Pressure Ulcer Prevention in Robotic Surgical Patients

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Objectives

• Identify stages, surgical positions and risk factors associated with pressure ulcers.
• Analyze patient positioning in reduction of pressure ulcers.
• Identify necessary components involved with implementing a pressure ulcer program within your hospital.

Understanding Pressure Ulcers

• “Pressure ulcers result from prolonged pressure, which causes skin, tissue, or muscle damage”(Armstrong & Bortz, 2001, p. 645).
• Patient Risk Factors
Keep your Eyes Open
for...

Patient Risk Factors
1. Poor Nutritional Status
2. Age - Older Adult Population
3. Body Type - Thin/Obese
4. Multiple Co-Morbidities
5. Hypotension
6. This can happen to ANYONE!

Surgical Risk Factors
1. Shearing
2. Positioning
3. Friction
4. Anesthetic
5. Hypothermia
6. Wetness

Pressure Ulcer Stages

Stage 1
Stage 2
Stage 3
Stage 4
Stage I Pressure Ulcer

"Intact skin with non-blanchable redness of a localized area usually over a bony prominence. Darkly pigmented skin may not have visible blanching; its color may differ from the surrounding area" (National Pressure Ulcer Advisory Panel, 2007, p.1).

Stage II Pressure Ulcer

"Partial thickness loss of dermis presenting as a shallow open ulcer with a red pink wound bed, without slough. May also present as an intact or open/ruptured serum-filled blister" (National Pressure Ulcer Advisory Panel, 2007, p.1).

Stage III Pressure Ulcer

"Full thickness tissue loss. Subcutaneous fat may be visible but bone, tendon or muscle are not exposed. Slough may be present but does not obscure the depth of tissue loss. May include undermining and tunneling" (National Pressure Ulcer Advisory Panel, 2007, p.1).
Stage IV Pressure Ulcer

“Full thickness tissue loss with exposed bone, tendon or muscle. Slough or eschar may be present on some parts of the wound bed. Often include undermining and tunneling” (National Pressure Ulcer Advisory Panel, 2007, p.1).

Deep Tissue Injury

- **Suspected Deep Tissue Injury:**
  Purple or maroon localized area of discolored intact skin or blood-filled blister due to damage of underlying soft tissue from pressure and/or shear. The area may be preceded by tissue that is painful, firm, mushy, boggy, warmer or cooler as compared to adjacent tissue. (National Pressure Ulcer Advisory Panel, 2007).

Unstageable Pressure Ulcer

- Full thickness tissue loss in which the base of the ulcer is covered by slough (yellow, tan, gray, green or brown) and/or eschar (tan, brown or black) in the wound bed.
Why is this Important?

• “Negative outcomes experiences by the patient include pain, discomfort, additional treatment, disfigurement, multiple surgeries, increased morbidity, increased length of stay and loss of income” (Schouchoff, 2002, p. 80).

• “Patients who undergo a surgical procedure have a 90% greater chance of developing pressure ulcers than medical patients” (Armstrong & Bortz, 2001, p. 651).

Patient Wellbeing

Prevent

- Pain
- Prolonged Hospital Stay
- Infection
- Additional Treatments
- Death

Pressure ulcers are a serious problem in health care and are associated with pain, prolonged hospital stay, and even death (Schoonhoven, Defloor & Grypdonck, 2002, p. 480).

Finance

- Hospital acquired pressure ulcers in stages 3-4 are considered by Medicare a “never event” (Centers for Medicare & Medicaid Services, 2008). Medicare will not pay for patients hospital services who acquire pressure ulcers staged 3-4 during their stay.
• WHAT HAPPENED?

• WHY THE STUDY?

Increase at our Facility

• Increase in deep tissue injury has been noted after long Robotic (more than 2 hours) surgical cases.

• Patients are seen 4-5 days post operatively with stage 3-4 pressure ulcers.

Evidence

• “During surgery, patients are immobile and are not able to feel pain caused by prolonged pressure and shearing forces. Moreover, they cannot change their position to relieve the pressure and shearing forces” (Schoonboven, 2002, p.163).
Common Surgical Positions

Assessment Aid: Vulnerable Anatomy

SUPINE POSITION: Patient lies on back with face towards ceiling, arms padded at sides in neutral position or on padded arm boards at less than 90-degree angle with palms up. Legs are parallel, head and upper body aligned with hips.

Areas of Vulnerability:
- Occiput
- Scapulae
- Arms/Elbows
- Thoracic vertebrae, Lumbar
- Sacrum, Coccyx
- Heels

Prone Position

Face down, head placed on padded headrest, head and cervical alignment is maintained. The patient's arms are at sides or on padded arm boards at less than a 90-degree angle.

Areas of Vulnerability:
- Forehead, eyes, ears, and chin
- Anterior shoulders
- Breasts
- Iliac crests
- Genitals
- Knees, shins
- Dorsum of feet, toes
Lateral Position

- Patients dependent leg is flexed and top leg is straight with pillow between legs. The dependent arm is on padded arm board, the upper arm is supported by Allen overhead arm rest or slings. Pillow is placed for patient's head.

Areas of Vulnerability:
- Dependent side face, ear
- Dependent shoulder, Arms, axilla
- Dependent Hip
- Legs, Dependent knee
- Ankles, feet

KRASKE/JACKKNIFE Position

- OR bed is flexed to 90 degree angle. Padded headrest and chest bolsters are often used. Arms placed at sides or on arm boards at less than 90 degree angle.

Areas of Vulnerability:
- Forehead, eyes, ears, and chin
- Anterior shoulders
- Breasts
- Iliac crests
- Genitalia
- Knees, shins
- Dorsum of feet, toes

Lithotomy Position

- Patient's buttocks are on the break of procedure bed. Arms on arm boards at less than 90 degree angle with palms up. Legs raised in stirrups at even height. *Note many Robotic Low anterior Resection cases place patient in Steep Trendelenburg position.

Areas of Vulnerability:
- Occiput
- Shoulders, scapulae (Steep Trendelenburg)
- Hips
- Sacrum, coccyx
- Lateral aspect of legs, Heels.
Robotic Positioning

• Patients undergoing robotic surgery are at higher risk of acquiring pressure ulcers due to steep Trendelenburg position.

Evidence

• “AORN’s recommended practices for positioning the patient in the perioperative setting suggests that a patient should be repositioned every two hours to prevent continuous pressure on pressure points and assist in decreasing the risk of adverse physiological responses” (Walton-Geer, 2009, p.542).

Gap Analysis

• Current practice is to keep patient in same position throughout entire length of surgery.
• Brief skin assessment is performed at the end of the case by Circulating Nurse.
PICO Question

• In Robotic Surgeries exceeding 3 hours, Will releasing shoulder harness for 5-10 minutes every 2-3 hours result in improved post operative skin integrity?

Stakeholders

• Surgeons, Anesthesiologists
• Nurses - OR, PACU, ICU, Med-Surg
• Administration (Surgical Services & Hospital)
• SWAT Nurses (Skin Wound Assessment Team)
• Finance
• Quality & Risk Management

Collection

• Photos are taken of intervention performed on one shoulder and compared with shoulder without intervention.
Challenges

• Minimal nursing staff and physician resistance to intervention.
• The main concern was interruption of case.
• Data Collection
  – Historical
  – reports

4 Hours Unreleased

Suspected Bilateral Deep Tissue Injury

Skin Assessment Pre-op

Preoperative Skin Assessment Right Shoulder
Preoperative Skin Assessment Left Shoulder
Results

6 hour Surgery

Left Shoulder Post-Operative Non-Intervention
Formation of 8cm x 6cm pressure ulcer

Right Shoulder Post-Operative Intervention
Shoulder Bolster released after 3 hours of steep Trendelenburg right side down for 6 minutes. Erythema subsided by PACU.

Results

5 hour surgery

Right Shoulder Post-Operative Non-Intervention
Erythema and slight bruising noted, subsided in 1 day.

Left Shoulder Post-Operative Intervention
Bolster removed for 10 minutes after 2 hours

Results

5 ½ hour Surgery

Right Shoulder Post-Operative Non-Intervention
Formation of 6cm x 1 cm Stage 2 pressure ulcer with blister

Left Shoulder Post-Operative Intervention
Bolster released after 2 hours for 5 minutes.
Results

Left and Right Shoulder released for 10 minutes after 2 hours of surgery. Circulator released only 1 time. Total length of surgical 6.5 hours. Elderly patient with fragile skin resulted in no pressure ulcers.

Ethical Consideration

- In the four initial cases, clinically significant results were seen between the non-intervention group and intervention group.
- Ethical concerns raised regarding further collecting a non-intervention shoulder group.
  - The risk manager and ethics committee was contacted and data collection changed.

Current Collection

- Circulating Nurses are releasing alternate shoulders between 2 hours for 5-10 minutes during steep-trendelenburg position.
  - Data collection is obtained by absence of pressure ulcer.
- Skin assessment form created to track skin condition
  - following patient from surgery to floor.
  - Information retrieved provides additional data.
Skin Assessment Form

Assessment Checklist

- Health History?
- Length of Surgery?
- Patient Position?
- Protective Devices?
- Time-out after 2 hours?
- Documentation Performed?

Assess and Document

- Documentation: Include measurement, names of notified personnel, disposition of photo and treatment if any.
- Measure: Length cm x Width cm
- Photos: Clear photo, including patient sticker and ruler placed next to area of concern.
- Report to Surgeon, Anesthesiologist and PACU or Floor RN.
Intraoperative Checklist

- Thermoregulation- Bair Hugger on?
- Patient laying on smooth surface- knots untied on gown? sheets smooth?
- Dryness ensured?
- Positioning supplies available
- Moving help- slow transfers!

Change Happened!

- What did we see?

Results

- 4 cases in which one shoulder was intervention and the other was non-intervention indicated stages 1-2 on non-intervention shoulder.
- 7 cases in which intervention was performed bilaterally indicated no pressure ulcers.
- For the dates 3/30/10 to 2/28/11, 1946 cases reviewed (over 2 hour case), 61 cases assessed as possible PUs all but 8 cases subsided with no additional treatment needed. None of these were robotic cases.
Results

Communication
- Role as EBP Fellow
- RN/MD Collaboration
- In-services
  - SWAT RN
- Assessment OR & PACU & B6
- Reporting

Positive Working Environment

- Creating an environment in which staff can carry pride in serving excellent community care.
- Hospital reputation, nursing reputation is important in ensuring a hospital community of excellence, safety and success.
- Working in a hospital one can be proud of is very important in nursing, physician and ancillary staff retention as well as overall morale.

Looking Forward

- Upon showing results surgeons and staff have implemented this practice for over a year. Statistics of pressure ulcers emerging from the OR are less than .4%
- Presented at numerous Nursing Safety Collaborative groups in California.
- Presented at Research Symposia in the Bay Area
- In Process of Publishing Article
- Seeking IRB approval for Formal Research Study
Implementing at your Facility

• Patience is Key!
• Nurse Champions
• Physician Acceptance
• Communication

References


Questions???