

# Sepsis is a medical emergency, CDC says. It can be stopped if caught in time.

BY ARLENE KARIDIS

The Centers for Disease Control and Prevention has declared sepsis a medical emergency, reporting Tuesday that about 72 percent of patients with this fast-moving and deadly illness have recently been seen by doctors and nurses, representing missed opportunities to catch it early or prevent it.

The most common illnesses leading to sepsis include pneumonia and infections of the urinary tract, skin and gut, the CDC said in its report. There is no specific test for sepsis and symptoms can vary, which means it is often missed. But the report outlined several ways medical personnel could act, including vaccinating against pneumonia, preventing infections by washing hands and increasing general awareness of sepsis.

“When sepsis occurs, it should be treated as a medical emergency,” CDC Director Tom Frieden said in a statement.

While the deaths this year of actress Patty Duke and boxing legend Muhammad Ali (and Muppets creator Jim Henson in 1990) have brought attention to sepsis, fewer than half of Americans know what the condition is, according to Thomas Heymann, executive director of the Sepsis Alliance.

“There is a lot of work to do to change that,” he said, and noting that, despite common belief, sepsis is more often contracted in community settings than in hospitals. Tuesday’s CDC report said sepsis began outside of the hospital for 80 percent of patients.

Megan Jones is an example of how quickly sepsis can develop. She went in for knee surgery after a sports injury one day in 2004 and was home eating pizza a few hours later. She tossed away her crutches the next day; then a 20-year-old living near Annapolis, she was feeling pretty good.

But a week later she was back in the operating room: Her knee had swollen to about triple its normal size; it throbbed intensely, and she had spiked a high fever. “As I was drifting off from the anesthesia,” Jones recalled, “I heard my surgeon say, ‘If we don’t move now, she is going to die.’” as the doctors began working to clean out the infection she had contracted, probably from the first surgery.

In addition to the severe swelling, pain and fever that Jones experienced, classic symptoms include a body temperature that is too low, an elevated heart rate, a high respiratory rate and white blood cell counts that are too high or low. Sepsis can ravage tissue; it causes organ dysfunction, and it kills: According to the CDC, more than 258,000 Americans die of the condition annually, more than the number of deaths from heart attack.

Sepsis deaths are difficult to track because there is no test for it and no standard definition. As a result, death certificates may not offer a reliable count. But some figures suggest death rates are climbing. In-hospital deaths rose from 128,766 in 2009 to 159,690 in 2013, the Agency for Healthcare Research and Quality reported. Mortality is probably even higher than that, according to AHRQ, because its figures account only for primary and not secondary sepsis diagnoses.

Sepsis is most common among older people, the very young and those with compromised immune systems, particularly if they have chronic diseases such as AIDS, have had surgery or take immunosuppressant drugs such as steroids or chemotherapy. Along with antibiotic resistance and invasive surgeries, a rise in the use of those drugs is believed to be responsible for the higher sepsis numbers.

Jones’s second surgery was the start of a rocky ride to rid her body of the aggressive microorganisms. She has since had numerous others to prevent or control re-emerging sepsis, to rebuild part of her leg damaged by spreading infection and finally to amputate the limb above the knee.

Sepsis is so difficult to control that even though Jones went to her doctor quickly and he diagnosed her condition by the severity and rapid onset of her symptoms, the infection wasn’t eliminated.

One of the biggest hurdles in treating sepsis can be identifying it, and quickly, because the condition can rapidly advance to septic shock, where blood pressure drops so low that blood does not reach vital organs.

Aside from specialists in critical and intensive care, it is not uncommon for doctors to miss sepsis, according to Steven Simpson, a professor of pulmonary and critical care medicine at the University of Kansas Medical Center.

Even those well versed in sepsis debate how best to diagnose it.

“It gets tricky,” Simpson said, “because some symptoms result from multiple conditions. Also, not everyone has the same responses, often because something else may be going on to mask symptoms, such as the effects of certain medications. But we know you can improve mortality with the right actions.”

His hospital, he said, made an astounding reduction in its sepsis mortality rate, from 49.1 percent in 2004 to 7 percent in 2015. The turnaround, Simpson said, came about not because of medical breakthroughs but from persistent efforts to catch it early and treat it quickly and aggressively, with antibiotics a mainstay of treatment.

Attention to the condition has been encouraged by a Medicare rating system that

includes sepsis outcomes in hospitals. Yet many still fall behind, Simpson said.

In 2011, sepsis was the No. 2 reason for readmissions, following congestive heart failure. Forty percent of those sepsis readmits could have been prevented with timely and appropriate care, according to a study in the journal *BMJ* in 2015.

When sepsis is caught early, prognosis is very good, but mortality climbs to 25 to 30 percent for severe sepsis and 40 to 70 percent if septic shock occurs. "Early" can mean within a matter of hours. One study found that once a person goes into septic shock, chances for survival decrease 7.6 percent for every hour that it goes untreated.

Physicians trained to look for sepsis typically see warning signs in fever, elevated heart rate, elevated respiration and low blood pressure, said Henry Masur, chief of critical care medicine at the National Institutes of Health Clinical Center in Bethesda.

"We use these vital signs and supplement with a history and preliminary lab work [such as white blood cell count] to determine whether to admit and whether to go

straight to the intensive care unit or a general medical floor," he said.

If he suspects sepsis, he will first address low blood pressure by administering fluids, ideally increasing pressure so blood will circulate to organs.

If the fluids don't work, he begins IV drugs to constrict blood vessels and raise blood pressure. He starts patients on broad-spectrum antibiotics that are likely to attack multiple organisms while he awaits culture results to reveal the actual offender. Then he narrows the drug arsenal to those most likely to target the problem. If he can identify the original source of infection, he drains that spot.

"So basically, outcome depends on fluids, blood pressure, antibiotics and source control. But it also depends on what organs are affected and underlying health status. Some people turn around in a few hours; some in days, weeks or months. Some will, unfortunately, die," Masur said.

### **Knowing the symptoms**

A rapid pulse, fast breathing, and swelling and red tissue should put people on

guard. The most troubling symptoms are a combination of intense pain and mental confusion that worsens within a few hours, Simpson said. "If you have these symptoms, ask the doctor in these words: 'Is this likely sepsis?'"

Practitioners also urge that people of all ages get vaccinated for the flu, that those older than 65 get vaccinated for pneumonia and that teenagers get vaccinated for meningococcal meningitis. These are among the infections that can lead to sepsis.

For Megan Jones, "having one leg and the ongoing risk for serious infection changes how you live," she says. "Everything has to be handicap-accessible; you need antibiotics for when you travel, just in case; I have all my doctors' home and cell numbers."

After a fever triggered seizures last August, she gets post-sepsis headaches. Still, she calls life "stable and normal" overall.

"I am doing my graphic design and writing. I get around well with crutches or a wheelchair, and I drive. I realize waking up is a good day when you know you came close to not being able to do that again."