

HOW TO BUILD A BETTER APPROACH TO SEPSIS USING RESOURCES ON-HAND TODAY

Troponin changed the way physicians practiced in the ED, serving as the perfect biomarker to diagnose a heart attack. What if sepsis had a similar biomarker, its own version of troponin?

"That would be nice, but sepsis is far more complicated," says Faheem Guirgis, MD, emergency medical physician and research fellowship director at UF Jacksonville. "For one, the heart is just a single organ. Sepsis can impact multiple organs."

It would be nice if we had the luxury to wait for our own version of troponin to come along, but with the high costs of sepsis across healthcare systems, we don't. What can we do in the meantime to better diagnose it? We asked Dr. Guirgis and two of his colleagues for their expert insights.

They all agreed it was less about a single diagnostic or magic bullet, and more about a singular approach that holistically differentiates possible from probable sepsis patients.

In this, the last of our four-part series on improving sepsis management, we'll take a look at their ideas for "building a more sustainable system." For them, it boiled down to a combination of three key components – all of which are currently available in every ED across the country.

HERE'S WHAT THEY IDENTIFIED.



COMPONENT #1: EVIDENCE-BASED PROTOCOLS

There are any number of scoring systems in medicine – for organ failure to heart attacks – and they're among clinical best practices. "You'll hear people frequently reference them," says Dr. Guirgis. "What's your 90-day risk for stroke? Can that chest pain be quantified as high or low risk?"

There are useful scoring systems relevant to sepsis too – Prehospital Early Sepsis Detection (PRESEP), Sequential Organ Failure System (SOFA), and the National Early Warning Score (NEWS) come to mind – but none is quite perfect.

Murtaza Akhter, MD, an emergency physician at the University of Arizona, employs another rule to predict bacteremia in ED patients. While bacteremia is not sepsis, both Dr. Akhter and Dr. Guirgis agree there's value in predicting for it.

"If you can show somebody has a bacterial infection rather than a viral one in the setting of their clinical presentation, that's a step in the right direction," says Dr. Guirgis. "While there is such a thing as viral sepsis, it has far less morbidity and mortality than bacterial sepsis."

What system does Dr. Akhter use?

"I tell residents to follow the Shapiro rule, which gives certain major and minor criteria based on when you send blood cultures. You can draw the cultures – and still give fluids and antibiotics – but if the Shapiro rule isn't met, you can hold off on sending the cultures to the lab."

AN OVERVIEW OF **THE SHAPIRO RULE**:

MAJOR CRITERIA

- Suspected endocarditis
- Temperature above 103.0 °F
- Indwelling vascular catheter

MINOR CRITERIA

- Age >65 years
- Temperature
- Chills
- Vomiting
- Hypotension
- White blood cell count
- Platelets
- Creatinine

"Few seem to have heard of the Shapiro rule," says Dr. Akhter. "I think it's a good thing to utilize because, without, a lot of people wind up getting the whole sepsis bundle – whether they need it or not."

Because sepsis is a time-critical diagnosis, identifying ED patients at risk for bacteremia is important. Whether used alone or in conjunction with another scoring system, the Shapiro rule offers additional context that can help clarify whether patients fall in the possible v. probable sepsis category.

COMPONENT #2:

CLINICAL GESTALT

Perhaps no holistic approach to diagnosing sepsis is complete without a heuristic approach to decision-making. In fact, Dr. Guirgis describes clinical gestalt as the qualifying differentiator that makes another scoring system – the Canadian Syncope Risk Score (CSRS) – so successful:

"There are so many potential causes of syncope, which made it really hard to come up with a risk stratification tool. Finally, the Canadians cracked the code. If you look at it, what makes it successful is that a big piece of it is clinician gestalt. It doesn't involve a lot of biomarkers, but it does involve a few objective test results, like EKG findings. If you think it's X, or if the patient presents Y, then you apply these other things. It works well. I liken sepsis to that – though sepsis is a lot more complicated."

When it comes to sepsis, that complexity – plus the time pressures of the Sepsis Hour-1 Bundle – can sometimes work against clinical gestalt. "If you're going based on gestalt, there are a lot of people who don't want to take that risk," says Dr. Akhter.

Dr. Guirgis elaborates:

"There is this undifferentiated patient that comes to us sick and what they're asking us to do is, in an hour, figure out if they're septic or not. It has led to a proclivity to overantibiose. What I've been teaching my residents is that you can wait if they're not shocky, or hypotensive, or at death's door. You have some time to figure out what's wrong with patients – unless they're overtly sick."

While sepsis is a time-critical diagnosis, it's important for physicians to remember they often have enough time to rely on clinical gestalt. It's the difference between being proactive in their evaluations, and reactive to metrics currently in place.

66 When making a sepsis diagnosis, there's no magic bullet or holy grail. It all comes down to clinical gestalt and following the lab data."

- Frank LoVecchio, DO, Director of Research at the University of Arizona Maricopa Medical Center and longtime ED physician

COMPONENT #3:

RAPID DIAGNOSTICS AND POINT-OF-CARE TESTING

Without the right data points at the right time, scoring systems and clinical gestalt don't make much difference. That's why all three of our experts agreed rapid diagnostic results were the third pillar in their combination approach to diagnosing sepsis. When asked specifically about the potential value of a serial lactate in their point-of-care data-point arsenal, they all agreed.

Serial data points are better than just one. If I get an elevated lactate and start to treat the patient, the next one should show improvement, meaning their perfusion is improving with fluids, antibiotics, and the other interventions that we're doing. If it doesn't, that's concerning."

-Faheem Guirgis, MD

The lactate is a good marker. It helps you determine a couple of things. One is severe sepsis or septic shock, versus just normal sepsis. Two is fluids. Do I need to give a full 30/kg in fluids, or can I give a bolus? If the lactate is fine, then I've given enough fluids."

-Murtaza Akhter, MD

" I think if it looks like sepsis and lactates are persistently elevated after giving fluids, the data is clear – patients have a worse prognosis, and you should probably put them in intensive care. Lactate isn't the end-all be-all, but if it's persistently elevated or worsening, it suggests vou should look harder and be more aggressive if you can."

-Frank LoVecchio, DO

Dr. LoVecchio goes further. "Having a second lactate at bedside is valuable. It helps you decide whether the patient is a potential discharge or admission. Our hospital doesn't do point-of-care testing, which causes delays on all labs, and delays on decision-making."

The Surviving Sepsis Hour-1 Bundle requires EDs to run a second lactate test. To ensure that consistently happens, it's recommended to order the second lactate upfront. This puts the trending result in physicians' hands faster, giving another all-important reference point to differentiate a possible from a probable sepsis case.

THE PATH FORWARD IS HERE TODAY

There's no need to wait around for "the new troponin" or to simply shrug our shoulders and say the current approach to sepsis management "is what it is." While there's no single (or simple) diagnostic or protocol to definitively diagnose sepsis today, there are multiple ways to address the challenge.

We simply have to get better about using what's available to us.

With overburden and burnout rampant across many health systems that, of course, is easier said than done. But sometimes all it takes is a few incremental changes to unlock an even higher level of patient care. What's available to us today may not be perfect but does offer us a solid place to start.

And more than a little direction forward.

That concludes our series on improving sepsis management. If you found value in these articles, please consider sharing them with your colleagues.

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