Fawcett researches pressure problems for surgical patients

By Mary Ellen Stephenson

Immobile for hours, an anesthetized body can press against an operating room bed with sufficient sustained force to break skin, reduce blood flow and cause pressure sores in tissue. A patient's hair can fall out at the spot where his head was resting during surgery.
As you lie in an operating room about to have cardiac surgery, you want a skilled surgeon standing over you. What's underneath you at that moment could also influence your recovery.

Fawcett

Debra Fawcett, professor of nursing at IU Kokomo, spent five years researching this phenomenon for her doctoral dissertation at the University of Cincinnati College of Nursing. She successfully defended her dissertation in 2004 and has been spreading word of her findings at hospitals and nursing conferences throughout the country. Fawcett earned her master's degree in nursing education from Ball State University in 1991. She has been a certified perioperative (surgical) nurse since 1983 and a member of the IU Kokomo School of Nursing faculty since 1990.

When people sleep under normal conditions, they move their bodies' positions as much as 17 to 18 times a night, Fawcett said. Anesthetized patients can't resort to this natural pressure-relieving reflex.

The pressure injuries sustained under anesthesia can slow healing, be painful, require more medication to treat and increase the length of a surgical patient's in-hospital recovery time as well as their hospital expenses. Treatment of such injuries might include additional surgeries for skin grafts.

Pressure injuries are not always evident at the end of surgery because the damage has been done internally. "It may be four to five days later that a pressure sore becomes apparent with a break in the skin. If a sore is deep and seems to have developed under the skin, the injury probably happened during surgery," Fawcett said. Pressure injuries occurring during surgical recovery are more likely to have started on the surface of skin irritated by moisture or patient movement.

A "light bulb" regarding pressure injuries came on for Fawcett when she was teaching and witnessing surgeries at a hospital in another state. That hospital's operating room (OR) staff used sealed intravenous fluid bags like sandbags to stabilize the position of surgical patient's bodies. "The plastic caused the skin to sweat. The fluid was too rigid to disperse the pressure," Fawcett recalled. "Later, I couldn't find any research saying this was a right thing to do."

Her doctoral research tested reactions to three types of operating bed mattresses, measuring which best distributed the pressure of a prone body. Healthy volunteer subjects lay on each mattress for one minute, while Fawcett measured the pressure exerted with a pressure monitor. Her subjects only had to lie still for 60 seconds, she explained, "because, while the circulation changes as a body remains still over a long time, the measure of pressure doesn't change."

The test mattresses were made with foam, gel or combinations of both. One was a standard-price mattress used in many ORs, the second cost about twice as much and the third mattress was a still more expensive experimental model, not yet in general health-care use.

The second mattress seemed to do the best job of distributing pressure in Fawcett's tests. "So, even though it would raise the costs for hospitals to use that model mattress, it can reduce the potential for patient injuries and resulting litigation against the health-care providers and facilities," Fawcett said.

She believes nurses can be on guard against potential pressure problems by performing thorough pre-surgery health assessments. "You must take into account the patient's anatomical structure and pre-existing risks. You must get the patient's body aligned in the proper position for the surgery before an anesthetic is administered."

Risk of pressure injuries during surgery goes up if the surgery is lengthy—think heart and orthopedic procedures—and if a patient has less than ideal health before an operation. The latter is common among the elderly, the morbidly obese and the malnourished, she noted.

Arthritis can limit patients' range of motion. "After they are anesthetized, patients can't complain when a stiff joint gets moved too far," Fawcett said. Nurses who know about these limitations "can be more careful during surgery, in the event that they

have to reposition a patient's limb to allow the surgeon better access to the surgery field," she said. "We can protect those tender parts with more padding, particularly under elbows or wrists."

Conversely, the fat that seemingly "pads" an overweight patient doesn't necessarily protect them from pressure injuries during surgery. "The bodies of obese patients might not fit on standard-size OR beds," Fawcett said. "There will be pressure points where the body hangs over the edge of the bed."

Additionally, obese people have more skin to be fed by their arteries, so they have less overall blood circulation to bring oxygen to muscles under pressure, according to Fawcett. Skin blood flow "isn't an area where a lot of people have done research," she said. Fawcett wants to earn certification in the use of a laser Doppler, which measures blood flow at the site of pressure. She also wants to be certified in thermography—measurement of a body's heat, a factor that can aggravate pressure injuries.

Fawcett has presented her dissertation findings at hospitals in Kentucky, South Carolina and Virginia, and at the 2004 IUPUI Research Symposium. Audiences seemed very interested, reflecting health care's current "intense focus on patient safety," Fawcett said. "The feeling is, 'If you can prevent an injury, let's prevent it.' Knowledge is the best preventative."

Hill-Rom, an Indiana manufacturer of hospital beds and other medical supplies, hired Fawcett to make five presentations of her research at a national conference for perioperative nurses in Dallas last year. Hill-Rom shared some of its equipment knowledge with Fawcett and, along with IU Hospital in Indianapolis, donated the pressure-reducing surfaces that she compared in her studies. The company did not fund the actual research, Fawcett stressed. "If they had funded it, they could have controlled what I can publish."

A past national officer of the American Association of Perioperative Nurses (AORN), Fawcett continues her active involvement as chairperson of the association's academic task force. The committee is trying to address the fact that many U.S. schools of nursing have dropped surgery as a specific curricular focus. "Students may get a brief clinical experience in a surgery unit as part of another nursing focus, but few are getting extended exposure to the discipline. Curricula are crammed full, and schools argue that they can't add an operating room clinical experience," Fawcett said.

The average age of operating nurses in the United States is higher than the overall average age of all nurses, which indicates that fewer new nursing graduates are entering the field. To make up for the lack of specific OR education at university levels, she said, nurses hired for surgical positions today typically don't start actual work for six months to a year, while they completed on-site training at their hospital.

AORN is putting together a database of schools that offer OR education as an elective. The group has also documented that fewer OR nurses are opting to teach in schools of nursing, so there is less mentoring of students to enter surgical nursing. Fawcett and Diana Sullivan, an operating room nurse at IU Hospital, plan future research on nursing faculty attitudes toward providing longer clinical experience in operating rooms.□□

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