Preoperative screening program reveals missed diagnoses and reduces mortality

Cancelled surgical procedures at Carilion Roanoke Memorial Hospital (CRMH) in Roanoke, Virginia, are considered a success rather than a failure. “That’s because we cancel procedures for cause,” says Sandy Fogel, MD, FACS.

Before 2010, many patients at CRMH were having surgery with undiagnosed, untreated medical problems, and postoperative 30-day mortality was too high.

After a preoperative screening clinic was set up, however, postoperative 30-day mortality was cut almost in half at CRMH, a 763-bed hospital with 31 ORs.

These days, a patient who is found to have an abnormal ECG during preoperative screening, for example, may need a stress test and an angiogram, so the surgery is cancelled.

“That’s a potential cardiac complication or death we have avoided,” says Dr Fogel, a general surgeon and the American College of Surgeons National Surgical Quality Improvement Program (ACS-NSQIP) champion at CRMH.

Quality report prompted change

Implementation of the preoperative screening clinic was spurred by CRMH’s first ACS-NSQIP report after becoming a member in 2007.

“Our first report showed that surgical mortality was significantly higher than expected and significantly higher than the national average,” says Dr Fogel.

He put together a working group to review patient charts and find the cause of the high mortality rate. This group consisted of both physicians and nurses who reviewed charts and brought their different perspectives to the project.

“The single finding that made us think we were operating on patients with undiagnosed diseases was that admitting nurses were reporting that patients were short of breath at rest and there were no diagnoses in the chart to explain why,” he says.

Looking further, the group found that 42% of hyperglycemic patients were not diagnosed as diabetic. They also found patients with angina who had no diagnosis of coronary artery disease and hypertensive patients who had no diagnosis and were not on any medications.

Preoperative screening lacking

Because southwest Virginia has a relative shortage of primary care physicians and because primary care physicians in Virginia aren’t reimbursed for preoperative screening, it became habit over the years for surgeons to do their own screening, notes Dr Fogel. “As we discovered in our chart reviews, many of the patients were not adequately screened preoperatively,” he says.

The NSQIP findings prompted Dr Fogel and other surgeons to first seek help from the primary care physicians. But it would have been overly burdensome and time-consuming to do complete preoperative screening of all surgical patients.

The surgeons then considered other preoperative screening models:

- A preoperative screening service run by hired primary care physicians. This idea was rejected because the hospital wouldn’t be reimbursed for the preoperative assessments and therefore didn’t want to pay additional salaries to physicians hired
for that purpose. In addition, the patients’ primary care physicians would be cut out of the loop with another primary care physician taking care of their patients.

• All histories and physicals done by nurse practitioners. This model was deemed too expensive, and the surgeons decided it would take too long to find and hire the 10 or more nurse practitioners they needed.

• An anesthesiologist-run clinic. Anesthesiologists were also in demand for clinical duties and could not be spared.

Finally, the surgeons decided on a preoperative screening clinic run by RNs. To help them develop a screening tool, the surgeons asked primary care, internal medicine, cardiology, pulmonary, and infectious disease practitioners what specific questions they usually ask their patients to pick up on a disease.

The final list of questions was made into a computer-based checklist for the preoperative screening nurses to use, and it was incorporated into the hospital’s electronic medical record.

**RNs screen all patients**

The preoperative screening clinic was opened adjacent to the hospital in 2010. Every patient scheduled for surgery is required to undergo a preoperative assessment by a nurse.

There are 15 nurses in the preoperative clinic who work from 7 am to 8 pm in staggered shifts to accommodate the patients’ schedules. They assess 100 surgical patients per day, including endoscopy patients.

Spending approximately 1 hour with each patient, the nurses discover an enormous number of undiagnosed problems, says Dr Fogel.

Some of the screening is done by telephone. For example, a 20-year-old man scheduled for an inguinal hernia repair would not have to be screened at the clinic unless the nurses found problems during the telephone assessment.

If a problem is identified in the clinic, the patient’s primary care physician is contacted. Because the primary care physicians are now seeing the patients for a particular problem such as uncontrolled diabetes, an abnormal ECG, or uncontrolled hypertension—not just for preoperative screening—their time is better spent, notes Dr Fogel.

If the primary care physician prefers to have a patient assessed by a specialist such as a cardiologist, the preoperative screening nurses make all of the arrangements for the patient.

Dr Fogel notes that when they were setting up the clinic, they persuaded each specialty service to keep open slots each day for these urgent preoperative visits.

“We have been pretty successful in getting that accomplished,” he says. To help with this, patients now come to the clinic 1 to 2 weeks before surgery instead of 2 to 3 days ahead. “If we pick up abnormalities, there is either time to correct them or time to postpone their surgery,” he says.

**Mortality cut almost in half**

“After implementation of the new preoperative screening clinic, overall 30-day surgical mortality decreased from 3.5% to 1.9%, which is clinically and statistically sig-
significant,” Agathoklis Konstantinidis, MD, told OR Manager. Dr Konstantinidis, a general surgery resident at CRMH, compiled the preoperative screening data for a presentation at the ACS-NSQIP National Conference in July.

Between July 2007 and December 2009—before the preoperative screening clinic was started—the odds ratios for 30-day mortality in all cases were 1.40, 1.43, 1.58, and 1.56 in successive ACS NSQIP 6-month reporting periods (chart).

Beginning with the first report after implementation of the preoperative screening program in 2010, there was a progressively decreasing odds ratio for 30-day mortality in successive reporting periods: 1.26, 1.19, 1.14, and 0.86. In the last report in 2012, the odds ratio dropped to 0.84, says Dr Konstantinidis.

Of more than 20,000 patients who were screened in 2012, 5,866 patients had some previously unidentified risk factor:

- 3,691 had undiagnosed obstructive sleep apnea
- 2,361 had an abnormal preoperative ECG
- 437 had undiagnosed diabetes
- 192 had undiagnosed hypertension
- 67 had undiagnosed shortness of breath

Other risk factors also were found, and some patients had more than 1 undiagnosed problem.

In 2012, as a result of the screening, surgery for 218 patients was cancelled and 147 were referred to cardiology specialists for further evaluation. In the past, operations were performed without knowledge of patients’ risk factors, Dr Konstantinidis notes.

The last time Joint Commission surveyors visited the hospital, Dr Fogel says, they were shown the results of the preoperative screening process, and the Joint Commission asked CRMH to put it on their website as a best practice.

“We are very proud of that,” he says.

—Judith M. Mathias, MA, RN