Bundle Up: Evidence-based Perioperative Pressure Injury Prevention

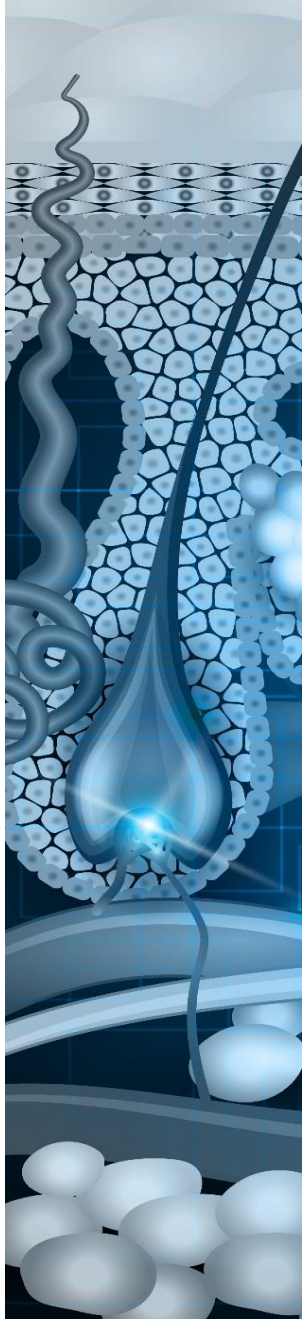
Susan M. Scott, MSN, RN, WOC Nurse

Scott Triggers ® PLLC

Faculty Disclosure

Susan M. Scott, MSN, RN, WOC Nurse

Consultant/Speakers' Bureau: Stryker/Sage Products



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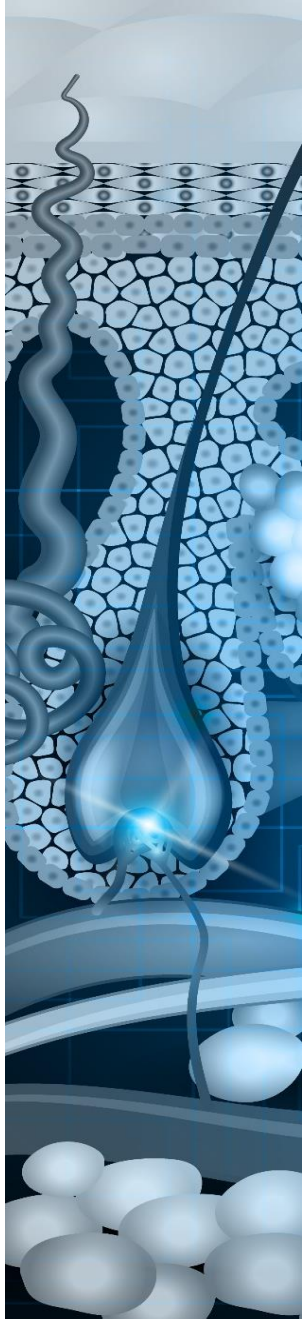
Outcomes

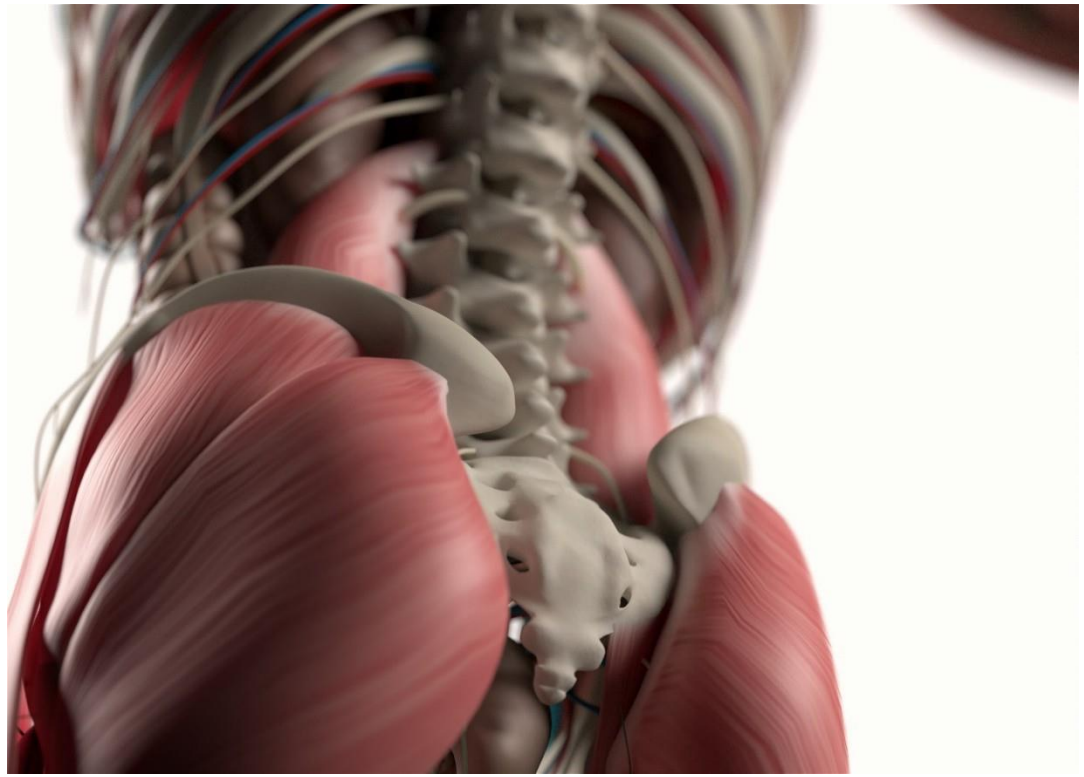
1. Identify the factors that increase the risk of pressure injuries in the surgical patient.
2. Describe the role of the WOC nurse in creating strategies to reduce the incidence of hospital-acquired pressure injuries in the surgical population.

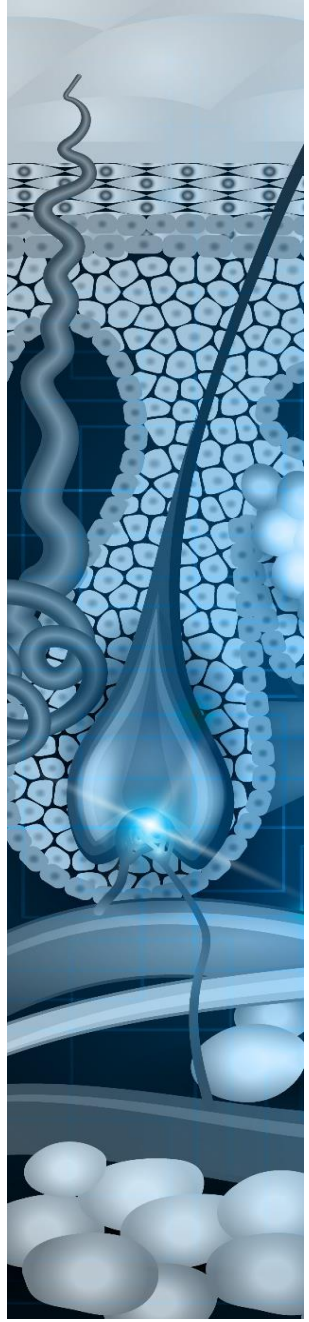


Goals of Patient Positioning

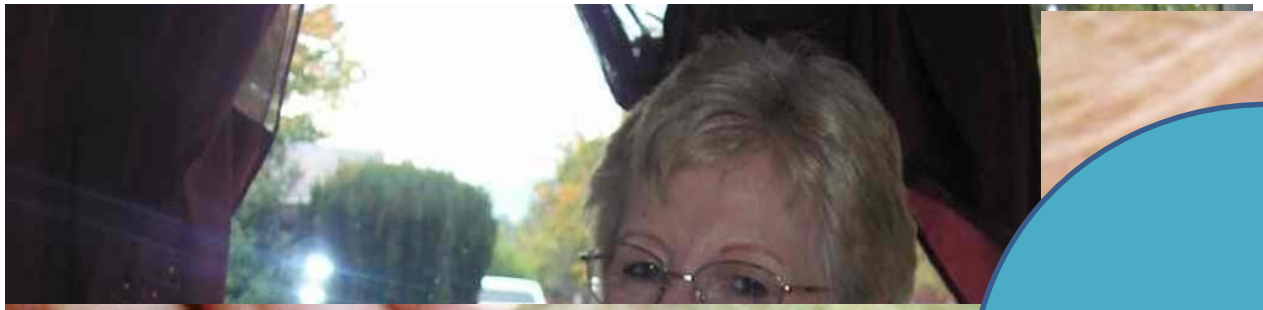
"Protecting muscles, nerves, bony prominences, joints, skin, and vital organs from injury" *AORN 2017*

Goal: Eliminate patient harm





Case Study Amy's Story - Reoperation



It's up to us.

Photos used with permission Amy Green

Perioperative Pressure Injury (PPI)

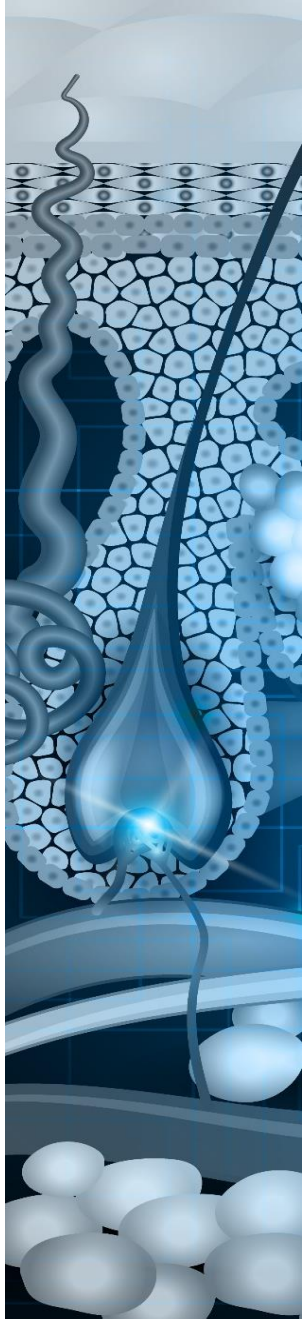
A perioperative pressure injury is any pressure-related tissue injury that presents as (non-blanchable erythema, purple discoloration or blistering) within 48-72 hours postoperatively and is associated with the surgical position or medical device.

Scott S. Progress and Challenges in Perioperative Pressure Ulcer Prevention. *J Wound Ostomy Continence Nurs. 2015;*42 (5);480-485.

AORN Position Statement PPI

AORN believes that:

- the **entire** health care team must collaborate to prevent pressure ulcer formation in the perioperative patient,
- pressure ulcer prevention should begin **before** the patient enters the surgical suite,
- **every** patient experiencing a surgical procedure should be assessed for **risk factors** that may lead to the development of a pressure ulcer,
- the pressure ulcer **risk assessment** and **skin assessment** should be communicated during ***all*** patient **hand overs**,
- education related to pressure ulcers in the OR should be performed **yearly,** and
- communication of pressure ulcer development **back to the surgical team** is imperative.



Prevention of Perioperative Pressure Ulcers /Tool Kit. AORN. http://www.aorn.org/guidelines/clinical-resources/tool-kits/prevention-of-perioperative-pressure-ulcers-tool-kit. Published December 31, 2015. Accessed April 29, 2016.

Background

Surgical Procedures

48.3 M in 2010

53% Hospital

47% Amb Surgery

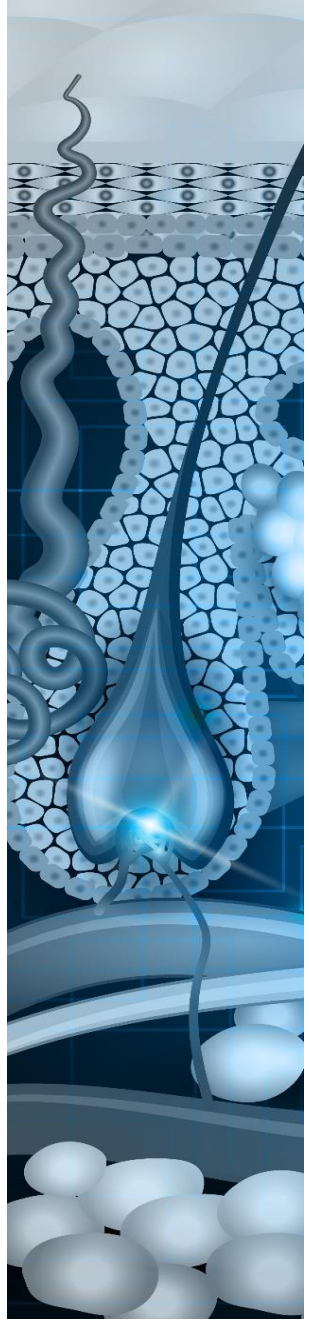
33% > age 65

$11 Billion Hospital Acquired Pressure Ulcer (HAPU)

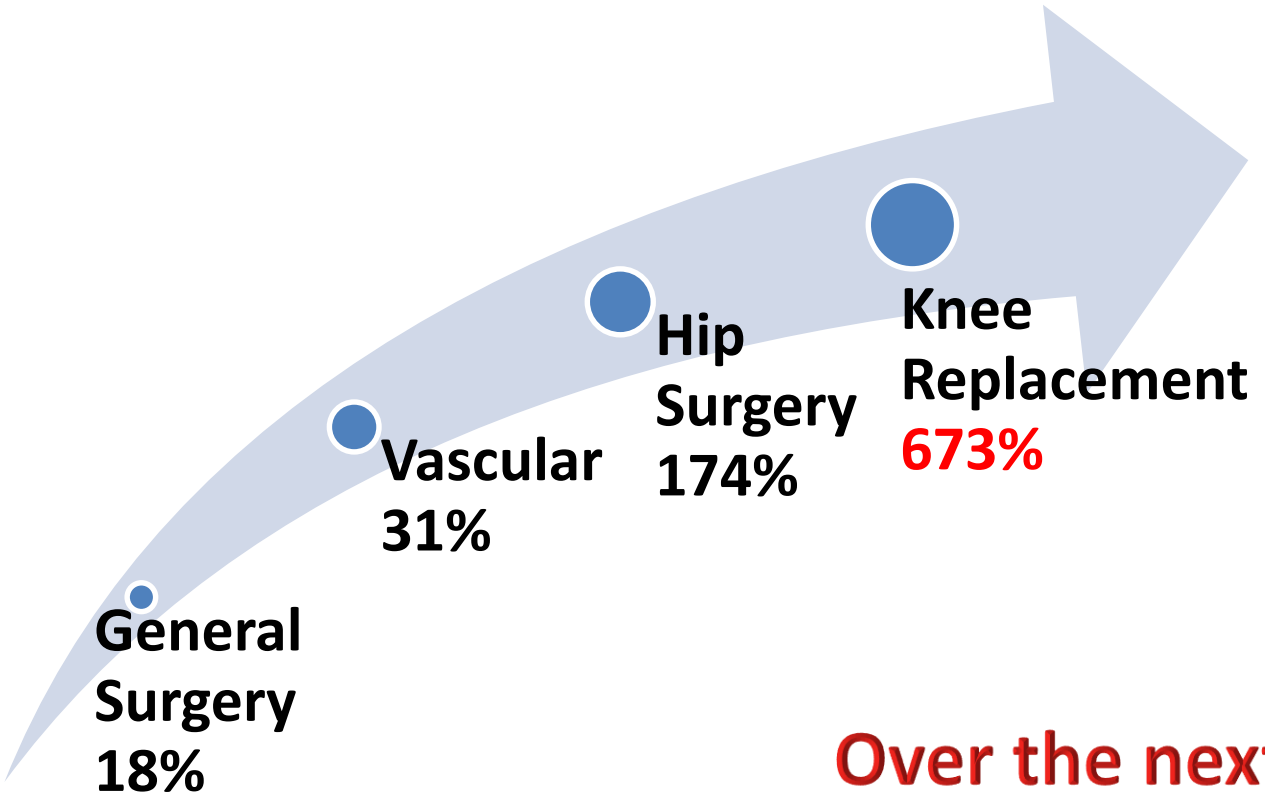
Incidence 0.3%-57% Mean 15%

Hundreds of risk factors

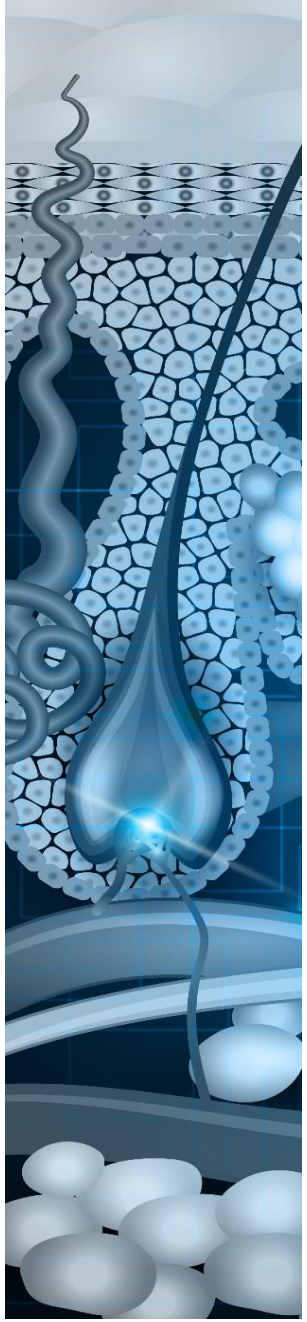
2 surgery specific tools



Aging Surgical Population



Over the next 20 years



American Geriatric Society (2015) Optimal Perioperative Management of the Geriatric Patient: Best Practice Guideline from ACS NSQIP ®/ American Geriatric Society Retrieved 02-12-16 from https://www.facs.org/~/media/files/quality%20programs/geriatric/acs%20nsqip%20geriatric%202016%20guidelines.ashx NCHS Data Brief Hospitalization for Total Hip Replacement Among Inpatients Age 45 and Over: United States, 2000-2010 Retrieved 12-07-2016 from http://www.cdc.gov/nchs/data/databriefs/db186.pdf Dall TM, Gallo PD, Chakrabarti R, West T, Semilla AP, Storm MV.An aging population and growing disease burden will require a large and specialized health care workforce by 2025. *Health Aff. (Millwood).* Nov 2013;32(11):2013-2020.

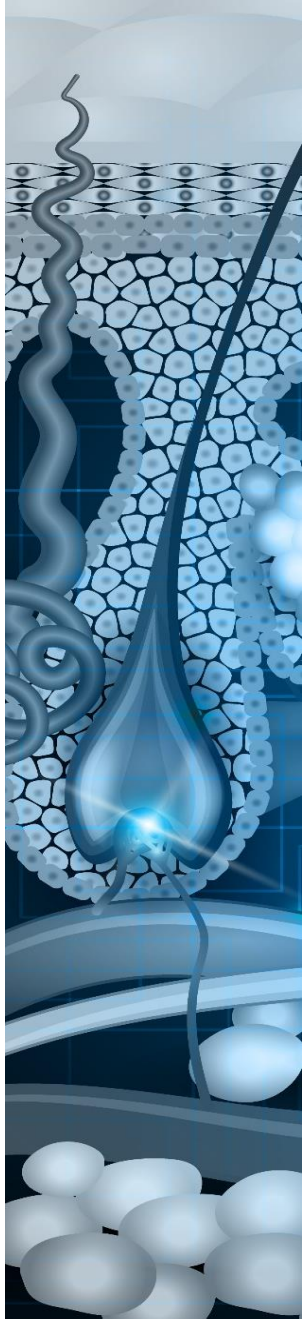
OR Skin Bundle

Susan M. Scott MSN, RN, WOC Nurse

Scott S. Use of an OR skin bundle to prevent pressure injury. *AORN Journal* 2017;106(4):P18-19.

Risk and OR Skin Bundle

1. Risk and Skin assessment pre-op and immediately post-op;
2. Safe patient handling;
3. High specification OR table pads;
4. Redistribute pressure or padding bony prominences;
5. Offloading pressure on heels while maintaining knees in slight flexion;
6. Consider prophylactic dressing for bony prominences or under medical devices;



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Scott, S. Perioperative Pressure Injuries: Protocols and Evidence-Based Programs for Reducing Risk. *PSQH,* 2016;13(4), 20-28.

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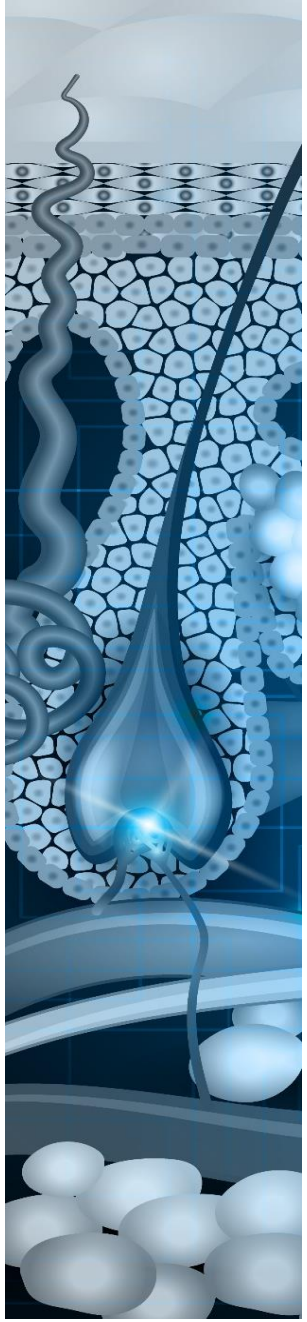
Risk and OR Skin Bundle Continued

7. Avoid use of unapproved positioning devices;
8. Maintain normothermia and microclimate
9. Using hand-over communication i.e. IPASS;
10. Institute early movement, daily skin assessment and pressure management and
11. Reporting PIs that develop within 72 hours after the procedure.



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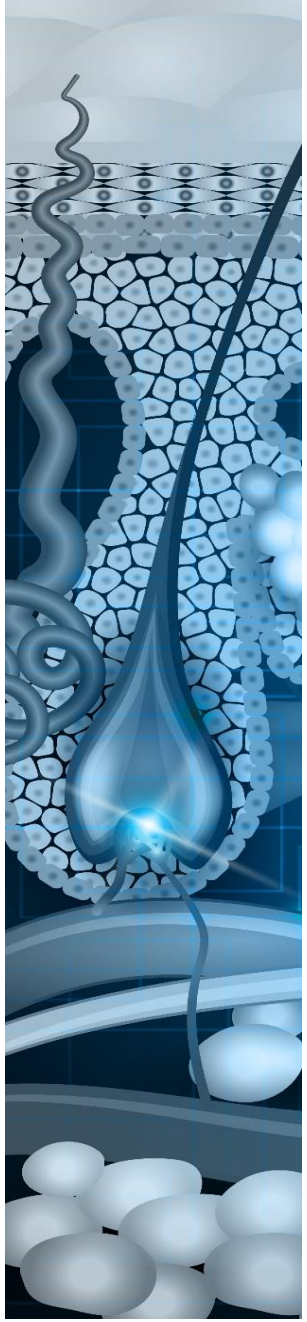
Risk Assessment

"Perioperative RNs should use a structured risk assessment tool for preoperative assessment of the patient's risk for pressure injury." [1: *Strong Evidence]*

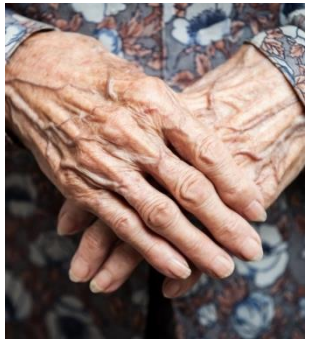
Suzy Scott & Barbara Braden

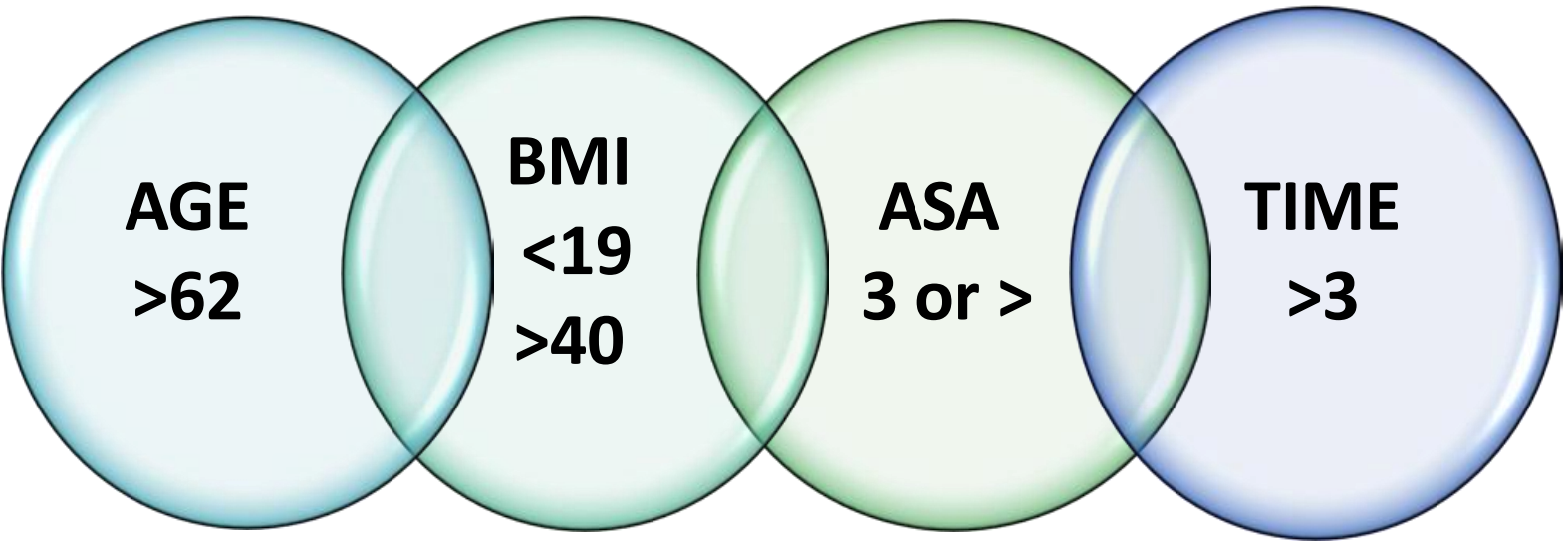
- Braden Scale
- Munro Scale
- Scott Triggers Tool
- Braden Q +P Scale



Association of PeriOperative Registered Nurses. (2017) Guideline for Positioning the Patient. In AORN(Ed). *2017 AORN Guidelines for Perioperative Practice*. Philadelphia, Wolters Kluwer.

Assess Pre-op





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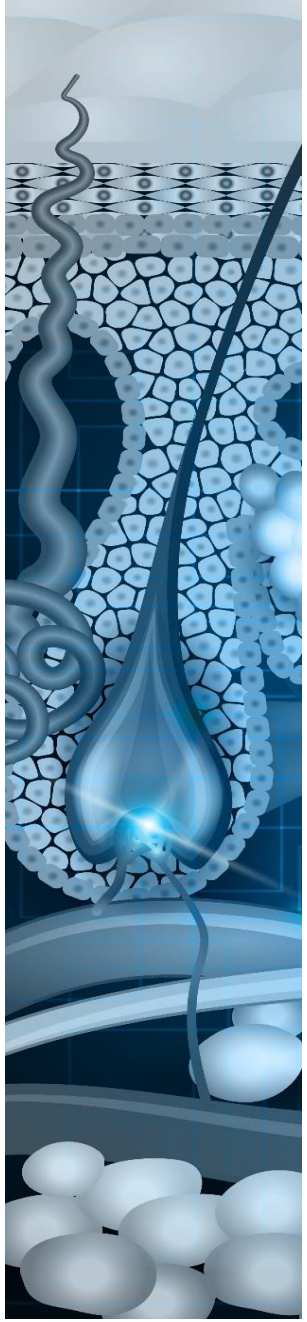
Scott Triggers®	Does it meet these qualifications?	If YES, please place check here
Age	Age 62 or older	
Serum Albumin ____g/L or BMI	Albumin level <3.5 g/L or BMI <19 or >40	
ASA Score (Circle) 1 2 3 4 5 6	ASA score 3 or greater	
Estimated surgery time Hours/minutes	Surgery time over 3 hours or 180 minutes	
Two or more YESES =	**HIGH RISK SURGICAL PATIENT**	

Polling Question #1

Skin Assessment: In your setting how often do the perioperative nurses do a complete skin assessment of pressure points prior to surgery?

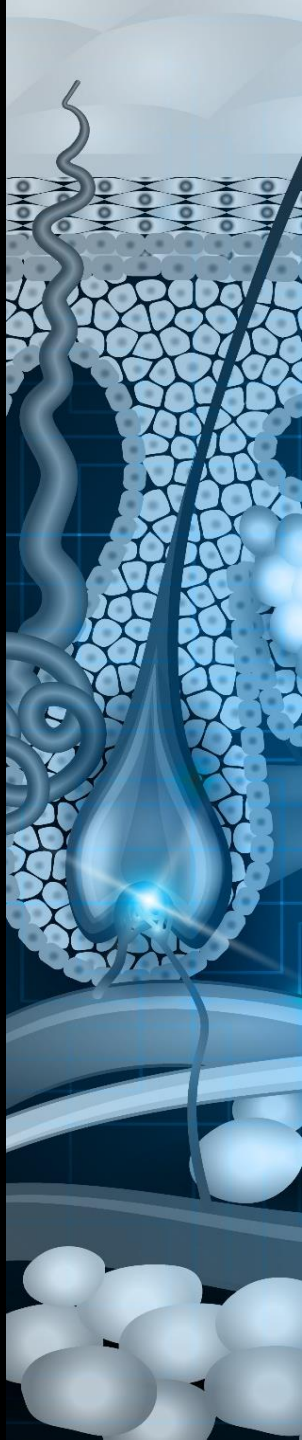
Enter Answer options

A. Always
B. Very Often
C. Sometimes
D. Rarely
E. Never

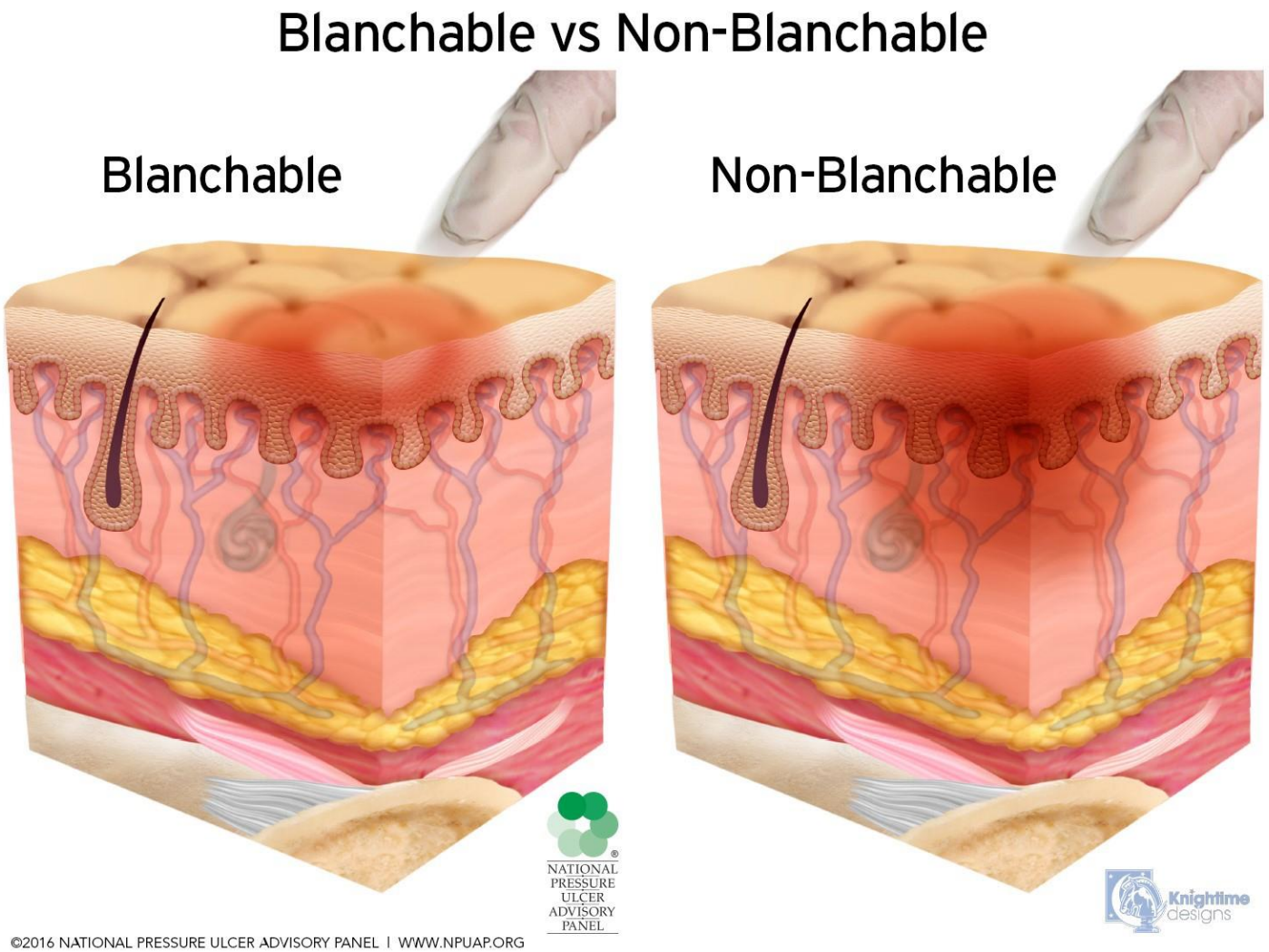


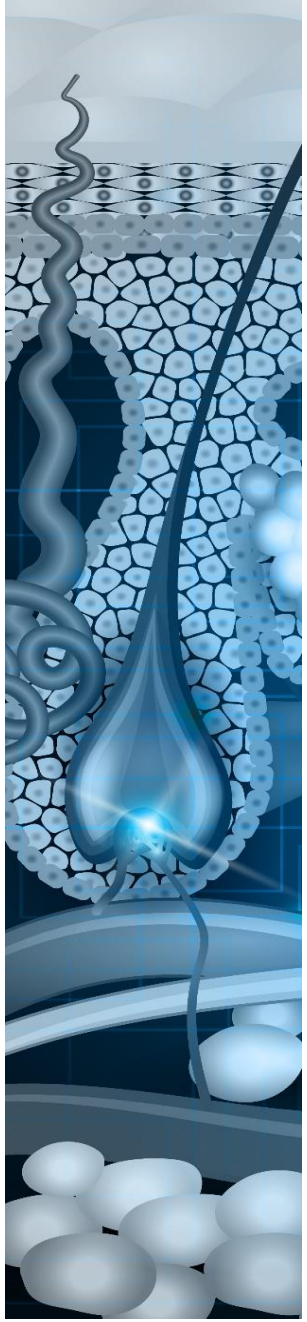
Assessment of Risk and Skin

Skin Assessment on admission and per policy



Skin Assessment

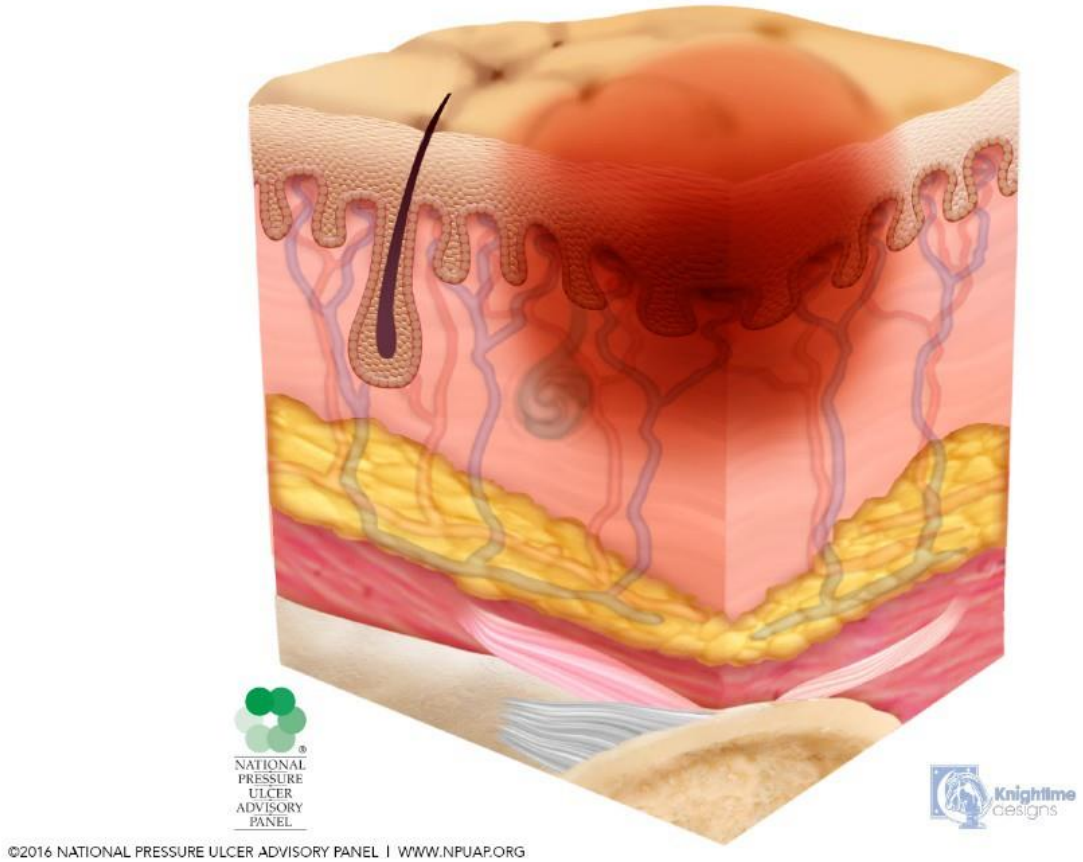




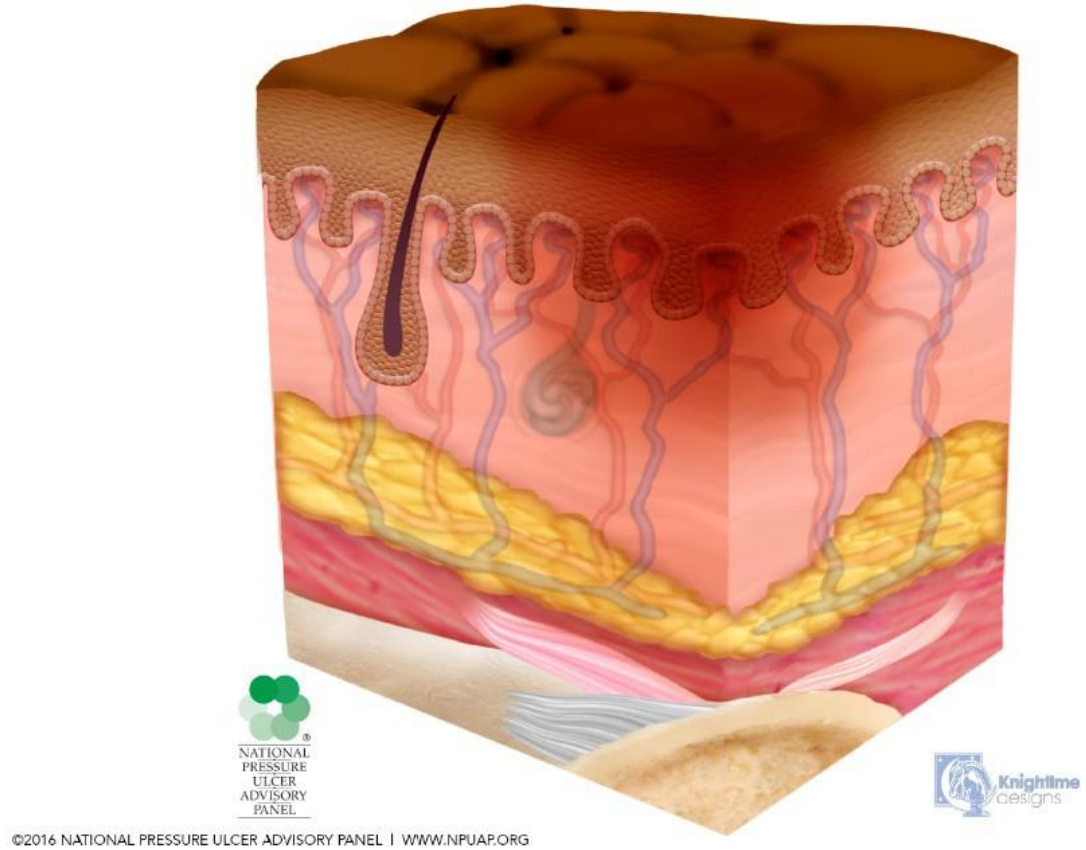
Photos used with permission NPUAP http://www.npuap.org/resources/educational-and-clinical-resources/npuap-pressure-injury-stages/

Stage 1 Pressure Injury (PI)

Stage 1 Pressure Injury - Lightly Pigmented



Stage 1 Pressure Injury – Darkly Pigmented



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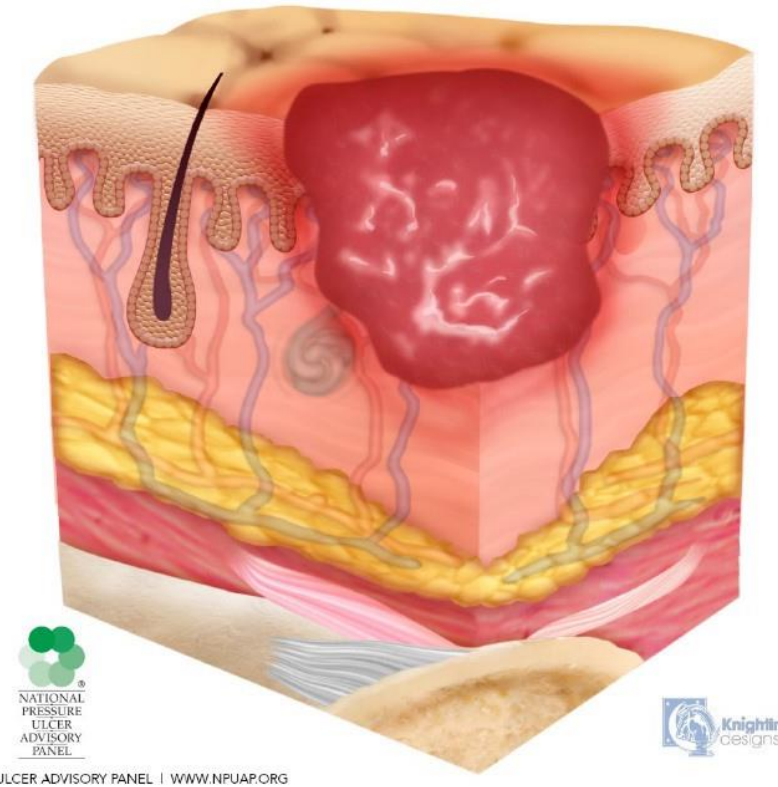
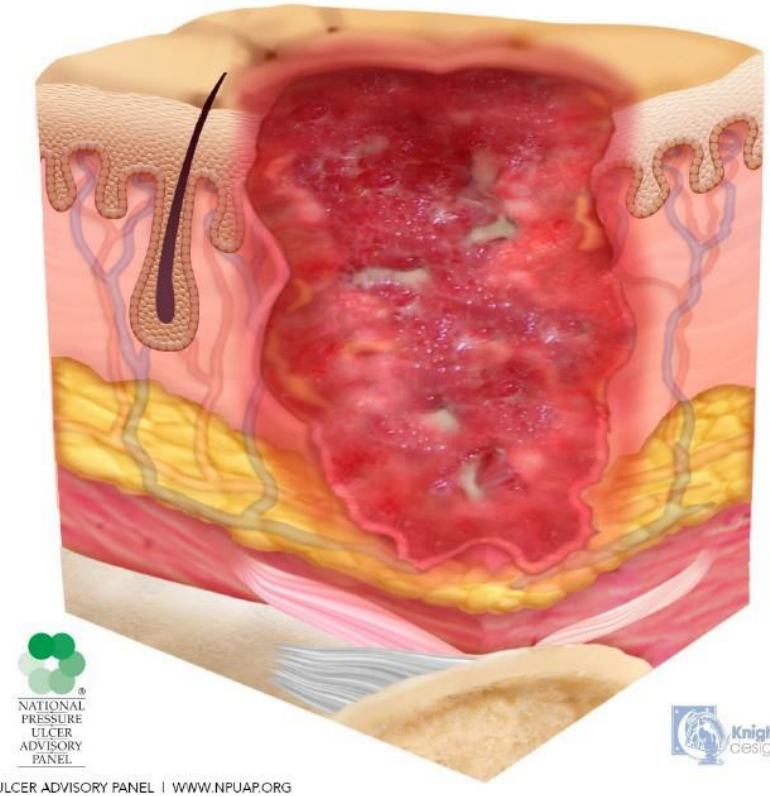
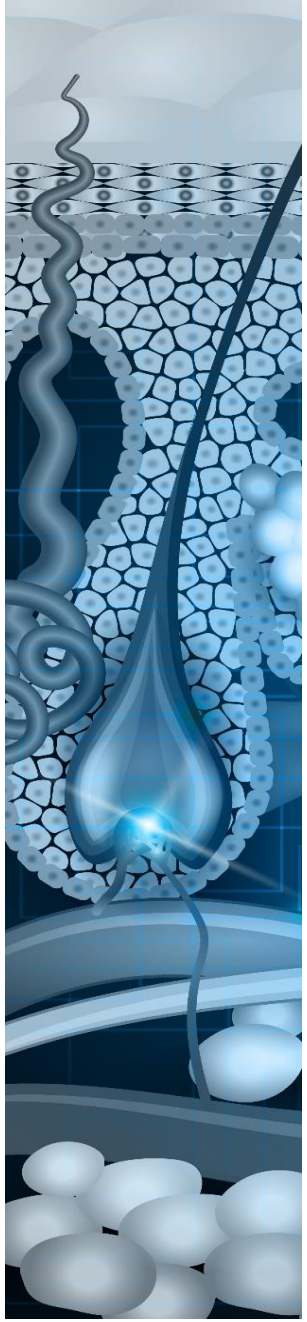
Stage 2 & 3 Pressure Injury

Stage 2 Pressure Injury



Stage 3 Pressure Injury





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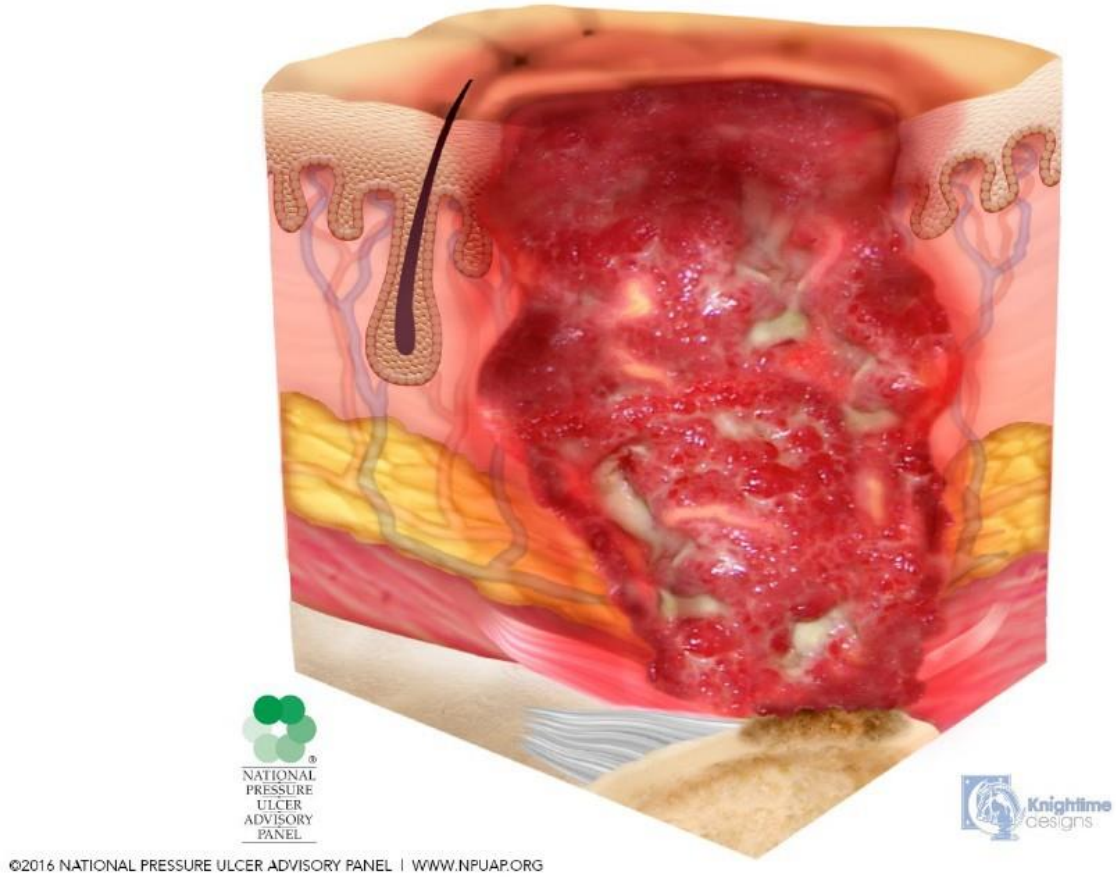
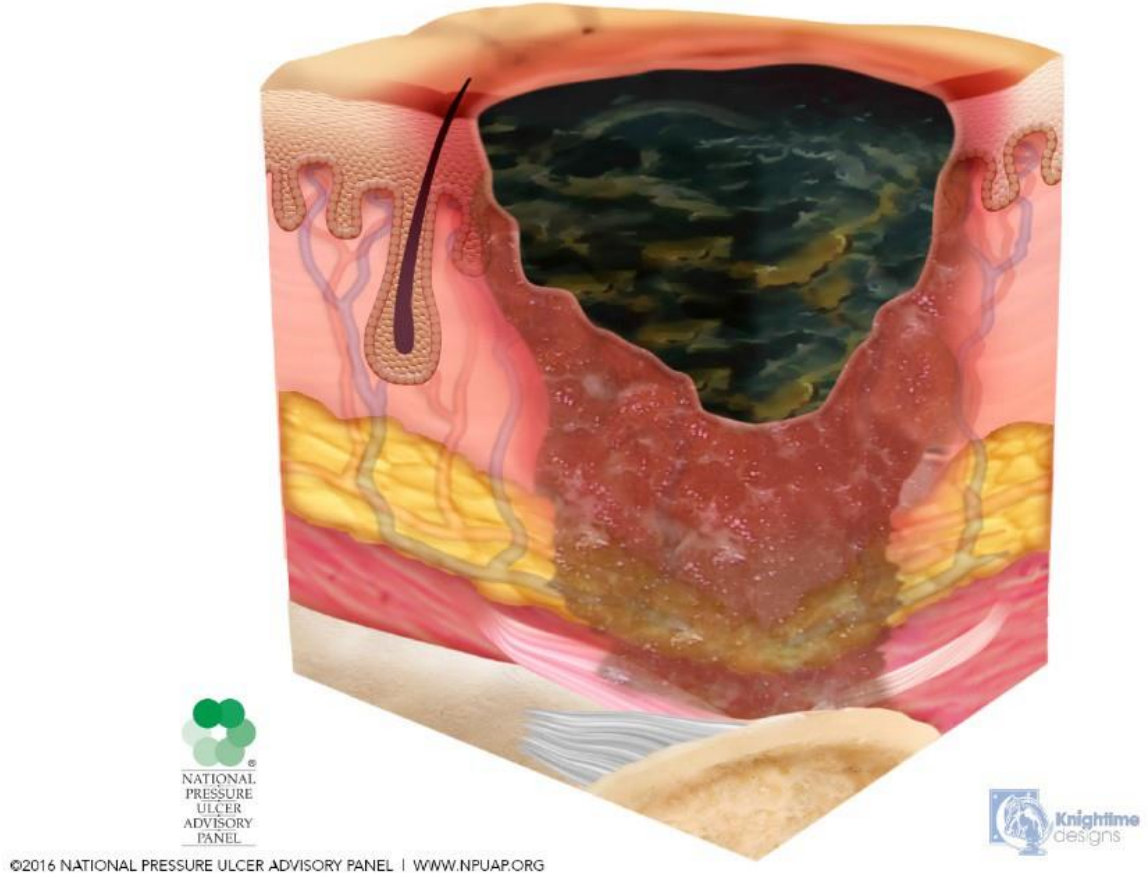
Stage 4 PI & Unstageable

Stage 4 Pressure Injury



Unstageable Pressure Injury – Dark Eschar



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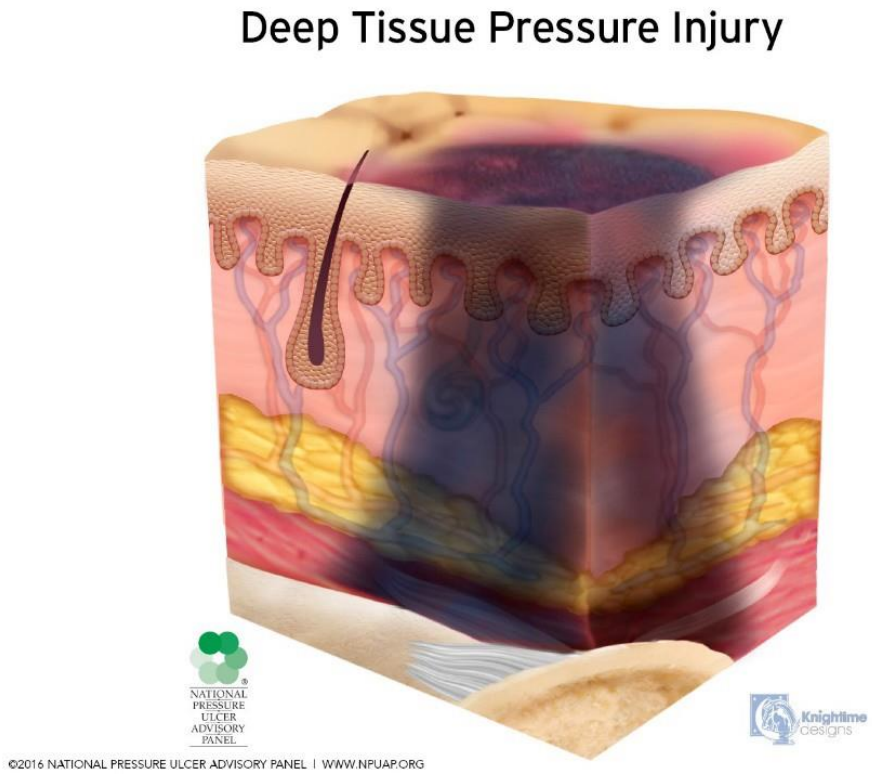
Deep Tissue Pressure Injury



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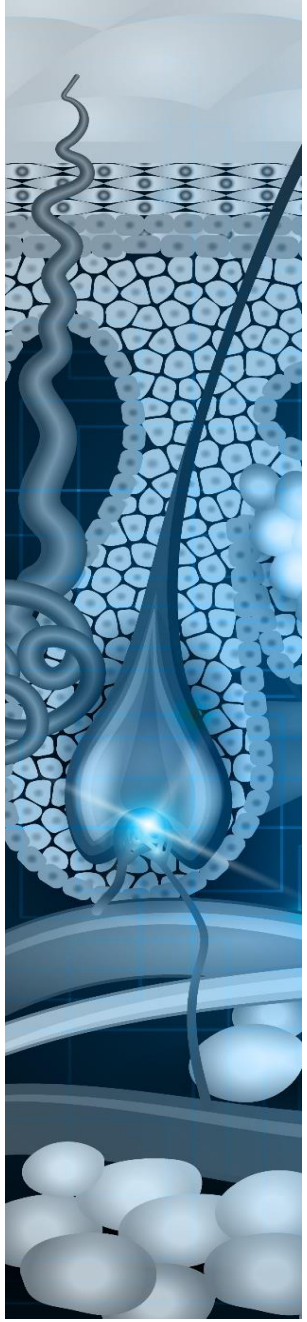
Safe Patient Handling

Nursing Impact



AORN Safe Patient Handling and Movement Toolkit

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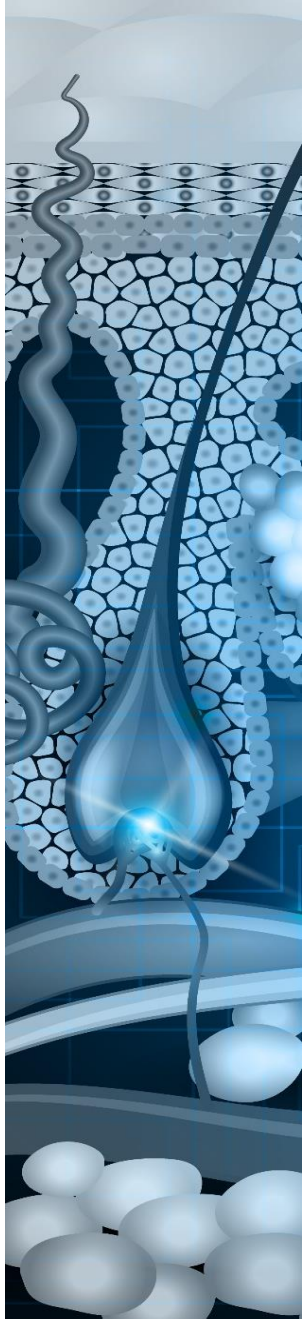
SPH Wide Spread Response

- 11 States have enacted Safe Patient Handling legislation
- Introduction of the Nurse & Health Care Worker Protection Act of 2013
- OSHA & The Joint Commission renew alliance to protect safety & health of health care workers
- OSHA to increase fines for HCW injuries
- American Nurses Association (ANA) released *Safe Patient Handling & Mobility: Interprofessional National Standards*

Safe Patient Handling/Tool Kit. AORN. https://www.aorn.org/guidelines/clinical-resources/tool-kits/safe-patient-handling-tool-kit Published December 1, 2014. Accessed April 17, 2017

Safe Patient Handling (SPH)

- Injuries are common and costly
- Incidence rates
- Patients have 6 or more lateral transfers
- Nursing impact
- Risk factors in the OR
- What are the Myths
  - Lift limits 35 lbs.
- Legislation



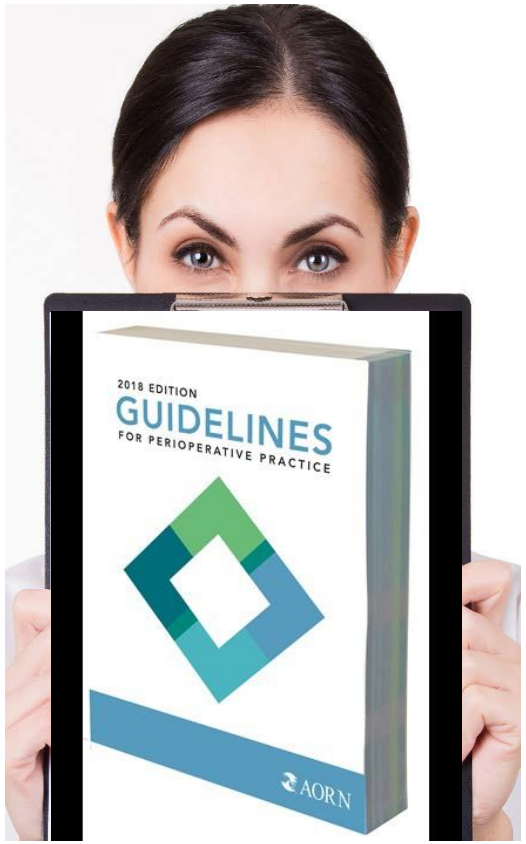
SPH Recommendations

Essential Task Elements

- Maintain the patient's body alignment & airway & support extremities during transfer to protect the patient from a positioning injury

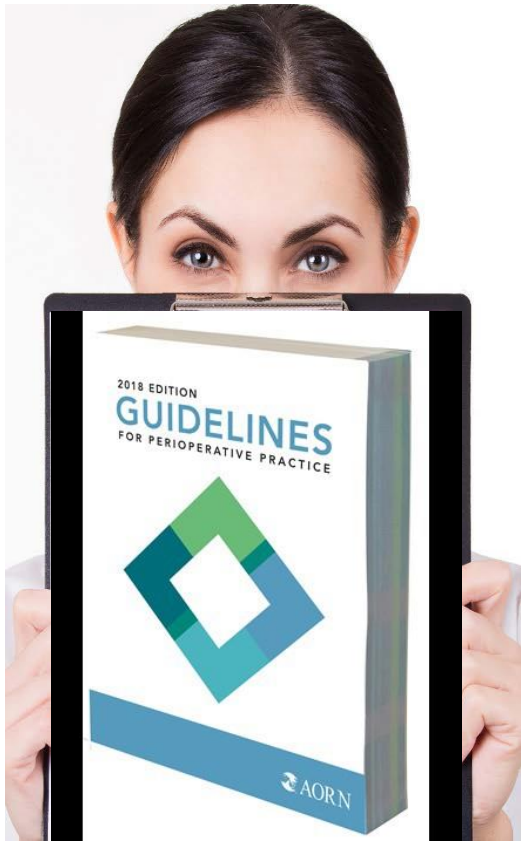
Task Recommendations

- General Lateral Transfer
  - Use lateral transfer device that extends the length of the patient (e.g., slider board)
  - Destination surface should be slightly lower



Safe Patient Handling/Tool Kit. AORN. https://www.aorn.org/guidelines/clinical-resources/tool-kits/safe-patient-handling-tool-kit
Published December 1, 2014. Accessed April 17, 2017

SPH Guidelines



Supine

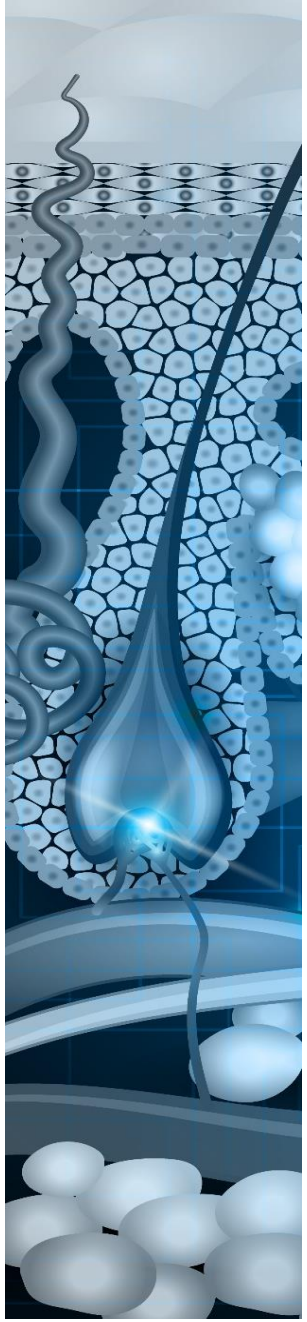
- Anesthesiologist supports head and neck
  - Weight < 157 lb.
    - Use lateral transfer device & 4 caregivers
  - Weight > 157 lb.
    - Use mechanical lift with supine sling, mechanical lateral transfer device, or air-assisted lateral transfer device & 3 to 4 caregivers

Safe Patient Handling/Tool Kit. AORN. https://www.aorn.org/guidelines/clinical-resources/tool-kits/safe-patient-handling-tool-kit
Published December 1, 2014. Accessed April 17, 2017

Types of Lateral Transfer Devices

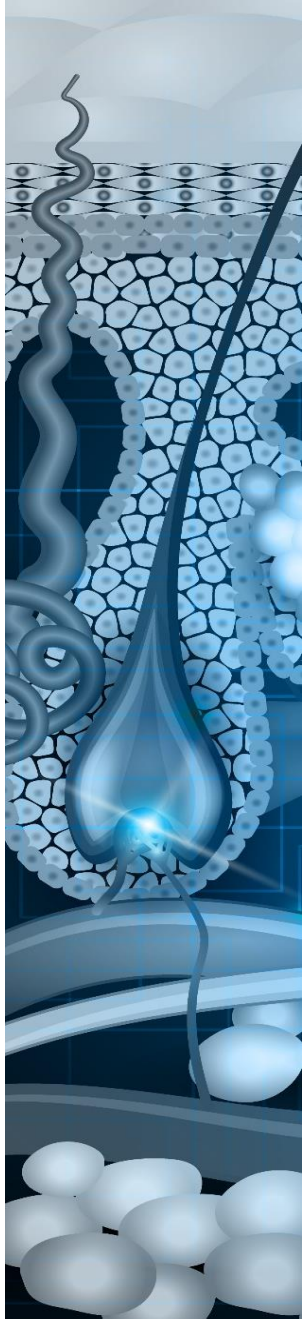
BEST

- Two + person lift
- Roller board
- Patient Sliders
  - Board
  - Plastic
  - Sheet
- Air transfer Devices



Air Transfer Benefits

- Radiolucent
- No skin shear
- Pain free transfers
- Less injuries



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High Specification OR Table Pads

Susan Scott

High Specification OR Table Pads

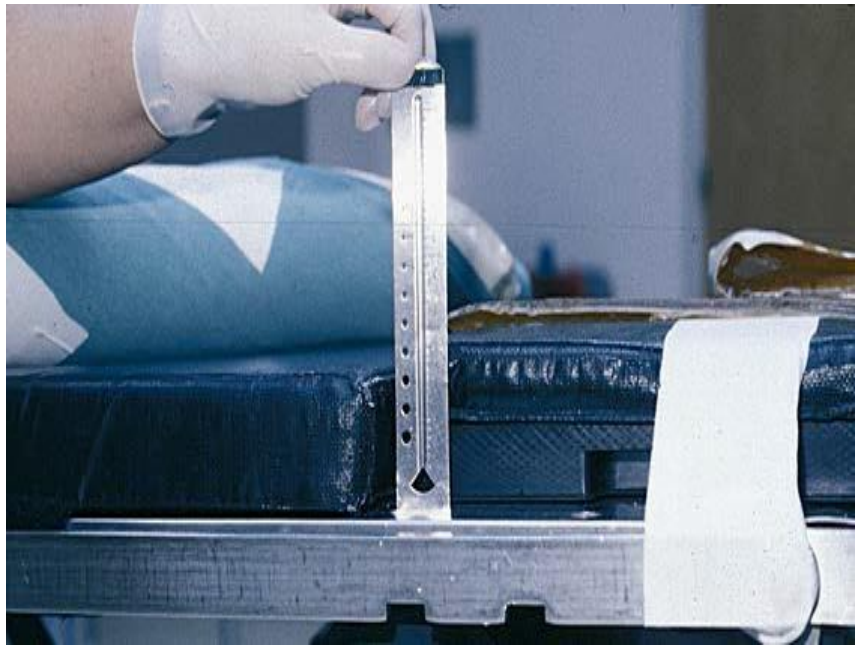
- Non Powered
  - Foam alternatives: Viscoelastic,
  - Gel/foam combination
  - Air

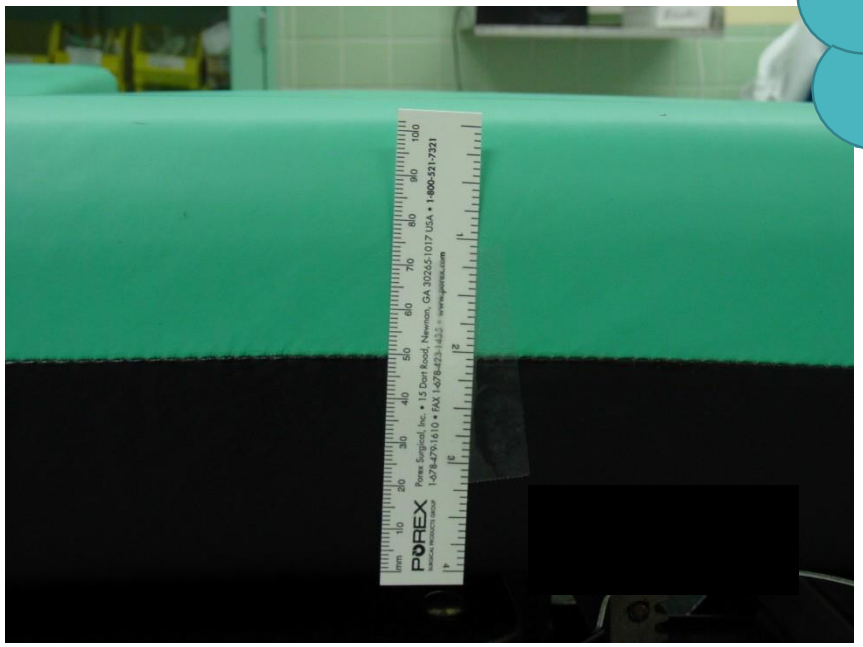
- Powered
  - Limited evidence
  - Fluid Immersion Simulation
  - Alternating air overlays

Life Expectancy of Surface

National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. . Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. Emily Haesler (Ed.). Cambridge Media: Osborne Park, Western Australia; 2014. AORN

Memphis, TN VA Study





Weight Limit?

Patients were eight times more likely to develop a pressure injury on the standard pad versus the high specification pad

Scott SM. Progress and challenges in perioperative pressure ulcer prevention *J Wound Ostomy Continence Nurs. 2015;*42 (5):480-485.

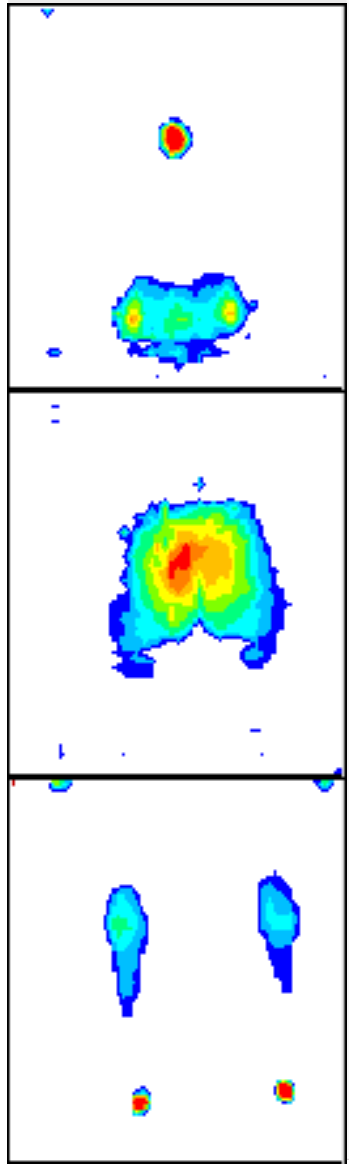
Tissue Interface Pressure Measurement

Occiput

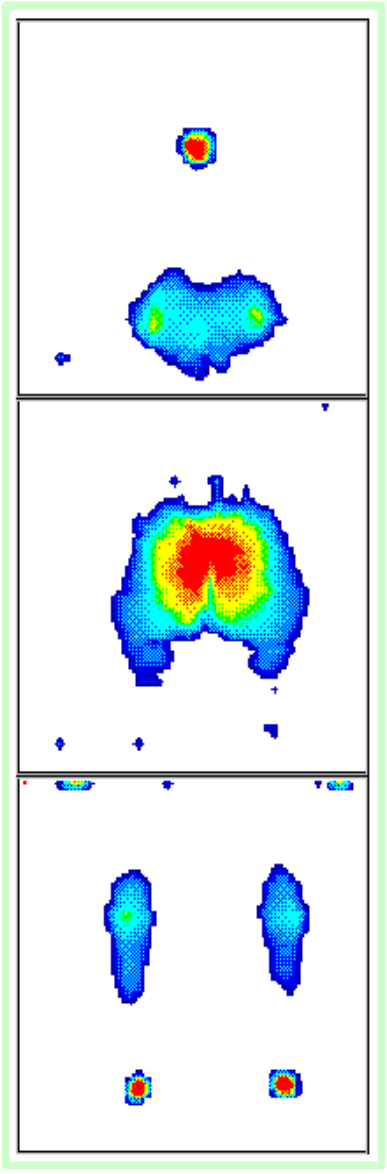
Sacral

Heels

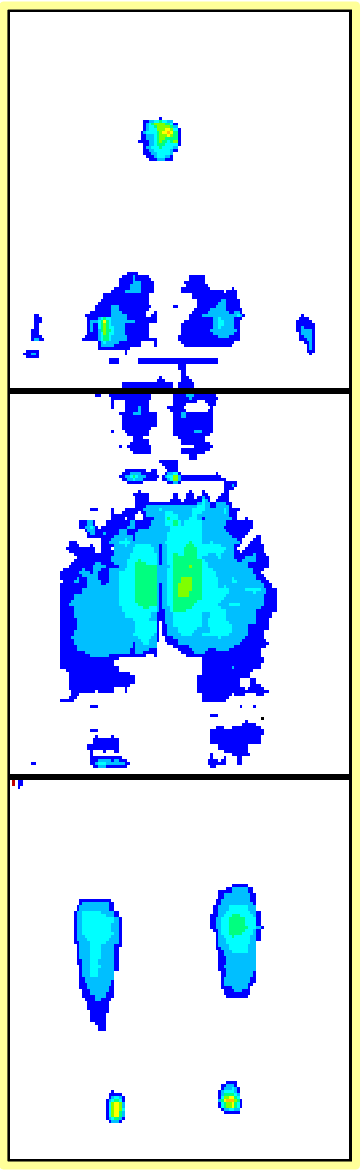
Standard



Standard & Gel



Visco-elastic



Redistribute Pressure and/or Pad Bony Prominences

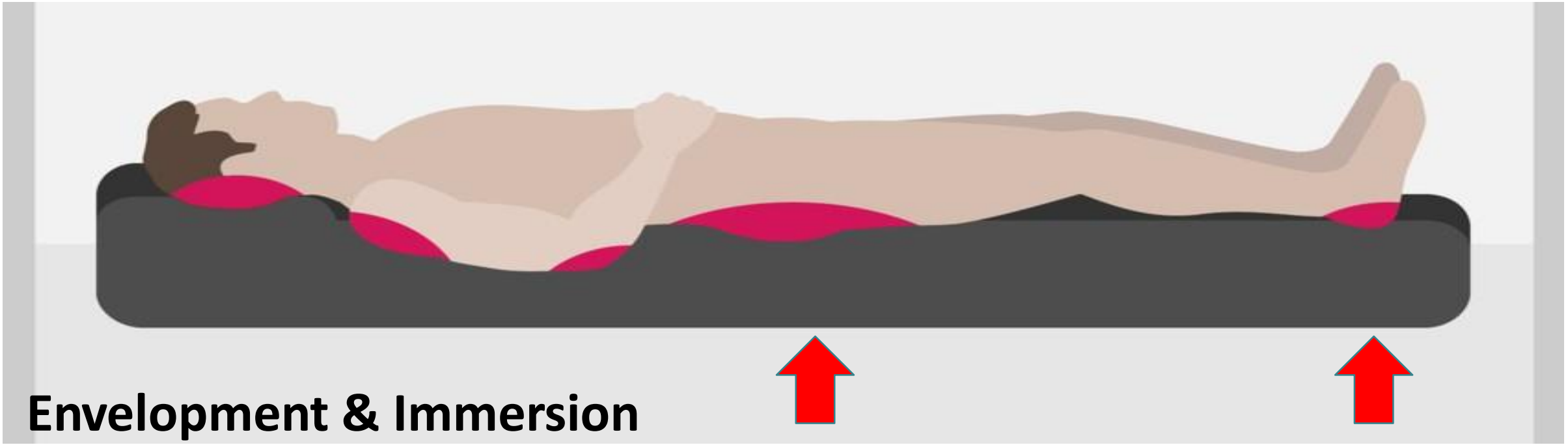
Redistribute pressure and/or pad bony prominences

- Supine
- Lithotomy
- Prone
- Trendelenburg
- Lateral/Jack Knife

National Pressure Ulcer Advisory Panel, European Pressure Ulcer Advisory Panel and Pan Pacific Pressure Injury Alliance. Prevention and Treatment of Pressure Ulcers: Clinical Practice Guideline. Emily Haesler (Ed.). Cambridge Media: Osborne Park, Western Australia; 2014. Association of PeriOperative Registered Nurses. (2017) Guideline for Positioning the Patient. In AORN(Ed). *2017 AORN Guidelines for Perioperative Practice*. Philadelphia, Wolters Kluwer.

Supine

Occiput → Scapula → Arms → Elbows → Vertebrae → Lumbar → Sacrum → Heels



Envelopment & Immersion

Alopecia

Reposition head every 30 minutes

- Pressure injury of the occiput can result in alopecia (hair loss) which may be permanent or temporary.
- Most common site for ulcers in pediatrics is the occiput cardiac surgery.

Photo used with permission Amy Green

Rothrock, J (2014) Alexander's Care of the patient in surgery 15th edition. St. Louis Mo. Mosby

Lithotomy

- Procedures
  - Obstetrics and gynecological procedures
  - Genitourinary procedures
- Pressure Points
  - Occiput
  - Shoulders
  - Scapulae
  - Hips
  - Sacrum/coccyx
  - Lateral aspect of the legs
  - Heels

Photograph used with permission STERIS Corporation. Walton-Greer, P. (2009). Prevention of pressure ulcers in the surgical patient. AORN Journal, (89)3. 538-548.

Lithotomy Prevention Plan

- Careful placement of buttocks do not extend over break of bed.
- Pad lateral aspect of upper fibula
- Avoid prolonged (>2 hour) exposure in Lithotomy position
- Avoid Candy Cane and crutch stirrups linked with nerve injury
- Boot type stirrups reduce stretching of nerves

Photograph used with permission STERIS Corporation. Walton-Greer, P. (2009). Prevention of pressure ulcers in the surgical patient. AORN Journal, (89)3. 538-548.

Prone

Complications

- Hemodynamic
- Ophthalmologic
- Neurologic
- Myocutaneous

Photography supplied courtesy of STERIS Corporation.

Walton-Greer, P. Prevention of pressure ulcers in the surgical patient. *AORN Journal,* 2009;(89)3: 538-48. DePasse JM, Palumbo MA, Haque M, Eberson CP, Daniels AH. Complications associated with prone positioning in elective spinal surgery. *World J Orthop* 2015; 6(3): 351-359 Available from: URL: http://www.wjgnet.com/2218-5836/full/v6/i3/351.htm DOI: http://dx.doi.org/10.5312/wjo.v6.i3.351

Prone Injury

Prone injury from towel roll

Pressure Areas

- Forehead, eyes, ears, and chin
- Anterior shoulders
- Lower costal margins
- Breasts (implants)
- Iliac crest
- Genitalia (Penis, scrotum, perineum)
- Knees
- Shins
- Dorsum of the feet
- Toes

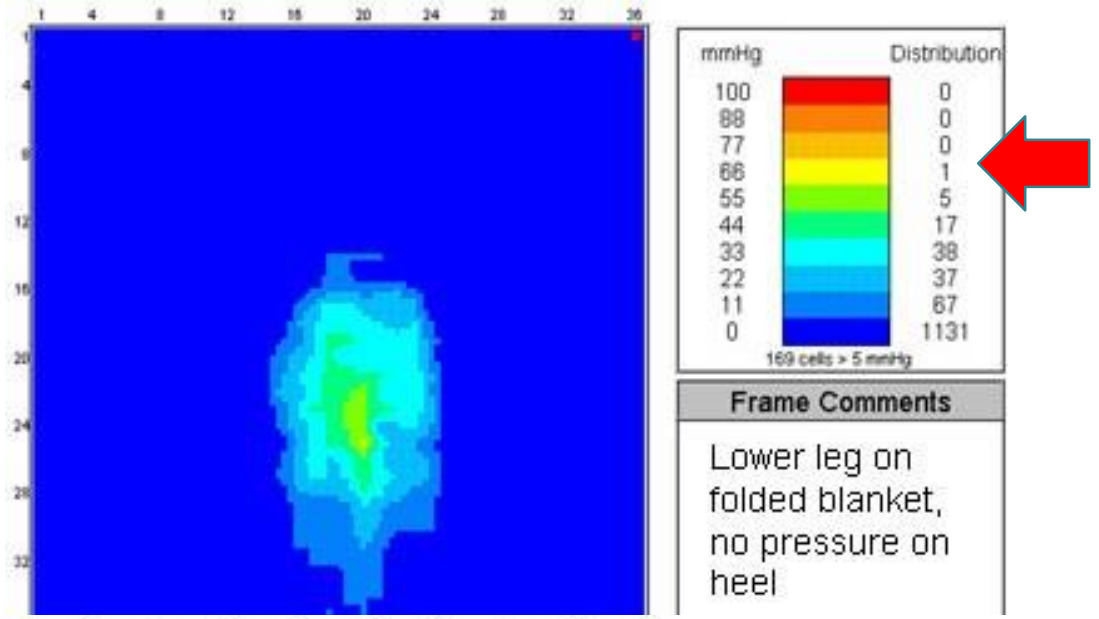
Walton-Greer, P. (2009). Prevention of pressure ulcers in the surgical patient. AORN Journal, (89)3. 538-548. Lumbley et al. Retrospective review of predisposing factors for intraoperative pressure ulcer development. Journal of Clinical Anesthesia. 2014; 26 :368-374.

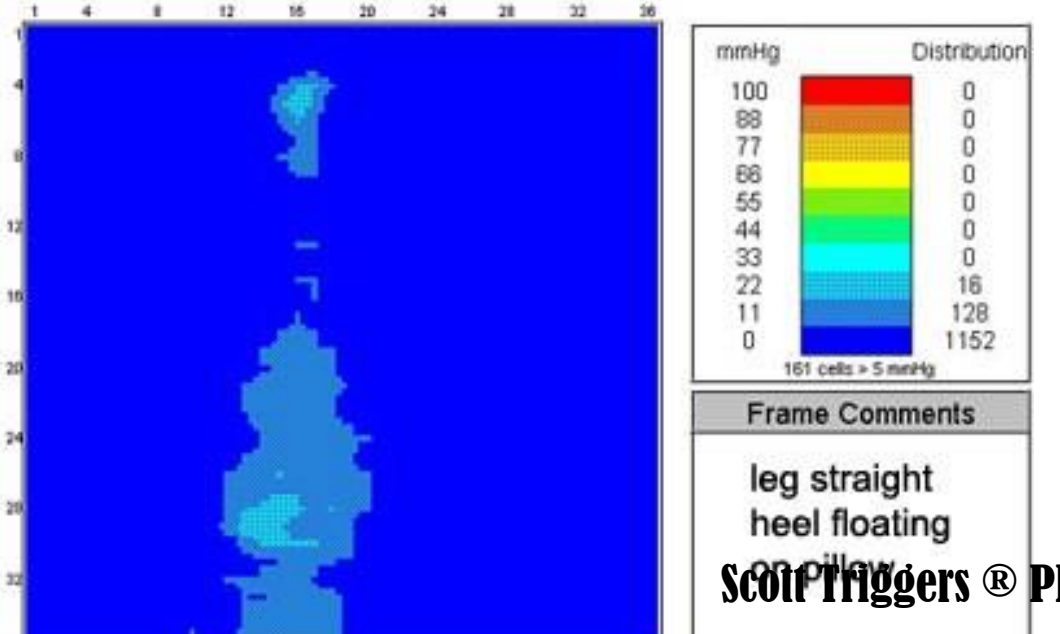
Blanket vs Pillow Interface Pressure

Capillary closing pressure

32 mmHg

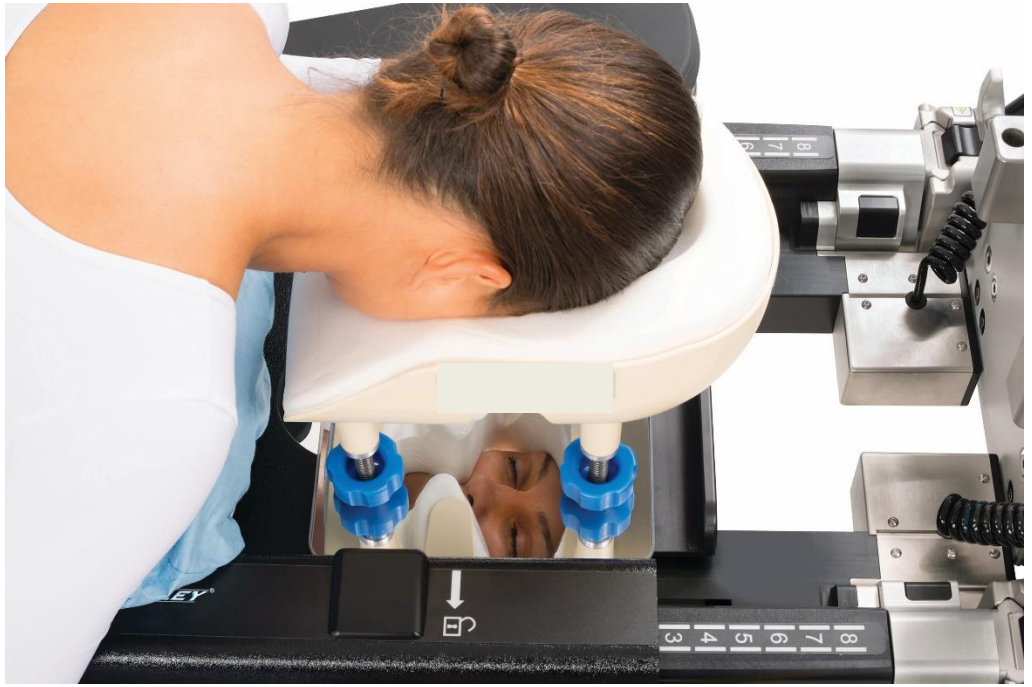
Select pillows with 18 oz. fill





Prone Prevention Plan

- Face pillows
- Prophylactic dressings
- Pad bony prominences
- Pressure redistribution positioning devices
- Inspect spinal table pads every 6 months



McMichael JC, Place HM, Face tissue pressures in prone positioning: a comparison of 3 pillows. J Spinal Disorder Tech J Spinal Disord Tech. 2008 Oct;21(7):508-13.

Photography supplied courtesy of Mizuho OSI

Trendelenburg

- Procedures
  - Minimally Invasive Surgery (MIS)
  - Laparoscopic
  - Robotic
  - OB/GYN procedures
  - Genitourinary procedures

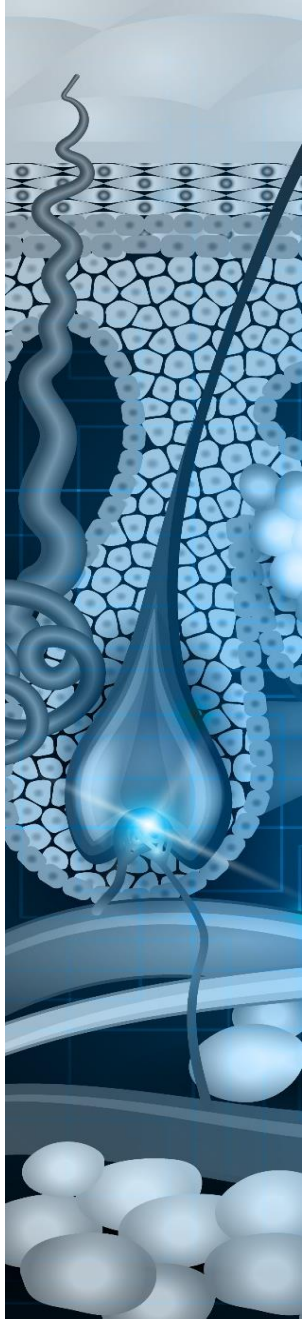


Photo used with permission D. A. Surgical Http://www.dasurgical.com

Allen, D Positioning and the Surgical Robot. *Surgical Products* (2013) Retrieved at http://www.surgicalproductsmag.com/article/2013/02/positioning-and-surgical-robot

Trendelenburg

- Safety Issues
  - Sliding, friction, shear
- Use a high level table pad
- Shoulder braces linked to brachial plexus nerve injury
- Restraints must not incorporate crossing chest straps to assure proper respiration

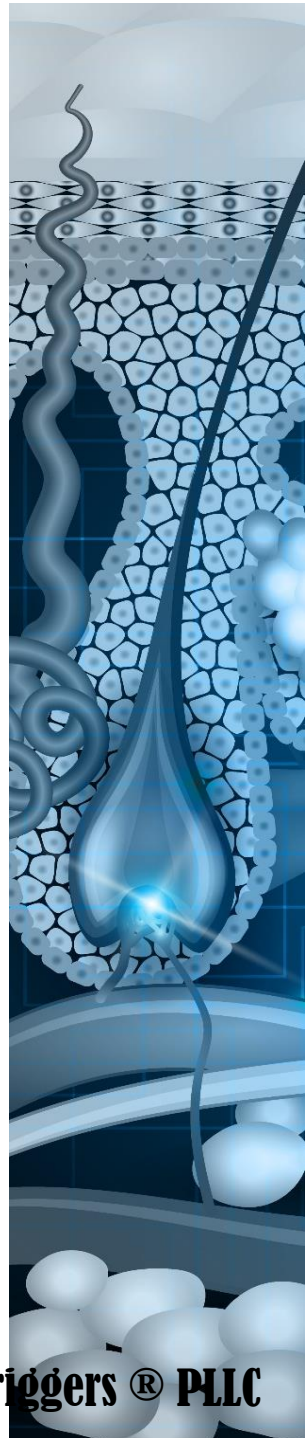


Photo used with permission D. A. Surgical Http://www.dasurgical.com

Allen, D Positioning and the Surgical Robot. *Surgical Products* (2013) Retrieved at http://www.surgicalproductsmag.com/article/2013/02/positioning-and-surgical-robot

Lateral

- Procedures
  - Chest, Lung, Kidney, Hip
- Pressure Points
  - Dependent side of face and ear
  - Dependent shoulder
  - Arms
  - Dependent axilla
  - Dependent hip
  - Legs
  - Dependent knee
  - Ankles
  - Feet

Photography supplied courtesy of STERIS Corporation.

Walton-Greer, P. (2009). Prevention of pressure ulcers in the surgical patient. AORN Journal, (89)3. 538-548.

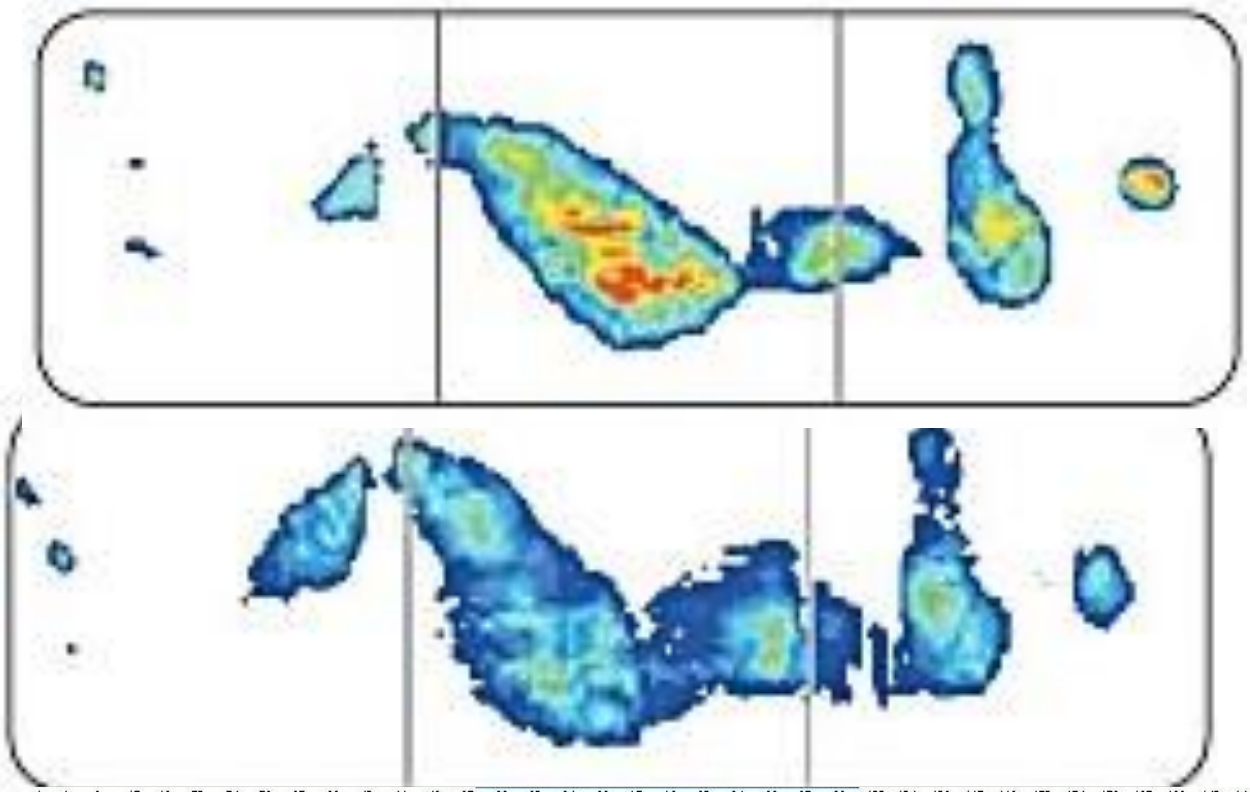
Lateral Prevention Plan

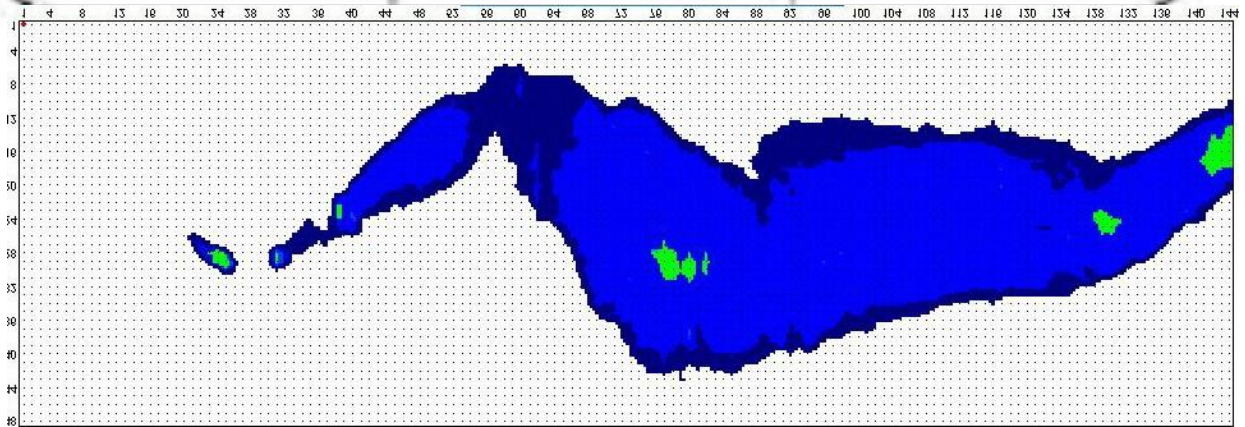
- Head aligned, torso stabilized, lower arm is slightly forward, bottom leg flexed padding between legs.
- Pad lateral aspect of upper fibula
- Stabilizing devices (Beanbag/Vacuum) linked to Rhabdomylisis

Photography supplied courtesy of STERIS Corporation.

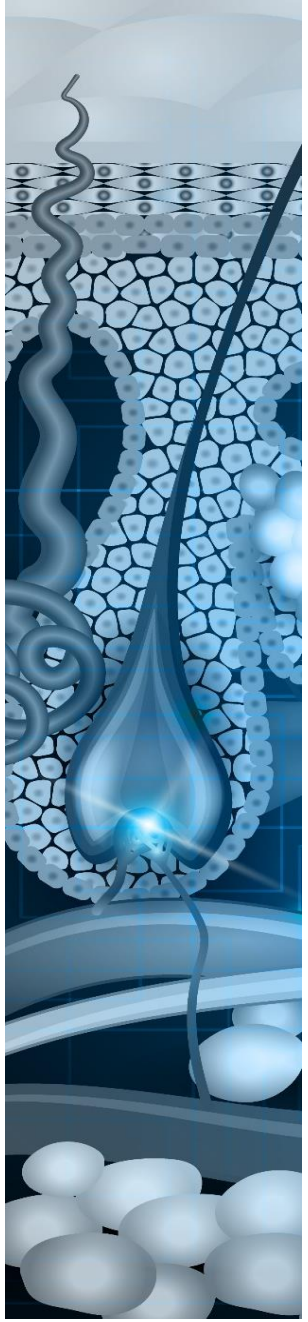
Walton-Greer, P. (2009). Prevention of pressure ulcers in the surgical patient. AORN Journal, (89)3. 538-548.

Tissue Interface Pressure Measurement





Envelopment
Immersion



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Lateral Positioner

Vacuum-packed Positioning Device

Before

After

Device can increase pressure on nerves, muscles and over bony prominence.

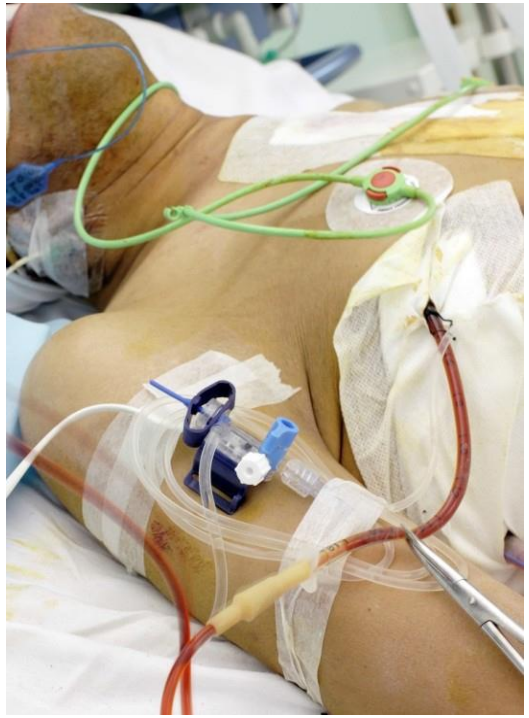
Device related Pressure Injury - Lateral

No Protective padding or dressings (82)

Protective dressing applied pre-op (72)

Medical Device Related Pressure Injury (MDRPI)

- Anesthesia devices
- Face plates in prone position
- External fixators
- Urinary catheters & tubing
- Vacuum-Packed Positioning Device
- Bookwalter
- Mayo stands on the toes
- Safety straps
- Compression stockings



Medical Device Related Pressure Injury (MDRPI)

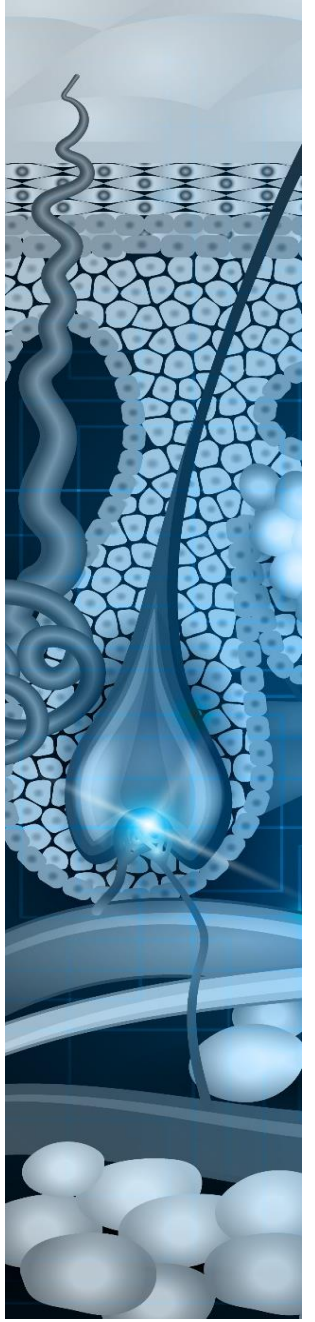
Robotic arm

Photo used with permission L. Minnich PACU JMCC

Compression Stockings

Mitigation for Medical Device-Related Pressure Injury (MDrPI)

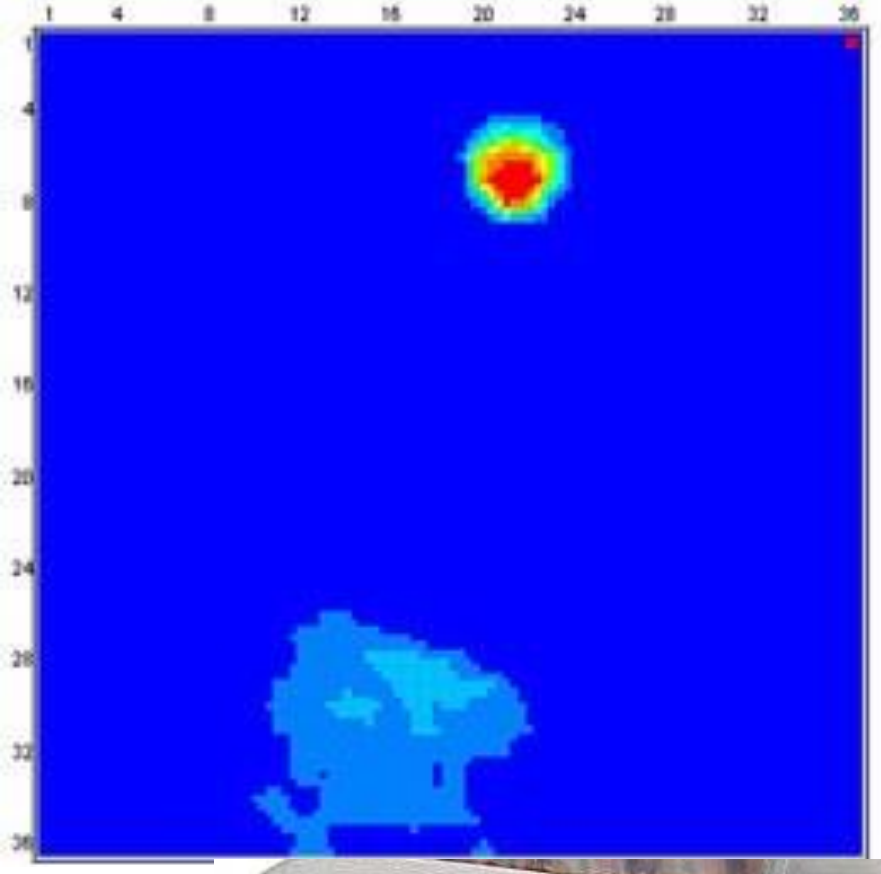
- Meticulous patient positioning with attention to rigid devices and contact with bony prominence
- Manufacturer Instructions for Use (IFU)
- Pressure-redistribution padding
- Prophylactic dressing
- Ensure patient is not lying on tubes or bed trash

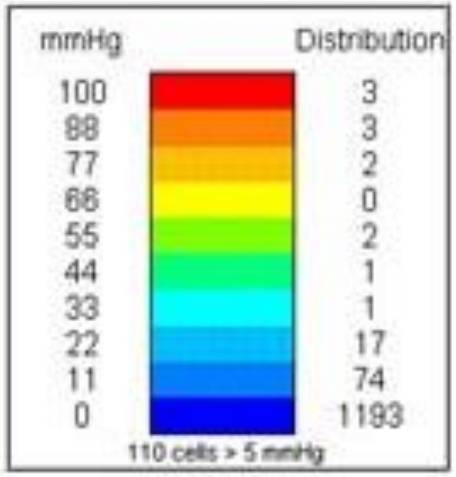


Wound Ostomy and Continence Nurses Society. (2016) Bottom-Up (Pressure Shear) Injuries. In D. Doughty, and L. McNichol (Ed). *Core Curriculum Wound Management*. (pp. 313-332). Philadelphia, Wolters Kluwer.

Offload pressure on heels while maintaining knees in slight flexion

Heels are Vulnerable in Supine and Lithotomy Positions





Frame Comments

Pillow under knee, no other supports

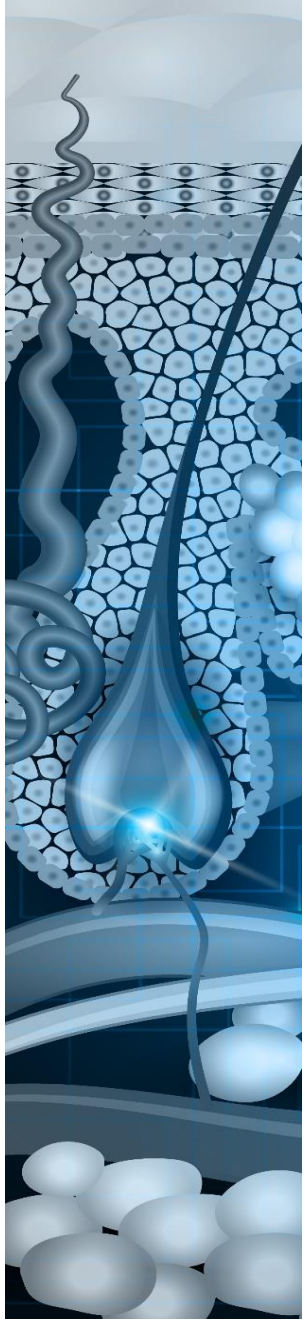
Schoonhoven and Scott 52.9% and 52 % respectively

Use Heel Off Loading Devices (HOLD)

Offload the heel & distribute the weight of the leg along the calf without putting all the pressure on the Achilles tendon. Hyperextension of knee, can lead to popliteal vein compression and increase risk of DVT.


Consider prophylactic dressings for bony prominences or under medical devices.

Protecting Bony Prominences



Prophylactic Dressing - Evidence

- Prophylactic dressings may be used to prevent pressure injury from critical devices
- May reduce forces of shear, pressure and friction.
- There is limited research in the OR with perioperative patients
- Not a substitute for offloading, or positioning interventions

Association of PeriOperative Registered Nurses. (2017) Guideline for Positioning the Patient. In AORN(Ed). *2017 AORN Guidelines for Perioperative Practice*. Philadelphia, Wolters Kluwer.

Avoid use of unapproved positioning devices

Follow Manufacturer Instructions for Use (IFU)

Association of PeriOperative Registered Nurses. (2017) Guideline for Positioning the Patient. In AORN(Ed). *2017 AORN Guidelines for Perioperative Practice*. Philadelphia, Wolters Kluwer.

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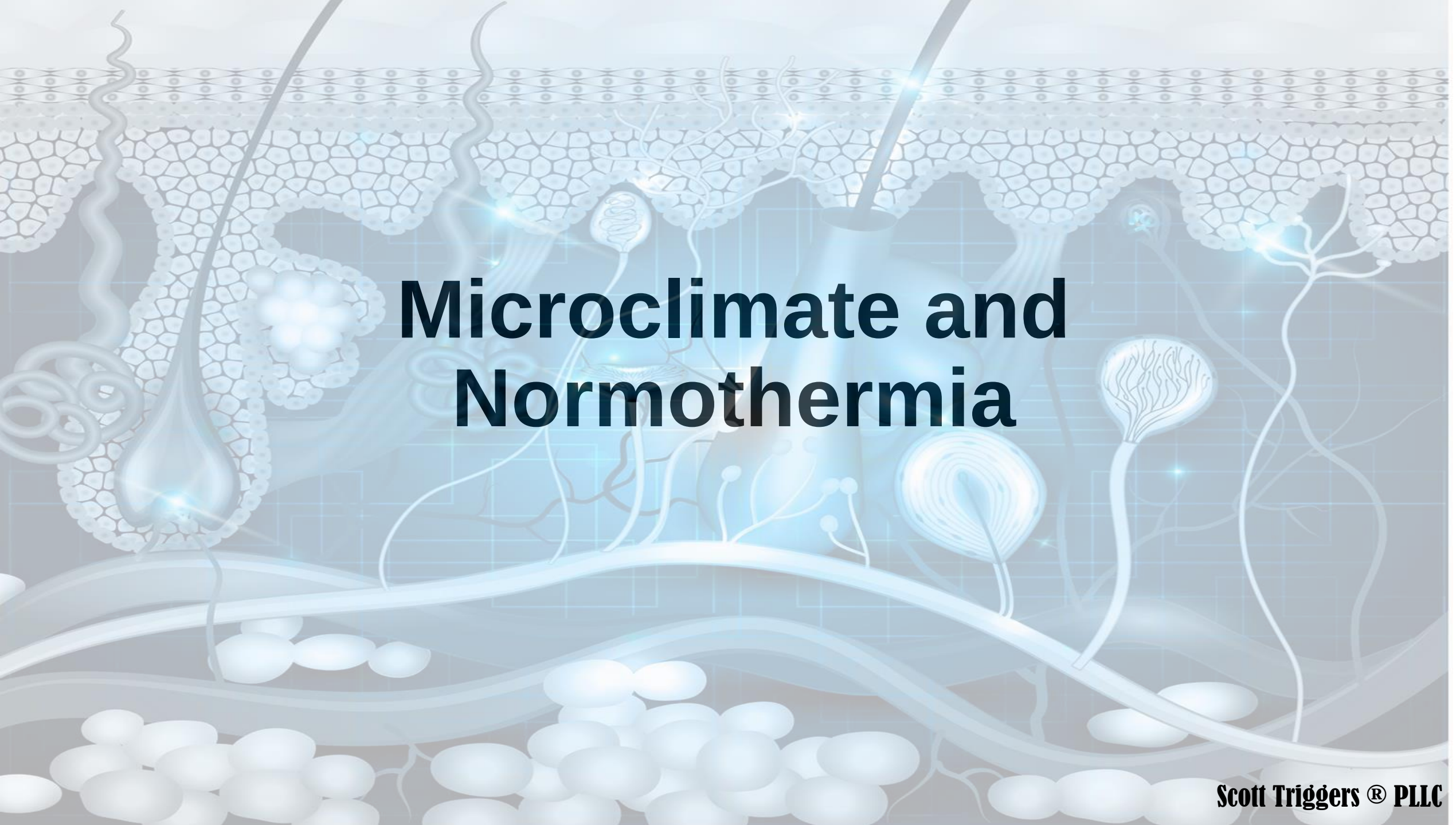
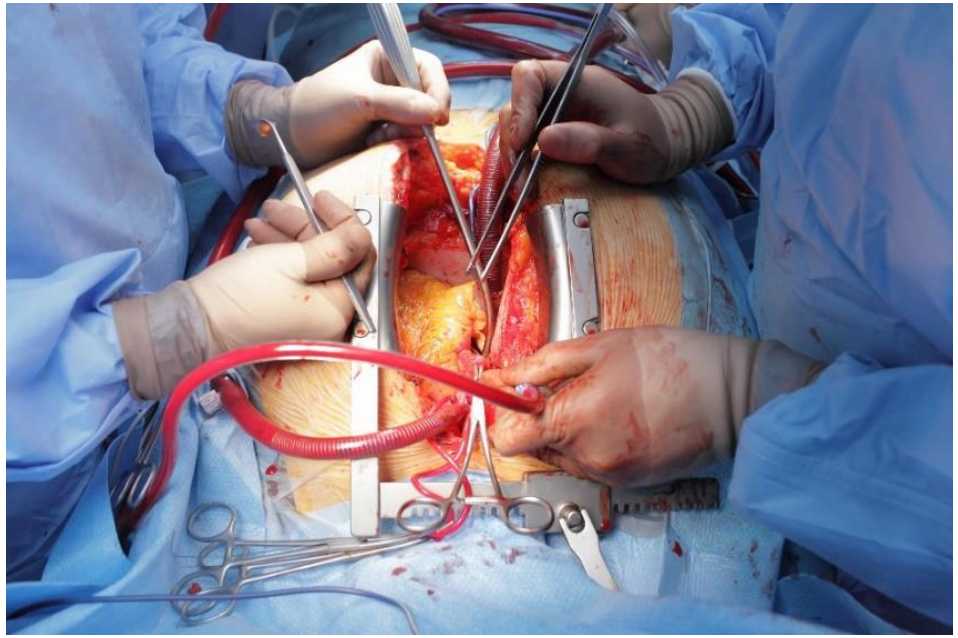


Microclimate

- Microclimate – the temperature of the body and the amount of moisture between the body and the surface.

- In the OR sources of moisture may include:
  - Irrigation
  - Blood
  - Prep solution
  - Sweat



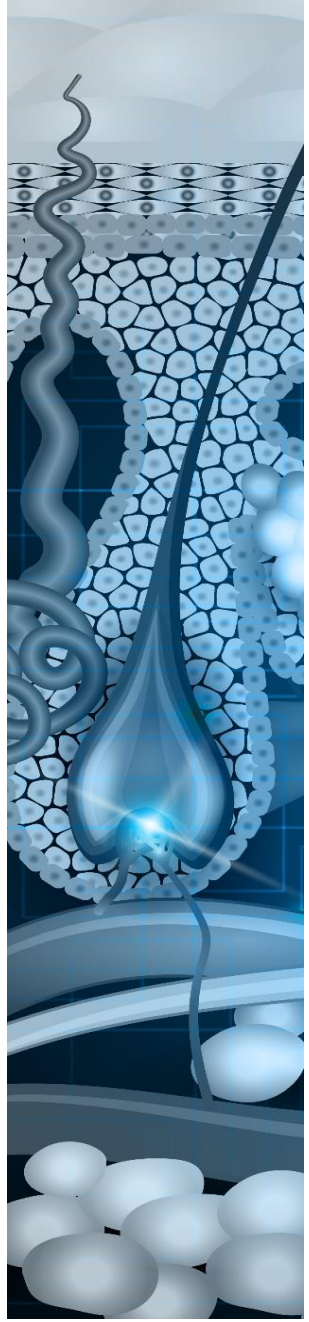
Fred, C., Ford, S., Wagner, D., & VanBrackle, L. (2012). Intraoperatively acquired pressure ulcers and perioperative normothermia: A look at relationships. *Association of Operating Room Nurses. AORN Journal, 96*(3), 251-60. doi:http://dx.doi.org/10.1016/j.aorn.2012.06.014

Microclimate

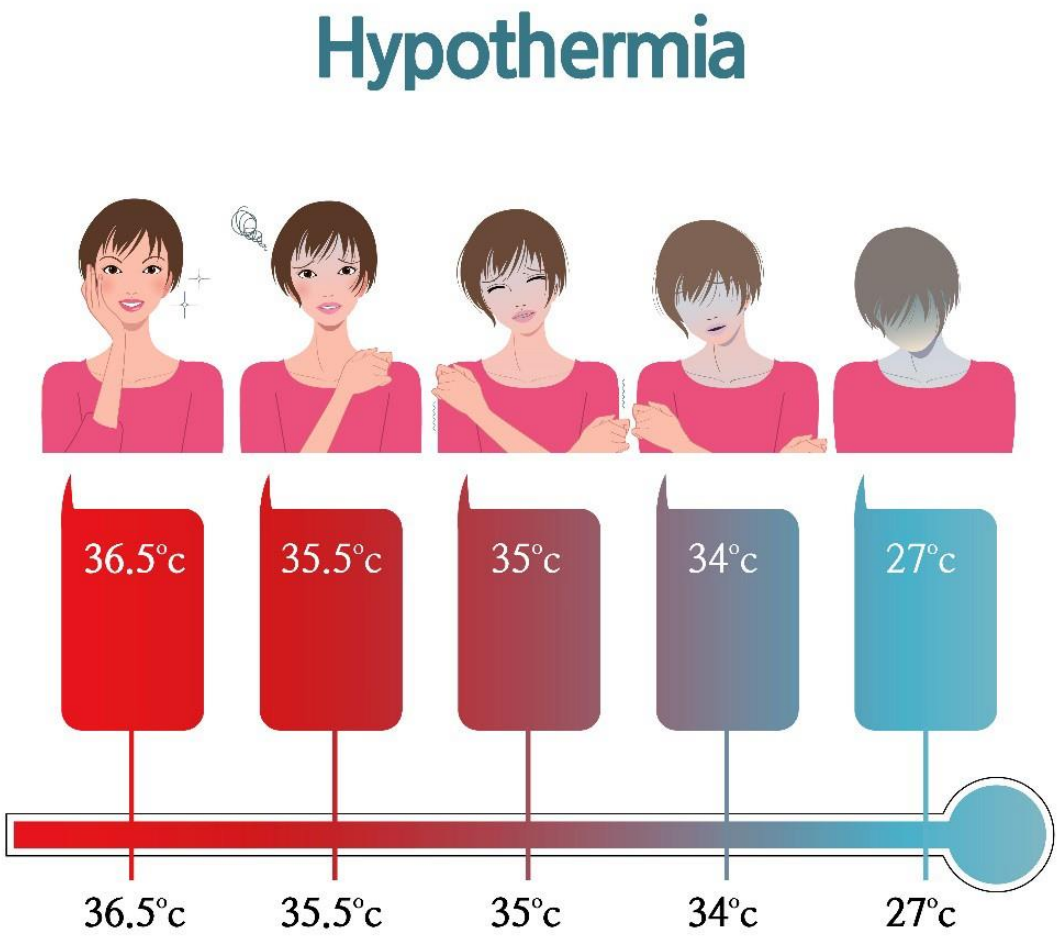
Temperature

- Sweat & Perspiration
- Moisture & Maceration
- Weaken Epidermis

- Yoshimura indicated excessive perspiration and body temp greater than 100.6 F (38 C were risk factors in the park bench position.



Maintain Normothermia

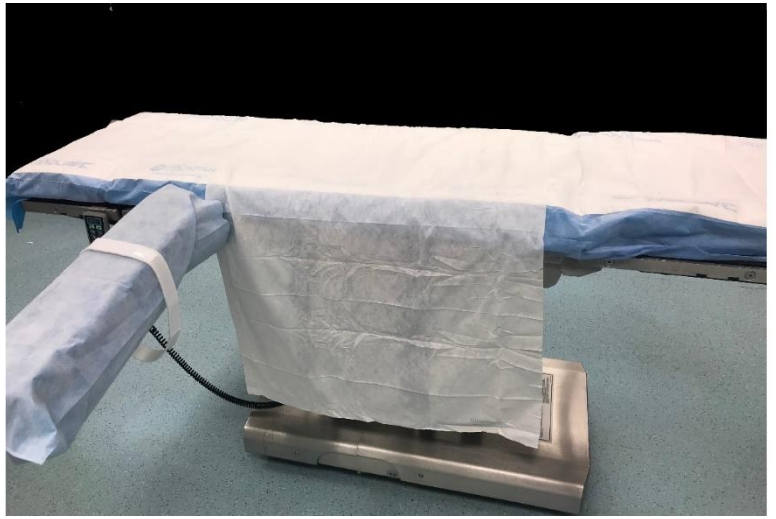


- Normothermia is the process of keeping the patients temperature at a normal level (96.8 F to 100.4 F [36.0 C to 38.0 C])
- Fred et al found that a 1 degree F (1.8 degree C) body temperature decrease was linked with a higher rate of PI.

Hypothermia associated with increases in SSI, PI, LOS, and Mortality rates

Normothermia & Microclimate

- Warming blankets forced air
- Cooled/warmed IV solutions
- Mechanical ventilation
- Room Temperature
- Sheets or drapes that wick moisture away from the skin may help manage microclimate.



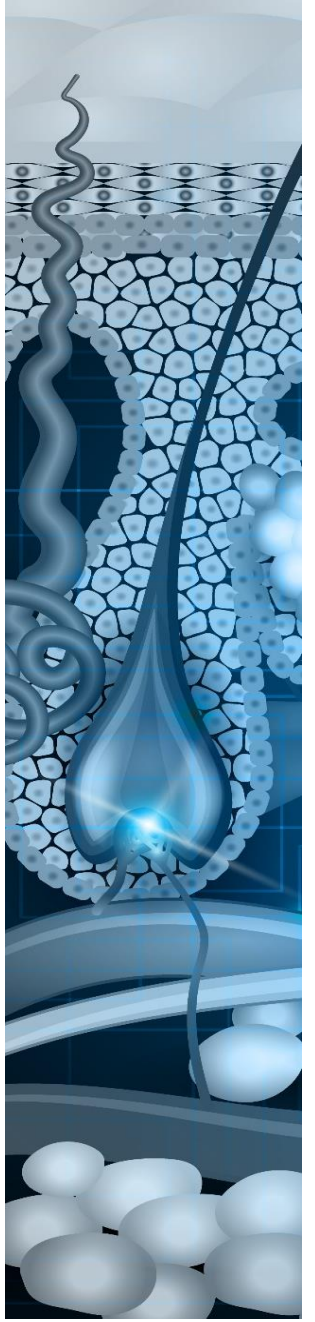


Photo Used with permission Connie Garrett CNOR

Hand-over Communication

Structured standardized tools

Communication Tools

- SBAR, IPASS, SWITCH (circulators)
- Illness Severity
- Patient Summary/Surgical Procedure
  - **Risk Assessment**
  - **Surgical Position**
  - **Time on the table**
  - **Skin assessment of pressure points/devices**
- Action List: Consult WOC Nurse
- Situational Awareness and Contingency Plan
  - **What are your concerns? Possible pressure injury**
- Synthesis by Receiver

Spector N, Starner A, Allen A, et al. I-PASS handoff curriculum: core resident workshop. *MedEdPORTAL*. 2013;9:9311. https://doi.org/10.15766/mep_2374-8265.9311

Minnich L, Bennett J, Mercer, J. (2014) Partnering for Perioperative Skin Assessment: A time to change a Practice Culture. Journal of PeriAnesthesia Nursing, 29(5):361-3

Institute early movement, daily skin assessment and pressure management

Universal Pressure Precautions

- Manage pressure before and after surgery
- Position the patient differently preoperatively and postoperatively than the position during surgery.
- ERAS
- “UP Program”

NPUAP. HRET

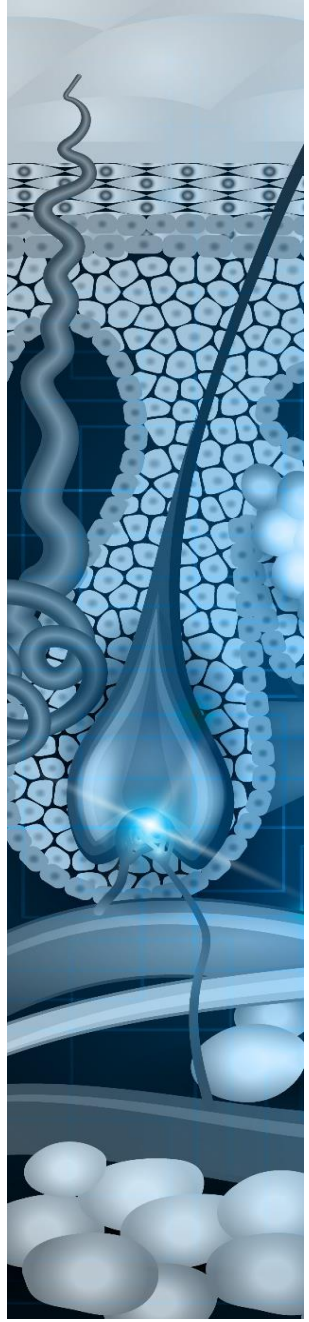
Reporting PIs that develop within 72 hours after the procedure.

Root Cause and System Analysis

What happened?

Why did it happen?

How to prevent it from happening again?



Focus on the "how" and the "why" ? not on the "who"

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5-Whys Exercise:

Case Study: 47 y/o bilateral knee repair presented with Deep Tissue PI on PO day one. WHY?

Patient was high-risk for pressure injury (PI). Scott Trigger Score 3: Morbid Obesity BMI 59, ASA 3, 3.38 hrs time on table

Risk assessment was not identified prior to surgery, pt. placed on standard OR surface

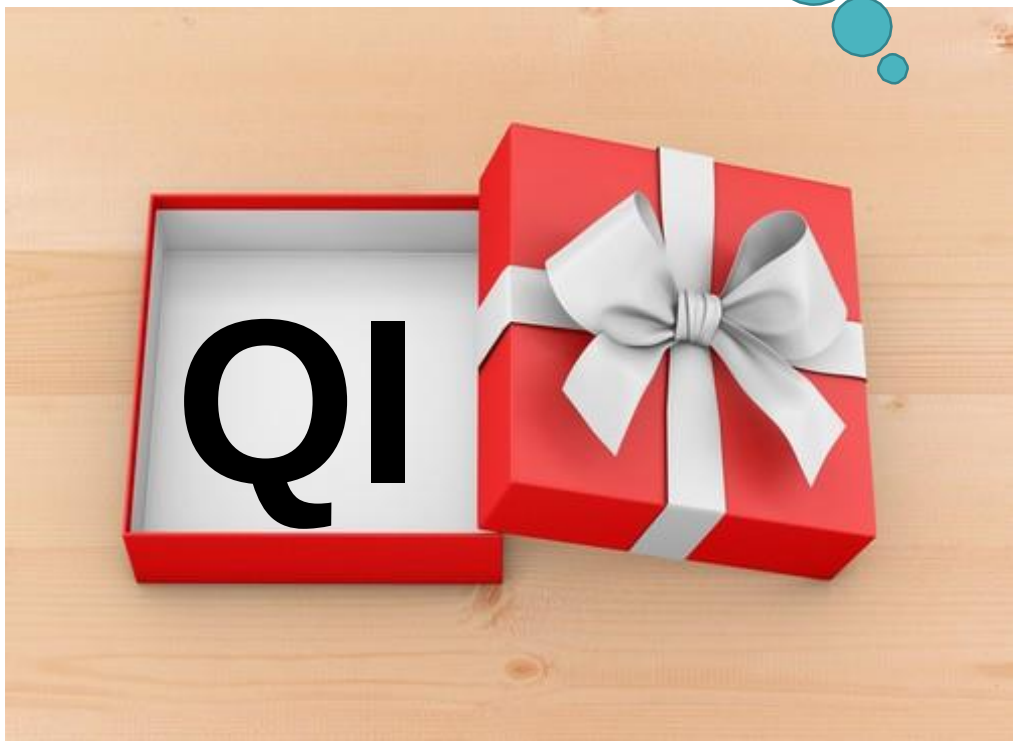
OR surfaces for morbidly obese not available

A PPIP Program with OR skin bundle has not been implemented

Staff unaware of Hospital Acquired PI rates and risks, evidence-based guidelines.

Action Item	Action Plan	Target Date Responsibility
Define Improvement opportunity(s) (PROBLEM)		
What disparities will be addressed? CLARIFY		
What is the Cause of the Problem? 5 Whys		
Type of Measure: Process, Outcome, Efficiency		
Aim Statement (SMART) Specific, measureable, Achievable/attainable, Realistic/relevant, Time-bound.		
Feasibility and impact of project, Is focus narrow enough.		
Who will be on the team (Interprofessional engagement).		
What will you measure? How will you get the data? Data collection plan, point of contact, resources. MEASURE		
What quality metrics and benchmarks will we use?		
PDSA Cycle What will you test? IMPROVE		
How will you know improvement has been made? ANALYZE		
What is sustainability plan? CONTROL		

Use for Action Plan



See downloads in conference materials.

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Create a Strategy

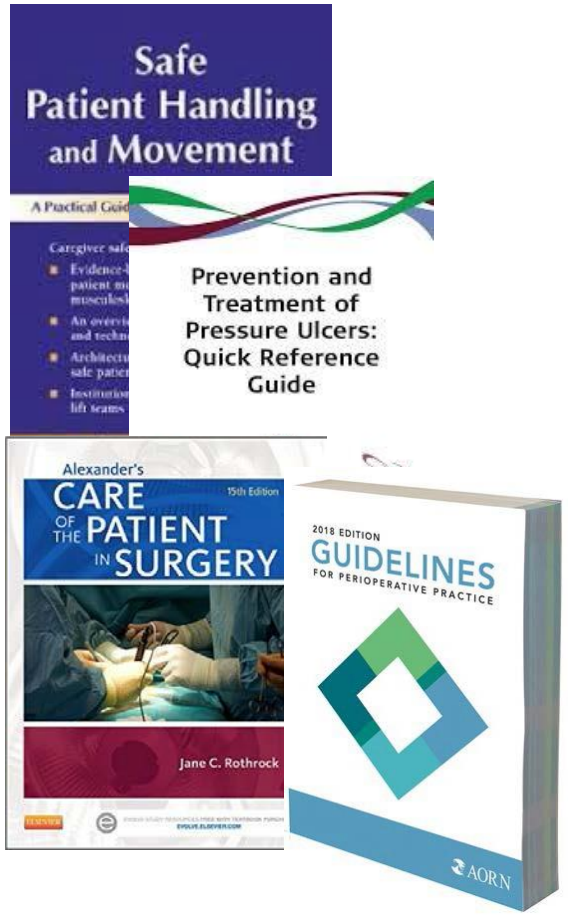
1. Quality Improvement
2. Assessment (Gap Analysis)
3. Staff Education & Awareness
4. Evidence-based best practices
5. Risk Assessment
6. Perioperative Nursing Care Plan
7. Universal Pressure Precautions
8. Positioning Competencies
9. Product Selection/standardization
10. Interprofessional collaboration

SCOTT PPIPP

www.scotttriggers.com

Scott S. Creating a strategic plan for perioperative pressure ulcer prevention. *AORN Journal* 2016;103(4):13-14.

Other Ways to Gain & Spread Knowledge



Guidelines & Books

Journals

AORN

[Safe Patient Handling Toolkit]

[Prevention of Perioperative Pressure Injury Toolkit]

Wound Ostomy and Continence Nurses Society®

Toolkits & Webinars

https://www.aorn.org/guidelines/clinical-resources/tool-kits/prevention-of-perioperative-pressure-ulcers-tool-kit

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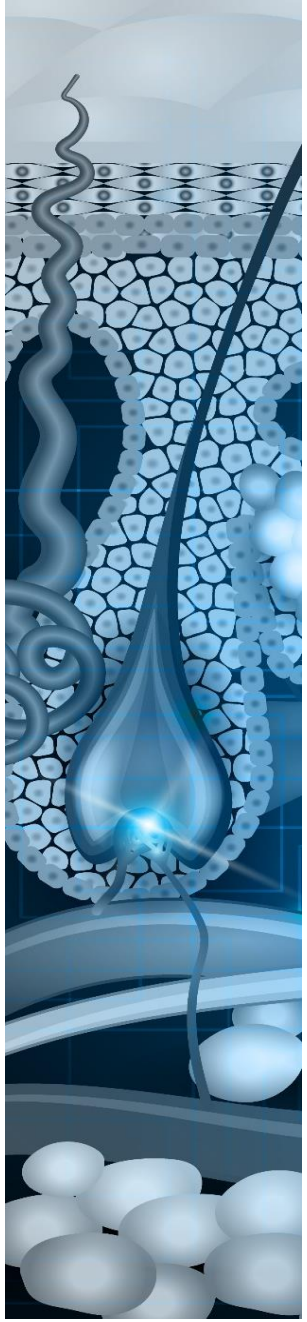

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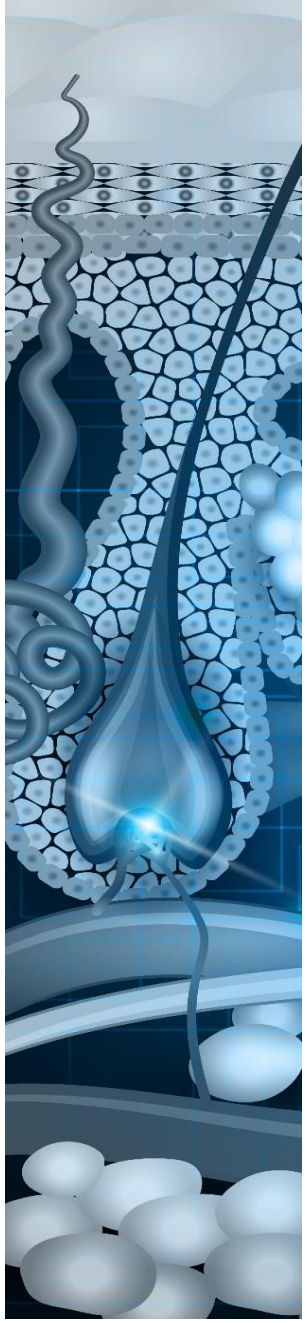

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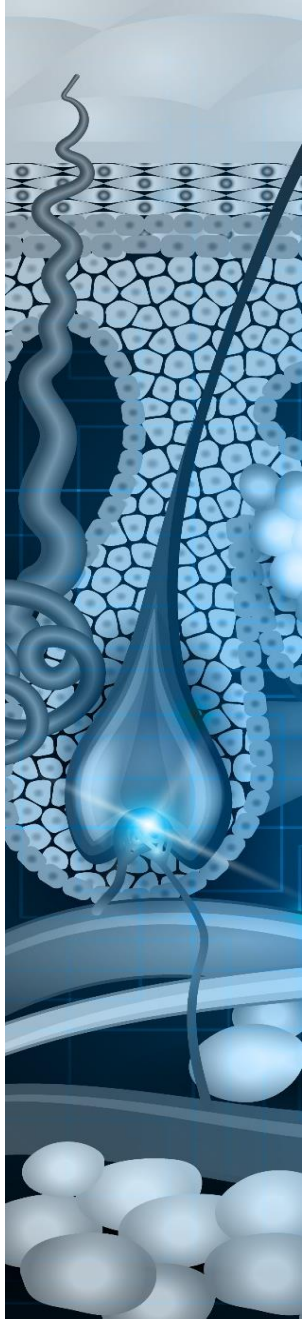

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