CONDITION

Gangrene

Gangrene is the death of body tissue caused by lost blood flow, severe infection, or both.

WHAT IT IS
Death of body tissue from lost blood flow or infection

BODY SYSTEM
Skin, soft tissues, and blood circulation

MAIN SYMPTOMS
Skin colour change, severe pain or numbness, swelling, foul discharge

WHAT CAUSES IT
Blocked blood flow, severe infection, or both

HOW IT IS DIAGNOSED
Examination, imaging, blood tests, and tissue or fluid cultures

MAIN TREATMENT
Urgent surgery, antibiotics, and restored blood flow

CAN IT BE CURED?
Sometimes - dead tissue removed and cause controlled

IS IT AN EMERGENCY?
Yes - suspected gangrene needs urgent hospital assessment

LONG-TERM OUTLOOK
Early treatment improves survival, but tissue loss can be permanent

Overview

Gangrene means that body tissue has died because it lost its blood supply, developed a serious infection, or both. It most often affects toes, feet, fingers, or limbs, but it can also occur inside the body.

Blood carries the oxygen and nutrients that keep tissue alive. If blood flow stops, cells begin to die. Poor circulation also makes it harder for the immune system and antibiotics like amoxicillin or doxycycline to reach an infection.

Forms of gangrene include:

Dead tissue cannot recover. However, urgent treatment may stop damage from spreading, control infection, restore circulation, and save healthy tissue.

- Dry gangrene , usually caused by poor blood flow. The area may become dry, shrivelled, dark, and clearly separated from healthier tissue.
- Wet gangrene , which involves infection and swelling in tissue with poor blood flow and can spread quickly.
- Gas gangrene , or clostridial myonecrosis, a rare but severe infection that destroys muscle and may produce gas within tissue.
- Internal gangrene , which affects an organ, such as a section of bowel, when its blood supply is cut off.

Symptoms

Symptoms depend on the location, cause, and whether infection is present.

Affected skin may become pale, red, purple, blue, brown, or black. On darker skin, early colour changes may be harder to see, so compare the area with surrounding skin.

Other possible symptoms include:

Infection can cause fever, chills, weakness, confusion, a fast heartbeat, or rapid breathing. These may mean the infection is affecting the whole body.

Internal gangrene may not cause visible skin changes. It can cause severe or persistent pain, vomiting, abdominal swelling, fever, or feeling very unwell.

- Severe pain followed by reduced feeling or numbness
- Swelling, warmth, tenderness, or blisters
- Skin that feels unusually cold, hard, or thin
- A wound that does not heal
- Pus, watery fluid, blood-stained discharge, or an unpleasant smell
- Crackling under the skin caused by gas
- A clear line between damaged and healthier skin

Causes and risk factors

Gangrene develops when tissue does not receive enough blood or when a severe infection destroys it.

Blood flow may be reduced by peripheral artery disease, in which fatty deposits narrow

arteries supplying the limbs. A sudden blood clot can also stop circulation. Crushing injuries, burns, frostbite, or a very tight bandage or cast may damage blood vessels.

Bacteria can enter through a cut, ulcer, injection site, operation, or traumatic wound. Some infections release toxins that damage muscle and blood vessels. Wet gangrene can develop when damaged tissue becomes infected.

Risk factors include:

Diabetes raises risk because nerve damage can make wounds difficult to feel, while poor circulation slows healing and limits the response to infection.

Having a risk factor does not mean you have or will develop gangrene. However, concerning wounds or skin changes need prompt assessment.

- Diabetes, especially with reduced foot sensation or poor circulation
- Peripheral artery disease
- Smoking
- A weakened immune system
- Serious injury, surgery, burns, or frostbite
- Pressure injuries or deep skin ulcers
- Blood clots or disorders affecting small blood vessels

Diagnosis

Gangrene is often suspected from symptoms and a physical examination. Treatment may begin before every test result is available.

Blood tests can identify infection, inflammation, organ problems, and signs of severe illness. Fluid or tissue samples may be tested to identify bacteria and guide antibiotic treatment.

An X-ray, ultrasound, CT scan, or MRI scan may show gas, damaged muscle, blocked blood vessels, or the depth of infection. An arterial ultrasound or angiogram may be used to map blood flow.

Surgery sometimes provides the clearest information about how far damage has spread. Removed tissue may also be examined in a laboratory.

Treatment and management

Gangrene requires urgent hospital treatment. The priorities are to remove dead tissue, control infection, restore blood flow where possible, and support the body.

Surgical removal of dead tissue , called debridement, helps stop infection and allows nearby tissue to be assessed. More than one operation may be needed because the boundary between living and dead tissue can change.

If damage is extensive, amputation may be the safest option. This does not always mean removing a whole limb; the amount removed depends on the location and extent of damage.

When infection is present or strongly suspected, antibiotics are usually given into a vein. Treatment may be adjusted after laboratory results identify the organism. Antibiotics cannot restore dead tissue and do not replace necessary surgery.

If blocked arteries caused the gangrene, specialists may widen an artery with a balloon, insert a stent, remove a clot, or create a bypass around the blockage.

Hyperbaric oxygen therapy may be considered as an additional treatment in selected cases, particularly some serious tissue infections. It involves breathing oxygen in a pressurised chamber and must not delay surgery or other urgent care.

After the immediate danger is controlled, care may include wound treatment, pain relief, blood glucose management, rehabilitation, mobility support, reconstructive surgery, or a skin graft.

Complications

Gangrene can spread into nearby tissue or the bloodstream, causing sepsis. This dangerous whole-body response to infection can lead to shock, organ failure, or death.

Other complications include loss of part of a finger, toe, foot, or limb; long-term pain; reduced movement; scarring; and slow-healing wounds. Poor circulation may cause further ulcers or tissue damage.

Early treatment reduces these risks, but the outcome also depends on the location, cause, extent of tissue death, and the person's overall health.

Prevention

Not every case can be prevented. A sudden injury, blood clot, or internal loss of blood supply may occur without warning. Risk can sometimes be reduced by protecting circulation and detecting wounds early.

If you have diabetes, reduced sensation, or peripheral artery disease, follow your healthcare

team's foot-care plan. Check your feet regularly for cuts, blisters, redness, swelling, colour change, or drainage. Do not walk barefoot if you have reduced sensation, and have new foot wounds assessed promptly.

Smoking damages circulation. Stopping can reduce the risk of further blood-vessel disease. Counselling, support, and stop-smoking medicines may help.

Clean minor wounds and cover them with an appropriate dressing. Seek medical advice if a wound becomes more painful, swollen, discoloured, or slow to heal. Avoid direct heat on numb skin because burns may go unnoticed.

Wear suitable clothing in extreme cold and seek help for suspected frostbite. Do not rub frozen tissue or apply direct heat.

Living with it and what to expect

Recovery can take weeks or months. Some people need repeated procedures and ongoing wound care. Fatigue, pain, sleep disruption, and reduced mobility are common early in recovery.

Although dead tissue cannot recover, surrounding tissue may heal after infection is controlled and circulation improves. Some people return to previous activities. Others have lasting changes in movement, sensation, appearance, footwear, or equipment needs.

After an amputation, rehabilitation may include strengthening exercises, balance training, learning new ways to complete daily tasks, and fitting a prosthetic limb when appropriate. Phantom sensations or pain can occur and can be treated.

Follow-up usually monitors wound healing, circulation, diabetes, and new pressure points or ulcers. Attend planned appointments, but do not wait for the next visit if you develop a new wound, spreading discolouration, fever, or a sudden increase in pain.

Changes to appearance or independence may cause grief, anxiety, or low mood. Rehabilitation teams, psychological support, and peer groups can help.

When to get medical help

Suspected gangrene needs urgent medical assessment. Do not wait for skin to turn black, because blackening can be a late sign.

Seek urgent same-day medical help for:

Call emergency services or go to an emergency department if symptoms spread quickly or

there is severe pain, rapidly increasing swelling, blisters, crackling beneath the skin, fever with confusion, faintness, rapid breathing, or a fast heartbeat.

Sudden severe abdominal pain, persistent vomiting, or a swollen abdomen also needs emergency assessment because internal blood flow may be blocked.

After treatment, attend routine wound, vascular, diabetes, and rehabilitation appointments. Contact the treating service sooner if healing slows or new skin damage appears.

- A new wound with worsening pain, swelling, discharge, smell, or colour change
- Skin that becomes cold, pale, blue, purple, brown, or black
- Sudden numbness or loss of feeling near a wound
- A worsening foot ulcer, especially with diabetes or poor circulation

Common questions

Can gangrene heal on its own?

No. Dead tissue cannot become living tissue again. Dry gangrene may spread slowly, but it still requires urgent assessment because infection can develop and circulation may need treatment.

Does gangrene always mean amputation?

No. Some people can be treated by removing a smaller amount of dead tissue, controlling infection, and restoring blood flow. Amputation is used when necessary to remove extensive damage or stop a dangerous infection.

How quickly does gangrene spread?

Dry gangrene may progress gradually. Wet or gas gangrene can worsen over hours and needs emergency treatment. It is not safe to judge the type or speed from appearance alone.

Is gangrene contagious?

Gangrene itself is not contagious. Bacteria in an infected wound are not usually spread through ordinary social contact, although careful wound hygiene is important.

What does early gangrene look like?

Early signs may include unusual paleness, redness, darkening, swelling, cold skin, severe pain, or numbness. Black skin may not appear at first. These changes can have other causes but need urgent assessment.

Can diabetes cause gangrene?

Diabetes does not directly make tissue die, but it increases risk through poor circulation, reduced sensation, infection, and slower wound healing. Prompt care for foot wounds can reduce severe damage.

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