New data from Minnesota hospitals offers more insight into preventing pressure ulcers during long surgical procedures. Data collected through the state’s adverse event reporting system in 2009 found 13% of the 122 Stage 3, Stage 4, and unstageable pressure ulcers reported were related to long surgical procedures.

Attention to this potentially devastating complication has ramped up since Medicare announced it will no longer pay for Stage 3 and Stage 4 pressure ulcers that develop during a patient’s hospital stay.

A statewide advisory group of wound care and perioperative nursing experts came together to analyze the reports and develop recommendations. The group found 2 primary contributing factors:

- a lack of awareness of risk of skin breakdown by OR teams and a lack of communication of the risk during handoffs
- a lack of guidance for determining the types of surgical cases that increase the risk of skin breakdown.

They also found confusion about support surfaces and other practices for preventing pressure ulcers during surgery.

“Patients under anesthesia are among our highest risk patients because they cannot move,” says Denise Nix, RN, MS, CWOCN, a member of the advisory group and an ostomy and wound care expert. She is an advisor to the Minnesota Hospital Association and coauthor of *Acute and Chronic Wounds: Current Management Concepts* (Mosby Elsevier, 2007).

The advisory group began by consulting professional guidelines, including those of AORN and an international body, and then developed recommendations to address issues they were seeing in Minnesota (sidebar).

**Recommendations**

The Minnesota recommendations and guidance are intended to address these issues. Anne Hanzel, RN, MSN, MA, senior director of perioperative services at the University of Minnesota, Fairview, and a member of the statewide advisory panel, talked with *OR Manager* about her organization’s efforts to prevent pressure ulcers.

**Risk factors in surgery**

The recommendations say that surgical patients with the following should be considered at high risk for a pressure ulcer:

- any procedure lasting longer than 4 hours
- cardiac, vascular, trauma, transplant, or bariatric surgery or procedures involving at-risk positioning such as sitting
- patients with weight or nutritional extremes—obese or thin, small in stature
Preoperative briefing process
The briefing at the University of Minnesota, Fairview, includes the patient’s skin condition.

<table>
<thead>
<tr>
<th>Brief* Hard-stop process</th>
<th>Time-out* Hard-stop process</th>
<th>Debrief</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Brief</strong> Occurs before position/prep/drape</td>
<td><strong>Time-out</strong> Occurs after surgeon has scrubbed and gowned, just prior to incision</td>
<td><strong>Debrief</strong> Occurs before the surgeon leaves the OR</td>
</tr>
<tr>
<td>2. Team focuses on the Brief discussion.</td>
<td>2. Team ceases all other activity.</td>
<td>2. Confirm postop diagnosis.</td>
</tr>
<tr>
<td>3. Introductions.</td>
<td>3. circulating nurse:</td>
<td>3. Confirm wound class.</td>
</tr>
<tr>
<td>4. Suggested content for developing a shared mental model:</td>
<td>a. Reads the following from the patient’s Affirmation of Informed Consent:</td>
<td>4. Verify specimen(s) handling.</td>
</tr>
<tr>
<td><strong>Surgeon</strong>: Type of case, review equipment, critical times, positioning, VTE prophylaxis, other.</td>
<td>i. Patient name.</td>
<td>5. Confirm blood loss.</td>
</tr>
<tr>
<td><strong>Circulator</strong>: Allergies, x-rays, implants as appropriate, skin care plan, other.</td>
<td>ii. Procedure.</td>
<td>6. Discuss concerns/issues for this patient/ case.</td>
</tr>
<tr>
<td><strong>Scrub person</strong>: Instruments/supply concerns, medications on the sterile field, other.</td>
<td>iii. Laterality of procedure (and level) as appropriate.</td>
<td>7. Complete OR case log.</td>
</tr>
<tr>
<td><strong>Anesthesia care provider</strong>: Physiologic concerns, blood availability, preop block placed, beta blockers, antibiotic(s), other.</td>
<td>b. Notes position of patient.</td>
<td><strong>Note:</strong></td>
</tr>
<tr>
<td><em>Note:</em></td>
<td></td>
<td>• Each time the patient is moved from supine to prone (or vice versa) after the time-out, another time-out is necessary immediately following the repositioning.</td>
</tr>
<tr>
<td>• The Brief must occur before positioning, prep, and drape.</td>
<td></td>
<td>• If the patient has multiple procedures scheduled with a different attending surgeon(s), a time-out will be conducted immediately prior to the initiation of each procedure.</td>
</tr>
<tr>
<td>• A surgeon, circulator, scrub person, and anesthesia care provider must be present for the Brief.</td>
<td></td>
<td><em>Note:</em></td>
</tr>
<tr>
<td>• If the attending surgeon has not conducted the Brief in person or by speaker phone prior to positioning, prep, and drape, he/she will be paged by the circulator. The attending may delegate the Brief to a chief resident, fellow, physician assistant, or fellow attending surgeon only if he/she is properly informed of the case details.</td>
<td></td>
<td>• Each time the patient is moved from supine to prone (or vice versa) after the time-out, another time-out is necessary immediately following the repositioning.</td>
</tr>
<tr>
<td>• A team may Brief once prior to the first of multiple similar procedures done in succession.</td>
<td></td>
<td>• If the patient has multiple procedures scheduled with a different attending surgeon(s), a time-out will be conducted immediately prior to the initiation of each procedure.</td>
</tr>
</tbody>
</table>

Source: University of Minnesota, Fairview, Minneapolis.
The guidelines recommend a thorough preop skin inspection on the day of the procedure before handoff to the perioperative team. It is suggested that nurses use a script, such as the following:

“Because we know that being in one position for a period of time, such as in surgery, can put you at risk for getting a bedsore, or what we call a pressure ulcer, I am going to take just a couple of minutes and check your skin from head to toe now before you go into surgery.”

At the University of Minnesota, Fairview, nurses use the script in their head-to-toe skin assessments on the day of surgery, Hanzel says. Because the medical center’s patients are highly complex, nurses assess all patients before surgery, being alert for:

- the patient’s age
- body size
- temperature
- anesthetics to be used
- length of surgery
- nutritional status.

### Safe Surgery Process

#### The Brief

<table>
<thead>
<tr>
<th>WHY</th>
<th>WHEN</th>
<th>WHO</th>
<th>WHAT IF</th>
<th>HARD STOP</th>
</tr>
</thead>
</table>
| • Introduce/greet team members  
• Develop a shared mental model  
• Discuss the case/concerns | • Prior to positioning  
• If not done, RN will page the attending surgeon  
• Hard stop occurs until Brief is done | • All disciplines:  
—Surgeon  
—OR RN  
—Scrub person  
—Anesthesia care provider | • The surgeon needs to be paged for the Brief?  
—Surgeon may Brief by phone.  
—Surgeon may delegate Brief to an informed chief resident, fellow, physician assistant, or fellow attending surgeon.  
• There are multiple repetitive cases scheduled in the OR?  
—Repetitive sequential cases may be briefed all at once at the beginning of the day.  
• People refuse to participate in the Brief?  
—A Hard stop is called. | • The case does not progress.  
• A leadership person is called to assist.  
Call hierarchy:  
—Unit supervisor  
—Charge nurse  
—Nurse manager  
—Director  
—Medical director |

Source: University of Minnesota, Fairview, Minneapolis.
At first, Hanzel says nurses thought patients might push back about the skin inspection. “But there has been no pushback. Even if a patient asks about it, the nurse explains, and patients have been fine with that.”

The condition and appearance of the skin and any abnormalities are documented in the electronic record, where it can be accessed by circulating nurses in the OR.

**Handoffs**

The recommendations advise that the handoff from preop nurses to the OR team include:

- the most recent Braden Scale information (the Braden Scale is an evidence-based tool for scoring pressure ulcer risk. www.bradenscale.com)
- any history of pressure ulcers
- location of any existing pressure ulcers.

One obstacle is that ORs and nursing units often use different electronic documentation systems, making it difficult to access information on risk factors electronically.

“We realized that if up-to-date communication is going to occur, there has to be a system for oral or written handoffs,” Nix says.

At the University of Minnesota, the patient’s skin condition is included in the preop briefing conducted in the OR before the case begins (illustration, p 13).

After surgery, the skin condition is checked again, documented, and included in the handoff to the postanesthesia care unit (PACU). PACU nurses in turn recheck the skin before transferring the patient to the postop unit.

To aid communication for patients coming to surgery from inpatient units, the electronic documentation system includes a “transfer of care” report that collects critical elements for the handoff.

“By accessing the report, the perioperative RN can see the skin condition and related assessments in greater detail,” Hanzel explains. “It’s a nice way to bring together information that is important in transitioning patients to the next provider.”

**Support surfaces**

For patients at risk for pressure ulcers, the Minnesota and AORN recommendations strongly advise using an OR mattress with “pressure-redistributing properties greater than the standard OR mattress.” (The standard mattress is defined as 1 to 2 inches of foam covered with a vinyl or a nylon fabric).

An informal survey of hospitals in Minnesota found a mix of surfaces was used. There was confusion about what surfaces were used and the terminology used to describe them (sidebar).

“What one person called gel is different from what another called gel. There are 2-inch gel pads that are not that effective. Conversely, you have the viscous, fluidized products that are often mistaken for gel. These are considered by many as the top of the line for pressure redistribution,” Nix says.

There was also confusion about foam.

“Memory or viscoelastic foam is profoundly different from the standard, or elastic foam,” she says.

Quite a bit of work on support surfaces has been performed outside the OR. Nix suggests that some of this, particularly standardized terminology
from the National Pressure Ulcer Advisory Panel, could be used in perioperative care to reduce confusion and improve communication.

Unfortunately, science to guide support surface selection is lacking.

“There needs to be more comparative studies and information,” Nix says.

**Standardizing surfaces**

Standardizing support surfaces is one way to improve prevention by mistake-proofing product selection, Nix suggests. Replacing surfaces one at a time as they wear out can result in a mixture of products that makes it hard to select the right surface for a patient.

In her organization, communication with the purchasing department has helped.

“Now the purchasing department knows exactly what to order, and we know we aren’t getting new products that aren’t effective,” she says. “They are still replacing the surfaces by attrition, but at least nothing new is being purchased that isn’t going to prevent pressure ulcers.”

The University of Minnesota, with its complex patients, has moved to an advanced fluidized pressure redistribution mattress for 16 of its 21 ORs. Because these are expensive, the mattresses have been added gradually, Hanzel notes.

“Because the OR schedule changes dynamically, it’s hard to make sure you have the right mattress on the right bed. So we have put these advanced surfaces on most of our beds,” she says. The decision to move to the advanced mattresses was made after networking with another academic medical center that has used this mattress for 10 years with a much reduced rate of injury.

**Lateral transfer**

Regarding lateral transfer, the basic recommendation in the Minnesota guidelines is to move the patient without dragging the body, which can cause a shearing injury.

A variety of transfer devices are available. Examples mentioned in the guidelines are:

- Samarit Rollboard
- Hovermatt (HoverTech)
- AirMatt
- Z-Slider (Sandel Medical).

**Positioning, repositioning**

The Minnesota recommendations include specific pointers for positioning. Two of these are to:

- Ensure that responsibility for positioning and repositioning the patient is assigned and well defined.
  
The reports showed “there was a lot of confusion in the OR about who positions the head during long cases,” Nix says. At some facilities, the anesthesia provider is responsible; at others, it was not clear who had responsibility, or if it was even done.
- When the patient is in the supine position, suspend the patient’s heels off the surface.
  
The University of Minnesota uses pillows to fully suspend patients’ lower legs.

“We used to use gel pads under the feet and head, but we no longer do,”
says Hanzel. The reason: “Gel settles out over time. Some of our gel pads had pits where the heels would rest.”

**Handoff after surgery**

In the handoff to the PACU, the guidelines advise that perioperative nurses communicate:
- patient positioning in the OR (eg, lateral, prone)
- any existing pressure ulcers
- patient’s preoperative Braden Scale score.

For patients at risk for pressure ulcers, the guidelines say to consider upgrading the surface, such as using a gurney with a pressure redistribution surface.

In the handoff to the nursing unit, the recommendation is to communicate the patient’s position in the PACU (suggesting that the patient be placed in an alternative position if not contraindicated); any existing pressure ulcers; and the patient’s postoperative Braden score.

**Value of collaboration**

Nix and Hanzel both say that the collaboration of perioperative nurses and wound care specialists is making a difference in the prevention of pressure ulcers.

Hanzel, who is on the hospital’s pressure ulcer prevention committee, now reviews every report that comes into the facility’s Safe Skin registry to see if the patient had a procedure, whether in the OR, GI lab, or cath lab. If the report is from another department, she refers it to the director. If it’s from surgery, she reviews the perioperative patient chart to see, “Did we identify the problem and begin care? Did we share the information with the next provider in our SBARs and through documentation of findings?”

An added benefit of the statewide project, Nix says, was learning “how eager both parties are to participate, once they are given time and support from their facilities. There is so much we can learn from each other.”

*Access the Minnesota Hospital Association recommendations for pressure ulcer prevention in the OR at www.mnhospitals.org/index/patient1*

**References**


What support surfaces are ORs using?

Results of an informal survey of 51 hospitals in Minnesota.

What criteria does your hospital use to determine if a patient is at high risk for pressure ulcer development in the OR?

- Braden assessment 38%
- Length of procedure 26%
- No criteria 23%
- Patient characteristics 15%
- Braden assessment plus other criteria 13%
- Not applicable (lengthy procedures not performed) 5%.

Support surfaces used in OR

For patients not at risk for pressure ulcer development

- Standard OR mattress 61%
- Mattress with pressure redistribution properties beyond standard surface 39%.

For patients deemed at high risk for pressure ulcer development

- Standard OR mattress 44%
- Mattress with pressure redistribution properties beyond standard surface 56%.

Source: Minnesota Hospital Association.