

Labs add safety net to critical values procedure

Valerie Neff Newitt

March 2019—A hypercritical value notification policy at Northwell Health in New York State authorizes the laboratory alone to activate a hospital's rapid response team when necessary. This is the newest step in a critical value notification process that had been working well—but not quite well enough.

A rare communications breakdown at a Northwell Health hospital nine years ago involved a critical lab value that delayed a patient care intervention, which eventually resulted in an untoward sentinel event.

In response, Northwell Health leaders devised and implemented a hypercritical value notification policy to reduce notification time and expedite patient evaluation and treatment. The new policy also empowered laboratory professionals to send the hospital's rapid response team to a patient's room when a licensed clinical caregiver is not available to be at the bedside.



Castagnaro

"In late 2010 a patient in one of our EDs was determined to have succumbed due to a low hemoglobin count," says Joseph Castagnaro, vice president, laboratory services integration and operations, Northwell Health Laboratories. "The patient was in the ED where there were numerous caregivers looking after many patients. Sadly, when the one call came in with the critical hemoglobin report, it didn't get to the right person."

From the tragedy came the question: Can this be prevented in the future?

With laboratory and clinical leaders from across the health system weighing in, it was determined that the following laboratory values, if not acted on, could lead to serious patient harm:

- Glucose \leq 30 mg/dL
- Potassium \leq 2.0 mEq/L
- Potassium \geq 7.0 mEq/L
- Hemoglobin \leq 5.0 g/dL

Now when laboratory staff report on these values, they call the patient's unit and follow a standardized script, which begins with the lab staffer saying, "Do *not* hang up the phone. I'm calling with a hypercritical lab value."

The rest of the process goes as follows:

- Read back and document the test result and patient information.
- Confirm the patient's location.
- Clarify whether a rapid response team or physician is evaluating the patient.
- Communicate to the licensed staff member that the lab will call a rapid

response team to address the patient's status if a physician or RRT is not already there.

- Call the operator to request activation of a rapid response team to the patient's bedside.

"The clinical leadership had a problem to solve," says Dwayne Breining, MD, executive director of Northwell Health Laboratories. "We needed to prevent this small percentage—so small, it wouldn't even show up on the radar screen—of mishaps from ever happening again. Because, when it did happen, there was a horribly negative outcome that was potentially preventable."

May Kam Tso, BS, MT(ASCP), senior administrative director of the clinical labs, hospital lab operations, says Northwell Health, which consists of 23 hospitals, already had a "nearly perfect" communications system. "We already had a small number of critical values of which we notified floors on a timely basis, yet sometimes clinical staff did not apply the appropriate interventions in the timeframe we expected."

In a systemwide review of patient outcomes related to critical laboratory values, Northwell Health leaders found a small number of cases in which the appropriate floor personnel were notified in a timely manner but the appropriate clinical intervention did not take place quickly enough to affect the outcome. In some of these cases, Dr. Breining says, it seemed as though more rapid escalation could have potentially led to more timely and effective clinical intervention, particularly in some cases in which laboratory test results were significantly worse than the critical value threshold.

Division chiefs from Northwell Health hospitals met for six months to brainstorm. "After many brainstorming sessions, we realized a few things," Dr. Breining says. "One, that the critical value notification system we already had in place was pretty effective, getting the right result to the right place in the right time period virtually 99.9 percent of the time. Two, any significant revamping of that system was as likely—probably more likely—to result in a decline in performance as it was to cause improvement. And, three, engineering an additional system to get at this significant but very small percentage of cases, which could occur anywhere in any of our facilities, proved extremely challenging and could easily result in an operation significantly more resource-intensive than was feasible."

The solution, then, was to not disturb the existing functions that almost always performed well, but to add a layer to catch the few cases in which things moved too slowly.

Tso says the goal became to strengthen "the existing infrastructure and communication system to implement a safety net for a large and complex health system."

Rapid response teams in general have been shown to be effective in improving outcomes in the hospital setting, Dr. Breining says. "What is unique about our new process is that in specific instances the RRT is initiated directly from the laboratory."

Once they had a plan, they also had a little pushback. "No one initially wanted to champion it," Castagnaro says. "No one wanted to stand up and say, 'I'll take it and run with it.' There was reluctance because some people felt this was overkill perhaps, in reaction to a situation that might never occur again. Others said, 'It's not my area' or 'It's not my responsibility.' Everyone already had plenty to do."

Pushback came primarily from the clinicians who were already part of the rapid response teams, Dr. Breining says, noting the RRT and medical leaders in the hospitals were concerned about false alarms.

"But the lab has solid, hard, objective data," Dr. Breining says. "We went through the data in our LIS, set the parameters on the four values we thought were worthy of this RRT activation, and could see how many times the RRT would have been triggered, based on that data. We could tell maximums per day and per week. And even in those cases, an alert wouldn't necessarily have been activated, assuming clinicians were already on the floor. So

everyone became more comfortable seeing reasonable numbers and knowing this was not something that would be encouraging 12 false alarms a day.”

They also knew there would be less activation in some hospitals than in others. Some ICUs and critical care units always have a care team at the bedside, Dr. Breining says. Some areas were excluded from the initiative in some hospitals. “In our post-anesthesia care units, for example, there is always a caregiver at the bedside monitoring a patient.”

There was laboratory pushback too. “It was very unnerving for our lab folks,” Castagnaro says. “Unless you’re a blood banker, it’s rare that lab folks get that close to the patient.”

“Of course people in the lab were worried,” Tso agrees. “They hesitated in the beginning. But we worked to involve them right from the start, and we came to understand their concerns. Someone suggested we develop a standardized script for the calls they would make. Once there was a format to follow, they felt much more comfortable.” Adds Dr. Breining: “As we honed and scripted the process quite rigidly and made it a firm algorithm to follow, lab people were protected from potential mistakes. The algorithm was a protective shield.”

At each hospital, standard operating procedures had to be determined. “We have been living by the mantra that evidenced-based, scientific, medical best practices need to be universal. However, we’ve learned it is okay to allow some variation in the process, and found that the best fit for the local site can enhance the effectiveness of a procedure,” Dr. Breining says, adding, “Operations are often highly local and acceptably variable.” As long as the process overall functioned well and wasn’t threatened, he says, “we had a much better chance of durable success by working in concert with local staff practices, rather than forcing unnecessary total local practice adjustment to a new process.”

Academic, tertiary care hospital ICUs tend to have large care teams at the bedside, while a smaller community hospital might have one intensivist in that unit for one or two shifts in the day. “So when you map this type of process against those staffing models, it changes,” Dr. Breining says. “In the tertiary acute care center, a cardiac care unit would likely be excluded because a care team is always there. But in a small hospital, they may feel understaffed in that area and would welcome a process like this to bolster that staffing difference.”



Tso

When developing an SOP, it is essential to think of what other downstream departments might be affected, Tso says. “Right from the get-go we included all the stakeholders—hospital administration, CMO, CNO, nursing education, RRT chief, lab medical director, lab administrator, communications department. Even IT was included because we needed to create an LIS template to pop up when we get this type of hypercritical result so that we can document when and why an RRT is activated, who spoke to whom, et cetera.”

The next step was training at each site. “It was a combination,” Castagnaro says, “of the local medical leadership understanding this was happening, followed by education for local clinicians, nurses, hospitalists, and RRT members. And of course lab techs who were going to be making the phone calls had to be trained in what to do when they receive one of these hypercritical values, and exactly how to report it.”

One of Northwell Health’s tertiary care hospitals implemented the new policy in 2012. After the laboratory activated the rapid response team for the first time, Tso says, “People in the lab felt elevated, empowered, and connected to the patient. They felt they were taking an active role at the forefront of patient care—no longer passive and in the background.”

Every case in which the laboratory activated the RRT was reviewed with clinical leadership, Dr. Breining says. “It was an exercise that provided valuable insight into every operation on every unit touched by the process.”

In about half of the lab-triggered RRTs, he says, there was consensus that there was a reasonable likelihood that a very bad outcome was prevented, though he’s quick to note that it’s impossible to know what would have happened had the intervention not been escalated.

The system’s other hospitals implemented the new initiative between 2016 and 2018, and Tso says participants “feel welcome and engaged with our culture and our entire organization. Such great engagement helps the entire health system to further improve quality patient care and satisfaction.”

Tso, Castagnaro, and Dr. Breining say that the initiative has triggered a change in culture at Northwell Health, with a combination of things having occurred over time. Says Castagnaro: “We’ve actually retrained our clinical folks at the bedside to take greater notice of critical values in addition to these four hypercritical values. Furthermore, I know many hospital labs over the years have talked about calling in critical values and getting put on hold and then waiting 15 or 20 minutes, or they may never effectively have gotten that report through. Now when a lab calls a critical value, everyone is much more responsive and attuned to making sure someone is at the bedside. We like to think we have helped to change the culture for the better.”

Rapid response team activations by laboratory, pilot hospital

Pilot hospital	2012*	2013	2014	2015	2016	2017
Total hypercritical values	207	489	579	709	724	822
K+	111	222	260	326	286	344
Hgb	65	174	214	316	342	416
Glu	31	93	105	67	96	62
RRT activations	25	23	7	3	6	0

2012* Data: August to December

Tso recalls one incident in which the lab called with a hypercritical value and a nurse was already at the bedside so there was no need to activate the RRT. “But a few minutes later the nurse herself activated the RRT. I think this is evidence that awareness of the importance of the hypercritical values has improved and made nursing staff more concerned and conscientious about those values.”

Dr. Breining senses “a palpable morale thing.”

“It’s difficult to put a finger on it exactly,” he says. “But putting this process in place has made a tighter integration and interlocking of clinical and lab teams. It gives a real-world demonstration of how well a process can work when we all work together and communicate clearly.”

He points to what he sees as an “endless opportunity” for laboratories to capitalize on their existing, robust notification and communication systems. “As health care systems continue to face ever-increasing pressures to do more with less, we are realizing we simply cannot afford to build a new infrastructure for every new initiative undertaken, nor can we outsource. Laboratories, by definition, are highly reliable systems for distributing highly targeted, reproducibly accurate information, and they could easily be even more. This existing communication and coordination infrastructure can be a powerful low-cost/no-cost tool on which to quickly implement clinical processes that are needed.” Says Tso, “We used essentially no additional resources to roll out the systemwide initiative to provide value-added patient services.”

Nothing had to be built, and no additional staff or computers were needed, Dr. Breining says. “We are all told to do more with less and to do it efficiently. How do you solve that riddle? By optimizing resources and finding a way to add a slight variation on to a process that already exists and on to infrastructure that is in place.” And it’s just the start, he adds. “We can apply this to other areas; outpatient side may be next. There are many arenas whereby bringing the lab closer to actual clinical resources activation and allocation can unburden some of the clinical

services, allowing them to do other things and cover more patients.”

Those with experience in operations management and improvement recognize that once a process operates at above 97 percent efficiency, Dr. Breining says, trying to get that additional three percent to hit the 100 percent mark “is often the most difficult thing they will ever do.” And yet Northwell Health’s critical value reporting had been perched at a near-perfect 99.9 percent efficiency. “So I guess there really is such a thing as improving upon perfection. It is the Holy Grail,” he says. “That is something I am so proud of.”□

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