

by KEITH GILLOGLY



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Sepsis alert

COMBATING A LITTLE-KNOWN SYNDROME
THAT IS BOTH COMMON AND DEADLY

BY THE TIME NANCY SCHOLLAERT Nichol arrived to see her family doctor after experiencing abdominal pain for five days, the visit didn't last long. She was immediately sent to the UPMC Northwest emergency department in Cranberry where she found out she'd need emergency gallbladder surgery. When doctors opened her up, they found gangrene and a ravaging infection that had triggered sepsis, a life-threatening condition. Nichol quickly grew worse, having entered septic shock. She remembers feebly consenting to being intubated and then, nothing—she'd next wake up emerging from a medically induced coma.

Sepsis is a condition that arises when the body's response to infection injures its own tissues and organs. During sepsis, the body's immunological defenses against pathogens drastically overshoot, resulting in inflammatory changes and collateral damage that can rapidly wreak havoc on tissue and organ systems. While we still don't fully understand why the body incites such a dramatic response, doctors are revamping their approach to sepsis to emphasize the aggressive, immediate level of treatment that's needed to save lives.

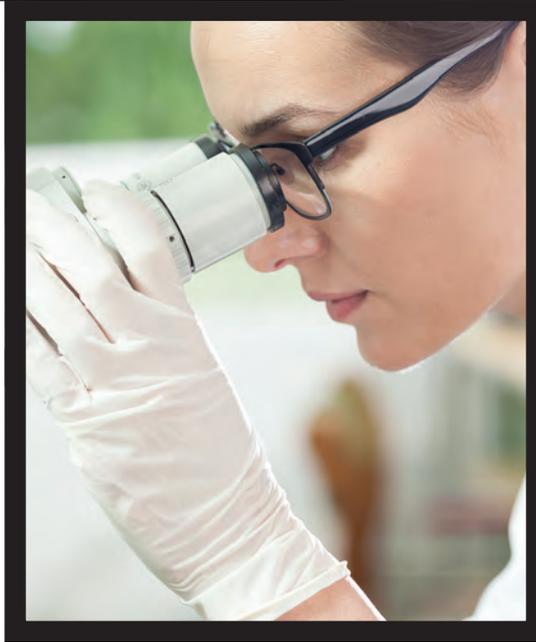
"Sepsis is the No. 1 killer in hospitals," says Dr. Christopher Seymour, assistant professor of critical care medicine and of emergency medicine at the University of Pittsburgh School of Medicine. "It is extremely common and deadly. It's a large, probably underappreciated public health burden." Sepsis strikes more than 1.5 million Americans every year and, according to the National Institutes of Health, caus-

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es far more deaths than prostate cancer, breast cancer and AIDS combined. Depending on severity, sepsis mortality rate can approach 50 percent.

Yet many Americans know nothing of sepsis. In a 2014 survey cited by the U.S. Centers for Disease Control and Prevention, the Sepsis Alliance advocacy group found that fewer than half of Americans had even heard the term. The CDC since has begun a campaign to make sepsis a household word and to alert the public to recognize signs of sepsis as easily as it detects heart attack and stroke. A variety of health organizations now observe September as Sepsis Awareness Month.



good clinical suspicion and aggressive treatment with fluids and antibiotics, which every hospital has,” says Dr. Jason M. Biggs, chair of emergency medicine at St. Clair Hospital.

PREVENTING SEPSIS DEATHS

Untreated septic patients or those unresponsive to treatment can progress to septic shock, dramatically escalating their mortality risk. During shock, blood pressure plummets. The body struggles to perfuse blood and oxygen to its tissues and organs.

Facing enormous strain, organ systems can fail. The kidneys may shut down. The heart strains to pump blood. The lungs, often assisted by a ventilator, can become overwhelmed with inflammation—survival slips to its most

narrow window. “When multiple organ systems are failing,” Biggs says, “it’s much harder to keep someone alive.”

To prevent sepsis, start by preventing infections. Being up-to-date on vaccines, including an annual flu shot, and properly managing chronic conditions such as diabetes and cardiovascular disease will keep the body better fortified against infection. Treating any cuts or skin abrasions is also vital. While bacteria cause the vast majority of sepsis, viral—and in rare cases fungal—pathogens can trigger it.

The medical community has been putting new emphasis on sepsis care over the past decade, particularly in the past few years. In 2014, St. Clair Hospital launched a multidisciplinary committee that imparted sepsis best practices and the importance of early detection across the hospital. After a year, the hospital saw a 64 percent decrease in its patient sepsis mortality rate. The Allegheny Health Network has integrated alerts into its patient electronic health records to warn if abnormalities in patients’ vital signs could indicate sepsis, Venkat says.

SOLUTIONS FOR A SOCIETAL EMERGENCY

While still not widely known, sepsis is gaining momentum in the public eye. In 2012, the well publicized death of Rory Staunton pushed sepsis into the spotlight. After Staunton cut his arm playing basketball at school in New York City, bacteria likely entered. Sepsis set in. Days later, he died. Thinking he had a stomach bug, doctors never diagnosed his sepsis. Staunton was 12 years old.

Staunton’s death incited “Rory’s Regulations,” state-mandated protocols that New York state hospitals use to rapidly identify and treat sepsis. The regulations require three key patient protocols: testing blood culture for infection, measuring blood lactate and administering antibiotics, all within three hours of sepsis diagnosis. Hospitals must also submit data on compliance and outcomes.

A study on Rory’s Regulations led by Pitt’s Seymour was

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KNOWING THE SIGNS

While complex, sepsis is a syndrome, meaning it’s marked by multiple simultaneous symptoms. These symptoms and signs, including fever, elevated heart rate, low blood pressure, fast respiratory rate and changes in mental status such as disorientation and confusion, can indicate that the organs are under stress.

Yet these symptoms often occur alongside other conditions that harbor the same or similar traits, making sepsis difficult to diagnose, especially in its early stages. “The problem is, it’s a matter of having the right level of clinical suspicion,” says Dr. Arvind Venkat, vice chair for research and faculty academic affairs in the Department of Emergency Medicine at the Allegheny Health Network. While sepsis doesn’t emerge on its own, pneumonia, urinary tract infections, intra-abdominal infections and many other infectious conditions can lead to it.

Sepsis can affect anyone, although it’s more common and deadlier in the elderly, immunocompromised patients and patients with certain chronic illnesses. Upon suspecting sepsis, patients will receive intravenous broad-spectrum antibiotics, as well as significant amounts of fluids, which can prevent drops in blood pressure and help keep blood and oxygen flowing to organs and tissue. The idea is to bring sepsis under control by quickly eliminating the infectious bacteria. Because rapid treatment is so critical in sepsis, Venkat says that, even if sepsis ultimately isn’t present, it’s much better to treat those suspected of being septic than to delay. “Early treatment is far, far beneficial compared to waiting.”

In addition to clinical symptoms, certain lab tests can help point toward sepsis. Doctors look for higher blood lactate levels, which may reveal that tissue isn’t receiving enough oxygen. They check for abnormal white blood cell levels and a low platelet count. Yet there is no single test that definitively indicates the syndrome’s presence.

Still, lab tests take time to process, time that septic patients can’t spare. And some hospitals aren’t equipped to perform lab tests. “What we’ve learned—which is encouraging—over the last few years is that the basics of sepsis can be well-handled at even small community or rural hospitals. You just have to have early recognition,

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published in the New England Journal of Medicine this spring. It evaluated the regulations' effectiveness at 149 New York state hospitals and found that 83 percent of the hospitals completed the protocols within three hours. For every hour it took to complete the processes, the odds of patients dying rose by 4 percent, the study showed.

The study is important because it provides scientific evidence confirming that treating sepsis faster is better, Seymour says. It also provides an indicator for other states or hospitals pursuing similar protocols.

As sepsis treatment continues to evolve, Venkat says that we may see new techniques to reduce complications and negative outcomes associated with the syndrome. Recovered sepsis patients can still experience cardiovascular complications and end up on dialysis if they suffered kidney damage. Blood flow impeded by sepsis can result in amputation of extremities and digits. A septic episode may even disrupt the immune system's ability to fight future infections.

But not all septic patients experience long-term consequences, even among those who slide so close to death.

When Nichol woke from her medically induced coma,

While eight of 10 sepsis cases originate outside of hospitals, Seymour says that medical centers can reduce hospital-borne infectious bacteria by following handwashing practices and sterilization precautions.

eight days had passed. She recalls struggling to open heavy eyelids. Gradually, outlines of people began to take shape, and indiscernible voices pulled her back to reality. She woke up in UPMC Montefiore, having been flown by helicopter from UPMC Northwest. Surrounded by her daughters and medical team,

Nichol began recovery, and then spent a couple days in rehabilitation before being discharged home. "The hand of God was in there, because a lot of patients don't survive sepsis," she says.

Even though Nichol doesn't know many details about the treatments that saved her life three years ago, today, at 65, she's healthier, more energetic and more effervescent than ever. She had smoked for 16 years before her bout with sepsis. After the coma, she never smoked again.

Now, Nichol is outspoken in promoting sepsis care urgency. As Seymour says, "Thinking sepsis is the first step because we know that timing matters and that administering treatment quickly saves lives." **P G**

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