

A Strategic Plan for Perioperative Pressure Injury Prevention (PPIP)

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Presentation Disclaimer

I am a paid consultant for Molnlycke. The information presented herein is provided for educational and informational purposes. It is for the attendees' general knowledge and is not a substitute for medical advice. The material provided herein is not comprehensive for all medical developments and may contain errors or omissions. If you need advice regarding a specific medical situation, please consult a medical professional.

Objectives

- Identify current trends in incidence, cost, litigation, and regulations for hospital acquired pressure injury (HAPI).
- Identify factors that increase the risk of pressure injuries in the surgical patient and solutions at each stage of perioperative care.
- Illustrate a strategic plan to improve competency and skills in reducing the incidence of hospital-acquired pressure ulcer/injuries in the surgical population.

1901



Operating Room Table Circa 1905

Photo credits: Marie Brown-Etris RN, CWON, CCHP

“Surgery is one of the few times a normal healthy individual is placed at risk for pressure sores”

Gendron 1980

Gendron, F. “Burns” occurring during lengthy surgical procedures. *Journal of Clinical Engineering*. 1980;5:19–26.
Gendron, F. Unexplained Patient Burns: Investigating Iatrogenic Injuries. West Publishing Company Inc. Brea, CA. 1988

The Awakening

2.5 M

HAPI developed in
the US Acute Care

\$26.8 B

US Cost of HAPI

Public Health Crisis

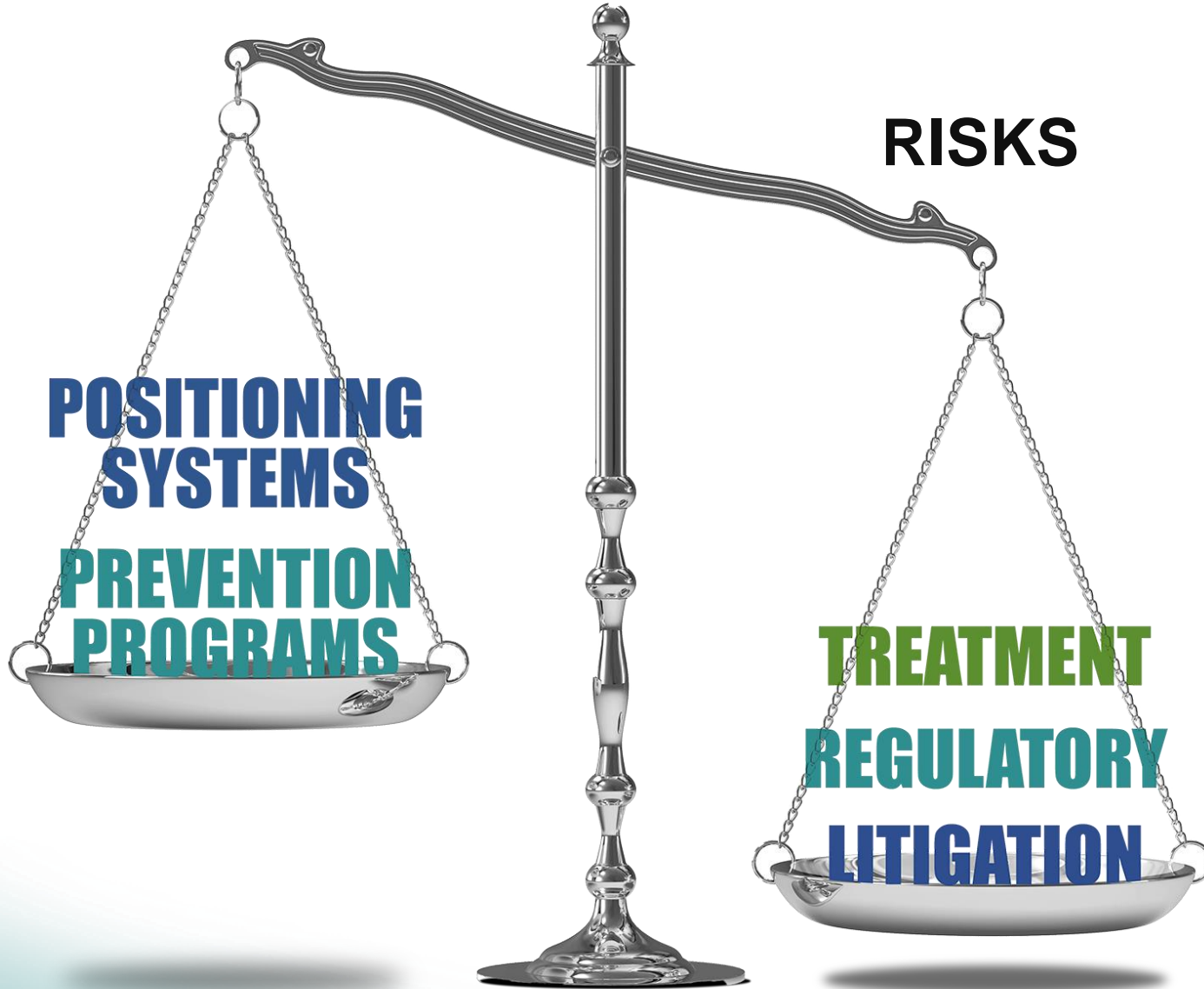
59% of Cost

Stage 3 & 4

Non- reimbursable

Padula WV, Delarmente BA. The national cost of hospital- acquired pressure injuries in the United States. Int Wound J. 2019;1–7.
<https://doi.org/10.1111/iwj.13071>

PREVENTION



\$500 - \$70,000

Single HAPI episode

45% of HAPI

Pressure Injuries attributed to the operating room

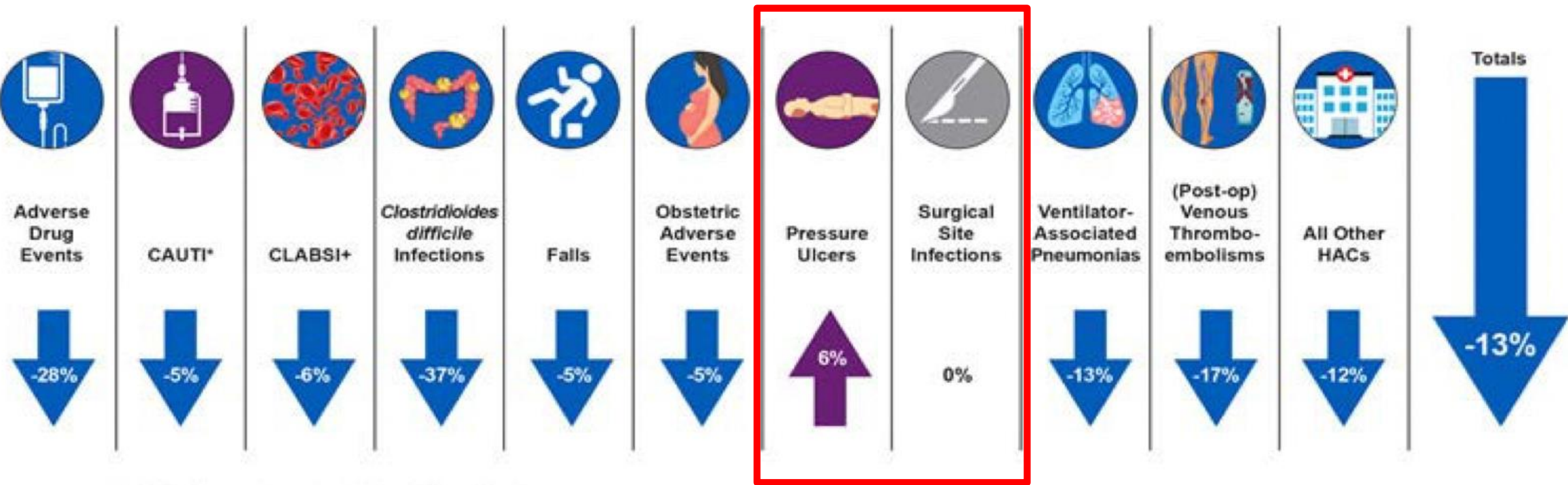
\$250,000

Average settlement

Declines in Hospital-Acquired Conditions



National efforts to reduce hospital-acquired conditions such as adverse drug events and injuries from falls helped prevent 20,500 deaths and saved \$7.7 billion between 2014 and 2017.



*CAUTI - Catheter-Associated Urinary Tract Infections

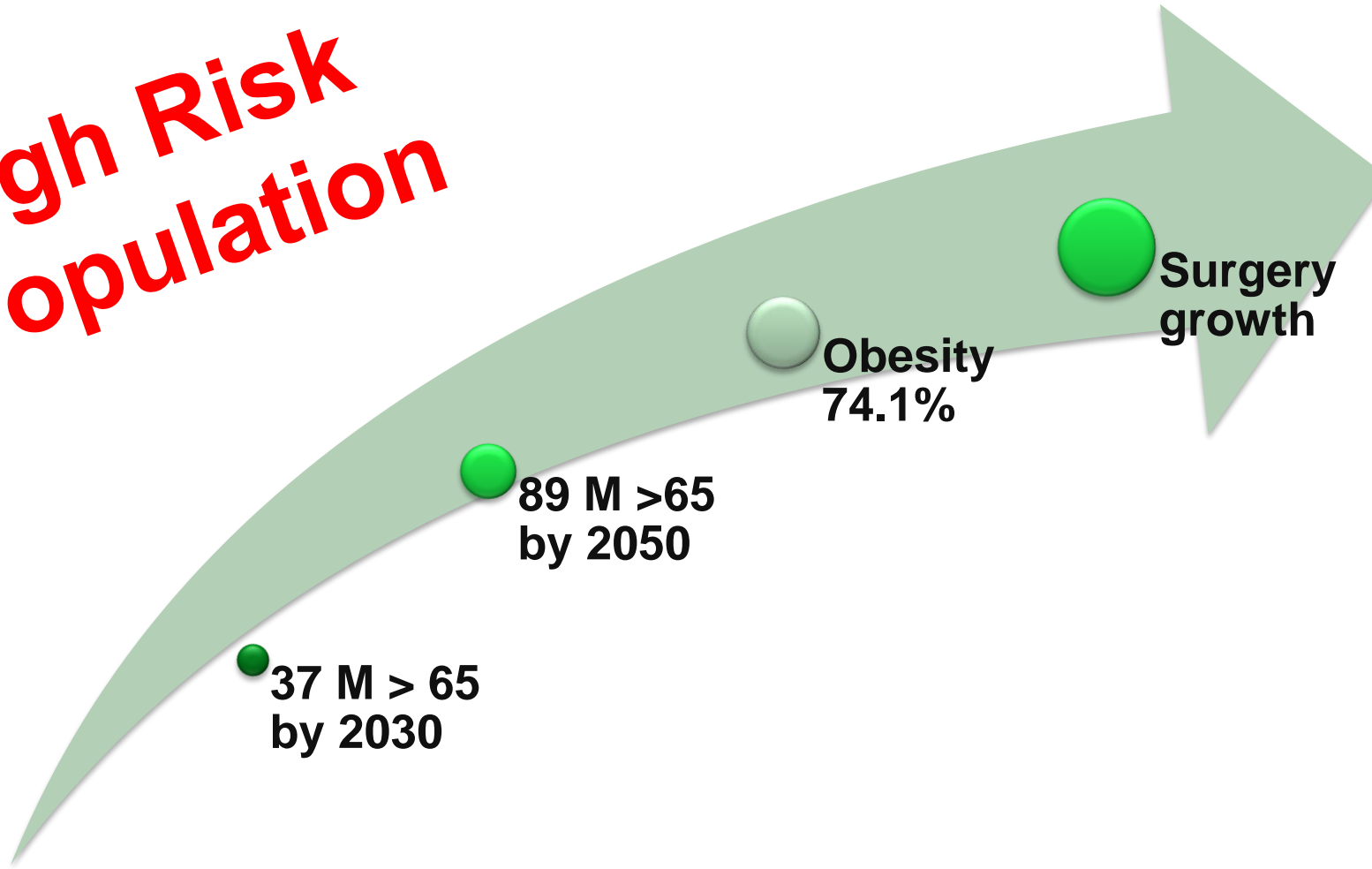
+CLABSI - Central Line-Associated Bloodstream Infections

**The percent change numbers are compared to the 2014 measured baseline for HACs.

Source: AHRQ National Scorecard on Hospital-Acquired Conditions Updated Baseline Rates and Preliminary Results 2014-2017

Silver Tsunami

**High Risk
Population**



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2. 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>
3. 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.



Set the Vision

How do we provide safe care across the continuum?



Strategy

Keys to Success

- Administration
- Bundles and Toolkits
- Culture Change, and Communication,
- Documentation and Artificial Intelligence
- Education and Competency
(Knowledge, Skills and Attitude)



Gap Analysis

Current State VS Desired State

- QI Data, Incidence, prevalence, audits
- Root Cause Analysis and Action (RCA²)
- Key Drivers Equipment and Device inventory

Evidence Based Strategy & Bundles



- Emergency Department



- Surgery



- ICU
- Acute Care



- Procedural Areas

NCHS 2010 National Hospital Discharge Survey Retrieved 12-716 from http://www.cdc.gov/nchs/data/nhds/4procedures/2010p+ro4_numberprocedureage.pdf

Background Operating Room



48.3 M
Procedures

- 16 M > age 65

2016
Meta-analysis
Shafipour

- N= 9,527
- 18.96%

Rates are
Increasing!

Goals of Patient Positioning

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

Eliminate Patient Harm

OR Skin Protection Programs

Skin Bundles

1. Risk and Skin assessment pre-op and immediately post-op
2. Safe patient handling
3. High specification OR positioning systems
4. Redistribute pressure or padding bony prominences
5. Offloading pressure on heels while maintaining knees in slight flexion



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

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

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

OR Skin Protection Programs

Skin Bundles

6. Use of approved positioning devices
7. Maintain normothermia and microclimate
8. Using hand-over communication
9. Institute early movement, daily skin assessment and pressure management
10. Report PIs that develop within 72 hours after the procedure.

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

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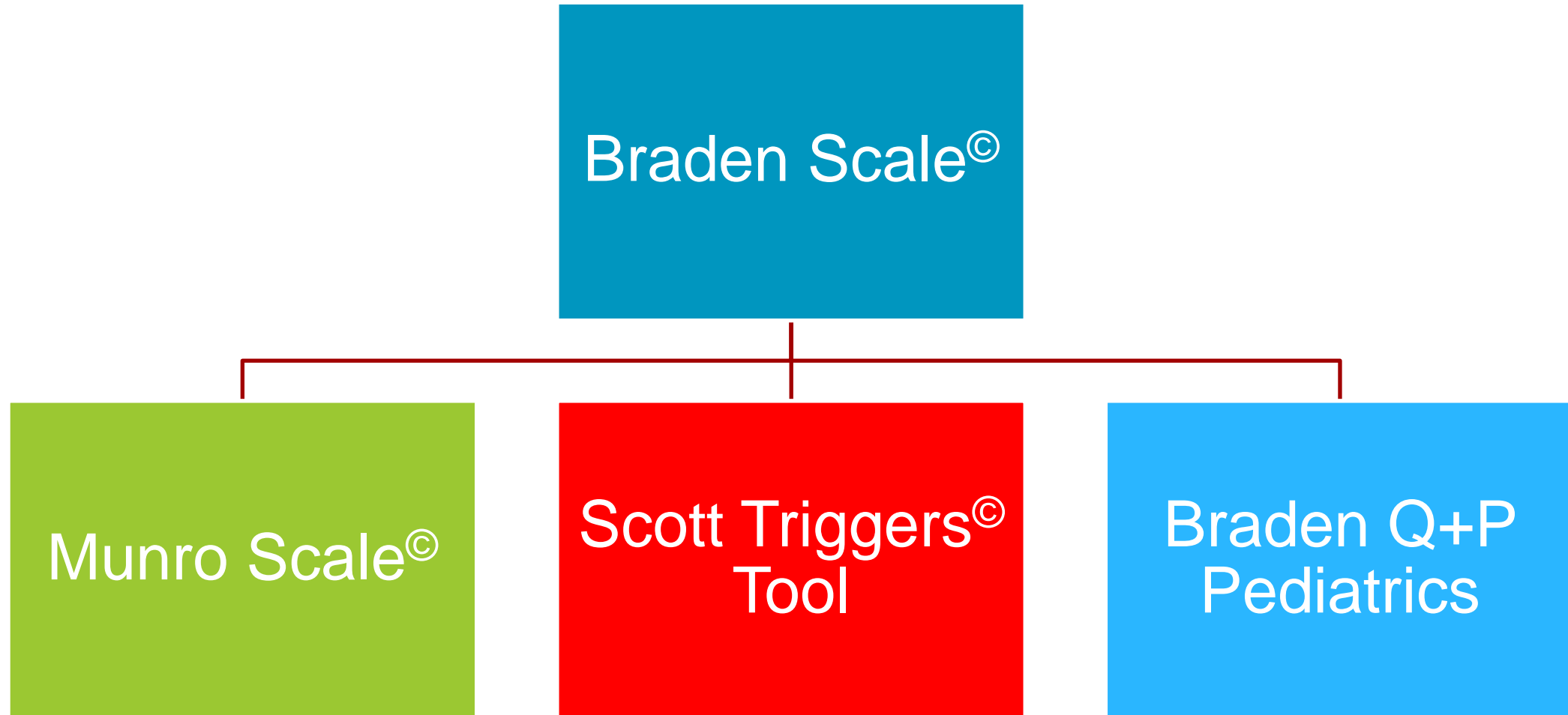
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Keys to Success

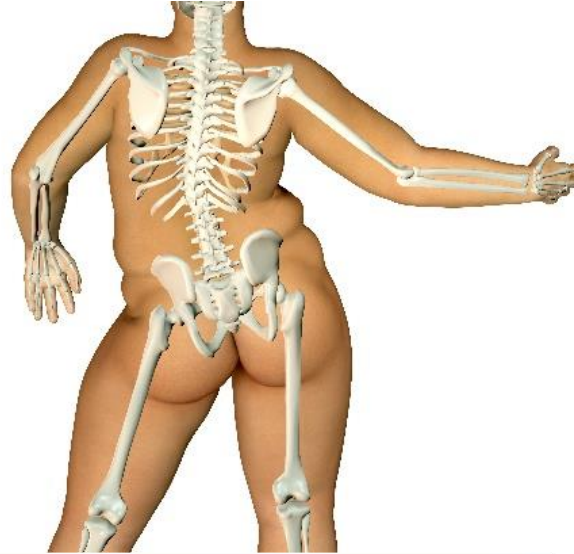


#1 Risk and Skin Assessment

Risk and Skin Assessment



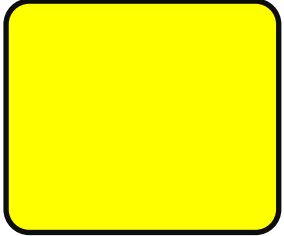
Pre-op Risk Assessment



SCOTT TRIGGERS®

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	

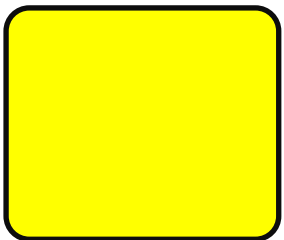
NRF Grant South Korea



Braden 1



Scott Triggers #2



Scott Triggers #3

- N = 400
- Model #2
- Highest sensitivity 84.4%
- Highest negative predictive value of 94.6%
- Lowest Akaike information criterion (302.03)

Scott Triggers Risk Assessment

Age 62 or Older (Current Age: 69)

No Yes

Albumin Level <3.5 g/L (Current Albumin Level: 3.2)

No Yes

BMI <19 or >40 (Current BMI: 46.37)

No Yes

ASA Score 3 or Greater (Current ASA: 4)

No Yes

Surgery Time Over 3 Hours or 180 Minutes (Scheduled Surgery Time: 185 Minutes)

No Yes

****Patient is at High Risk for Developing a Pressure Ulcer****

Choose Patient's Position

Supine

Prone

Lateral/Parkbench

Lithotomy

Please see positioning instructions in the sidebar report titled **JHH OR Scott Triggers Prone Position.**

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Risk and Skin Assessment



Pre-op

Post-op

Daily

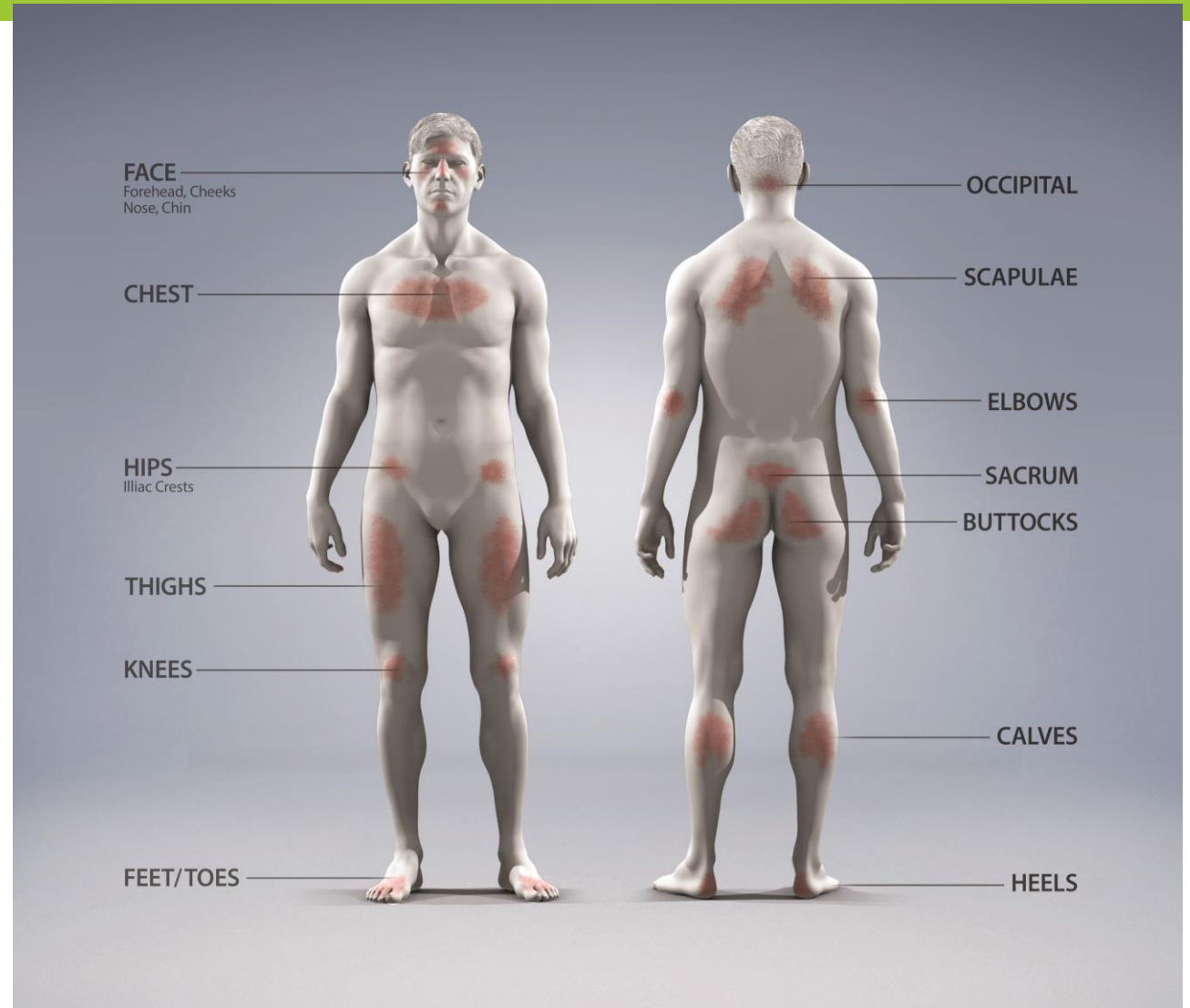
Pressure Points

Medical Device

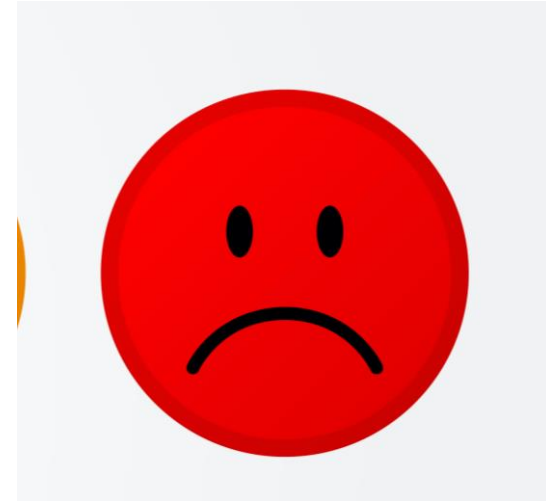
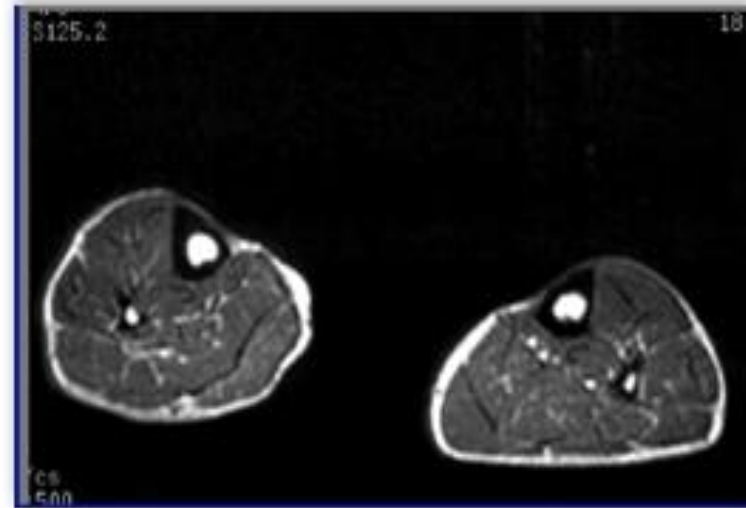
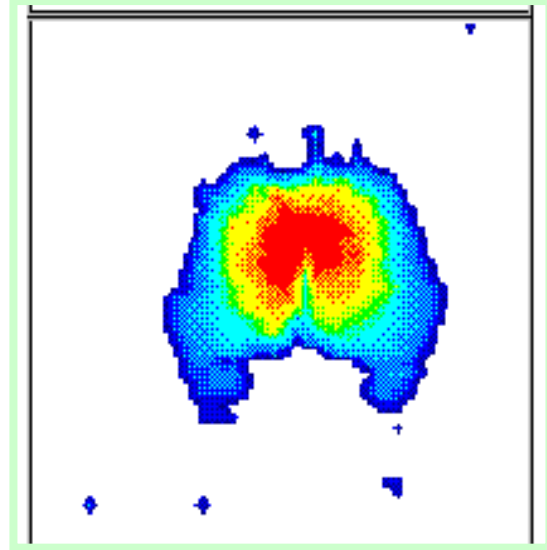
Pain

Skin Temperature

Texture



Etiology of Pressure Injury



Bony
Prominence

Sustained
Pressure

Tissue Distortion

Cell Death

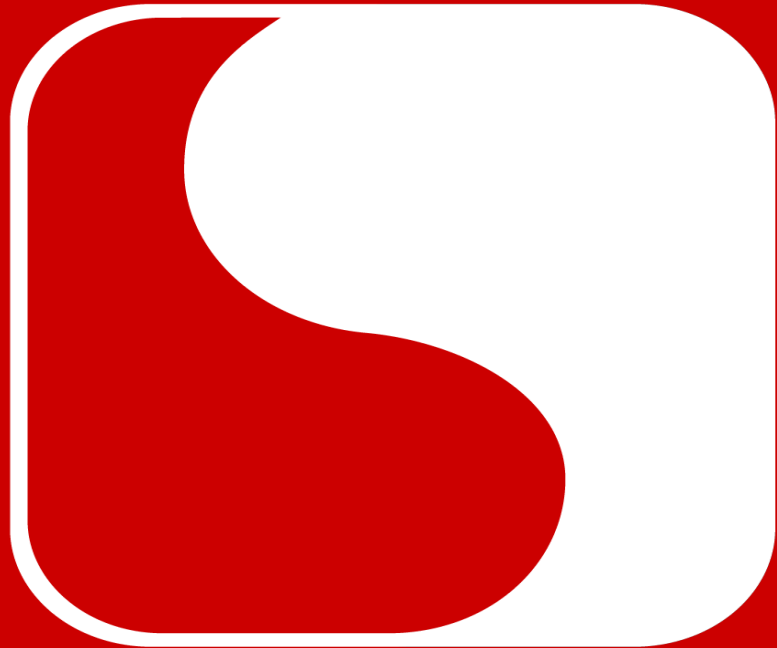
Pressure
Injury



Perioperative Pressure Injury (PPI)

A PPI 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, and up to 7 days for deep tissue injury.





#2

Safe Patient Handling

Safe Patient Handling



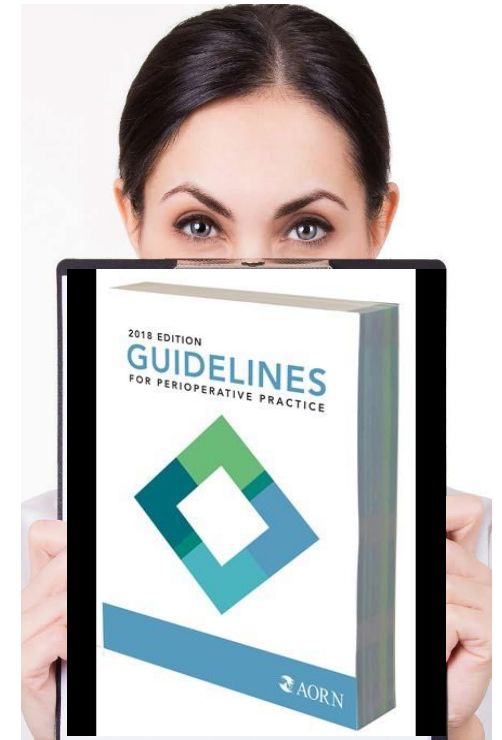
Impact in an 8 hour shift the average nurse lifts 1.8 tons

Surgical patients average 6 or more lateral transfers per episode

AORN SPH Recommendations “Supine”



- **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



How many of our patients weigh >157 lbs?



#3

High Specification OR Table Pads

How do we measure efficacy of surfaces

Tissue Interface Pressure

Thermography

Ultrasound

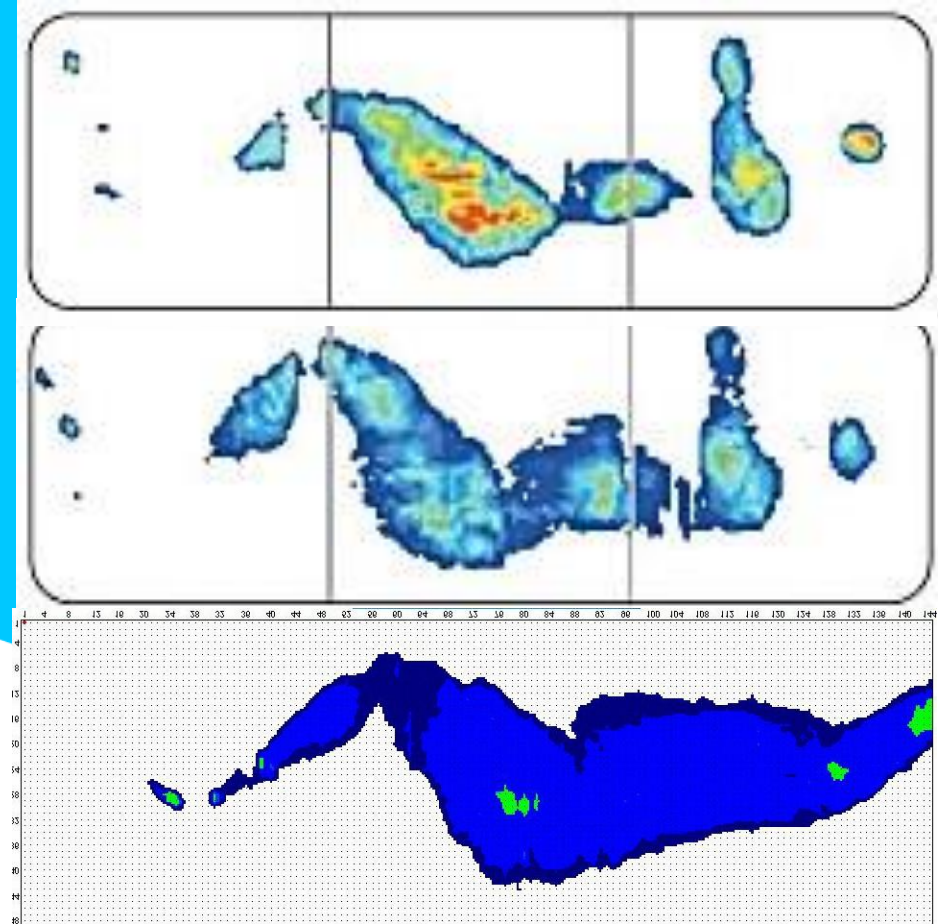
Sub-Epidermal Moisture (SEM)

Finite Element Modeling

CT Scan/MRI/PET Scans

S3I Testing Labs

OR table pads must provide Immersion & Envelopment





#4

Redistribute Pressure and/or Pad Bony Prominences

Common Surgical Positions



Supine

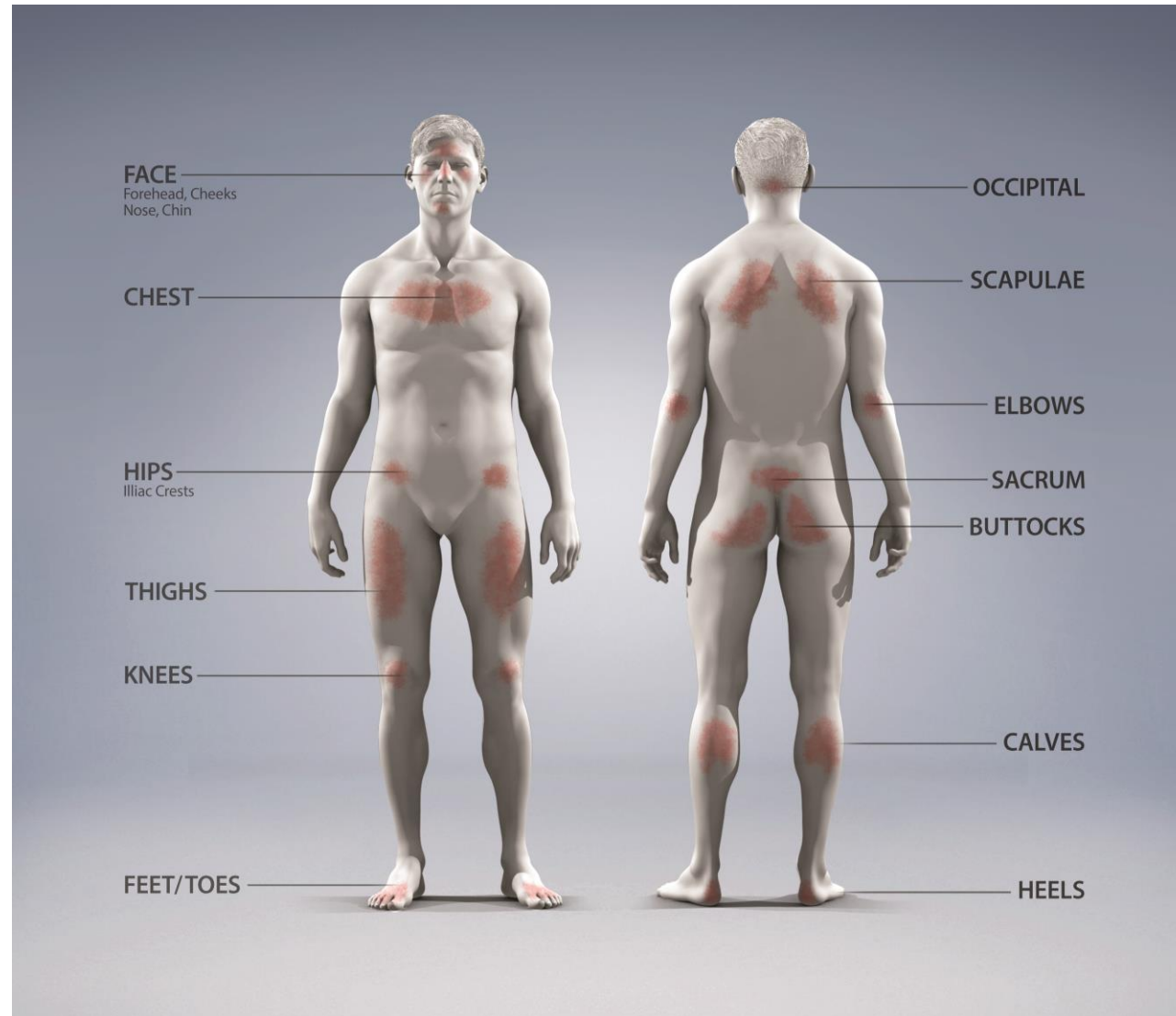
Lithotomy

Prone

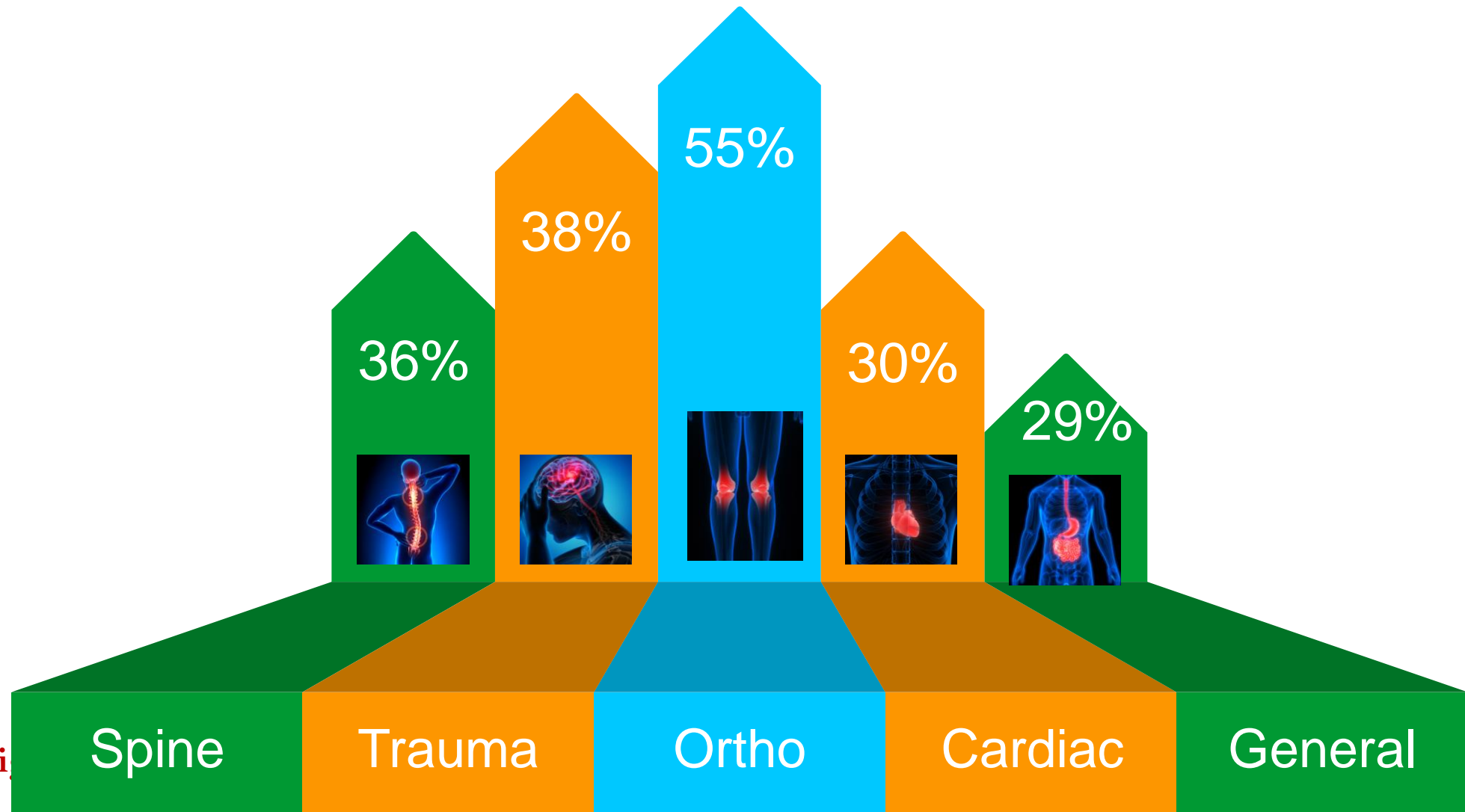
Trendelenburg

Lateral/Jack Knife

High Risk Pressure Areas



PI rates per Surgery Specialty



Location of PI in Studies



Occiput 4%

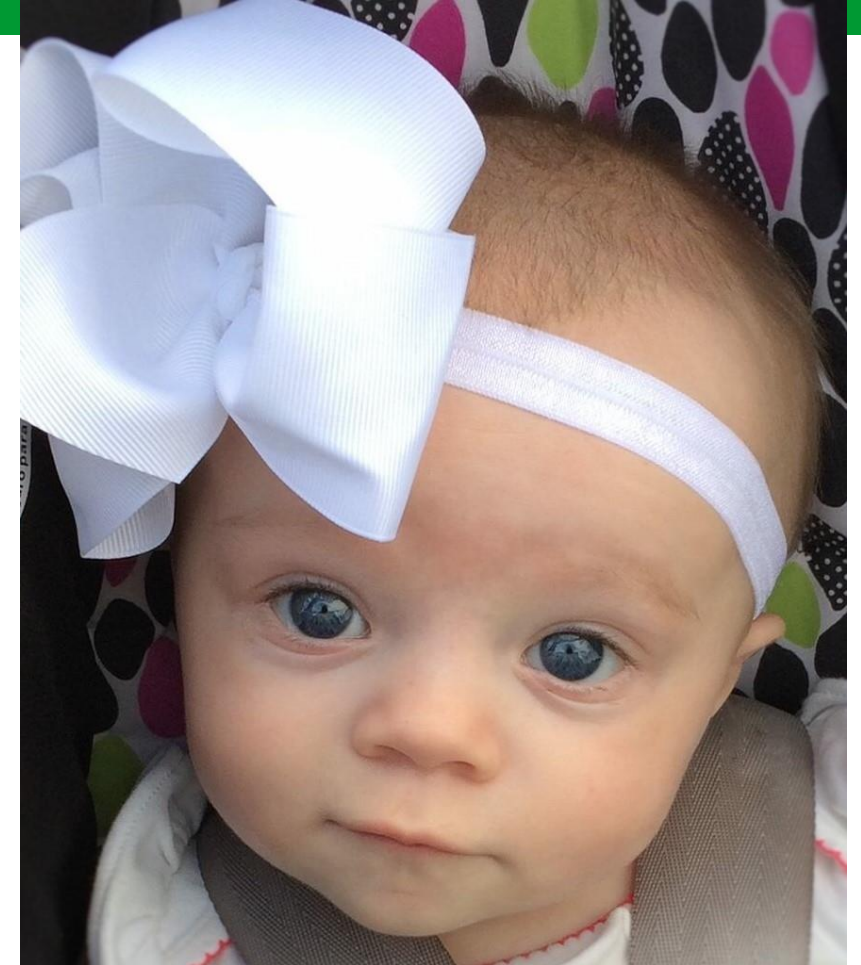
Elbow 5%

Sacral 22% - 41%

Buttocks 11% - 47%

Heels 14% - 52%

Occiput PI - Alopecia



Occiput is most common
site in pediatrics

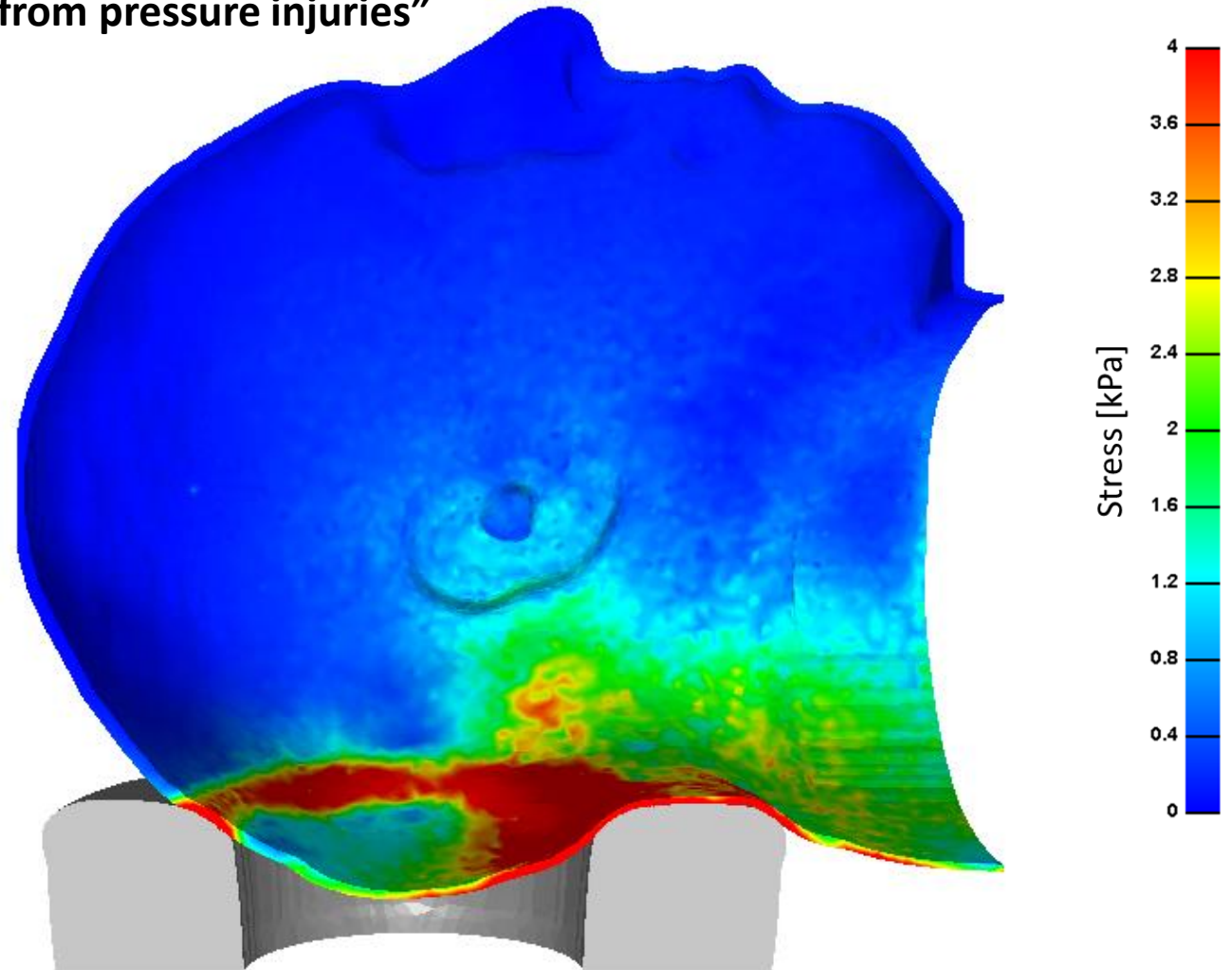
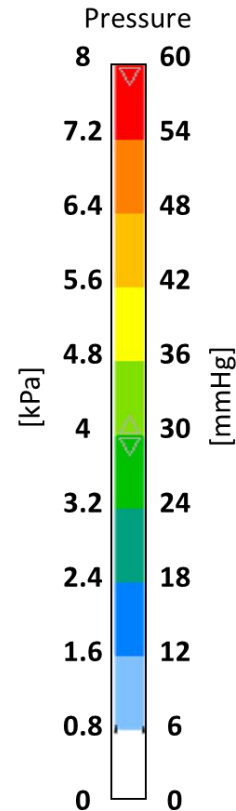
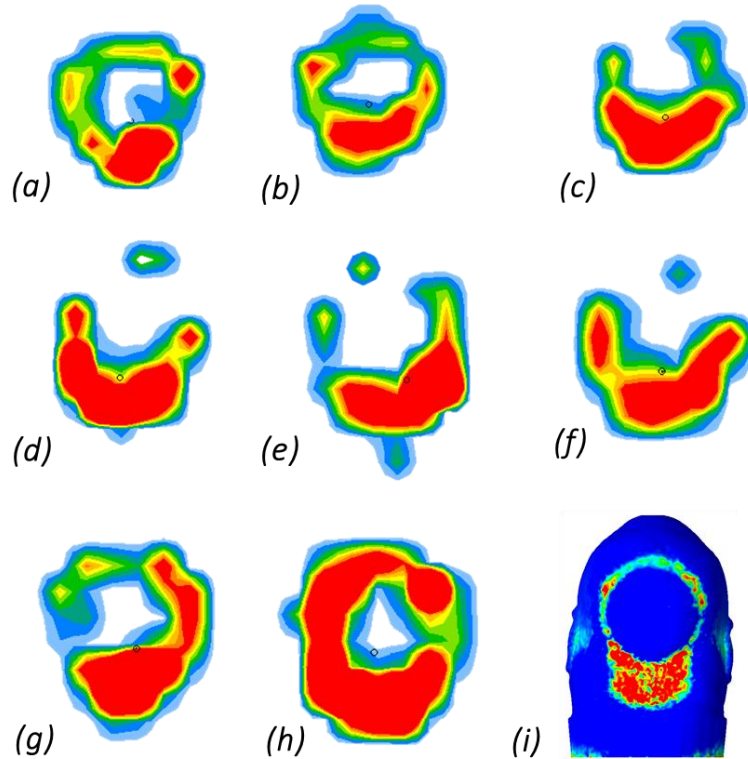
New understanding can lead to better preventive technologies



The donut-shaped gel head support: An example of a **wrong** solution

“Offload pressure from occipital protrusion to protect the patient from pressure injuries”

Donut head-positioners

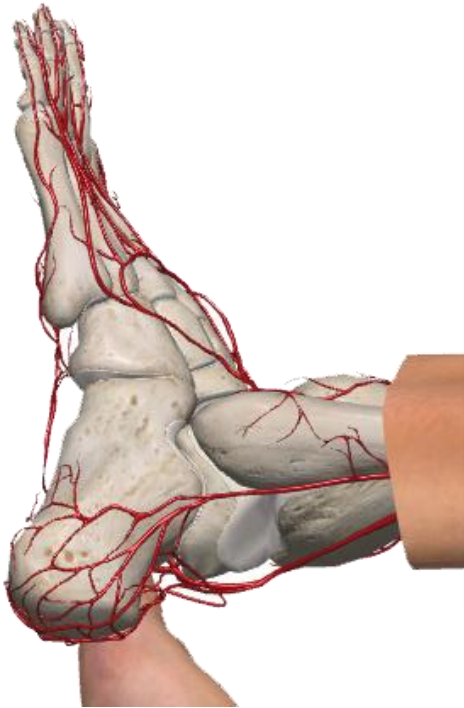


Pressure and Distortion of Tissues



Photos Used with Permission by Joyce M. Black PhD RN FAAN

Heel Pressure Injury



Photos courtesy of www.scotttriggers.com and Marie Brown-Etris



#5

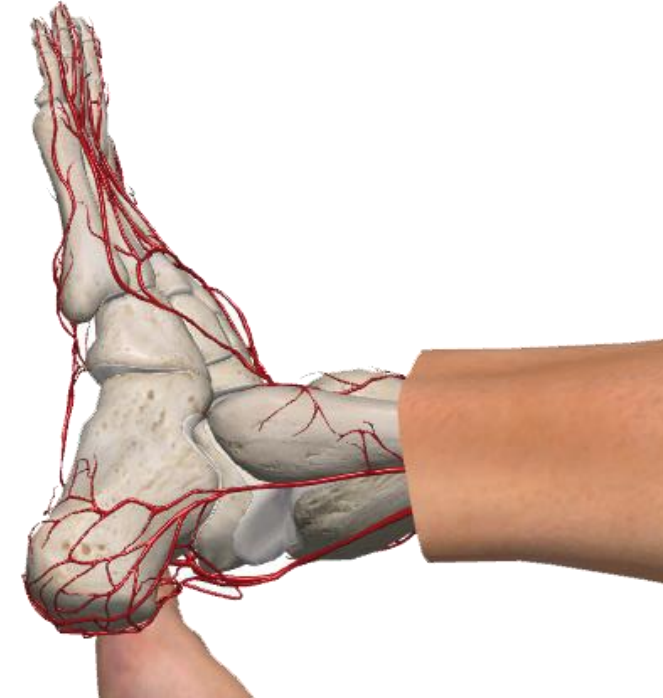
**Offload pressure on
heels while maintaining
knees in slight flexion**

Heels are Vulnerable in Supine and Lithotomy Positions

OR Heel Pressure Injury
52.9% and 52 %
Schoonhoven and Scott 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.”



#6

Consider Prophylactic Dressings for Bony Prominences or Under Medical Devices

Prophylactic Dressings



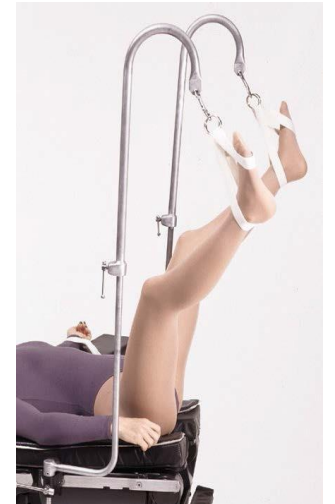
- AORN guidelines: “High evidence to support use of prophylactic dressings for bony prominence and under medical devices.”
- Prone kits effective in case studies

NOT a substitute for offloading,
or positioning interventions!

#7 Avoid Use of Unapproved Positioning Devices



**Follow
Manufacturer
Instructions for
Use (IFU)**





#8

Microclimate and Normothermia

Microclimate and Normothermia



Temperature

Sweat &
Perspiration

Moisture &
Maceration

Weaken
Epidermis

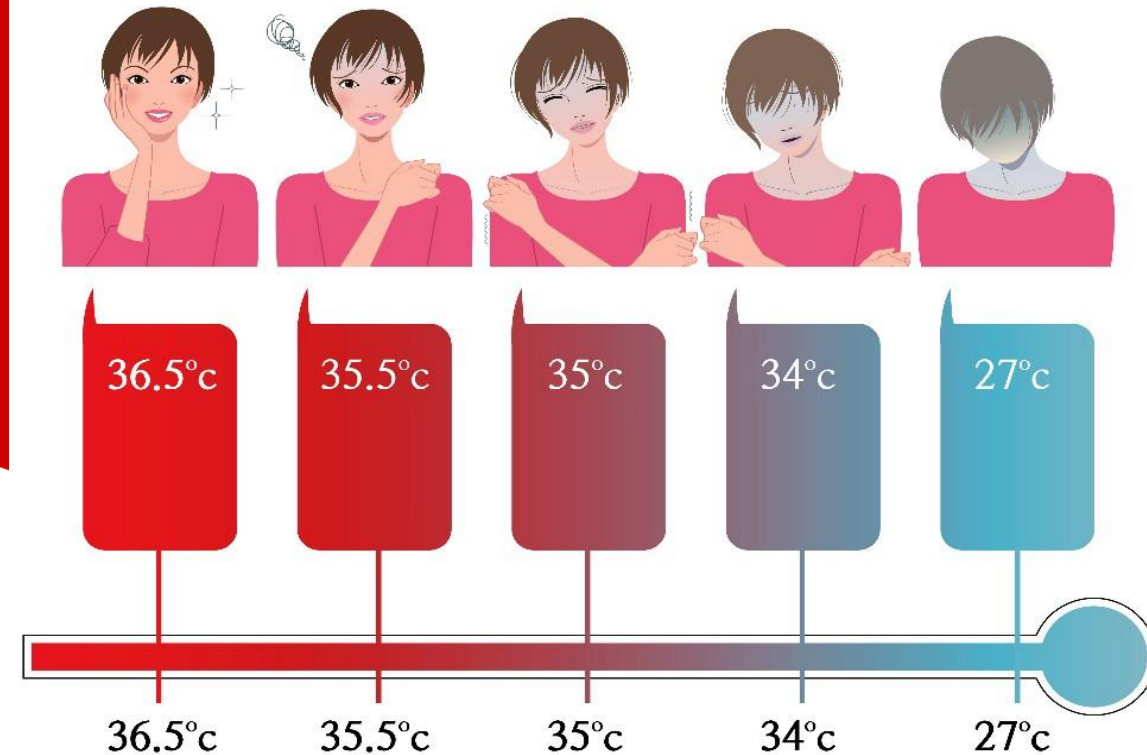
- Yoshimura indicated excessive perspiration and body temp greater than 100.6 F (38 C) were risk factors in the park bench position.



**Fred et al. 1 degree F
(1.8 degree C) body
temperature decrease
was linked with a
higher rate of PI.**

**Hypothermia is associated with
increases in SSI, PI, LOS and
Mortality**

Hypothermia



Key Drivers in OR



- 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.
- Prophylactic Dressings

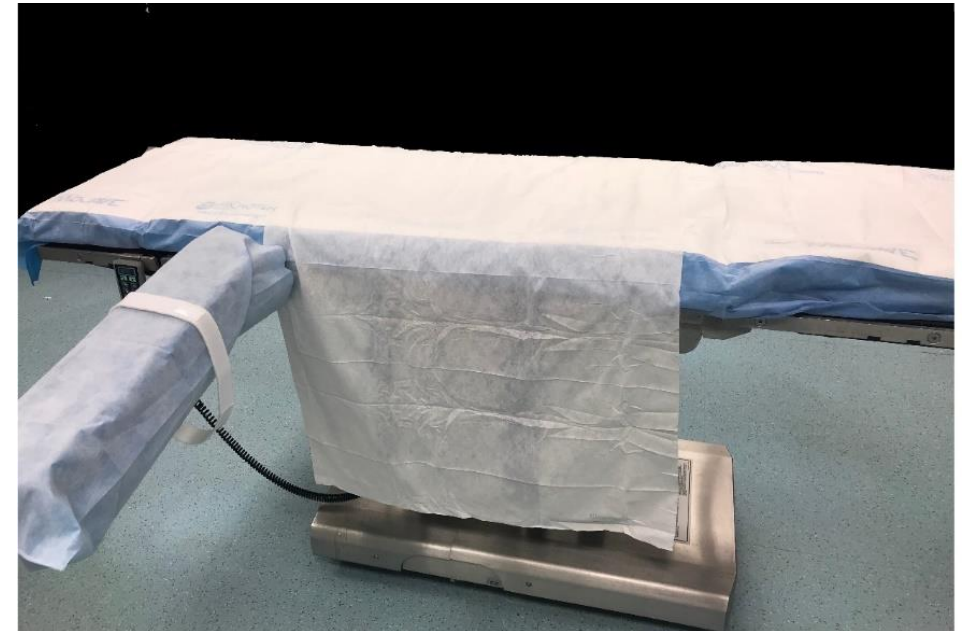


Photo Used with permission Connie Garrett CNOR



#9

Hand-over Communication



Communication Tools “IPASS”

- **Illness Severity**
- **Patient Summary: Surgical Procedure**
 - Risk and skin assessments
 - Type of surgery, position, time on table
- **Action List: Consult WOC Nurse**
- **Situational Awareness and Contingency Plan**
- **Synthesis by Receiver**



#10

**Institute early movement,
daily skin assessment and
pressure management**



Horizontal Approach

Universal Pressure Precautions

Make the right thing to do easy!



#11

**Reporting PIs that develop
within 72 hours after the
procedure**

Strategic Planning

1. Quality Improvement RCA²
2. Assessment (Gap Analysis)
3. Staff Education & Awareness
4. Evidence-based best practice bundles
5. Risk Assessment
6. Universal Pressure Precautions
7. Positioning Competencies
8. Product Selection/standardization
9. Interprofessional collaboration



SCOTT PPIPP



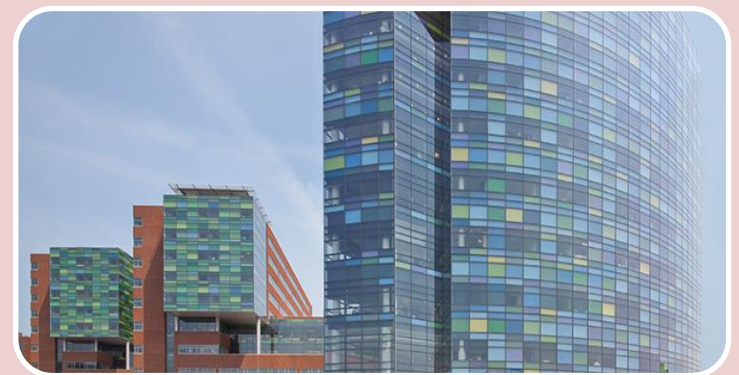
Success Stories



(P= .0004)
\$2.17M

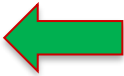
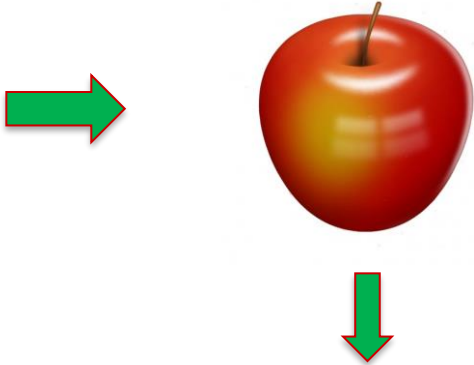
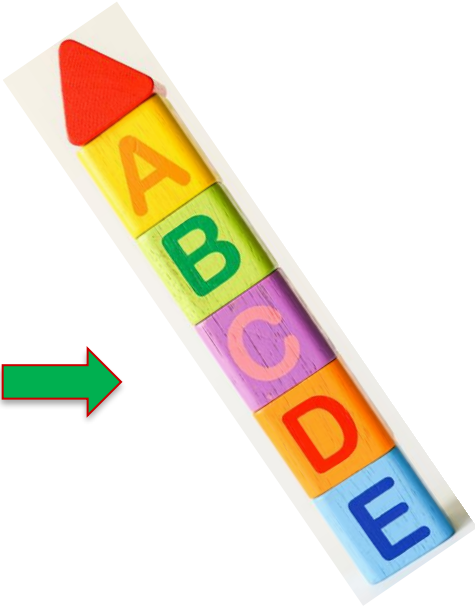


48 Mo.
No Injury



Reduction
in HAPI
(P = 0.03)

Conclusion



Thank You Very Much!



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