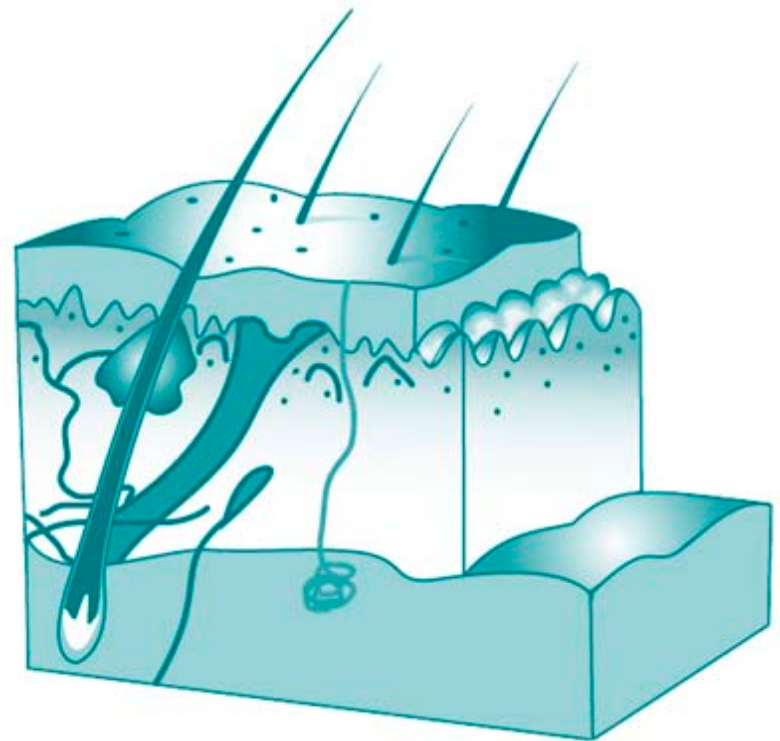
Subcutaneous Tissue



Anatomy and Physiology of the Skin

Six Functions of the Skin

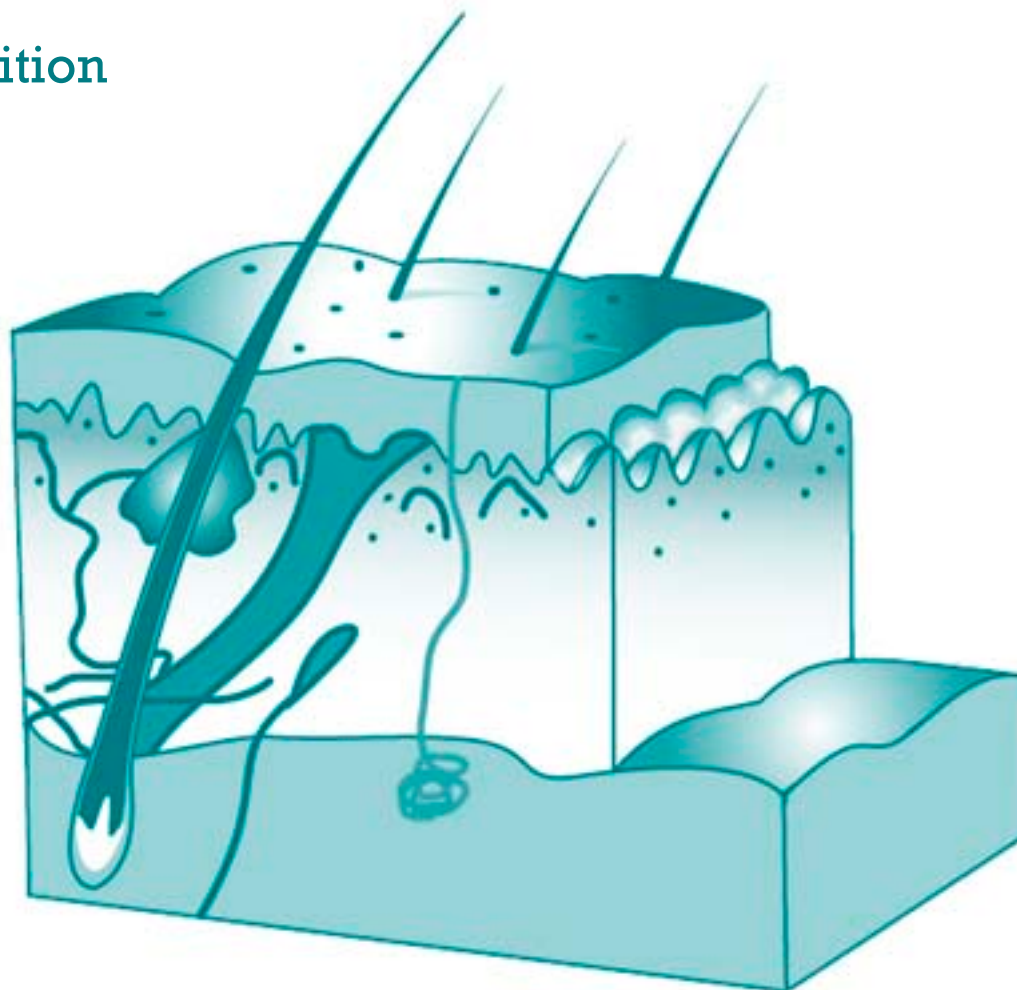
- ▶ Supports underlying body structures
- ▶ Maintains thermoregulation
(body temperature)
- ▶ Source of sensation
- ▶ Eliminates waste
- ▶ Protects
- ▶ Synthesizes vitamin D
(Molony et al., 1999)



Anatomy and Physiology of the Skin

Factors that Affect Skin Condition

- ▶ Dryness
- ▶ Age
- ▶ Nutrition
- ▶ Hydration
- ▶ Environment



Assessing Risk Factors for Developing Pressure Ulcers

Pressure Ulcer

Definition

- ▶ Any lesion caused by unrelieved pressure that results in damage to underlying tissue
- ▶ Usually occurs over a bony prominence
- ▶ Staged to classify the degree of tissue damage observed

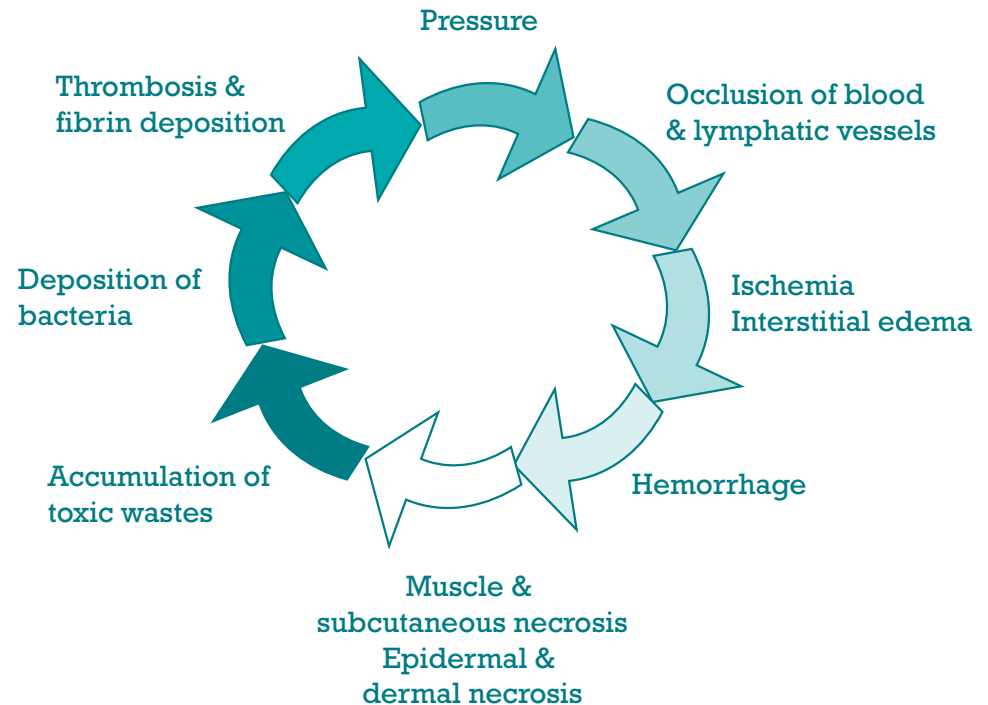
(National Pressure Ulcer Advisory Panel, 1989)

Assessing Risk Factors for Developing Pressure Ulcers

Pressure Ulcer Etiology

- ▶ Area of greatest damage: near bony prominences
- ▶ By the time inflammation becomes visible, necrosis of muscle, fat and subcutaneous tissue may have occurred
- ▶ Worsen between 1-2 days
- ▶ Underlying damage has begun as tissue destruction has been set in motion

(Patterson & Bennett, 1995)



(Goode & Allman, 1989)

Assessing Risk Factors for Developing Pressure Ulcers

Risk Factors

- | | |
|----------------------------|-----------------|
| ▶ ↓ Mobility | ▶ ↑ Pressure |
| ▶ ↓ Activity | ▶ ↑ Moisture |
| ▶ ↓ Sensory Perception | ▶ ↑ Friction |
| ▶ ↓ Nutrition | ▶ ↑ Shear |
| ▶ ↓ Arteriolar Pressure | ▶ ↑ Age |
- (Braden, 1987)

Assessing Risk Factors for Developing Pressure Ulcers

Common Pressure Ulcer Sites

Supine Position

- ▶ heels, sacrum, elbows, scapulae, back of head

Lateral Position

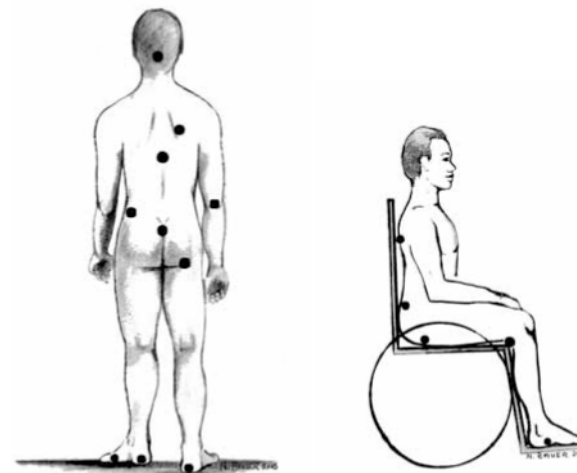
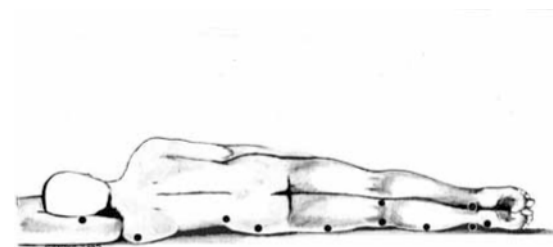
- ▶ malleolus, medial and lateral condyles, greater trochanter, ribs, acromion process, ear

Prone Position

- ▶ toes, knees, genitalia (men), breasts (women), acromion process, cheek and ear

Sitting Position

- ▶ elbow, sacrum, ischium



Illustrated by Nancy A. Bauer, BA, Bus Admin, RN, ET

Assessing Risk Factors for Developing Pressure Ulcers

When to Assess Risk

- ▶ On admission
- ▶ Weekly basis
- ▶ Change in patient/residents' health status
- ▶ Before transfer to another facility

Assessing Risk Factors for Developing Pressure Ulcers

The Braden Scale

- ▶ validated instrument
- ▶ used to aid professional and clinical judgment
- ▶ full patient profile context
- ▶ composed of six sub-scales that reflect sensory perception, skin moisture, activity, mobility, friction and shear, and nutritional status
- ▶ five of the six sub-scales are rated from one (1) (least favourable) to four (4) (most favourable); friction and shear sub-scale is rated from one (1) to three (3). A total of 23 points is possible. The lower the score, the higher the risk for pressure ulcer development
- ▶ total score is only a number to guide interventions
(Braden, 2001; Ayello, 1999)

Assessing Risk Factors for Developing Pressure Ulcers

The Braden Scale for Predicting Pressure Sore Risk

					SCORE
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 that limits the ability to feel pain or discomfort over half of body.	3. Slightly limited Responds to verbal commands but cannot always communicate discomfort or need to be turned, or has some sensory impairment that limits ability to feel pain or discomfort in 1 or 2 extremities.	4. No impairment Responds to verbal commands, has no sensory deficit that 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. Very 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 only requires changing 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 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 or extremity position independently.	4. Walks frequently 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 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 IVs for more than 5 days.	2. Probably inadequate Rarely eats a complete meal and generally eats only about half 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 if offered, or is on a tube feeding or TPN regimen, which 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 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.	2. Potential Problems 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.	3. No apparent problem 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.	NOTE: Patients with a total score of 16 or less are considered to be at risk of developing pressure ulcers. (15 or 16=low risk; 13 or 14=moderate risk; 12 or less=high risk)	
© Copyright Barbara Braden and Nancy Bergstrom, 1988. Reproduced with permission.					TOTAL SCORE

Preventative Skin Care

Identify patient/residents at risk for skin breakdown

- ▶ Utilize the Braden scale to identify the level of patient/resident risk
- ▶ Implement a plan to reduce risk factors and prevent skin breakdown
- ▶ Monitor skin integrity
- ▶ Prevent dehydration and malnutrition

Preventative Skin Care

Prevent pressure and trauma in order to maintain skin integrity

Do's

- ▶ Prevent local areas of pressure
- ▶ Provide pressure reduction via use of mattress overlays, cushions, or foams

Don'ts

- ▶ Sheepskin provides comfort only, not pressure reduction
- ▶ Eggcrate mattresses and donut devices do not provide pressure reduction

Preventative Skin Care

Prevent maceration, irritation and bacterial growth

- ▶ Keep skin hydrated and supple
- ▶ Keep skin clean and dry
- ▶ Wash skin gently with water; pH balanced soaps or skin cleansers
- ▶ Investigate and manage incontinence

Preventative Skin Care

Prevent moisture retention and excessive warmth

- ▶ Avoid use of plastics (underpads and diapers) choose liner or fabric instead
 - ▶ Increase vigilance when patient is diaphoretic
 - ▶ Protect skin by applying barrier creams, gels or pastes
 - ▶ Avoid applying lotion between toes
- (Barton & Parslow, 1996)

A Multidisciplinary Approach to Ulcer Care

The Role of the Wound and Skin Care Specialist

Consultation

- ▶ Assess and recommend appropriate dressing and/or support surfaces

Education

- ▶ Provide education on prevention and management of pressure ulcers to the patient, family and team

Program Development

- ▶ Develop policies and procedures that are research and evidence based to advance the clinical practice of nursing staff

A Multidisciplinary Approach to Ulcer Care

Involvement of Physicians and Surgeons

- ▶ General Practitioners
- ▶ Geriatricians
- ▶ Dermatologists
- ▶ Plastic Surgeons
- ▶ Vascular Surgeons

How to Approach Pressure Ulcer Management

History and Physical Examinations

Pressure ulcers should be assessed in the context of the patient/resident's overall physical and psychological health

Intrinsic Factors – Relate to the aspects of the client's physical, medical or psychosocial condition.

► Physical

- Nutritional status
- Reduced mobility/immobility
- Posture/contractures
- Repetitive stress syndrome
- Neurological/sensory impairment
- Incontinence
- Age
- Level of consciousness

► Medical

- Acute illness
- History of previous pressure damage
- Vascular disease
- Chronic/terminal illness

► Psychosocial

- Stress and anxiety
- Sleep disturbances

How to Approach Pressure Ulcer Management

History and Physical Examinations, *cont'd*

Extrinsic Factors – Are derived from the environment

- ▶ Friction
- ▶ Pressure
- ▶ Shearing
- ▶ Hygiene
- ▶ Living Conditions
- ▶ Medication
- ▶ Garments
- ▶ Transfer slings
- ▶ Restraint use
- ▶ Support systems for pressure relief

How to Approach Pressure Ulcer Management

Psychosocial Assessment and Management

Ability and motivation to comprehend treatment program

1. Mental Status
2. Learning Ability
3. Depression
4. Social Support
5. Polypharmacy/Overmedication
6. Alcohol/Drug Use
7. Goals/Values and Lifestyle
8. Sexuality
9. Culture and Ethnicity
10. Pain as a symptom
11. Stressors
12. Resources (availability and skill of caregivers, finances, equipment) of individuals being treated for pressure ulcers in the home

How to Approach Pressure Ulcer Management

Quality of Life

- ▶ How do pressure ulcers affect the patient's quality of life?
- ▶ Ask patient to describe his/her current health status
- ▶ Ask patient how the pressure ulcer impacts on his/her day to day living

How to Approach Pressure Ulcer Management

Pressure Ulcer Assessment

- ▶ Location
- ▶ Depth/Stage
- ▶ Size (cm)
- ▶ Odour
- ▶ Sinus Tracts
- ▶ Undermining
- ▶ Tunnelling
- ▶ Exudate
- ▶ Wound Bed
- ▶ Appearance/Condition of Surrounding Skin (Periwound) and Wound Edges

How to Approach Pressure Ulcer Management

Location

Most common sites

- ▶ Sacrum (60% of all sores)
- ▶ Ischial Tuberosities in the sitting patient, greater trochanter, heel (15%)

Uncommon Sites

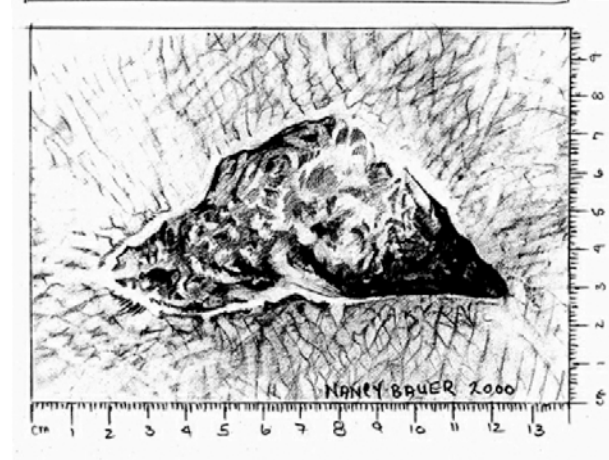
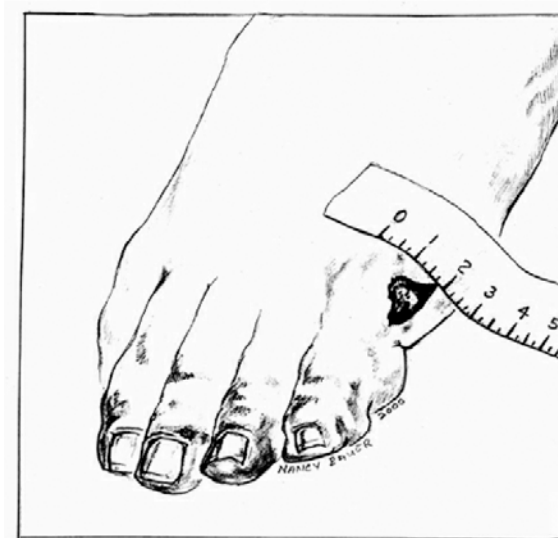
- ▶ Elbow
- ▶ Knee
- ▶ Ankle
- ▶ Occiput

(Barton & Parslow, 1996)

How to Approach Pressure Ulcer Management

Measurement

- ▶ Size (how to measure)
 - Use a ruler, transparency tracings or photography
 - Measure the width/depth/breadth
 - Weekly measurement are usually sufficient
- ▶ Depth
- ▶ Sinus Tracts
- ▶ Undermining (clock measurement)
- ▶ Tunnelling



Illustrated by Nancy A. Bauer, Hon BA, B. Comm, RN, CETN

How to Approach Pressure Ulcer Management

Exudate

Type

- ▶ *Serous*: Clear fluid with visual absence of blood, pus or other debris
- ▶ *Sanguinous*: Bloody, appearing to be composed entirely of blood
- ▶ *Serosanguinous*: Blood mixed with obvious quantities of clear fluid
- ▶ *Purulent*: Pus like in appearance, cloudy and viscous

How to Approach Pressure Ulcer Management

Exudate, *cont'd*

Amount

- ▶ *Dry:* Wound does not produce exudates
- ▶ *Low:* Wound is moist
- ▶ *Moderate:* Surrounding skin is wet
- ▶ *High:*
 - Surrounding skin is saturated (sometimes macerated)
 - Wound is bathed in fluid

How to Approach Pressure Ulcer Management

Wound Base

- ▶ black ▶ eschar, necrotic ▶ cleanse/debride
- ▶ yellow ▶ fibrin or slough ▶ cleanse/debride
- ▶ pink/red ▶ granulation ▶ protect

How to Approach Pressure Ulcer Management

Wound Healing

Definition

- ▶ A cascade of events of the biologic and immunologic system (CREST, 1998)
- ▶ The recognized end point in healing is total wound closure (Robson et al., 1998)

Acute Wounds

- ▶ Proceed normally through the repair process from injury to healing

Chronic Wounds

- ▶ Indolent and fail to heal in a timely and orderly process (Eaglstien and Falanga, 2000)
- ▶ Viability of tissue will determine the course and quality of healing (West and Grimbél, 2000)

How to Approach Pressure Ulcer Management

Phases of Wound Healing

Hemostasis

- ▶ Protects the body from excessive blood loss and increased exposure to bacterial contamination
- ▶ Vasoconstriction controls blood loss
- ▶ Vasodilation and increase capillary permeability to leukocytes and platelets
- ▶ Formation of clot

Inflammation

- ▶ Prepares wound bed for healing by natural autolysis
- ▶ Disintegration of liquefaction of tissue or cells by leukocytes and enzyme

How to Approach Pressure Ulcer Management

Phases of Wound Healing, *cont'd*

Proliferation

- ▶ Filling in and coverage of the wound bed
- ▶ Neoangiogenesis is the production of a capillary and arteriole network
- ▶ Granulation is the development of connective tissue
- ▶ Contraction is the mobilizing force of pulling the wound edges together
- ▶ Epithelialization is the resurfacing and closure of the wound

Remodelling

- ▶ Maturation of the wound
- ▶ Tensile strength of the scar tissue increases to not more than 80% of the tensile strength of non-wounded tissue

How to Approach Pressure Ulcer Management

Impediments to Wound Healing

Bacterial Impediment

- ▶ Bacterial contamination may prevent the wound from healing
- ▶ Primary goal of wound care is to prevent microbial contamination

How to Approach Pressure Ulcer Management

Impediments to Wound Healing, *cont'd*

Mechanical Impediment

- ▶ Dead tissue in a wound slows wound healing by impeding the migration of epithelial cells from wound edges
- ▶ Eschar prevents the wound edges from drawing together and is a breeding ground for bacteria
- ▶ Foreign material (lint and pieces of dressing) can impede epithelial migration and increase likelihood of infection
- ▶ A dry wound site can impede the viability of the cells and tissues involved in wound healing

How to Approach Pressure Ulcer Management

Impediments to Wound Healing, *cont'd*

Chemical Impediment

- ▶ When applied to healthy tissue, some antimicrobial preparations and cleansing agents may delay wound healing and may even be toxic to viable tissue
- ▶ *Example:* Full-strength hydrogen peroxide can damage newly forming cells that remain in the wound

How to Approach Pressure Ulcer Management

Wound Cleansing

- ▶ Wound cleansing refers to the process of using fluids to remove inflammatory contaminants from the wound surface
- ▶ Healing cannot take place until the foreign bodies that are responsible for inflammation have been removed
- ▶ Wound cleansing must be done in such a way as to minimize wound trauma

How to Approach Pressure Ulcer Management

How to Cleanse the Wound

- ▶ Cleanse wounds with normal saline at each dressing change
- ▶ To reduce surface bacteria and tissue trauma, irrigate the wound gently with 100 to 150 ml of normal saline. Use enough irrigation pressure to enhance wound cleansing without causing trauma to the wound bed
- ▶ 4-15 psi is the safe and effective irrigation pressure range
- ▶ To achieve 4-15 psi, use a 20-35 ml syringe with a 19 gauge angiocath
- ▶ Normal saline used in cleansing wounds should be at room temperature

How to Approach Pressure Ulcer Management

How to Cleanse the Wound, *cont'd*

Reminder: Do not use skin cleansers or antiseptics to clean the wound. For example:

- ▶ Povidine Iodine (Betadine)
- ▶ Iodophor
- ▶ Sodium Hypochlorite Solution
- ▶ Hydrogen Peroxide
- ▶ Acetic Acid

How to Approach Pressure Ulcer Management

Debridement

- ▶ Debridement is often necessary to remove devitalized tissue and exudates, reduce the risk of infection, prepare the wound bed and promote healing. Debridement can be:
 - Autolytic
 - Mechanical
 - Sharp
 - Enzymatic

Note: Subcutaneous debridement with scalpel is a controlled act and must be carried out by a physician or delegate.

How to Approach Pressure Ulcer Management

Assessment and Management of Infected Wounds

- ▶ Infection is diagnosed when $>10^5$ bacterial/gram tissue is present
- ▶ Notable exception to this is B-hemolytic streptococcus, where a wound infection may be diagnosed at a lower bacterial count

How to Approach Pressure Ulcer Management

Clinical Signs of Infection

- ▶ Delayed healing/dehiscence
- ▶ Increased wound pain
- ▶ Malodour
- ▶ Abscess/sinus formation
- ▶ Localized swelling/redness/heat
- ▶ Increased level of exudates/purulent discharge
- ▶ Pyrexia, rigours
- ▶ Tachycardia

How to Approach Pressure Ulcer Management

Management Strategies for Wound Infection

Infection Control

- ▶ Follow Body Substance Precautions (BSP) when treating pressure ulcers
- ▶ Use clean gloves for each patient

Contamination

- ▶ For multiple ulcers, attend to most contaminated ulcer last
- ▶ Protect pressure ulcers from sources of contamination (eg. fecal matter)

How to Approach Pressure Ulcer Management

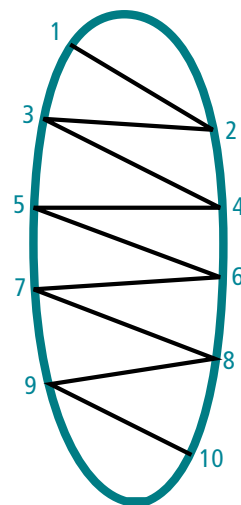
Management Strategies for Wound Infection, *cont'd*

Culture

- ▶ Treatment of infection is managed by wound cleansing, systemic antibiotics, and debridement
- ▶ A wound should be swabbed for culture and sensitivity to determine nature of organisms and sensitivities not to identify if bacteria are present
- ▶ To obtain wound culture, cleanse wound with normal saline first. Swab wound bed using the 10 point technique. Do not swab eschar, exudates or edges.

Note: Tissue biopsy or aspiration may provide for a more accurate analysis. Consult with MD.

Wound Cultures: Swabbing Techniques



- Thoroughly rinse wound with sterile saline prior to culturing
- Do not culture pus or exudate
- Do not swab over hard, dry eschar
- Use sterile Ca Alginate swab or rayon (not cotton) swab
- Rotate swab
- Swab wound edges and ten point coverage

Reprinted with permission. *Wound Care: A Comprehensive Guide for Community Nurses*, p. 12, 1996. Barton and Parslow.

Originally reprinted from: *Chronic Wound Care*, 1st Edition, p273, Health Management Publications Inc., 1990.

How to Approach Pressure Ulcer Management

Management Strategies for Wound Infection, *cont'd*

Antibiotics

- ▶ Systemic antibiotics are not required for pressure ulcers with only clinical signs of local infection
- ▶ Exceptions with locally infected wounds requiring systemic antibiotics
- ▶ Systemic antibiotics are used when the virulence of the organism is high and the host's defenses are compromised

How to Approach Pressure Ulcer Management

Management Strategies for Wound Infection, *cont'd*

Antiseptics

- ▶ Use of cytotoxic antiseptics to reduce bacteria in wound tissue is not recommended
- ▶ Typical management of infected wounds includes the use of topical antimicrobials rather than antibiotics or antiseptics

Dressings

- ▶ Sterile dressings should be used in all care settings
- ▶ Avoid all occlusive dressings if anaerobic infection is suspected or cultured
- ▶ Protect non-infected ulcers with occlusive dressings

Note: Consult Wound and Skin Care Specialist, MD or Plastic Surgeon if debriding is needed

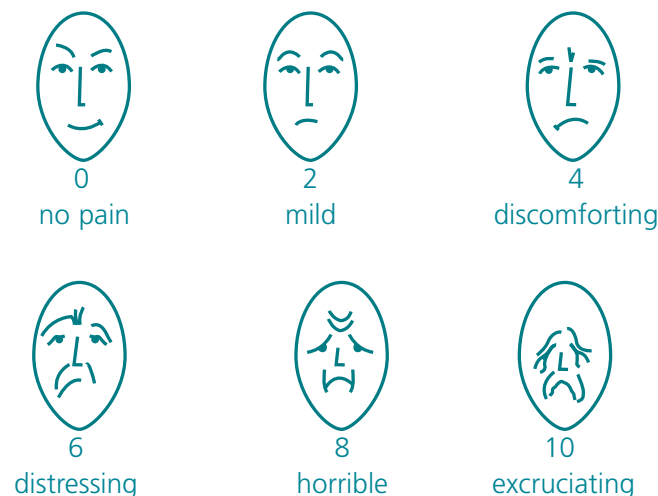
How to Approach Pressure Ulcer Management

Ulcer Care Special Considerations

Pain Assessment and Management

- ▶ Assess all patients/residents for pain related to the pressure ulcer or its treatment
 - Location
 - Frequency
 - Severity (use a pain scale or visual analogue scale)
- ▶ Manage pain
 - Eliminate or control source of pain (eg. covering wounds, adjusting support surfaces, repositioning)
 - Analgesia (procedure related and wound pain)
 - Consult MD

Facial Grimace Scale



Reference: Saint Joseph's Health Centre,
Sarnia Palliative Care Research Team

How to Approach Pressure Ulcer Management

Ulcer Care Special Considerations, *cont'd*

Vascular Assessment

- ▶ Recommended for ulcers in lower extremities to rule out vascular compromise
- ▶ Ankle/brachial index (ABI)
- ▶ Toe pressure

Note: Healability—Some wounds will not heal and treatment goal should focus on preventing infection or further deterioration so that quality of life is maintained.

How to Approach Pressure Ulcer Management

Ulcer Care Special Considerations, *cont'd*

Operative Repair of Pressure Ulcers

- ▶ Wounds can be closed by direct closure, skin grafting, skin flaps, musculocutaneous flaps and free flaps
- ▶ Procedure is performed by MD and plastic surgeon
- ▶ Candidates for operative repair are medically stable, adequately nourished, and can tolerate operative blood loss and postoperative immobility
- ▶ Other considerations are quality of life, patient preferences, treatment goals, risk of recurrence, and expected rehabilitative outcome
- ▶ Postoperative Care:
 - Have patient slowly increase periods of time sitting or lying on the flap to increase its tolerance to pressure
 - Monitoring the flap for pallor, redness, or both that do not resolve in 10 minutes or pressure relief

How to Approach Pressure Ulcer Management

Ulcer Care Special Considerations, *cont'd*

Discharge/Transfer of Care Arrangements

Patients/residents moving between care setting should have the following information provided:

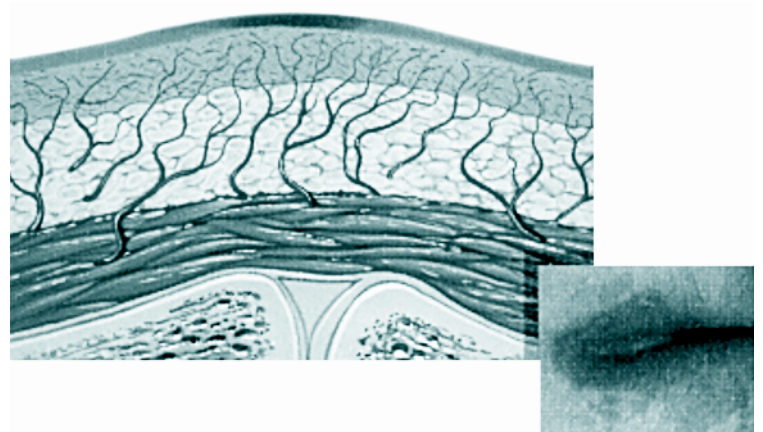
- ▶ Risk factors identified
- ▶ Details of pressure points and skin condition prior to transfer
- ▶ Type of bed/mattress required
- ▶ Details of healed ulcers
- ▶ Stage, site and size of existing ulcers
- ▶ History of ulcers, previous treatments and dressings used
- ▶ Type of dressing currently used and frequency of change
- ▶ Allergies to dressing products
- ▶ Need for on-going nutritional support

Staging of Pressure Ulcers

Stage I

- ▶ Non-blanchable erythema of intact skin, the heralding lesion of skin ulceration
- ▶ In individuals with darker skin, discolouration of the skin may be purplish/bluish or violaceous (egg plant-like colour) accompanied by heat, edema, induration or hardness

(Bennett, 1995; NPUAP, 1998)

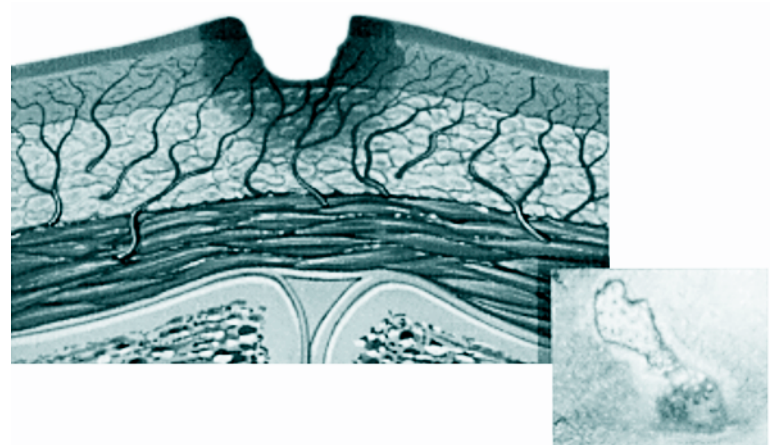


Staging of Pressure Ulcers

Stage II

- ▶ Partial thickness skin loss involving epidermis, dermis or both
- ▶ Ulcer is usually superficial and presents clinically as an abrasion, blister or shallow crater

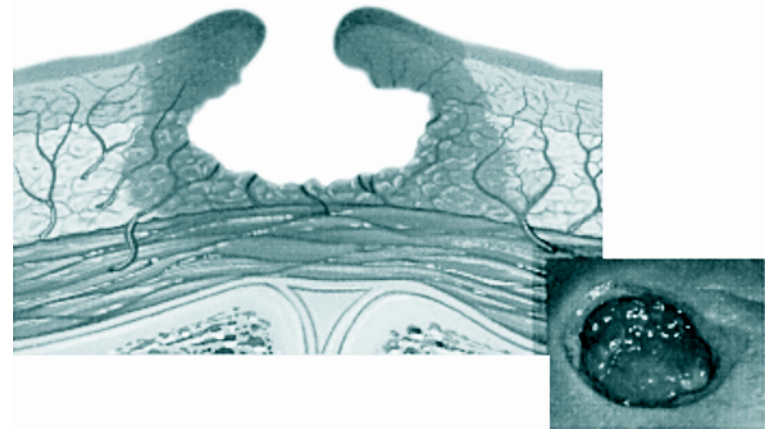
(NPUAP, 1998)



Staging of Pressure Ulcers

Stage III

- ▶ Full thickness skin loss involving damage to or necrosis of subcutaneous tissue that may extend down to, but not through underlying fascia
 - ▶ Ulcer presents clinically as a deep crater with or without undermining of adjacent tissue
- (NPUAP, 1998)

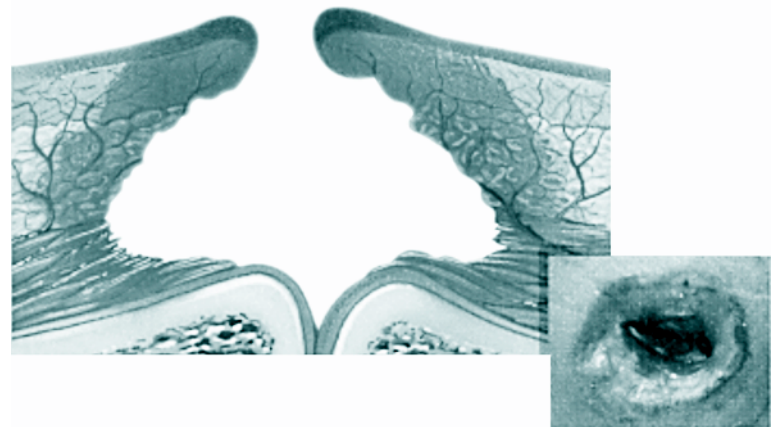


Staging of Pressure Ulcers

Stage IV

- ▶ Full thickness skin loss with extensive destruction, tissue necrosis, or damage to muscle, bone or supporting structures (ie. tendon joint capsule)
- ▶ Undermining and sinus tracts also may be associated with Stage IV ulcers

(NPUAP, 1998)



Staging of Pressure Ulcers

Stage X

- ▶ Slough or necrotic tissue and/or black discoloured tissue is present
- ▶ Difficult to stage
- ▶ Staging requires the removal of eschar (NPUAP, 1998)

Staging of Pressure Ulcers

Reverse Staging of Pressure Ulcers

- ▶ It is incorrect to describe a healing pressure ulcer by using the staging of I to IV in reverse order
- ▶ Reverse staging should not be used to describe the healing process of a wound for the following reasons:
 - When pressure ulcers heal, they do not regenerate the same lost tissue
 - Wound heals with granulation tissue composed of endothelial cells, fibroblasts, collagen and an extracellular matrix

(NPUAP, 1995)

Setting the Treatment Goals

Stage 1

Goals:

- ▶ To reduce further skin breakdown and prevent skin loss
- ▶ Protect against moisture and friction

Interventions:

- ▶ Protect area from friction, shear, and maceration using a transparent film dressing or thin hydrocolloids
- ▶ Provide pressure relieving devices to reduce friction and shearing forces

Setting the Treatment Goals

Stage II

Goals:

- ▶ To reduce further skin breakdown and prevent skin loss
- ▶ To protect the surrounding skin from moisture by managing exudates and providing a moist wound environment to promote healing

Interventions:

- ▶ Clean the ulcer with normal saline
- ▶ Protect the wound by covering it with a transparent dressing or hydrocolloid
- ▶ For moderate amount of exudates, use an absorbent foam dressing
- ▶ Use liquid or solid barriers to protect periwound skin from maceration damage

Setting the Treatment Goals

Stage III & IV

Goals:

- ▶ To remove cell debris and promote autolysis
- ▶ To provide clean, moist environment for the healing process to begin
- ▶ To absorb exudates
- ▶ To protect from contamination and trauma
- ▶ To decrease dressing changes
- ▶ To protect surrounding skin

Setting the Treatment Goals

Stage III & IV

Interventions: Dry Cavity

- ▶ Irrigate with normal saline using a 20-35 ml syringe and 19 gauge needle or angiocath
- ▶ Protect periwound skin with a protective barrier
- ▶ Fill dead space with appropriate filler (including sinus tracts)
- ▶ Line cavity with gel and place 4 x 4 gauze packed loosely
- ▶ Protect from contamination by use of an absorbent outer semi-occlusive dressing

Setting the Treatment Goals

Stage III & IV

Interventions: Exudating Cavity

- ▶ Irrigate with normal saline using a 20-35 ml syringe and 19 gauge needle or angiocath
- ▶ Protect periwound skin using a protective barrier
- ▶ Fill dead space with appropriate filler (including sinus tracts)
- ▶ Use absorbent foam dressings
- ▶ Protect from contamination by use of an outer semi-occlusive dressing

Setting the Treatment Goals

Stage X

Goals:

- ▶ To debride and remove dead tissue
- ▶ To rehydrate the eschar by providing a clean, moist environment for the healing process to begin
- ▶ To promote closure/healing

Interventions:

- ▶ Clean with normal saline
- ▶ Surgical debridement by MD or trained person
- ▶ Autolytic debridement using gels
- ▶ Protect periwound skin using a protective barrier
- ▶ Cover with transparent dressing

Assessment and Management of Pressure Ulcers

References

- Ayello, E. A. (1999). Predicting pressure ulcer sore risk. *Journal of Gerontological Nursing*, 25, 7-9.
- Barton, P. & Parslow, N. (1996). Wound care: A comprehensive guide for community nurses. Toronto, Ontario, St. Elizabeth Health Care.
- Bergstrom, N., Braden, B. J., Laguzza, A., & Homan, V. (1987). The Braden Scale for predicting pressure sore risk. *Nursing Research*, 36, 205-210.
- Braden, B.J. (2001). Risk Assessment in Pressure Ulcer Prevention. In D. Krasner, G. Rodenheaver and R.G. Sibbald (Eds.), *Chronic Wound Care: A Clinical Source book for Healthcare Professionals* (3rd ed. pp. 641-651). Wayne, PA: HMP Communications.
- Brignell, A. (ed) 2000. Guideline for developing a pain management program. A resource guide for long-term care facilities, 3rd edition. Sarnia, Ontario: Saint Joseph's Health Centre.
- Clinical Resource Efficiency Support Team (1998). *Guidelines for the prevention and management of pressure sores*. Belfast, Northern Ireland: CREST Secretariat.
- Eaglstein & Falanga. (1997). Chronic Wounds. *Surg Clin North American Wound Healing*, 77, 689-700.
- Goode, P. S. & Allman, R. M. (1989). The prevention and management of pressure ulcers. *Med Clin North Am.*, 73, 1511-1524.
- Molony, S., Waszynski, C. & Lyder, C. (Eds.) (1999). Gerontological Nursing: An Advanced Practice Approach. New York: Appleton and Lange.

Assessment and Management of Pressure Ulcers

References, *cont'd*

National Pressure Ulcer Advisory Panel (1989). Pressure ulcers prevalence, cost and risk assessment: Consensus development conference statement. *Decubitis*, 2, 24-28.

National Pressure Ulcer Advisory Panel (1995). *NPUAP statement on reverse staging of pressure ulcers* (Rep. No. 4(2)).

National Pressure Ulcer Advisory Panel. (1998). Stage 1 assessment in darkly pigmented skin.

Patterson, J. A. & Bennett, R. G. (1995). Prevention and treatment of pressure sores. *J Am Geriatr Soc.*, 43, 919-927.

West, J. & Gimbel, M. (2000). Acute surgical and traumatic wound healing. In R.Bryant (Ed.), *Acute & Chronic Wounds: Nursing Management* (2nd Edition ed., pp. 189-196). St. Louis: Mosby.



Part A: Educational Workshop for RNs and RPNs Assessment and Management of Pressure Ulcers

Part 2: Positioning Techniques and Devices in Wound Management

Based on the Registered
Nurses' Association of Ontario
Best Practice Guideline:

*Assessment and Management
of Stage I to IV Pressure Ulcers*



RNAO

Registered Nurses' Association of Ontario
L'Association des infirmières et infirmiers
autorisés de l'Ontario

NURSING BEST PRACTICE GUIDELINES PROGRAM

Positioning Techniques and Devices in Wound Management

The Role of PT and OT in the Management of Pressure Ulcers

- ▶ Assess mobility and function
- ▶ Improve/maximize mobility and function
- ▶ Assess for and recommend positioning/seating needs and devices
- ▶ Prescribe indicated devices and monitor use
- ▶ Provide education to the patient, family, and team

Positioning Techniques and Devices in Wound Management

The Role of PT and OT... *cont'd*

Assess Mobility and Function

- ▶ AROM, PROM
- ▶ Contractures, deformities, posture
- ▶ Bed mobility, transitional movements, transfers
- ▶ Cognitive level and function
- ▶ ADL function and independence
- ▶ Previous physical functional status
- ▶ Precautions secondary to medical conditions and/or surgeries

Positioning Techniques and Devices in Wound Management

The Role of PT and OT... *cont'd*

Improve/Maximize Mobility and Function

- ▶ Develop appropriate goals
- ▶ Increase patient independence and therefore aid in prevention/healing process
- ▶ Improve circulation and healing

Assess for and Recommend Positioning/Seating Needs

- ▶ Positioning in bed
- ▶ Appropriate seating systems

Positioning Techniques and Devices in Wound Management

The Role of PT and OT... *cont'd*

Prescribe Indicated Devices and Monitor Use

- ▶ Seating systems and overlays for bed
- ▶ Protection and prevention devices
- ▶ Education to patient, family, and team re: use and monitoring of devices

Education to Patient, Family and Team

- ▶ Fosters empowerment and independence
- ▶ Coordinated effort
- ▶ Promotes adherence

Positioning Techniques and Devices in Wound Management

Extrinsic Forces to Consider in Seating and Positioning

Direct pressure/compression

- ▶ Force/area; the greater the area of contact with a surface, the less compression force over a specific area

Friction

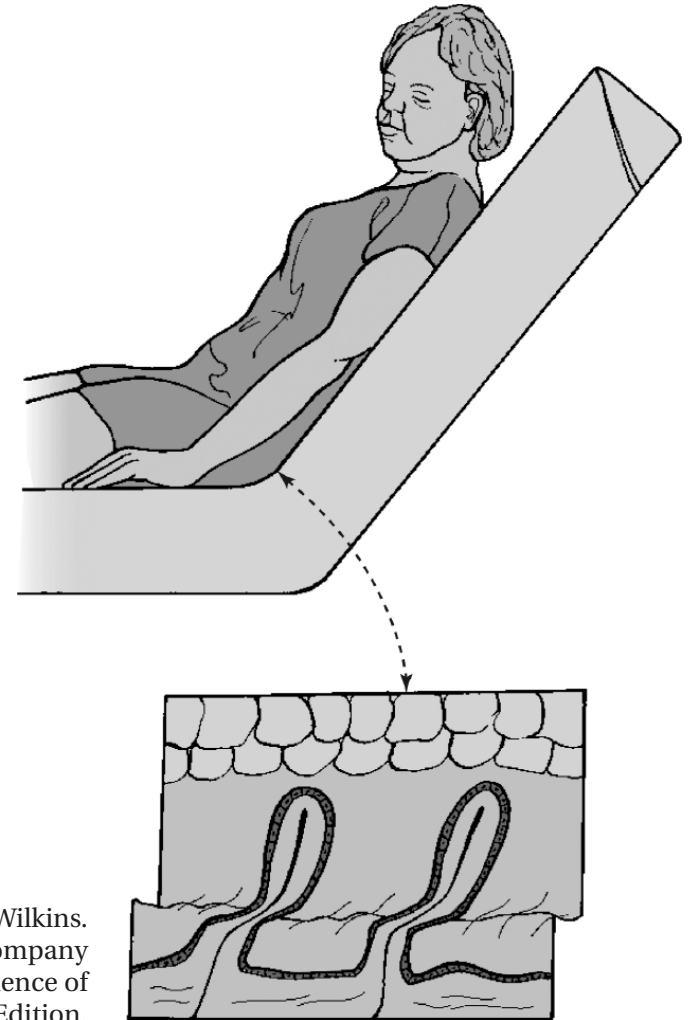
- ▶ Destructive force created by the rubbing contact between the skin and a surface material

Positioning Techniques and Devices in Wound Management

Extrinsic Forces to Consider in Seating and Positioning, *cont'd*

Shear

- ▶ Destructive force created by the rubbing contact between two layers of tissue or bone; results in the potential for tissues to be separated and ulceration to occur (ie. Repositioning HOB or in chair with recline feature)
- ▶ The greater the distance between the hip joint and axis of recline, the greater the amount of shearing



Copyright C 2005 Lippincott Williams & Wilkins.
Instructor's Resource CD-ROM to Accompany
Fundamentals of Nursing: The Art and Science of
Nursing Care, Fifth Edition.

Positioning Techniques and Devices in Wound Management

Goals of Seating and Positioning

Promote:

- Postural alignment
- Even weight distribution
- Balance and stability
- Support for independent function (ie. ADL, mobility)
- Pressure relief
- ▶ Reduce compression, friction, shear forces
- ▶ Reduce agitated/aggressive behaviour
- ▶ Increase tolerance
- ▶ Facilitate ease of repositioning by self or caregivers

Positioning Techniques and Devices in Wound Management

Goals of Seating and Positioning, *cont'd*

Reduce Pressure, Friction, Shear

- ▶ Eliminate if possible; contact of affected or at risk areas on surfaces
- ▶ Distribute pressure across larger surface area
 - Eg. Decrease HOB angle, use of various support surfaces, use of devices
- ▶ Utilize proper transferring and repositioning techniques

Positioning Techniques and Devices in Wound Management

Goals of Seating and Positioning, *cont'd*

Reduce Agitated/Aggressive Behaviour

- ▶ Poor positioning may result in increased abrasions, shear, and friction forces
- ▶ Frequent position changes, comfortable seating and positioning may increase tolerance
- ▶ Independent mobility and ADL function promoted by proper positioning may reduce agitation/aggression

Positioning Techniques and Devices in Wound Management

Goals of Seating and Positioning, *cont'd*

Facilitate Ease of Repositioning by Self or Caregivers

- ▶ Introduce proper body mechanics, techniques
- ▶ Education
- ▶ Reduce friction/shear during repositioning with proper seating positioning devices

Positioning Techniques and Devices in Wound Management

Positioning and Seating Surfaces

- ▶ Pressure Reducing Surface
 - A surface that lowers pressure compared to a standard product such as a mattress or chair surface (IAET; Standards of Care, 1987)
 - Does not maintain pressure below capillary closing pressure
- ▶ Pressure Relieving Surface
 - A surface that consistently reduces pressure below capillary closing pressure (ie. 32mmHg) (IAET; Standards of Care, 1987)
- ▶ Foam
 - Has “memory”, compresses and breaks down (needs to be replaced in 6-9 months), difficult to clean, forces the body to conform to its shape, inexpensive

Positioning Techniques and Devices in Wound Management

Positioning and Seating Surfaces, *cont'd*

- ▶ Air
 - Lightweight, does not “bottom out”, able to customize, conforms to body position, minimal shearing, redistributes pressure, expensive
- ▶ Seating cushions are grouped into categories: maximum, excellent, medium, low pressure reduction
- ▶ Avoid “donut” devices as they create a ring of direct pressure

Positioning Techniques and Devices in Wound Management

Positioning in Bed

Supine

- ▶ Keep HOB as low as possible to avoid shear, pressure, friction
- ▶ Protect bony prominences (elbows, heels, sacrum/coccyx, ischial tuberosities, trochanters)



Positioning Techniques and Devices in Wound Management

Positioning in Bed, *cont'd*

Sidelying

- ▶ 30 degree laterally inclined
 - avoids pressure on greater trochanter and sacrum
- ▶ Frequent position changes between the 3 positions
- ▶ Every 1-2 hours



Positioning Techniques and Devices in Wound Management

Positioning in Bed, *cont'd*

Devices

- ▶ Reduce pressure
 - Pillows, foam wedges, egg crate, heel relief splints
- ▶ Reduce shear/friction
 - Gel

Things to Avoid

- ▶ Any donut type devices
- ▶ Any direct pressure on bony prominences
- ▶ Restraint devices if possible

Positioning Techniques and Devices in Wound Management

Seating and Positioning

- ▶ Obtain OT/PT assessment of functional level, mobility, pressure reduction needs, transferring methods, assistive device needs
- ▶ Ischial tuberosities are the main points of weightbearing in a seated person with an upright posture
- ▶ Sacral sitting
 - Clients who “slide” out of their chairs, who have kyphosis have an increased risk for skin breakdown secondary to friction/shear forces, agitated behaviour and uneven pressure distribution
- ▶ Goals of seating:
 - To facilitate function and mobility, and to promote comfort, postural alignment, and pressure relief/reduction

Positioning Techniques and Devices in Wound Management

Seating and Positioning, *cont'd*

- ▶ Cushions
 - Prescribed by therapists after an assessment of posture, functional level and needs, and pressure reduction/relief needs (ie. Foam, gel, air)
- ▶ Sling seats and backs
 - Promote internally rotated hips and kyphotic postures – results in increased shear/friction forces and increased direct pressure on bony prominences on back and sacrum/coccyx regions

Positioning Techniques and Devices in Wound Management

Seating and Positioning, *cont'd*

Components that Affect Positioning

- ▶ Seat width
 - Too wide, too narrow
- ▶ Seat depth
 - Too deep, too short
- ▶ Armrests
 - Properly adjusted armrests will reduce pressure under the ischial tuberosities's by about 25% to 35% (C.A. Fleck, Crown Therapeutics Inc., 2000)
- ▶ Foot Rest Height
 - Too low, too high
- ▶ Seat Height
 - Too low, too high

Positioning Techniques and Devices in Wound Management

Seating and Positioning, *cont'd*

Tilt and Recline

- ▶ Tilt
 - Back to seat/hip/knee angles remains constant
 - Rotation of body around a pivot point on the horizontal axis
 - Position of body relative to the pull of gravity is altered thus redistributing pressure
 - Pressure reduction at 45 degrees of tilt

Positioning Techniques and Devices in Wound Management

Seating and Positioning, *cont'd*

Tilt and Recline

- ▶ Recline
 - Back to seat/hip angle opens up (obtuse), the seat remains parallel to the ground
 - Increase in the angle at the pivot point on the horizontal axis
 - Pull of gravity is spread over a larger body surface, thus decreasing the average PSI (pounds per square inch)
 - May promote shear/friction as a result of sliding in chair or during repositioning

Positioning Techniques and Devices in Wound Management

Seating and Positioning, *cont'd*

Poor positioning in sitting can result in:

- ▶ Increased pressure forces (ie. Tissue/skin breakdown)
- ▶ Decreased communication and alertness
- ▶ Decreased function and mobility
- ▶ Increased agitated behaviours (ie. Increased need for restraints – more pressure forces)
- ▶ Altered moods

Positioning Techniques and Devices in Wound Management

Transfers and Repositioning, *cont'd*

Transfer Methods

- ▶ Avoid increased pressure, more importantly shear and friction
- ▶ Common problems
 - Transfer boards
 - Leaving lift sheets under patients
 - Tugging pants and failure to readjust
- ▶ Solutions
 - Transfer belts
 - Remove lift sheets after use
 - Loosen tight clothing after transfers
 - Adequate assistance

Positioning Techniques and Devices in Wound Management

Transfers and Repositioning, *cont'd*

Repositioning

- ▶ Bed
 - Avoid sliding
 - Have patient shift hips
 - Crooklying position
 - Effective use of lift sheets
 - Adequate assistance
- ▶ Chair
 - Avoid tugging pants
 - Teach patients to shift hips, pushups, side-leans, front-back rocking
 - Up and back method
 - Use patient tilt to prevent sliding

Positioning Techniques and Devices in Wound Management

Summary

- ▶ Proper seating and positioning can facilitate:
 - Reduction of compression, shear and friction forces
 - Independent mobility and ADL function
 - Ease in transfers/repositioning/caregiving
 - Reduction of agitated behaviour and need for restraints
- ▶ Minor adjustments in seating systems and bed positioning can have a significant impact on pressure distribution
- ▶ Refer to PT and OT for assessment and assist with follow through of recommendations

Positioning Techniques and Devices in Wound Management

References

- Babinec, M. (1999). Tilt comparison: Weight shifting vs. non-weight shifting power and manual bases. *Canadian Seating and Mobility Conference Proceedings Manual: The Evolution of Revolution*. Toronto (pp. 130).
- Buck, S. (1999). Wheelchair foot propulsion: The complexities and mysteries of wheelchair and seating system set-up. *Canadian Seating and Mobility Conference Proceedings Manual: The Evolution of Revolution*. Toronto (pp. 83-89).
- Fleck, C. (1999). Pressure ulcer prevention and management. *Canadian Seating and Mobility Conference Proceedings Manual: The Evolution of Revolution*. Toronto. (pp. 88-89)
- IAET (1987) Standards of Care for Dermal Wounds: Pressure Sores. Irvine: International Association of Enterostomal Therapy.
- Lachaine, C. (2000). What, when and why of specialty mattresses. *Canadian Seating and Mobility Conference Proceedings Manual: Flexible Solutions Shaping Tomorrow*. Toronto (pp. 23-26).
- Pratt, S. (1999). Assessment techniques, the supine and sitting evaluation. *Canadian Seating and Mobility Conference proceedings Manual: The Evolution of Revolution*. Toronto (pp. 58-61).
- Taylor, V.C. (1999). Pressure mapping clinical protocol. *Canadian Seating and Mobility Conference Proceedings Manual: The Evolution of Revolution*. Toronto (pp. 66-67).



Part A: Educational Workshop for RNs and RPNs Assessment and Management of Pressure Ulcers

Part 3: Nutritional Intervention

Based on the Registered
Nurses' Association of Ontario
Best Practice Guideline:

*Assessment and Management
of Stage I to IV Pressure Ulcers*



RNAO

Registered Nurses' Association of Ontario
L'Association des infirmières et infirmiers
autorisés de l'Ontario

NURSING BEST PRACTICE GUIDELINES PROGRAM

Nutrition Intervention

The role of nutrition in a hospital setting

- ▶ Prevalence of malnutrition in institutional settings is well documented
- ▶ Malnutrition is associated with increased:
 - Morbidity and mortality
 - Length of hospital stay
 - Costs
- ▶ Nutrition support will allow for:
 - Faster recovery and increased strength
 - Improved wound healing
 - Decreased risk of infection

Nutrition Intervention

Patients at Nutritional Risk

- ▶ *Inadequate intake*
CVA, elderly, access to food, poor dentition or mouth sores, dysphagia, esophagitis or recent surgery
- ▶ *Inadequate absorption*
Irritable Bowel Disease (IBD), Crohn's, Colitis, diarrhea or vomiting
- ▶ *Increased losses*
Colostomy, ileostomy, wounds or fistula
- ▶ *Increased requirements*
CHF, COPD, pneumonia, asthma, wound healing

Nutrition Intervention

Indicators of Malnutrition

- ▶ Weight loss greater than 10% of usual body weight over 3 months
- ▶ BMI (body mass index) less than 18
- ▶ Albumin < 35 g/L
- ▶ Total protein < 65 g/L

Nutrition Intervention

Oral Nutrition Supplements

Definition of eating well – Consuming at least 2/3 of the meal tray at least 75% of the time

- ▶ For patients who are not consuming an adequate quantity of food to meet their nutritional requirements

Nutrition Intervention

Nutrition Support

- ▶ Nutrition support is an alternative to oral nutrition when a patient is unable to meet greater than 50% of their requirements for greater than 3 days
- ▶ Enteral and parental nutrition meet 100% of patient's nutritional requirements

Nutrition Intervention

Nutritional requirements in promoting wound healing

Stage I Pressure Ulcers require:

- ▶ Vitamin/mineral supplement: consider if intake is inadequate
- ▶ Protein: 1-1.2 g/kg
- ▶ Calories: 25-30 kcal/kg
- ▶ Fluids: 25-30 cc/kg

Nutrition Intervention

Nutritional requirements in promoting wound healing, *cont'd*

Stage II Pressure Ulcers require:

- ▶ Vitamin/mineral supplement
- ▶ Protein: 1.25-1.4 g/kg
- ▶ Calories: 25-30 kcal/kg
- ▶ Fluid: 25-35 cc/kg (increased fluid loss from exudate)

Nutrition Intervention

Nutritional requirements in promoting wound healing, *cont'd*

Stage III Pressure Ulcers require:

- ▶ Vitamin/mineral supplement: Vitamin C 500 mg OD; Zinc 25 mg elemental BID
- ▶ Protein: 1.5 g/kg
- ▶ Calories: 30-35 kcal/kg
- ▶ Fluid: 30-40 cc/kg

Nutrition Intervention

Nutritional requirements in promoting wound healing, *cont'd*

Stage IV Pressure Ulcers require:

- ▶ Vitamin/mineral supplement: Vitamin C 500 mg OD; Zinc 25 mg elemental BID
- ▶ Protein: 1.5-2.0 g/kg
- ▶ Calories: 30-40 kcal/kg
- ▶ Fluid: 35-45 cc/kg

Note: Zinc should be reassessed at 10 days and discontinued if within the normal range.

Nutrition Intervention

References

- Allman, R.M., Goode, P.S., Burst, N., Bartolucci, A. A., & Thomas, D. R. (1999). Pressure ulcers, hospital complications, disease severity: Impact on hospital costs and length of stay. *Advances in Wound Care*, 12(1), 22-30.
- Andrews, M., & Gallagher-Allred, C. (1999). The role of zinc in wound healing. *Advances in Wound Care*, 12(3), 137-138.
- Bergstrom, N., Bennett, M. A., Carlson, C. E. et al. (1994). Clinical Practice Guideline, No. 15, Rockville, Md: US Department of Health and Human Services. *Agency for Health Care Policy and Research*. AHCPR Publication No. 95-0652.
- Gilmore, S. A., Robinson, G., Posthauer, M. E., & Raymond, J. (1995). Clinical indicators associated with unintentional weight loss and pressure ulcers in elderly residents of nursing facilities. *Journal of the American Dietetic Association*, 95(9), 948-992.
- Granick, M.S., McGowan, E., & Long, C. D. (1998). Outcome assessment of an in-hospital cross-functional wound care team. *Plastic and Reconstructive Surgery*, 101(5), 1243-1247.
- Himes, D. (1997). Nutritional supplements in the treatment of pressure ulcers: Practical perspectives. *Advances in Wound Care*, 10(1), 30-31.
- Hoffman, D. R. (1996). The false claims act as a remedy to the inadequate provision of nutrition and wound care to nursing home residents. *Advances in Wound Care*, 9(5), 25-29.

Nutrition Intervention

References, cont'd

Jackobs, M. K. (1999). The cost of medical nutrition therapy in healing pressure ulcers. *Topics in Clinical Nutrition*, 14(2), 41-47.

Lipschitz, D. A. (1995). Approaches to the nutritional support of the older patient. *Clinics in Geriatric Medicine*, 11(4), 715-724.

Mazzotta, M. (1994). Nutrition and wound healing. *Journal of the American Podiatric Medical Association*, 84(9), 456-461.

Molony, S., Waszynski, C. & Lyder, C. (Eds.) (1999). *Gerontological Nursing: An Advanced Practice Approach*. New York: Appleton and Lange.

Poduch, C. (1996). The dietitian as a cost efficient agent. *Canadian Nursing Homes*, 7(1), 5-7.

Smith, P. W., Black, J. M., Black, S. B. (1999). Infected pressure ulcers in the long-term care facility. *Infection Control and Hospital Epidemiology*, 20(5), 358-361.

Spoelhof, G. D., & Ide, K. (1993). Pressure ulcers in nursing home patients. *American Family Physician*, 47(5), 1207-1215.

Strauss, E. A., & Margolis, D. J. (1996). Malnutrition in patients with pressure ulcers: Morbidity, morality, and clinically practical assessments. *Advances in Wound Care*, 9(5), 37-40.

Williams, C. M., Lines, C. M., & McKay, E. C. (1988). Iron and zinc status in multiple sclerosis patients with pressure sores. *European Journal of Clinical Nutrition*, 42(4), 321-328.

Xakellis, G. C. & Frantz, R. (1996). The cost of healing pressure ulcers across multiple health care settings. *Advances in Wound Care*, 9(6), 18-22.