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## ‘Multivariable testing’ aids process improvement

*Statistical analysis is key*

Results are “preliminary but promising” with the use of something called “multivariable testing” (MVT) to identify and implement ways to improve patient satisfaction at Blount Memorial Hospital, says **Richard Hall**, RN, MBA, chief nurse executive and assistant administrator.

Using MVT, Hill explains, the 304-bed hospital is simultaneously testing a number of improvement ideas, individually and in combination, to determine which activities result in improvement, which don’t have any effect, and which actually have a negative impact.

Blount Memorial in Maryville, TN, is working with QualPro, the Knoxville, TN-based company that developed the MVT process, on a six-month project focusing on its emergency department (ED) and operating rooms.

One test involves next-day follow-up calls to patients who have been treated in the ED, Hall says. “We do call-backs anyway to talk about whether they have any questions or if Johnny still has a fever.”

Now the staff member making those calls also asks about pain management and about the customer’s overall satisfaction with the ED experience, as well as whether he or she would recommend the facility, he adds.

Compared to traditional ways of measuring customer satisfaction, Hall says, “we have a month’s worth [of data] in one day. We see 120 to 140 people a day in the ED, so that makes it statistically significant for us.”

As expected, he notes, two things the hospital already was doing were validated as improving throughput and patient satisfaction. “One was having the ED physicians write admission orders, based on signs and symptoms, rather than waiting for the specialist, and the other is that we have an admissions holding area for patients we’re not sure are going to be admitted.”

In another instance, the variable being tested was successful in two ways, one of which was totally unexpected, Hall says.

The hospital developed scripts for ED personnel to use in explaining to patients the reasons for their wait times, and to lay out expectations for what the ED visit would entail, such as “seeing the physician, asking questions, having tests run,” he notes.

The idea was to enlighten people as to why they were waiting, but in the process of doing that, staff became more focused on the need to keep people from having to wait, Hall says. As a result, he adds, “they got more creative in getting people back to the treatment room,” which resulted in improved throughput times.

“Without this system,” he adds, “we wouldn’t have discovered that. You make changes all the time, but you don’t always know if they will result in improvement.”

Historically, process improvement efforts involved “having a consultant come in, say, ‘this is the problem,’ and then, ‘Here is what has worked in other hospitals—we think it will work here,’” recalls **Samuel Evans**, MD,

the hospital’s medical director and administrator of the OR piece of the Blount Memorial project.

“You end up looking at ideas, saying, ‘Try this,’ and if that doesn’t work, ‘Try something else,’ and eventually you get frustrated and quit.”

By testing several ideas at the same time, he says, “you have proof of what is helping and what’s not. The technique used is very intensive on the statistical side.”

QualPro uses an MVT categorization process, a company news release states, “to narrow test ideas to only those that are practical (easy and safe to test and implement with current resources), fast (quick to implement with current resources), and cost-free (no increase in operating cost or capital).”

Experience has shown, Evans notes, “that about 23% [of test ideas] will help, about the same percentage will hurt, and the rest of the variable will do nothing. There is no way to predict which will fall into which category.”

To prepare for the OR portion of the project, he says, sessions were held with surgeons, anesthesiologists, and OR staff. “We asked, ‘What are your problems and what do you think will help?’ We took all the ideas everybody had and analyzed them and came up with 23 different variables to test.

“One day we test two or three variables, the next day we change and do two more, and we do that for 30 days,” Evans continues. “Then we collect all the data and do a statistical analysis and say, ‘It appears this variable is helping, this one is also helping, this is not helping at all and is actually hurting.’”

At that point, some of the variables are eliminated, and there is another series of tests on the smaller group, he adds, “and we see what helps.”

One of the tests involved notifying surgeons the day before to verify scheduled procedures, Evans says. As a result of this advance check, he notes, “sometimes [the surgeon] decides to change the plan, or discovers there is an error in how it was recorded.”

Catching such glitches a day in advance, he notes, prevents last-minute cancellations that irritate patients and family members, delay turnaround time, and cost money “because the room is set up for one patient and you’re changing to another.”

“One of the things we’re doing to improve customer satisfaction is to be sure to communicate with family members so they have a better indication of when to be here, what time the surgery will begin, and when it will be over,” Evans says. “We look for ways to stimulate staff so they know to communicate that information at certain points.”

Hall points out that “while the literature is full of good ideas” for process improvement, the difficulty lies in identifying those that can be implemented and will actually result in improvement for the patient.

“We’ve got to make our resources count to the fullest for our patients and maximize all opportunities to do so,” he adds. “This system helps us know in advance whether long-term implementation of those resources will make sense.”