

# Reducing Perioperative Pressure Injuries in Cardiothoracic Surgery: Implementation of a Bundled, Evidence-Based Prevention Protocol

Ashlee Cummings, BSN, RN, CNOR, CRNFA; Ben Marthey, BSN, RN, CNOR, CRNFA;  
Ryan Carter, BSN, RN, CNOR, RNFA; Craig Demagall, BA, RN, CNOR, CRNFA

## Background

Perioperative pressure injuries (PPIs) remain a significant concern in cardiothoracic surgery due to:

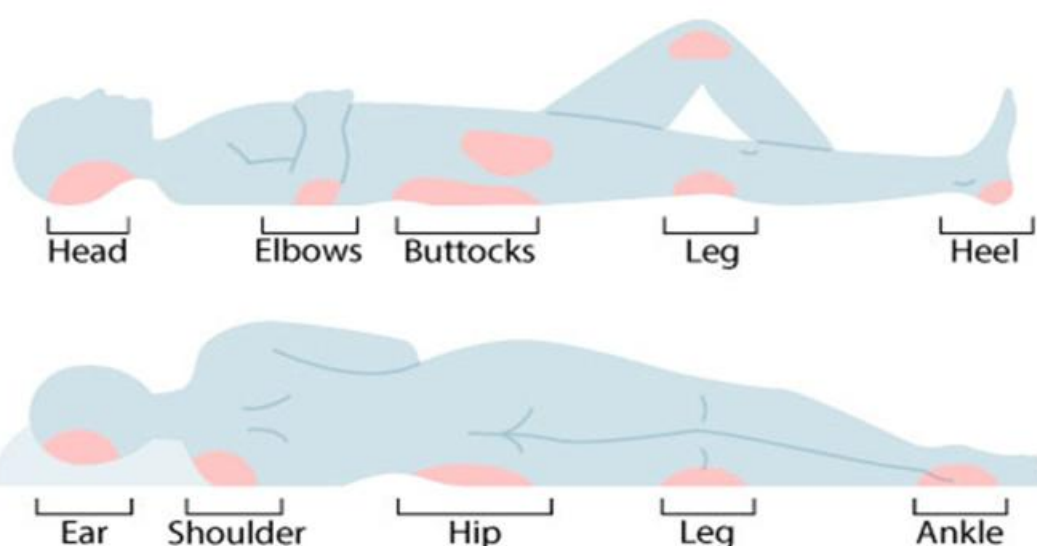
- **Prolonged operative time**
- **Mechanical ventilation & immobility**
- **Hemodynamic instability**

PPIs lead to increased morbidity, extended length of stay, and higher hospital costs.

Despite known risks, prevention in the OR is often **inconsistent**, relying on basic offloading techniques without standardized assessment or staff training. Evidence shows that **structured, bundled protocols** and **culturally competent skin assessments** significantly improve prevention outcomes.

## Clinical Pearls

- Cardiopulmonary bypass time  $\geq$  4HRS  $\uparrow$  PI risk
- Vasoactive medications  $\downarrow$  perfusion
- Warming/thermoregulation  $\downarrow$  skin vulnerability



\*\*Up to 20-30% of PPIs in Cardiothoracic surgery are avoidable

## Clinical Question

Can implementation of an evidence-based perioperative pressure injury prevention bundle reduce the incidence of operating room associated pressure injuries in cardiothoracic surgical patients by 50% within three months?



## Evidence-Based Protocol & Implementation

### Implementation Strategy

Guided by a **Quality Improvement (QI) framework**

### Stakeholders:

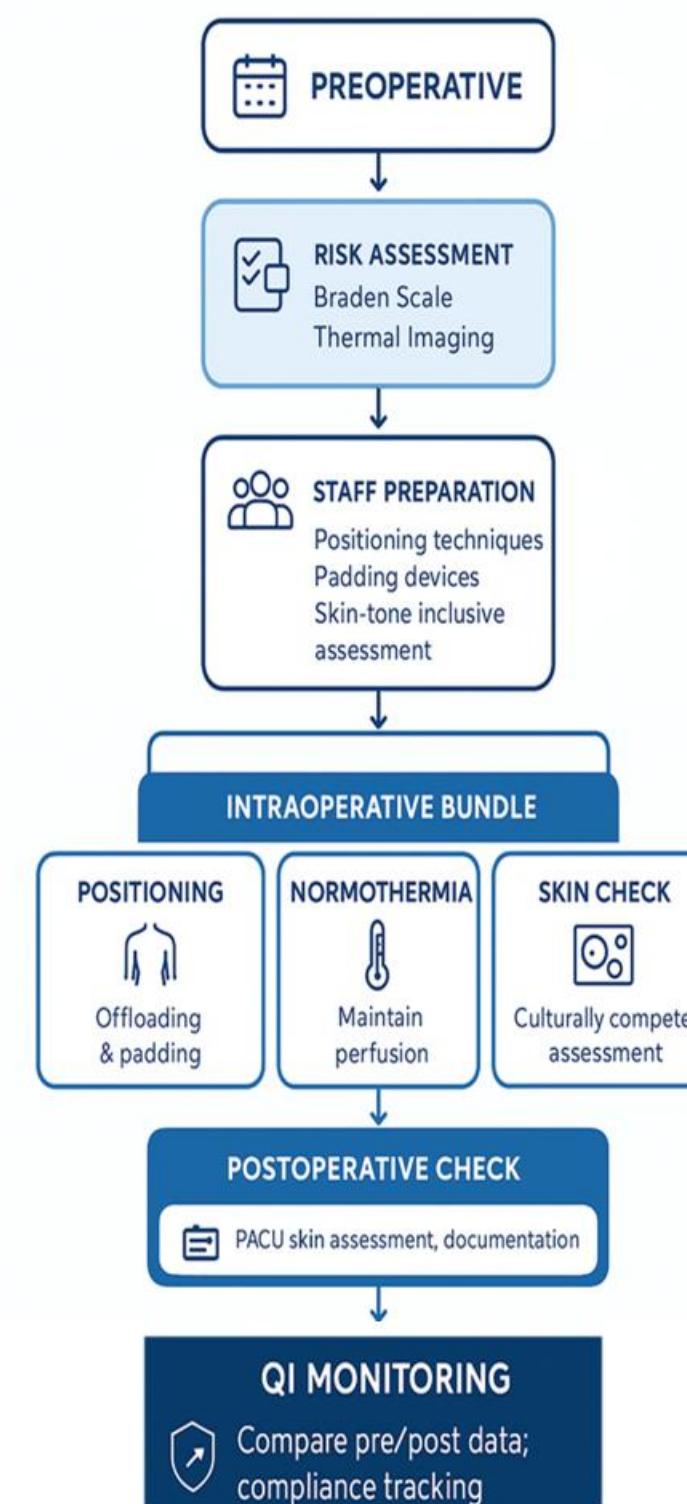
- Perioperative nurses, wound-care specialists, OR team members, and hospital leadership

### Approach:

- Retrospective baseline data (pre-intervention)
- Prospective data collection (post-implementation)
- Regular staff training, competency checks, and compliance monitoring
- Multidisciplinary collaboration to reinforce accountability and standardization

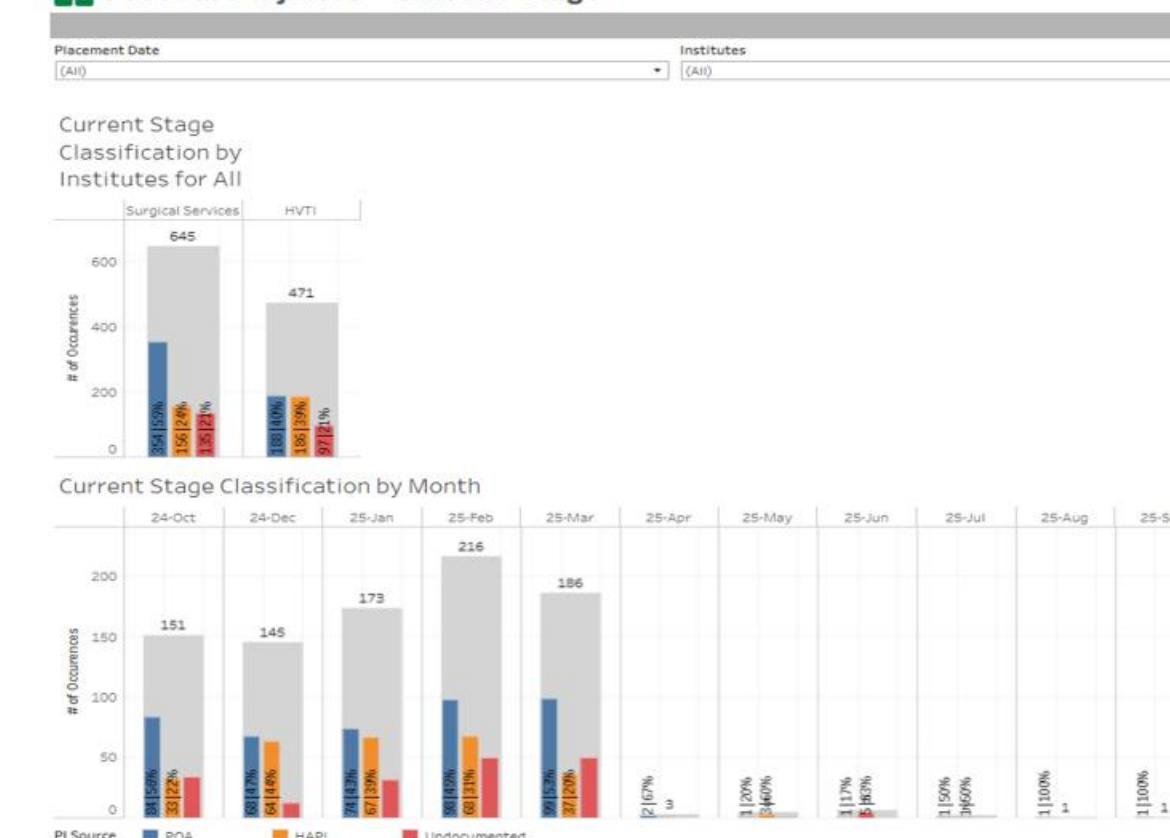
### Core Components:

1. **Comprehensive Risk Assessment**
  - **Braden Scale** completed preoperatively
  - Use of **thermal imaging** to identify early tissue compromise
2. **Staff Education**
  - Proper **positioning** techniques
  - Use of pressure-relieving devices and padding
  - Recognition of early skin changes
3. **Physiologic Optimization**
  - **Maintenance of normothermia** to support skin perfusion and tissue integrity
  - Gelli-roll and warming blankets
4. **Culturally Competent Skin Assessment**
  - Ensuring accurate detection of early pressure injury signs **across all skin tones**



## Results

### Pressure Injuries - Current Stage



Plan → Educate → Deploy → Audit → Sustain



H – Heating  
E – Elevation  
A – Assessment  
R – Repositioning  
T – Teamwork



## Conclusion / Discussion

The prevention bundle aims to:

- Enhance patient safety
- Reduce PPI incidence
- Shorten hospital stays
- Lower wound-care-related costs

The protocol can be **expanded across the institution**, supported by continued staff education and leadership engagement.

## Perioperative Nursing Implications

- Nurses lead PPI prevention through **assessment, positioning, and thermoregulation**
- The initiative highlights the value of **nurse-driven, interdisciplinary practice**
- **Culturally competent assessment** is critical for equity in outcomes
- Long-term success relies on sustained **nurse engagement, training, and advocacy**