



Sepsis

By Mayo Clinical Staff, July 23, 2014

<http://www.mayoclinic.org/diseases-conditions/sepsis/basics/definition/con-20031900>

Sepsis is a potentially life-threatening complication of an infection. Sepsis occurs when chemicals released into the bloodstream to fight the infection trigger inflammatory responses throughout the body. This inflammation can trigger a cascade of changes that can damage multiple organ systems, causing them to fail.

If sepsis progresses to septic shock, blood pressure drops dramatically, which may lead to death.

Anyone can develop sepsis, but it's most common and most dangerous in older adults or those with weakened immune systems. **Early treatment of sepsis, usually with antibiotics and large amounts of intravenous fluids, improves chances for survival.**

Many doctors view sepsis as a three-stage syndrome, starting with sepsis and progressing through severe sepsis to septic shock. The goal is to treat sepsis during its mild stage, before it becomes more dangerous.

Sepsis

To be diagnosed with sepsis, you must exhibit at least two of the following symptoms:

- Body temperature above 101 F (38.3 C) or below 96.8 F (36 C)
- Heart rate higher than 90 beats a minute
- Respiratory rate higher than 20 breaths a minute
- Probable or confirmed infection

Severe sepsis

Your diagnosis will be upgraded to severe sepsis if you also exhibit at least one of the following signs and symptoms, which indicate an organ may be failing:

- Significantly decreased urine output
- Abrupt change in mental status
- Decrease in platelet count
- Difficulty breathing
- Abnormal heart pumping function
- Abdominal pain

Septic shock

To be diagnosed with septic shock, you must have the signs and symptoms of severe sepsis — plus extremely low blood pressure that doesn't adequately respond to simple fluid replacement.

When to see a doctor

Most often sepsis occurs in people who are hospitalized. **People in the intensive care unit are especially vulnerable to developing infections, which can then lead to sepsis.** If you get an infection or if you develop signs and symptoms of sepsis after surgery, hospitalization or an infection, seek medical care immediately.

While any type of infection — bacterial, viral or fungal — can lead to sepsis, the most likely varieties include:

- Pneumonia
- Abdominal infection
- Kidney infection
- Bloodstream infection (bacteremia)

The incidence of sepsis appears to be increasing in the United States. The causes of this increase may include:

- **Aging population.** Americans are living longer, which is swelling the ranks of the highest risk age group — people older than 65.
- **Drug-resistant bacteria.** Many types of bacteria can resist the effects of antibiotics that once killed them. These antibiotic-resistant bacteria are often the root cause of the infections that trigger sepsis.
- **Weakened immune systems.** More Americans are living with weakened immune systems, caused by HIV, cancer treatments or transplant drugs.

Sepsis is more common and more dangerous if you:

- Are very young or very old
- Have a compromised immune system
- Are already very sick, often in a hospital's intensive care unit
- Have wounds or injuries, such as burns
- **Have invasive devices, such as intravenous catheters or breathing tubes**

Sepsis ranges from less to more severe. As sepsis worsens, blood flow to vital organs, such as your brain, heart and kidneys, becomes impaired. Sepsis can also cause blood clots to form in your organs and in your arms, legs, fingers and toes — leading to varying degrees of organ failure and tissue death (gangrene).

Most people recover from mild sepsis, but the mortality rate for septic shock is nearly 50 percent. Also, an episode of severe sepsis may place you at higher risk of future infections.

Diagnosing sepsis can be difficult because its signs and symptoms can be caused by other disorders. Doctors often order a battery of tests to try to pinpoint the underlying infection.

Blood tests

A sample of your blood can be tested for:

- Evidence of infection
- Clotting problems
- Abnormal liver or kidney function
- Impaired oxygen availability
- Electrolyte imbalances

Other laboratory tests

Depending on your symptoms, your doctor may also want to run tests on one or more of the following bodily fluids:

- **Urine.** If your doctor suspects that you have a urinary tract infection, he or she may want your urine checked for signs of bacteria.
- **Wound secretions.** If you have a wound that appears infected, testing a sample of the wound's secretions can help show what type of antibiotic might work best.
- **Respiratory secretions.** If you are coughing up mucus (sputum), it may be tested to determine what type of germ is causing the infection.

Imaging scans

If the site of infection is not obvious, your doctor may order one or more of the following imaging tests:

- **X-ray.** Using low levels of radiation, X-rays are good for visualizing problems in the lungs.
- **Computerized tomography (CT).** Infections in the appendix, pancreas or bowels are easier to see on CT scans. This technology takes X-rays from a variety of angles and combines them to depict cross-sectional slices of your body's internal structures.
- **Ultrasound.** This technology uses sound waves to produce real-time images on a video monitor. Ultrasound may be particularly useful to check for infections in your gallbladder or ovaries.
- **Magnetic resonance imaging (MRI).** MRIs may be helpful in identifying soft tissue infections, such as abscesses within the spine. This technology uses radio waves and a strong magnet to produce cross-sectional images of your internal structures.

Early, aggressive treatment boosts your chances of surviving sepsis. People with severe sepsis require close monitoring and treatment in a hospital intensive care unit. If you have severe sepsis or septic shock, lifesaving measures may be needed to stabilize breathing and heart function.

Medications

A number of medications are used in treating sepsis. They include:

- **Antibiotics.** Treatment with antibiotics begins immediately — even before the infectious agent is identified. Initially you'll receive broad-spectrum antibiotics, which are effective against a variety of bacteria. The antibiotics are administered intravenously (IV). After learning the results of blood tests, your doctor may switch to a different antibiotic that's more appropriate against the particular bacteria causing the infection.

- **Vasopressors.** If your blood pressure remains too low even after receiving intravenous fluids, you may be given a vasopressor medication, which constricts blood vessels and helps to increase blood pressure.

Other medications you may receive include low doses of corticosteroids, insulin to help maintain stable blood sugar levels, drugs that modify the immune system responses, and painkillers or sedatives.

Supportive care

People with severe sepsis usually receive supportive care including oxygen and large amounts of intravenous fluids. Depending on your condition, you may need to have a machine help you breathe or another to provide dialysis for kidney failure.

Surgery

Surgery may be needed to remove sources of infection, such as collections of pus (abscesses).

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