

# IT'S ABOUT TIME

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## Recognizing the Signs of **Sepsis**

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**Sepsis is a life-threatening condition** caused by the body's response to infection. This complex response can lead to tissue damage, organ failure, and death. The most common source of infection is bacterial, but infection can also arise from fungi, viruses, or parasites.<sup>1,2</sup> According to the Centers for Disease Control and Prevention, sepsis is the 11th leading cause of death in the United States.<sup>3</sup> However, deaths from sepsis are frequently reported as other comorbidities, suggesting that both incidence and cost estimates may be low.<sup>4</sup> Older studies likely underestimated mortality rates for sepsis; recent, more accurate epidemiology indicates that sepsis accounts for upwards of 270,000 deaths per year, placing sepsis as the third leading cause of death in the U.S.<sup>5</sup> In addition, sepsis creates a significant financial burden on healthcare systems in the U.S., where there were over 1.5 million cases of sepsis in 2014.<sup>6</sup> At an average cost of over \$18,000 per sepsis hospital stay, this amounts to more than \$27 billion annually.<sup>7</sup> Pediatric sepsis affects more than 75,000 children in the United States per year, with healthcare costs in excess of \$4.8 billion.<sup>8</sup>



## **Prompt treatment provides the best chance for reducing deaths and improving recovery from sepsis.**

Among experts in the healthcare community, sepsis is considered a time-sensitive condition and treatment protocols have been developed to promote rapid care.<sup>9</sup> From the disease onset, the transition to serious illness occurs during the critical "golden hours," the time in which appropriate treatments

can have the best chance of success.<sup>10</sup> Treatment for sepsis should be initiated as early as possible; for many sepsis patients, this occurs when they enter the emergency department.<sup>11,12</sup> Two important time-sensitive interventions for patients are early antibiotic administration and early delivery of intravenous (IV) fluids.<sup>9</sup> Early recognition and treatment have been shown to decrease morbidity and mortality.<sup>13,14</sup> Delays in antibiotic administration are associated with an increase

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in mortality.<sup>11,15,16</sup> Survivors of sepsis are at an increased risk for rehospitalization, particularly due to infection, and may experience both acute and chronic health problems, known as post-sepsis syndrome.<sup>17,18</sup> Effects can include, but are not limited to, decreased cognitive and physical function, anxiety, depression, and symptoms of post-traumatic stress.<sup>18,19</sup>

Despite the prevalence and healthcare costs of sepsis, public awareness around the condition is low. According to the 2017 Sepsis Alliance Awareness Survey, 42% of Americans have not heard of sepsis.<sup>20</sup> In addition to low awareness of the disease, the signs and symptoms of sepsis are not well known outside of healthcare settings. Less than 1% of Americans can correctly identify the most common symptoms of sepsis.<sup>20</sup> Even among healthcare providers, sepsis is difficult to recognize and may be missed.<sup>21,22</sup> Since most sepsis cases start in the community, patients may need to ask providers about sepsis and emergency care.<sup>5</sup>

In order to raise public awareness and promote recognition of this condition, Sepsis Alliance has developed the It's About TIME campaign, an easily remembered acronym that can aid in the recognition of the signs of sepsis and that imparts the importance of receiving treatment quickly. It's About TIME breaks down these signs as:



## Temperature

higher or lower than normal



## Infection

may have signs and symptoms of an infection



## Mental decline

confused, sleepy, difficult to rouse



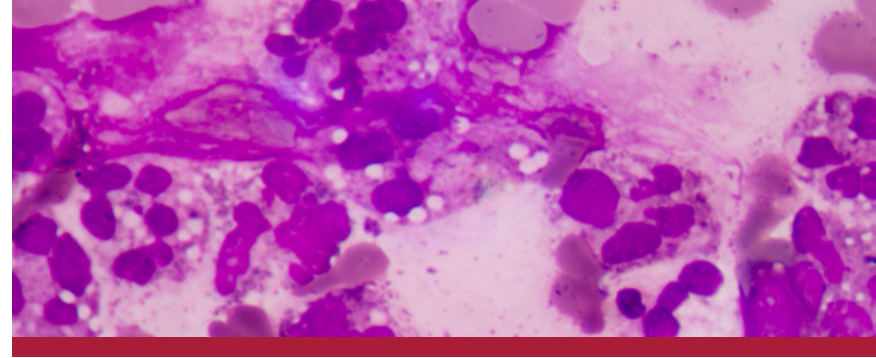
## Extremely ill

"I feel like I might die," severe pain or discomfort



## Temperature - Higher or lower than normal

Changes in body temperature are one of the hallmarks of sepsis. Patients with sepsis can present with fever, defined as a temperature above 101 °F (38.3 °C). Patients may instead present with hypothermia, defined as a temperature below 98.6 °F (36.0 °C).<sup>23</sup> However, some patients, such as those taking certain types of medications, may not experience any changes in temperature.<sup>2</sup> Temperature may be one of the first signs of illness that could potentially be sepsis, so it is important to observe if any other signs of sepsis are also present. If so, it is critical to seek medical treatment.



## Infection - May have signs of an infection

In addition to changes in temperature, there are other bodily signs that may indicate that an infection is present. For people with diabetes, one of the signs of infection can be a sudden elevation in blood sugar, for example. Additionally, sepsis can be the result of an infected cut or abrasion. If a cut or abrasion develops redness and tenderness, and continues to get larger, this may also be a sign of infection. Certain populations are more prone to infection, including those who are immunocompromised or suffer from liver disease. Other risk factors include chronic

pulmonary disease, congestive heart failure, cancer, and diabetes. The most common infections leading to sepsis are pneumonia and urinary tract infections.

Pain is also associated with many types of infections. Intense pain may be localized to an abscess related to infection. This can occur in the gastrointestinal system (as in appendicitis), in a joint (as in septic arthritis) or related to an organ (such as near the lungs in pneumonia or in a kidney infection). Sepsis can also produce generalized pain, like the achiness associated with flu. Pain should not be ignored, especially acute, intense pain; it is an indication that medical evaluation is necessary.



## Mental decline - Confused, sleepy, difficult to rouse

Another symptom of sepsis can be altered mental state.<sup>24</sup> Many patients experience feelings of excessive confusion and disorientation. This is often reported by family members, as the person with sepsis is unable to communicate these feelings because of their confusion. Recent advances in the management of sepsis have demonstrated the importance of recognizing altered levels of consciousness in patients suspected of being septic.<sup>2</sup> Symptoms can manifest themselves in a variety of behaviors. Excessive sleeping can be a sign of sepsis. People with sepsis can sleep for extended periods of time and are difficult to wake up. Confusion can manifest itself in a variety of behaviors as well, with people acting strangely, speaking without making sense, or not acting like themselves. In some cases, people who are septic won't be able to answer simple questions like "What is your address?" If it takes someone more than 20 seconds to answer this question, it may indicate that something is wrong and it is time to help them get medical care.



## Extremely ill - "I feel like I might die," severe pain or discomfort

Patients with sepsis often report that their symptoms are above and beyond previously experienced sickness. The severity of the symptoms can make patients feel like they are on the verge of death. Faces of Sepsis, an online resource for sepsis survivors and those who have loved ones affected by sepsis, reports the experiences of sepsis patients.<sup>25</sup> In describing their illness, quotes include "I was delirious from the fever and could barely breathe," "My initial memories are a jumble of breathing very fast, struggling to bring in air, confusion, time distortion and feeling like I was dying," and "I told him 'I'm dying.'" Additionally, some patients report severe pain or discomfort, often located in the abdominal region. As noted earlier, this acute, intense pain may be related to the infection that is triggering sepsis.

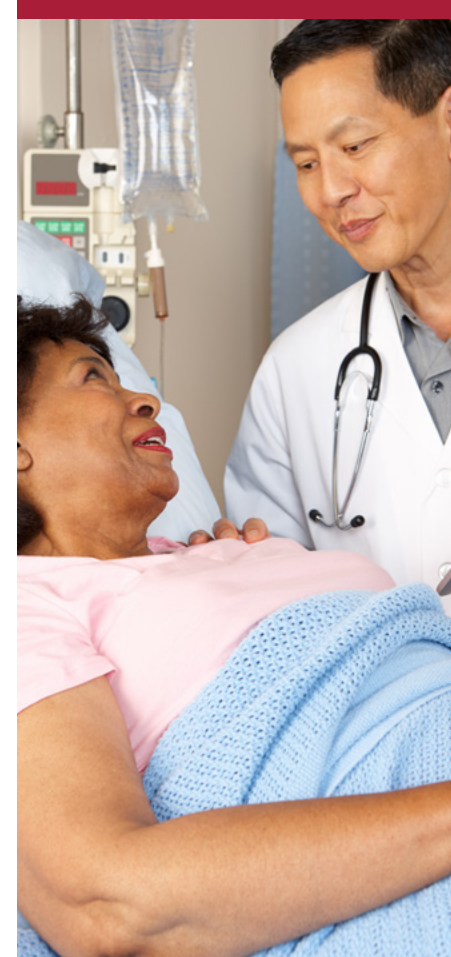
In some instances, friends and family are the ones to recognize the severe symptoms of sepsis. In one story, a survivor says, "My parents were in town and noticed how sick I was... my mom brought me back (to the doctor)." Recognizing that a loved one is experiencing significant illness is critical in directing them towards proper medical care.

The goal of the **It's About TIME** campaign is to raise awareness around the symptoms of sepsis so that proper medical care can begin as soon as possible. A delay in first antibiotic administration is associated with an increase in the risk of mortality for each hour delay.<sup>15,16</sup> If sepsis is caught early, there are significant short- and long-term benefits for the patient.<sup>10</sup> Treatment and triage protocols have been shown to be effective in reducing the amount of time to IV fluids and antibiotics for patients with sepsis.<sup>11,26,27</sup> Even the timing of established treatment protocols has been revised to take place in a shortened amount of time: down to 1 hour from 3- and 6-hour bundles.<sup>9</sup> The recognition of sepsis as a medical emergency dictates that delays in treatment be minimized.

Though sepsis is treated in the medical setting, most cases of sepsis originate in the community. As many as 80% of sepsis cases are present on admission to the hospital.<sup>5,28</sup> Therefore, there is a need for recognizing the signs of sepsis by the general public, so appropriate steps will be taken to obtain emergency treatment. Furthermore, awareness in the healthcare community may be limited to those with expert knowledge of sepsis; it may be necessary for a patient to know and ask about emergency care for sepsis, or risk not getting appropriate care. A public awareness campaign like **It's About TIME is crucial to address sepsis in everyday life where sepsis strikes**, as it can serve to inform people outside of the medical profession about what to look for when sepsis develops.

Awareness campaigns for other conditions have had a positive impact on the identification of the signs of disease that indicate the need for prompt medical treatment. Public awareness campaigns about stroke are an example, as stroke is another disease that benefits from rapid hospital treatment. Multimedia campaigns have been effective in increasing knowledge, awareness, and the intention to respond to a stroke as an emergency. Retrospective analysis of these campaigns has shown positive effects on reducing patient delay to hospital presentation and other behavioral indicants.<sup>29</sup>

Current treatments for sepsis can be effective if sepsis is caught in time. By aiming to reduce the time to treatment of septic patients, it is feasible that this campaign can serve its goal of reducing the incidence of largely preventable deaths. The Surviving Sepsis Campaign, aimed at medical professionals, has been successful in promoting timely and effective treatment of sepsis.<sup>9,30</sup> The It's About TIME campaign aims to educate patients and the public at large, so that the signs of sepsis are well known to all.



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