

Pressure Ulcers in the Critical Care Patient Population

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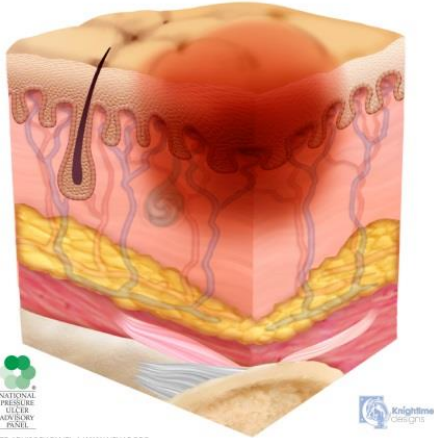
Pressure Injury definition

NPUAP:

A pressure injury is localized damage to the skin and underlying soft tissue usually over a bony prominence or related to a medical or other device. The injury can present as intact skin or an open ulcer and may be painful. The injury occurs as a result of intense and/or prolonged pressure or pressure in combination with shear. The tolerance of soft tissue for pressure and shear may also be affected by microclimate, nutrition, perfusion, co-morbidities and condition of the soft tissue.

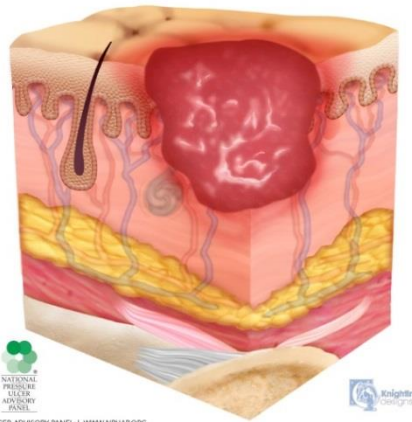
Pressure Ulcer Stages

Stage 1 Pressure Injury - Lightly Pigmented



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Stage 2 Pressure Injury



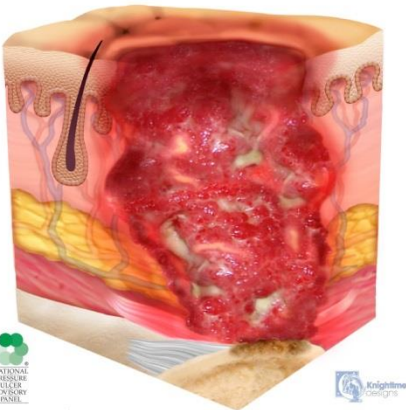
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Stage 3 Pressure Injury



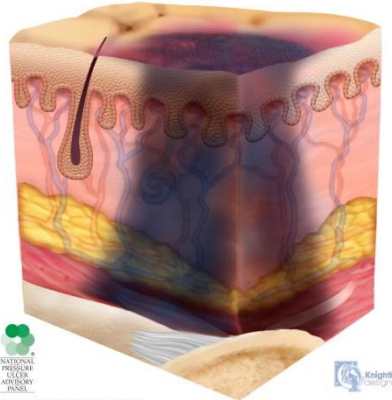
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Stage 4 Pressure Injury



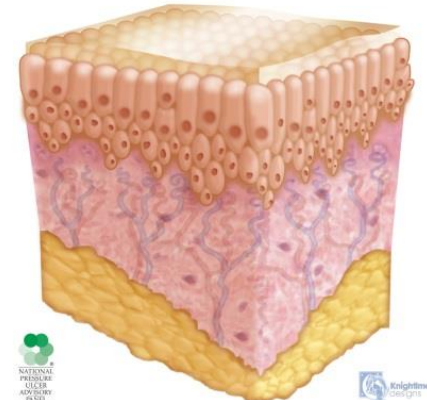
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Deep Tissue Pressure Injury



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Mucous Membrane



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Additional Pressure Injury Categories

- **Mucosal Membrane Pressure Injury:** Mucosal membrane pressure injury is found on mucous membranes with a history of a medical device in use at the location of the injury. Due to the anatomy of the tissue these ulcers cannot be staged.
- **Medical Device Related Pressure Injury:**
This describes an etiology.
Medical device related pressure injuries result from the use of devices designed and applied for diagnostic or therapeutic purposes. The resultant pressure injury generally conforms to the pattern or shape of the device. The injury should be staged using the staging system.

United States Pressure Injury Statistics

- > 2.5 million individuals develop PI in US annually
- Cost to U.S. healthcare system is \$9.1-\$11.6 billion per year
 - Treatment cost Stage 3 from \$5,900-\$14,840
 - Treatment cost Stage 4 from \$18,730-\$21,410
- Median Length of Stay 7 days with PI compared to 3 without PI.
- Mortality rate 9.1% with PI vs 1.8% without PI
- Up to 60,000 Americans die annually due to PI related conditions

(AHRQ)

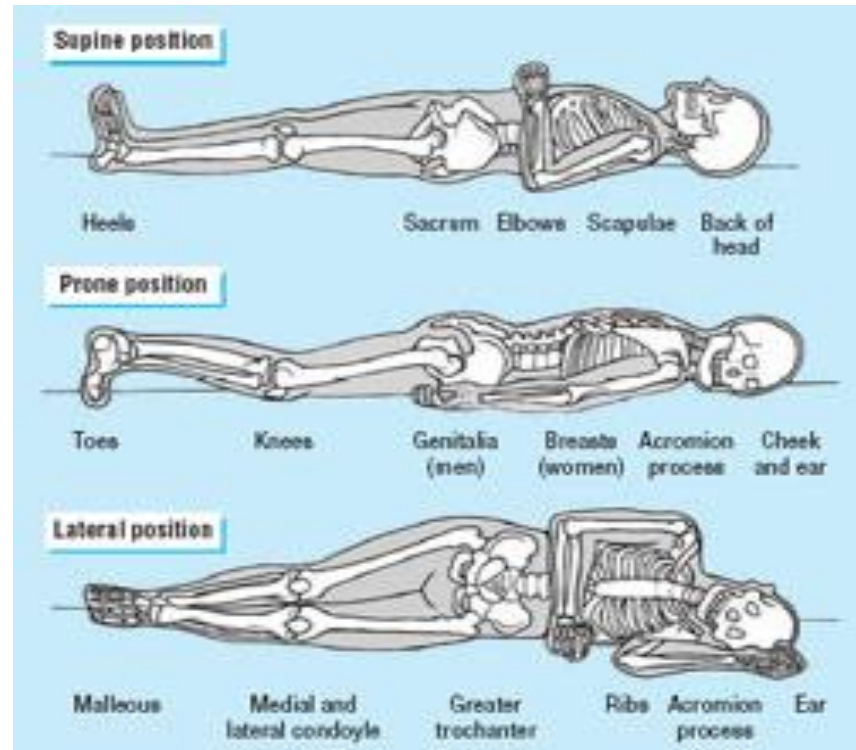
Avoidable vs. Unavoidable Pressure Injury

- National Pressure Ulcer Advisory Panel
- 2014 multidisciplinary conference
 - issue of PU unavoidability
 - considered nonmodifiable intrinsic and extrinsic risk factors.
 - Consensus was reached when 80% agreement was obtained.
 - The group reached consensus that unavoidable PUs do occur

Concept not yet adapted by CMS

Common Sites for Pressure Ulcers

- Supine:
 - 23% sacrococcygeal
 - 8% heels
 - 1% occiput; spine
- Sitting:
 - 24% ischium
 - 3% elbows
- Lateral:
 - 15% trochanter
 - 7% malleolus
 - 6% knee
 - 3% heels



Critical Care Patients

- Multiple co-morbidities-acute disease states
- Multiple procedures-surgery, imaging
- Poor nutrition-NPO, TPN, Enteral feeding
- Hemodynamic instability
- Multiple medical devices
- Limited Mobility



Effects of Bedrest/Immobility

- Supine positioning shifts 11% of blood flow away from legs
- First 3 days of bedrest = 8-10*% reduction in blood plasma volume
 - Increased cardiac workload, elevated resting heart rate, decrease stroke volume, reduced cardiac output.
 - Loss stabilizes to 15-20% 4 weeks.
- Healthy individuals at 5 days
 - Increased insulin resistance and microvascular dysfunction is seen.
 - Baroreceptor dysfunction, changes in autonomic tone, fluid shifts occur.

(Vollman)

- Vollman

Braden Risk Assessment

6 Parameters

- Sensory Perception
- Moisture
- Activity
- Mobility
- Nutrition
- Friction & Shear

Risk Scoring

- 19-23 Low Risk
- 15-18 At risk
- 13 and 14 Mod Risk
- 10 thru 12 High Risk
- 9 or less Very High Risk

Critical Care Risk Assessment Best Practice

- Conduct a structured risk assessment ASAP (Braden) and within 8 hours
- AND conduct a head to toe skin assessment with each risk assessment
- Repeat as often as necessary based on individual acuity
- Key components of acuity:
 - Perfusion and oxygenation
 - Poor nutritional status
 - Increased skin moisture

Intervention-Manage Moisture

- **USE MOISTURE BARRIER Product-Sprays, Creams**
- **USE ABSORBANT PADS THAT WICK & HOLD MOISTURE-No briefs**
- **Use catheter, urinary containment device**
- **ADDRESS CAUSE IF POSSIBLE**
- **OFFER BEDPAN/URINAL IN CONJUNCTION WITH TURNING SCHEDULES**
- **Microclimate sleep surface**

Intervention-Manage Nutrition

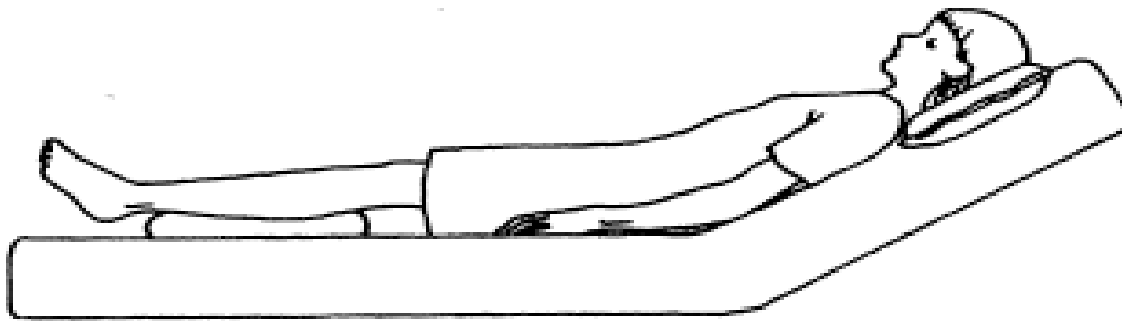
- **INCREASE PROTEIN INTAKE**
- **INCREASE CALORIE INTAKE TO SPARE PROTEINS.**
- **SUPPLEMENT WITH MULTI-VITAMIN & Protein**
- **ACT QUICKLY TO ALLEVIATE DEFICITS**
- **CONSULT Nutrition**
- Level 2 RCT isonitrogenous formula = increase in PU severity
 - Enteral feed with fish oil, Vit A,C, E, zinc, manganese, copper, protein No worsening of PU n=20
 - Greater decrease in C-reactive protein

Manage Shear



- A unit of mechanical force that is applied horizontally or parallel to a surface. Shear may play a role in triangularly shaped or tunneled sacral pressure ulcers.

Positioning



Limit head of bed to 30 degrees or less except when medically necessary

- Elevation of the head of the bed should be limited to minimize exposure to shear forces.

Intervention-Manage Friction & Shear

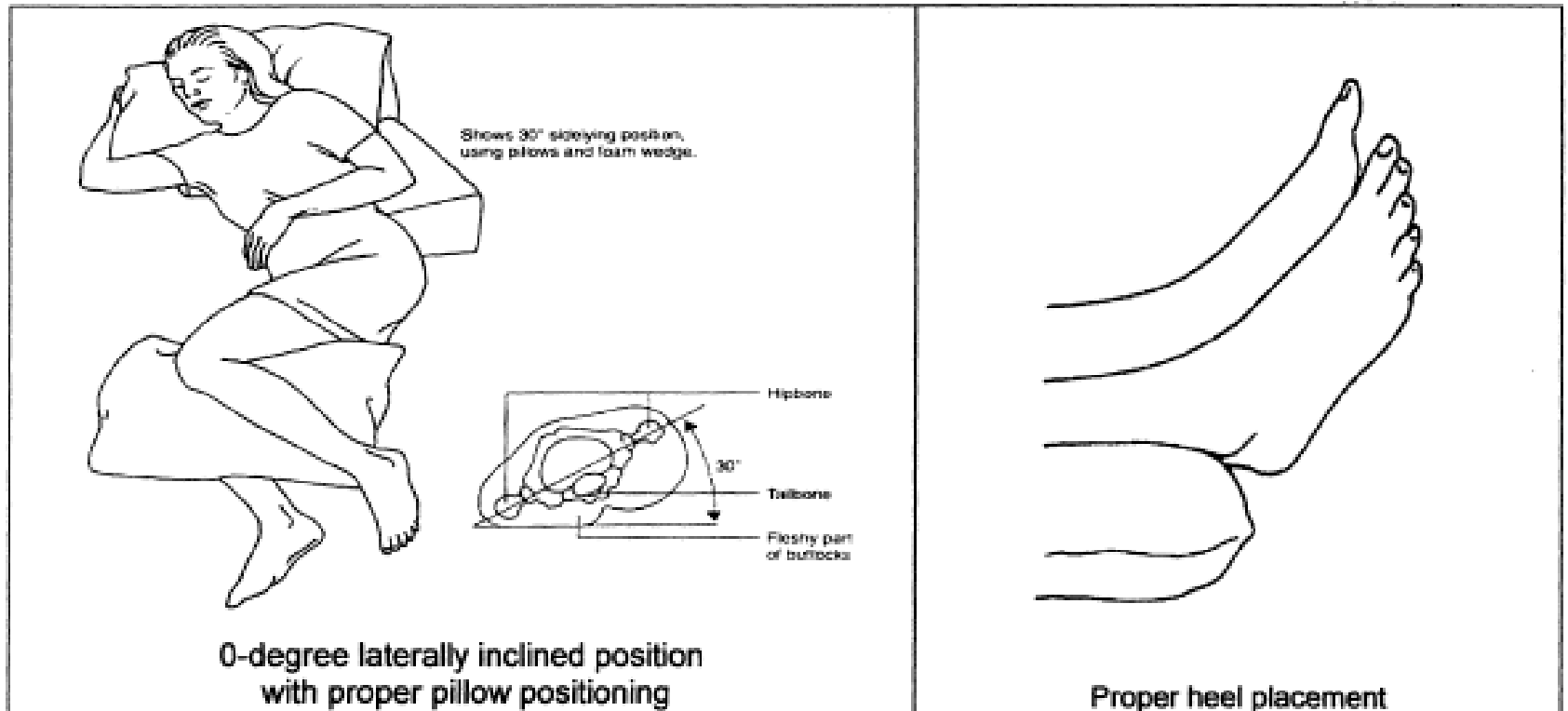
- **ELEVATE HOB NO MORE THAN 30 degrees**
- **USE TRAPEZE WHEN INDICATED**
- **USE LIFT SHEET TO MOVE PATIENT-Microfibers and new textiles more effective than cotton.**
- **PROTECT ELBOWS & HEELS IF BEING EXPOSED TO FRICTION**
 - Barrier Films
 - Transparent film dressing
 - Heel/elbow protectors

Intervention-Manage Pressure

- Reposition, reposition, reposition.....
- Pillows or foam wedges placed between the ankles and knees
- Heels require particular attention: place pillows lengthwise under the lower legs to elevate the heels, or special heel protectors can be used.
- Level 2 study-foam to float 2.8 days to 5.6 days 8.5 versus 54.2% with pillows.

(Cadue, 2008)

Positioning



Barriers to Repositioning

- Nursing Perception
 - 59% -unstable vital signs
 - 46% -low respiratory and energy reserves
 - 34% -safety, loss of tubes, concern for patient or staff injury
 - Point of interest: Staffing or admitting Dx. NOT perceived concern
- Components of successful repositioning
 - Presence of a protocol
 - Specific physician's order
 - Glasgow coma score > 10
 - Use of bed that provides a chair position

Contraindications to Turning

- Temporary oral-pharyngeal airway
- Spinal instability
- Risk of fatality due to hemodynamic status
- Active fluid resuscitation to maintain BP
- Active hemorrhaging
- Life threatening arrhythmia
- Changes in hemodynamic parameters that do not stabilize in 10 minutes of repositioning.

(NPUAP)

Repositioning Hemodynamically unstable

- Initiate repositioning as soon as possible
- Repositioning trial every eight hours
- Consider pre-oxygenating to increase O2 supply
- Attempt repositioning to the RIGHT
- Slow, gradual turns and allow ten minutes to stabilize
- Consider more frequent small shifts every 30 minutes
- Reposition limbs and head every hour
- Consider CLRT
- Resume regular schedule as soon as possible

Pronation

- 13% will develop a Stage II facial pressure ulcer 55 +/- 7 hours
- Assess with each rotation: face, breast, knees, toes, penis, clavicles, iliac crest, symphysis pubis
- Re-evaluate for necessity of proning and discontinue promptly



Offloading during Pronation

- Offload pressure areas as much as possible
- Use prophylactic dressings to all pressure points.
 - Foams
 - Hydrocolloids
 - Barrier sprays
- Goal is to minimize friction, shear and pressure AND manage moisture

Skin Management Guideline for RotoProne Therapy
ArjoHuntleigh (RotoProne) Support: 1-844-557-7663
APPLY BARRIER SPRAY PRIOR TO APPLYING DRESSINGS

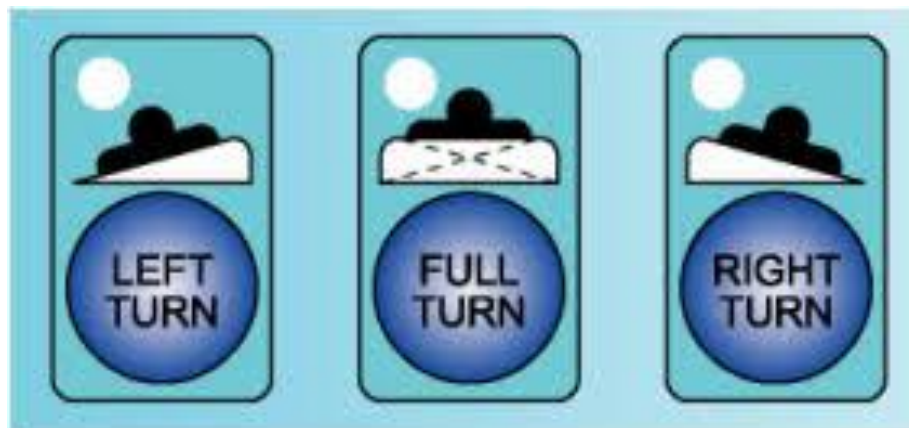
Size	QTY
3.2" x 3.2"	6
3" x 5"	6
7" x 7"	30
9.4" x 8.4" (Sacral)	2
8.5" x 5.5" (Heel)	6
10" x 4"	4
4" x 8"	8

GUIDELINES FOR DRESSING USE:

- Place date and time on each dressing
- Change dressings every day unless lifting or soiled
- Check skin integrity under ALL dressings while patient in supine position
- If breakdown noted, follow facility protocol for wound care and documentation
- Avoid "layering" dressings on top of each other to prevent shearing

Continuous Lateral Rotational Therapy

- High risk for shear force
 - Ensure proper alignment
 - Secure with bolsters
 - Use prophylactic dressings
- CLRT does not replace need for repositioning
- Reevaluate at first sign of injury, if appropriate, change to pressure redistribution surface



Medical Device Related Pressure Injury

Common locations of MDRPU's

- 30% to 70% of MDRPUs are located on the head and neck
- Heels, ankles, feet
- Coccyx, buttock, sacrum
- Common sources: CPAP, O2 tubing, G-tubes, ET tubes, NG tubes, pulse-ox probes, tracheostomy faceplates and ties, cervical collars, catheters, abd binders, restraints, SCD's, external fixators, and limb immobilizers. NPWT, bedpans, PICC/central line

(WOCN, 2014)

Medical Device Related Pressure Injury av vers un

- The prevention of MDRPUs is often more complicated than preventing typical PUs as the device may be an essential component of treatment.[241](#)

- Unavoidable PUs may occur when:

It is medically contraindicated to adjust or relocate or pad under a therapeutic device (80-82% consensus.)

When a life sustaining vascular access or other medically necessary device precludes turning and repositioning (83085% consensus.)

There is an inability to assess or pad underneath a device

When underlying edema or uncontrollable moisture under device that compromises tissue tolerance to pressure and/or shear forces.

(NPUAP, 2014)

Prevention of MDRPU

- Ensure correct size and fit
- Minimalize pressure or shear
- Reassess at least two times daily; more frequently prn
- Observe for agitation-pulling, scratching, repositioning.
- Ask the patient about pain, itching, burning, numbness with each assessment.
- Keep skin clean and dry
- Use skin protectant
- Pad from onset. Use prophylactic dressings.

Device specific-Head and neck

- NG tubes-Use stabilization device, avoid securing on top of head
- Et tube-Assess each lift-lips, rotate sites , use securement device
- Tracheostomy-Clean BID, more often if needed, Use split gauze, remove sutures asap (5 days), check ties.
- BiPAP/CPAPA-void other devices under mask, pad with foam hydrocolloids
- O2 tubing-use silicone tubing, keep tubing loose.
- C-collar-assess fit, keep skin clean and dry, pad occiput, soft collar when possible.

MDRPU-Other devices

- Abd feeding tubes-Remove sutures asap, stabilize, use drain sponge, check with each use or at least q shift, if leaking, fix, consider pouching.
- Bedpans-monitor and remove timely, set phone alarm, keep call light in reach, use protective barrier cream/spray to reduce shear.
- Prafo/heel boots-Assure proper fit, not everyone is a candidate, foot drop, edema, severe vascular compromise.
- SCD's/TED hose-assess prior to placement, assess q shift, use lotion.

References

Thank You

