

CATalyst for Change:

How Members of WellSpan's Central Alert Team (CAT) Are Revolutionizing Sepsis Care



By **Caitlyn Allen, MPH**
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In the United States, almost 1 million patients with sepsis are admitted to hospitals annually, and the cost of managing sepsis admissions is higher than any other disease state.¹ Early identification and treatment are critical for survival, though both are notoriously difficult as symptoms are often nonspecific.

Four years ago, WellSpan Health asked, “What if there were a way to provide real-time, meaningful clinical decision support to bedside providers to identify sepsis sooner and start lifesaving treatment?” Meet Margaret D’Ercole, Patricia Everett, Dana Gaultney, Angela Mays, Brenna Simcoe, and Cynthia Yascavage, who share how their Central Alert Team decreased mortality rates, increased bundle compliance, and proved there is a better way.

Caitlyn Allen: Tell me about the Central Alert Team (CAT).

Dana Gaultney (DG): We're a team of nurses with varied backgrounds: emergency room [ER], ICU [intensive care unit], home health, and NICU [neonatal ICU]. Because of our experiences, and because we operate remotely and are not in front of the patient, we are able to really dig through a chart and envision what that patient looks like to say, "Hey, there's potential for sepsis here."

We're here to connect the dots when the bedside staff is consumed with everything they have to do. We have this laser focus for sepsis and we're constantly looking for it.

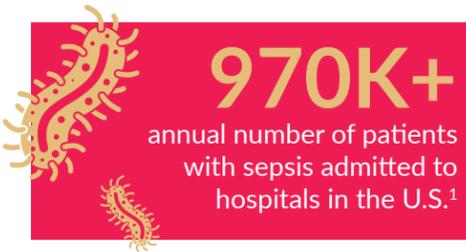
Angela Mays (AM): We're all experienced critical care RNs [registered nurses] with years of bedside experience seeing, touching, and smelling patients: all those things that bolster vital signs and reinforce, "They're sick, I need to do something."

I was worried about coming to this job and losing those sensory inputs. I'm happy to report: We developed this virtual sixth sense just from doing a chart review. We're able to say, "Oh my gosh, that patient is sick," and we've been right.

We came with critical care experience and we're willing to trust the technology and trust ourselves, and build and test, and build and test. Now we're at this point where we can pretty easily pick out the people on whom to pursue the sepsis bundle.

Because of that, we have built up a trust with the bedside team as well. When we say, "How about we start down the sepsis pathway?" They're like, "Yes, these people know what they're talking about." That has also helped us and the model be effective.

Patricia Everett (PE): It's been critical to understand how things work at the bedside and to work together as a team, especially understanding the timing of when to reach out. If they're intubating someone, maybe that's not the appropriate time to contact them. We want to



support them and work together for better outcomes for our patients.

AM: The bedside teams are so busy, and the patients who are coming in are just sicker overall. We're there to support the bedside team. For instance, keeping track of the times because sepsis is so time-sensitive.

Cynthia Yascavage (CY): Times and the vital signs. Especially during COVID, the bedside staff were all gowned up in other rooms and couldn't always monitor vital signs in real-time. There were a few times where we were the eyes in the sky and said, "Hey, your vital signs are a little low." We were keeping track.

Sepsis can be very difficult to diagnose and treat. Why do you think it is something with which hospitals have traditionally struggled?

PE: Sometimes sepsis doesn't present a clear picture when patients present to the emergency department. It can mimic a lot of other things.

DG: The majority of our patients come from the emergency department [ED], and they're really trying to narrow the scope of why the patient's there. They see patients anywhere from an infected tooth to cardiac arrest—the possibilities are endless. I think that broad-spectrum makes them consider every possibility.

AM: Sometimes too, when people come in with certain complaints, like chest pain, everybody in the ER first considers a heart condition. They were not treating sepsis until sepsis was like, "Hey, I'm pneumonia. I'm not a cardiac issue." Our team has helped to keep sepsis on everybody's mind while they are working up the patient for other things.

If sepsis bundles are known to be effective, why do you think that compliance has traditionally been low?

DG: Recognition [of sepsis] is the biggest thing. The patients who come in that look

very sick from an infection are identified quickly. It's the other ones that we are trying to wave the flag early and say, "Hey, let's consider this now, and we can start this workup while you're also investigating other avenues."

And then the timeliness of it. Because there's so much going on in the ED, and it's such a dynamic atmosphere, it's easy to get pulled away to something more critical, and that repeat lactic that's due is not at the forefront of your mind. Nor should it be at that moment. But we are here to say, "Hey, when you get a chance, this is due, or I can call the lab and get them to do that for you." We are a resource to get additional assistance.

Margaret D'Ercole (MD): They may not be thinking sepsis, but we are. "Hey, while you're drawing the labs, why not pick up the blood cultures and the lactic acid, just to be safe?"

AM: Before I started with this team, I didn't think of sepsis as "sepsis" unless they were sick, had hypotension, were tachycardiac. That was my picture of sepsis. But I think that picture has changed and is increasingly embraced by clinicians. We want to catch the patients before they're really sick.

We've been helping get that message through to everybody at WellSpan, because it is definitely our goal to make sure that sepsis is treated early and effectively.

Could this model be used more broadly than sepsis? If so, would it make sense to have a separate team or just expand the current CAT?

DG: We're getting alerts on inpatients and have stopped their decompensation. For example, a patient was on the floor, had decreased mentation and poor vitals and labs. The unit initially dismissed the idea he could be septic. And I responded, "Well, I don't know that he is either, but there's something wrong."

Hours later, the nurse messaged me back and said, "You were so right. He's in liver failure and he's going to the ICU." It had nothing to do with sepsis, but because of the alert and my digging through the chart, we were able to escalate that patient long before anybody else would have put it all together.

AM: That goes for the whole team. Even though sepsis is our lane, we're not going to put blinders on and ignore something because we don't think it's sepsis. We

have reached out and made some saves that have not been sepsis. And I think the bedside team appreciates that.

Back to your question, we're actually in the process of trying to operationalize other things using this model. We're not sure if it'll be this team that does it, or if we will have to develop another team. We do have another team in place—the central monitoring team—so some of the work might go to them too. But we're looking at operationalizing a deterioration index and potentially building a model around cardiogenic shock [a serious condition in which the heart cannot pump enough blood and oxygen throughout the body].

Having this central model, especially for health systems with more than one hospital, is helpful, because it allows you to cover a broad area with a small, centralized team that is, like Dana said, laser-focused on whatever they need to be laser-focused on. Prior to going with the CAT team, we had tried different models.

One of the models tried at York was a "boots on the ground" approach. They hired a dedicated sepsis nurse to join their rapid response team [RRT]. But as we said earlier, patients are just sicker. They have more comorbidities and preexisting diseases. When a patient is coding, the team's priorities, even for the sepsis nurse, may not be immediately on sepsis.

Their response times were not always where they wanted them. They were right around an hour, if not more. Our team is able to do all the hospitals within our system, and our response teams are generally under 10 minutes.

That's incredible.

Brenna Simcoe (BS): Some of our smaller hospitals did not have the boots on the ground resources, but by having this centralized team, you're providing the same level of care across the board and you're able to help the entire health system.

Smaller hospitals also see really sick patients in their EDs, and this model ensures patients are getting the same level of care everywhere across the system.

About how big is the team for about how many patients?

AM: The Central Alert Team provides services to eight hospitals within our health system, including six acute care hospitals of varying size and acuity. We currently have seven FTEs [full-time equivalents].

Over the past year our team has responded to 33,500 alerts on almost 18,000 patients. Our average alerts per day are approximately 90–100, but that swelled to about 135 alerts per day during our busiest month last year in December 2020. Our average alert response time is about 6–7 minutes, and this was maintained throughout the COVID-19 pandemic despite influxes in patients during times of surge. Our low observed-to-expected mortality across our facilities was also maintained despite the extreme challenges of the past year, which demonstrates the success of this model in its ability to deliver consistent and quality care despite many uncontrolled variables at the bedside.

Tell me about the implementation process. What guidance would you offer other hospitals who are interested in implementing a similar structure?

DG: Be adaptive. Very, very adaptive. We were making changes constantly in the beginning. Our directors and our initial manager put together the framework of the idea, but it was a team collaboration over the next few months to develop a working model. Every shift we would come in, we were like, "What's new today?" And be excited about it, not like, "All right, now, what are we doing?"

AM: Yeah, definitely. And standard work. Our standard work would sometimes change two, three times in a day, because when we went live, the idea was still very conceptual. We're still trying to optimize our standard work and our processes. We're not quite there yet but are definitely leaps and bounds ahead of what we were.

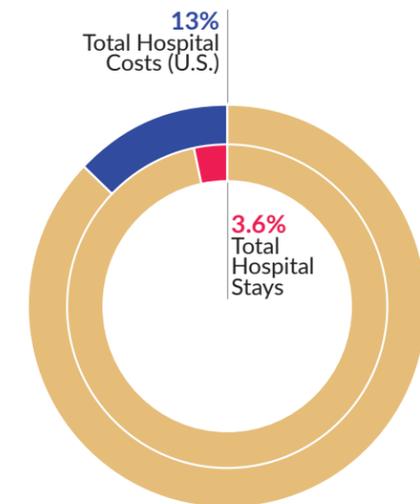
BS: For other places who would be interested in implementing this: Your team is important. These nurses are experienced and have the knowledge and experience to be able to build rapport and trust with the bedside team. If you don't have the right people in place, the bedside teams are never going to trust their recommendations.

AM: They need to know that the team is augmenting the great care that they're already giving. That was something we battled in the beginning: defensiveness and resistance.

How would you recommend others overcome some of that resistance?

AM: Education is key. Educate the bedside clinicians on what sepsis is, its early signs, the bundle, but also educate them on the team. Then they won't feel like the team's policing them or trying to tell them how to be a better nurse or how to do their job, or are punitive in any way.

In 2013, sepsis accounted for 13% of total hospital costs, but only 3.6% of inpatient admissions.¹



Fast Facts
Central Alert Team

Annual Alerts: 33,500 on 18,000 patients;
7 FTEs (full-time equivalents)

And get out there and talk about it. Meet people. Nobody really knew us when we first started. Epic [WellSpan Health's current electronic health record (EHR) software] went live at the same time we went live, so everybody was ramped up for Epic and I think we got lost. Some people didn't even know we were nurses. They thought techs or nonclinicians were telling them how to do their job.

When we realized there were misconceptions about our job—and subsequent resistance—we went around the floors with the “CAT cart” with candy and food, because that's what gets people to come to the cart.

They saw we were nurses who wanted to help them and be part of their team. That was the catalyst for culture change.

We listened to them too and made changes based on what the bedside team has said that they would prefer. We've also decreased some of the alert fatigue, because BPAs, these best practice alerts, are firing, firing, firing, and we're able to validate them. The data you get from any AI [artificial intelligence] or predictive analytics is black and white; we're able to fill in the gray area and determine whether we need to elevate the alert to the bedside team.

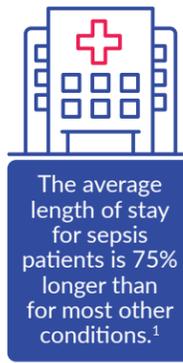
MD: We offer real-time critical thinking.

CY: We've also customized the technology and the alert quite a bit to ameliorate the alert fatigue and reduce the false positives and false negatives. Over time we've done a lot of modification: This wasn't Epic's stock sepsis alert. It's our custom tool we created from scratch based on a previous alert tool we used with Cerner [WellSpan's previous EHR software]. We're still making modifications.

What were some of the changes you made from the standard alert to what you are currently using?

CY: We use five different alerts that take into account many different factors like patient labs, vitals, etc. The ones for the patients presenting to the ED are more sensitive than ones for an inpatient. When the patient comes in the ED, they could have anything, and they haven't been seen yet, so you need to make those more sensitive so you're capturing all the patients who could have sepsis.

AM: The ED has its own additional, extra-sensitive alert that can trigger immediately after triage if there's the potential. That's fairly unique.



Building on this idea of the clinical decision support, as technology like artificial intelligence continues to improve, how might that drive further success?

BS: While our alerts are very good, we're not capturing 100% of patients perfectly. As the models improve and you're able to pull in more data points, the learning models will improve with time too. We'll be able to identify patients even earlier than we are right now and cast the net a little bit wider to be more accurate in who is alerting.

Technology is great, but you still need that human factor to take that alert and integrate it into the bedside care.

A lot of other places have used alerts and similar tools and haven't been as successful, so I think it's really the people at WellSpan who have made this model successful. Integrating technology with humans to have a good outcome is not easy, and this team has done it amazingly well, and so kudos to them. It's amazing what we've been able to accomplish by integrating those two things together very well.

The CAT development process focused on three core components: enhanced judgment, human factors, and communication across the care continuum. Tell me more about why these three were selected and how they interplay.

BS: You have to connect those three dots to make it successful. You need the technology piece, but you also need good communication, and then people who make a human connection with that patient. That bedside team is still interacting with the patient and the patient's family. Is this the right care for this patient at this time? Each of those things won't work by itself.

CY: Collaboration between the team and the family is key. We may decide they're septic and come up with a course of action, but

then the family declines, so we need to work together to come up with an alternative.

DG: We also follow the patients beyond the initial sepsis workup. If they re-alert as an inpatient, we will check to see if, for example, the sepsis bundle was done yesterday, or if today their white [blood cell] count changed. Maybe they're still running a fever. Back to providing real-time critical thinking, we can make sure the doctor's aware at 3:00 in the morning if something's amiss.

AM: Before the CAT, it could take months for the bedside team to learn about the opportunities for improvement; now they're hearing them weekly. The CAT also helped with end-of-life conversations and helping the families decide if they wanted to be aggressive or not aggressive, not just with sepsis, but with other conditions too.

Because sepsis wasn't being identified as sepsis, we weren't coding for sepsis even when we were treating it. That was an opportunity as well, and that gap was fixed.

But as far as enhanced judgment, human factors, and communication: They are interconnected. Each patient is unique, each patient experience is unique, and patient conditions are unique depending on what their past medical problems are, what their medications are, what their goals for treatment are. It's a dynamic process, and we're a piece of that, helping to provide information to the bedside team to provide individualized sepsis care.

How do you think increasing antimicrobial resistance factors into sepsis care, as broad-spectrum antibiotics are typically a key part of treatment?

BS: The thing with sepsis, as we talked about in the very beginning, is that it mimics other conditions. However, the earlier you treat it with antibiotics, the better the patient outcome. One challenge is asking care teams to order antibiotics on a patient when they don't yet have a confirmed diagnosis of an infection. It takes time to get labs back, imaging back, to have that absolute confirmation of an infection. They are trying to balance the risk of giving broad-spectrum antibiotics to a patient who might not have an infection with the risk of not giving antibiotics to a patient who might have sepsis.

It's a careful balance with sepsis and you need to have a strong antimicrobial stewardship program on the back end to take

those antibiotics off when sepsis is ruled out. And once you know what infection or organism the patient has, you want to make sure you narrow your antibiotics therapy to target that specific bug and that specific infection. While, yes, you give broad-spectrum antibiotics upfront, you are trying to limit the amount of time you're giving broad-spectrum and targeting that specific infection once you do have more information, because you're right, you don't want to overuse broad-spectrum antibiotics, which will continue to contribute to resistance.

DG: About two years ago, we had an in-service [training] on changes the lab made to process blood cultures to help rule out bacteremia earlier and narrow the focus of the antibiotics.

AM: There is resistance for our providers to order an antibiotic before they know there's an infection, but there's also this three-hour window, or even one-hour window, when we should be striving to get a broad-spectrum if there's a chance of infection. That's where we help. We allow some time if they want to wait for diagnostics to come back, but part of our job is then to remind them in enough time to hang the broad-spectrum antibiotic.

It helps when you can have a collaborative conversation.

AM: It is a collaboration, especially when we can say, “Maybe it's congestive heart failure, or maybe it's an infection.”

Reference

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About the Interviewees

Margaret D'Ercole is a clinical III registered nurse with the Central Alert Team (CAT). She joined the CAT in 2019 with 30-plus years of experience in the intensive care unit, where she cared for critical trauma/surgical patients. She holds a Bachelor of Science in nursing and a certification in medical-surgical nursing.

Patricia Everett is a Central Alert Team (CAT) registered nurse (RN). She worked in the emergency department for 20 years and served as co-chair for the Performance Improvement Committee for five years. She was also a lead quality specialist for the Clinical Improvement Department before coming to work as a CAT RN.

Dana Gaultney is a registered nurse with the Central Alert Team (CAT) at WellSpan Health, which provides real-time monitoring and guidance in the care of sepsis patients across seven acute care hospitals. Dana has been with the CAT since 2017, when it was first implemented. She has a critical care background with nearly a decade of experience working in the York Hospital Open Heart ICU.

Angela Mays is the clinical coordinator for the Central Monitoring Services at WellSpan Health. In this role, she monitors and manages the daily operations of the Central Monitoring team and Central Alert Team (CAT), both of which take a centralized system approach to monitor patients. She has a strong focus in process improvement initiatives and joined the CAT in 2017, just prior to its implementation, and was involved in CAT development and growth. Angie came into this role with 18 years of intensive care unit and emergency department nursing experience.

Brenna Simcoe is a clinical program director for the Medicine Service Line at WellSpan Health. In this role, she collaborates with leaders across the health system to ensure successful implementation and ongoing maintenance and optimization of clinical outcomes in sepsis care. She is a pharmacist by training with over 10 years of experience in critical care and involvement in sepsis quality improvement initiatives and research.

Cynthia Yascavage is a registered nurse team member on the Central Alert Team (CAT). In this role, she centrally monitors and collaborates sepsis care across seven WellSpan institutions. She has a strong interest in education and quality improvement. Cindy joined the CAT in 2018, bringing 25 years of critical care emergency and education experience.



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