

Mass casualty plan puts point-of-care testing in the ED

Valerie Neff Newitt

May 2019—If a mass casualty event brings patients to Le Bonheur Children's Hospital in Memphis, Tenn., clinical laboratory staff will head straight to the bedside.

Le Bonheur Children's Hospital is a level-one trauma center. Its new mass casualty response plan, two years in the making, has laboratory staff in the emergency department and triage areas, where they will perform point-of-care testing for frontline providers.

"Having medical lab scientists just sitting in the lab waiting for blood to come to them made no sense," says laboratory director Lisa M. Griffin, BS, MT(ASCP). "Instead of keeping them away from where all the injured patients are, we decided to send the techs to them. It's the best way to use the trained, professional human resources we already have."



Benson

The plan grew out of a conversation Griffin had with Kelley Benson, BS, MT(ASCP), point-of-care specialist, about the challenges mass casualties present, and it led to their working with the trauma team and the ED on the plan's details. Griffin and Benson's first thought was to recruit respiratory therapists who are already trained and competent in accordance with CLIA regulations and could easily run the lab's CG8+ test cartridge on the POC i-Stat machines instead of the G3+ cartridges that the respiratory therapists typically use. "However, in a mass casualty disaster situation," Griffin says, "the RTs would be overwhelmed and not a good fit."

The next thought, Benson says, was to train the more than 100 ED nurses on the i-Stat, which on further consideration seemed impractical, too. Keeping RNs competent on an analyzer they would rarely use, she says, "would be a nightmare," and nurses would already be needed for countless tasks in the course of a disaster.

"I had an epiphany," Griffin says. "We had medical laboratory scientists sitting in the core services laboratory who are all competent on the i-Stat and other assays needed by physicians." They could be partnered with phlebotomists who could collect the specimens that technologists would process at the bedside.



Revels

The efficiency of the idea was appealing. Anissa Revels, MSN, RN, trauma program director, says, "Having technicians who focus on labs, know exactly what the doctor is asking for, and know what we have in place to draw for critical situations like these could be monumental in the ED. Because lab professionals have that duty and maintain that capability and readiness, they could save a lot of time for the rest of the frontline staff who otherwise would have to figure out things like which tubes to use for various tests, and muddle through that process in the

midst of possible chaos.”

The result is a new laboratory response team composed of 10 MLS volunteers. The request for volunteers was made by email, “using very explicit language,” Griffin says. “It asked lab staffers to consider if they could handle the sights and sounds of trauma. A lot of people can’t. Like me, for example. I like my blood in a tube, not all over the floor.”

Two staff members from every shift stepped up. “And of course they are all competent on the i-Stat, which was the critical piece,” Griffin says.

The emerging plan called for the team to perform essential tests on disaster victims, but someone had to decide which tests were essential. Blake Robertson, Le Bonheur’s director of support operations and emergency preparedness coordinator, turned to Le Bonheur medical director Rick Hanna, MD, for input.

“I said to him, ‘Here is your current list of lab tests in your downtime packet.’ It looked like a complex tax form,” Robertson says. “It had to be pared down to essentials; simplicity would be the key. Dr. Hanna said he’d only need this, this, and this.” That direction translated into a test menu that consists of:

- urine pregnancy test (needed if the patient must have an x-ray).
- hematuria test for blood in the urine, possibly indicative of internal injuries.
- i-Stat CG8+ cartridge tests, which include sodium, potassium, glucose, ionized calcium, hematocrit, pH, PO₂, and PCO₂.

As each phase of the mass casualty plan took shape, new considerations emerged. Primary among them was finding a way to identify and keep track of patients in a chaotic and transient environment. If systems were down, where would lab results be recorded? How would physicians find results for specific patients whose identities might still be unknown?

Robertson had attended a disaster planning conference after the 2011 Tuscaloosa-Birmingham tornado in Alabama (64 fatalities, 1,500 injuries). He learned that Tuscaloosa’s 500-bed, “disaster-prepared” DCH Regional Medical Center, which escaped devastation by a scant quarter-mile margin, had provided care for about 1,000 emergency patients within nine hours.

“What stood out to me most was that of those 1,000 patients, only 131 actual medical records were generated,” he says. “They lost systems, lost information on those patients. They had no way to follow up with them, locate them, or recoup any costs on them. They were in really bad shape.”

DCH Regional realized post-disaster it needed a paper chart of sorts to employ in situations when electronic health records are not usable. So they put a few basic forms into a manila envelope and were done.

“I took what they had done and started a journey of discovery with all the key departments at Le Bonheur,” says Robertson, who formed an ongoing focus group which began with frontline clinicians and care providers in the ED, then grew to include laboratory, radiology, registration, and the full trauma team. The aim was to design and build a medical record that would be given to, and remain with, every patient who entered the door during a disaster. It would contain basic and precise information that clinicians would need to treat each patient as they moved through the steps needed for their care.

The resulting portable medical record packet is a spiral-bound booklet that has a barcode on its front, specific to the patient to whom the record is given. A similarly barcoded wristband and additional barcoded identification strips that can be removed easily and affixed to such things as records and test tubes are inside the book and travel with the patient. The book also contains a few essential forms that make up the paper medical record that can be used during a disaster.

"A barcode is slapped onto any form completed within the book and thus corresponds with the patient's wristband," Robertson says. "Everything is designed to be easy to access, easy to use. We stripped out all of the unnecessary lab tests and took it to the bare essentials that lab techs, ED doctors, and nurses would need to manage that patient's care." In chaos, he adds, "simplicity is paramount."

The hospital also employs a patient tracking system. "We have two iPads and an iPhone staged to be deployed in these situations," Robertson explains. "Our registration team is trained to enter the identifying barcode, enter in whatever basic information we have—name, age, acuity. And if the patient is unconscious, can't speak, or won't speak, we can take a quick picture or video as part of this digital record." The app stores everything on the device and then uploads to a secure server if the network is in place. If networks are down, it will save the information to the device; when network activity is reestablished, it will transfer the information to the secure server.

Other means of tracking patients would also be required, Robertson says. "There will be needs for actual written records, so registration is on board with taking the portable packets and, after the fact, scanning them into the electronic medical record when feasible. We will also use runners to carry messages, and other communication methods, such as walkie-talkies, to help track where patients are and to get the right results to the right doctors."

As the overall mass casualty plan came together, Griffin says, various groups broke off from the original focus group to better determine how each area could fine-tune its emergency response. For the laboratory, this meant devising a way to have the required equipment available and quickly en route to the ED during a crisis.



Griffin

"We didn't want to buy anything we don't normally need or waste resources since, hopefully, we will never have to put this plan into action. So we will use equipment we already have," she says. What is new are equipment carts for the lab response team. "Each cart is labeled with every item the team member needs to put on it—test cartridges from the POC office, an i-Stat device, a printer, a tape dispenser, an ink pen, et cetera. We estimate it will take less than 20 minutes to get the cart equipped, to the ED, and operational." Once there, the technologist will not leave the patient until all results are complete. "Typically it would take 30 to 45 minutes to get those results from the lab to the ED; now it will take three to five minutes. It's a huge difference," Griffin says.

Robertson says one of the first challenges he encountered was convincing clinicians to pare to the bare bones their must-have lists to be included in the portable medical record. "People initially wanted too much information in the book. We had to get rid of the 'we might need' items and get it down to the 'we must have' items. You must insist on something easy to work with or you will end up with something the size of a phone book," he warns others who want to implement a similar plan.

Robertson is still experiencing challenges as the plan evolves. "We are still trying to figure out blood typing—how to get the right blood type to the right patient. We are teaming with the blood bank on that," he says. "The current plan calls for the barcode to go on one of the vials that will go to the blood bank. When whatever needs to be done with the blood is accomplished, the blood bank folks would make a record however they are able, considering that systems could be up or down. That record would then go back to the ED via a runner or a two-way radio communication."

Although one might reasonably expect there to be pushback against the plan to have medical laboratory scientists show up in a busy, crowded, and frenetic ED, that has not been the case. "Instead of saying they didn't want us there," Griffin says, "clinicians have actually said they want more of us there. In the beginning, we had planned for

lab folks to run tests on patients in an intermediate triage zone, not on patients who were critical. We thought we might find something like blood in the urine indicating internal trauma that doctors didn't know about. We thought we would find those who look like they just have a broken arm but whose injuries may be worse than that. But as we got into this discussion the doctors said, 'We need you even more on the critical side.' Our goal now—admittedly optimistic—is to have three carts that we can respond with. That way we can lend adequate coverage.”

An inevitable difficulty is that emergency preparedness is not a return-on-investment activity, Robertson notes, yet it requires a lot of work in an already taxing and work-intensive setting.

“It's just plain hard for people to carve out the time to figure out these plans and know what the right response will be. Everybody acknowledges it is important, but a lot of organizations meet just the bare minimum and don't go into the depth required when a disaster happens. Our leadership does have awareness and understanding of this imperative,” he says. Griffin credits lab leaders Alex Ryder, MD, PhD, medical director of clinical laboratories, and Ali Saad, MD, chief of pediatric pathology, as being fully supportive of the time invested.

It's impossible to know if a mass casualty plan is sound unless disaster strikes. “We don't have all the details ironed out and don't know that we ever will,” Griffin admits. “Every time we have another drill, issues emerge.”

The hospital conducted a “tabletop drill” in January to test the utility of the new plan. “We got everyone in the room,” Robertson says, “and created a mini-version of the hospital on tabletops, with one for incident command, the lab, ED, central supply, registration, et cetera. Then we brought in a bunch of paper victims and ran them through our process in this simulated hospital. It was a frustrating and eye-opening experience, confounding at times.”

Communication was the primary area found to be in need of improvement. “People on the floors do not always know what is coming their way,” Robertson says. “And we realized these paper disaster medical records might be completely foreign to clinicians on the floor if they've never seen one before. We realized we needed more internal training about what they are, how to use them, and when they might see them. So many little things came up when we walked through processes of specific scenarios or situations. Often they created more issues, more questions, more challenges. And that was exactly the intent.”

The mass casualty response will be put through its paces this summer when the hospital participates in an emergency preparedness drill as part of Centers for Medicare and Medicaid Services requirements. “It will be our first opportunity to fully test the lab response team and our disaster medical records,” Robertson says. Staff will go through the whole process with simulated patients. “And we will see all of the additional challenges and problems that will reveal and that we will need to solve,” he says, “the things that are still beyond our imagination.”

Griffin says the experience of working toward broadening the lab's emergency response within the hospitalwide effort has shifted the hospital staff into what she calls “possibility thinking.”

“We are all so used to being regulatory people, doing everything by the book. But in times of disaster, adjustments have to be made. At first it was hard for us to push past thinking, ‘I *have* to have a date of birth, I *have* to have a weight, I *have* to have an age.’ In an emergency it is about what is possible to have now and what can wait for later. When someone walks in with a tree limb through his abdomen, his first stop is not going to be registration. That can wait.”

Trauma program director Revels says events like the Tuscaloosa-Birmingham tornado, the Las Vegas shooting, or any number of other such events require providers and hospitals “to step up and meet the needs we would have if this were to happen to us. These events around the world are not fiction. They are real; they are happening. We hope and pray this does not happen here, but if it does, we'll be ready.”

Robertson recalls that at the DCH Regional Medical Center in Tuscaloosa after the tornado, health care workers were using Sharpies to put identifying names and numbers on the foreheads and arms of the injured patients. “Our

ED now has three cases of Sharpies squirreled away,” he says. “And from the Las Vegas event we heard that one of the facilities experienced so much blood in the ED that it was freaking out the nonclinical and non-ED folks who weren’t used to seeing floors wet with blood. Now our ED has a 50-pound bag of blood-absorbent material stowed away.”

In preparing for extraordinary events, “Anything we can do to talk about the what-if situations creates a readiness mindset,” Robertson says. “It builds relationships between all of the departments working toward a preparedness goal.” Since he and the others undertook this work, he has heard: *It’s great that we have this entire collective of departments able to work together. . . . It’s wonderful to be able to put faces to names. . . . It’s comforting to know what people are going to be able to do.*

“And I hear clinicians say, ‘Wow, lab is actually going to come to the ED to do this work. That eliminates the giant step of having to send a sample to the lab and wait for it to come back. It eliminates the possibility of misidentifying, misplacing, or losing track of a patient. It is amazing.’”□

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