CONDITION

Septic shock

Septic shock is life-threatening circulatory failure caused by the body's extreme response to an infection.

WHAT IT IS
Life-threatening circulatory failure caused by the body's response to infection

BODY SYSTEM
Whole body, especially heart, circulation, lungs, kidneys, and brain

MAIN SYMPTOMS
Low blood pressure, confusion, breathing difficulty, very little urine

WHAT CAUSES IT
Severe response to bacterial, viral, or fungal infection

HOW IT IS DIAGNOSED
Clinical assessment, blood pressure, lactate testing, and infection investigations

MAIN TREATMENT
Immediate antibiotics, intravenous fluids, vasopressors, and organ support

CAN IT BE CURED?
Sometimes - prompt treatment can reverse infection and shock

IS IT AN EMERGENCY?
Yes - immediate hospital intensive care is needed

LONG-TERM OUTLOOK
High death risk; survivors may need months of recovery

Overview

Septic shock is the most severe form of sepsis. Sepsis happens when the body's response to an infection becomes harmful and begins damaging its own tissues and organs.

In septic shock, blood pressure remains dangerously low even after intravenous fluids have been given. The heart and circulation cannot deliver enough oxygen-rich blood to vital organs. The brain, lungs, kidneys, liver, and heart may then stop working normally.

Septic shock is always a medical emergency. Treatment begins immediately in hospital, often in an intensive care unit. Early treatment improves the chance of recovery, but septic shock remains life-threatening even with expert care.

Septic shock is not the same as having bacteria in the blood. Some people have a bloodstream

infection without shock, while others develop septic shock even when blood cultures do not identify a germ.

Symptoms

Symptoms may develop quickly. They can also appear after several days of illness or during recovery from surgery, an injury, or another medical problem.

Possible signs include:

Not everyone has a fever. Older adults, newborns, and people with weakened immune systems may have less typical symptoms. They may mainly become confused, less responsive, unable to eat, or much weaker than usual.

These symptoms do not by themselves prove that someone has septic shock. Other emergencies can cause similar changes. Medical assessment is needed immediately.

- Very low blood pressure, dizziness, or collapse
- New confusion, extreme sleepiness, or difficulty waking
- Fast, difficult, or unusually shallow breathing
- A fast or weak pulse
- Very little or no urine
- Cold, pale, blotchy, or blue-grey skin
- Fever, shivering, or feeling unusually cold
- Severe weakness or a sense that something is seriously wrong

Causes and risk factors

Septic shock begins with an infection. Bacteria are a common cause, but viruses and fungi can also cause it.

The infection may start in the:

The body's immune response normally helps contain an infection. In sepsis, this response becomes poorly controlled. Blood vessels widen and may become leaky, blood pressure falls, and abnormal blood clotting can interfere with circulation. Cells and organs may not receive or use oxygen normally.

Anyone with an infection can develop sepsis. Risk is higher in newborns, older adults, pregnant

or recently pregnant people, and people with serious long-term health conditions. Cancer, diabetes, kidney or liver disease, a weakened immune system, major surgery, severe burns, and invasive medical devices can also increase risk.

Having a risk factor does not mean septic shock will occur. Some previously healthy people develop it, while many people at higher risk do not.

- Lungs, such as pneumonia
- Urinary system or kidneys
- Abdomen, bowel, gallbladder, or pancreas
- Skin, wounds, or soft tissues
- Brain and its surrounding tissues
- Bloodstream
- Medical devices, including some intravenous lines or urinary catheters

Diagnosis

There is no single test that confirms septic shock on its own. Doctors use the person's symptoms, examination, blood pressure, response to fluids, and laboratory results together.

Blood tests commonly measure lactate, a substance that can rise when tissues are under stress or are not receiving enough oxygen-rich blood. Tests also assess blood cells, clotting, kidney and liver function, blood sugar, and the balance of salts and acids in the blood.

Blood cultures are taken to look for bacteria or fungi. Urine, mucus, wound fluid, spinal fluid, or samples from another suspected infection site may also be tested. Cultures can help identify the germ and guide treatment, but results take time and may remain negative.

Imaging such as a chest X-ray, ultrasound, or CT scan may locate pneumonia, an abscess, a blocked urinary system, or another source of infection.

In the clinical definition, septic shock involves sepsis with persistent low blood pressure requiring medicines called vasopressors, together with a raised lactate level despite appropriate fluid replacement. Treatment should not be delayed while every test result is pending.

Treatment and management

Septic shock requires immediate hospital treatment. Care often starts in an emergency

department and continues in intensive care.

Antibiotics like amoxicillin or doxycycline are usually given through a vein as soon as possible when a bacterial infection is suspected. Initial treatment may cover several possible bacteria. It can later be changed when test results identify a likely germ. Antiviral or antifungal treatment may be used when those infections are suspected or confirmed.

Intravenous fluids help support circulation. The healthcare team repeatedly checks blood pressure, breathing, urine output, blood tests, and signs of fluid overload. Fluid needs are different for each person, especially when heart or kidney function is reduced.

If blood pressure remains low, vasopressors are given through a vein. These medicines tighten blood vessels and help maintain blood flow to vital organs. Norepinephrine is commonly used. Some people need additional medicines, and corticosteroids like prednisone or hydrocortisone may be considered when shock continues despite fluids and vasopressors.

Treatment also focuses on controlling the source of infection. This may involve draining an abscess, removing an infected medical device, treating a blocked kidney, or operating on damaged or infected tissue.

Organ support may include oxygen, a breathing machine, kidney dialysis, blood products, nutrition, and medicines to support the heart. Treatment is adjusted frequently as the person's condition changes.

Complications

Septic shock can injure several organs at once. Possible complications include respiratory failure, acute kidney injury, heart problems, liver injury, and brain dysfunction that causes confusion or reduced consciousness.

Abnormal clotting may cause small clots throughout the circulation while also increasing bleeding risk. This is called disseminated intravascular coagulation, or DIC.

Reduced circulation can damage fingers, toes, or larger areas of tissue. Surgery or amputation is occasionally needed when damage is severe.

Even after the infection and shock improve, muscle loss, weakness, nerve problems, memory changes, anxiety, depression, or post-traumatic stress can continue. Some people have lasting organ damage.

Prevention

Septic shock cannot always be prevented. It can develop despite suitable treatment, and not every infection is recognised early.

Measures that reduce infections and encourage earlier treatment may lower risk:

Vaccination does not prevent every cause of sepsis, and antibiotics do not treat viral infections. Antibiotics should not be taken without medical guidance because unnecessary use can cause harm and contribute to antibiotic resistance.

- Keep recommended vaccinations up to date
- Wash hands and care for wounds as instructed
- Use antibiotics only when prescribed and complete them as directed
- Follow care instructions for catheters, intravenous lines, and surgical wounds
- Seek timely medical advice when an infection is worsening or not improving
- Manage long-term conditions with regular medical care

Living with it and what to expect

The early course of septic shock can change hour by hour. Some people respond quickly to treatment. Others need days or weeks of intensive care and support for several organs. It is not always possible to predict the outcome at the beginning.

Survivors may feel extremely weak after leaving intensive care. Muscle loss can make walking, washing, eating, or climbing stairs difficult. Sleep problems, poor appetite, pain, breathlessness, and fatigue are common during early recovery.

Thinking and emotions can also be affected. Some people have poor concentration, memory difficulties, frightening memories, low mood, anxiety, or nightmares. This group of physical and emotional effects is sometimes called post-sepsis syndrome, although experiences differ widely.

Recovery may continue over months. Rehabilitation can include physiotherapy, help with daily activities, nutritional support, and mental health care. Some people return to their previous health and activities. Others have lasting kidney, lung, nerve, or mobility problems and need ongoing support.

Routine follow-up after discharge may review medicines, organ function, mobility, nutrition, mood, and the original source of infection. New or worsening symptoms should be discussed rather than assumed to be a normal part of recovery.

When to get medical help

Suspected septic shock is an emergency. Call emergency services now if someone with a possible or known infection has:

Do not drive yourself if you feel faint, confused, or severely unwell. Do not wait for a fever or rash, because neither is required for septic shock.

After hospital discharge, seek urgent medical advice for a returning fever, worsening breathlessness, reduced urination, new confusion, a rapidly worsening wound, or other signs of infection. Call emergency services if severe symptoms develop.

Routine follow-up is appropriate for ongoing fatigue, weakness, poor sleep, memory problems, low mood, or difficulty returning to daily activities when these are stable and not rapidly worsening.

- New confusion, severe drowsiness, or difficulty waking
- Severe breathing difficulty
- Collapse, fainting, or signs of very low blood pressure
- Blue-grey, very pale, cold, or blotchy skin
- Little or no urine
- Rapid deterioration or an overwhelming sense of serious illness

Common questions

Is septic shock the same as sepsis?

No. Sepsis is life-threatening organ dysfunction caused by the body's harmful response to infection. Septic shock is a more severe stage in which circulation and cell function are profoundly affected, blood pressure stays low, and vasopressor medicines are needed.

Can someone recover fully from septic shock?

Yes, full recovery is possible, but it cannot be guaranteed. The outcome is influenced by the infection, the number of organs affected, underlying health, and how the person responds to treatment. Some survivors have lasting physical or emotional effects.

Is septic shock contagious?

Septic shock itself is not contagious. The infection that triggered it may be contagious, depending on the germ. Hospital staff may use isolation precautions when an infection could spread to other people.

How quickly does septic shock happen?

It can develop over hours, although some infections worsen more gradually over days. A person may appear to have a routine infection before becoming suddenly much more unwell. Rapid deterioration needs emergency assessment.

Can septic shock happen without a positive blood culture?

Yes. Cultures may be negative because the infection is outside the bloodstream, antibiotics were given before samples were taken, the germ is difficult to grow, or another test is needed. Diagnosis and treatment do not rely on a positive culture alone.

What is the difference between septic shock and toxic shock syndrome?

Septic shock can result from many kinds of infection. Toxic shock syndrome is a specific illness caused by toxins released by certain bacteria, usually Staphylococcus aureus or group A Streptococcus . Toxic shock syndrome can itself lead to shock and organ failure.

Sources

- Centers for Disease Control and Prevention. About Sepsis
- World Health Organization. Sepsis fact sheet
- Singer M, Deutschman CS, Seymour CW, et al. The Third International Consensus Definitions for Sepsis and Septic Shock. JAMA . 2016;315(8):801-810
- Evans L, Rhodes A, Alhazzani W, et al. Surviving Sepsis Campaign: International Guidelines for Management of Sepsis and Septic Shock 2021. Intensive Care Medicine . 2021;47:1181-1247
- National Institute of General Medical Sciences. Sepsis
- Prescott HC, Angus DC. Enhancing Recovery From Sepsis: A Review. JAMA . 2018;319(1):62-75