CONDITION

Necrosis

Necrosis is the irreversible death of cells or tissue after severe injury or loss of blood supply.

WHAT IT IS
Irreversible death of cells or tissue after severe damage

BODY SYSTEM
Any body system

MAIN SYMPTOMS
Pain, swelling, colour change, loss of function

WHAT CAUSES IT
Lost blood flow, infection, injury, toxins, or inflammation

HOW IT IS DIAGNOSED
Examination, imaging, blood tests, sometimes tissue biopsy

MAIN TREATMENT
Treating the cause and removing dead tissue when needed

CAN IT BE CURED?
Sometimes - causes may be treated, dead tissue cannot recover

IS IT AN EMERGENCY?
Sometimes - sudden severe pain or rapidly darkening tissue

LONG-TERM OUTLOOK
Ranges from full recovery to permanent organ damage

Overview

Necrosis means that cells or an area of tissue have died because they were badly damaged. It is a condition or finding, rather than one specific disease. It can affect the skin, bone, muscles, internal organs, or almost any other part of the body.

Common causes include loss of blood supply, serious infection, physical injury, and exposure to harmful substances. Necrosis can be small and limited, or it can involve a large area.

Dead tissue cannot return to normal. However, the body may remove a small area and replace it with healthy tissue or scar tissue. Larger areas may need treatment to remove the damaged tissue, control infection, restore blood flow, or support the affected organ.

Necrosis matters because the underlying cause may still be active. It can also weaken an

organ, interfere with movement, or provide an area where infection can develop.

Necrosis is not the same as apoptosis , which is the controlled process the body uses to remove old or unneeded cells. Necrosis follows harmful injury and often causes inflammation around the damaged area.

Symptoms

Symptoms depend on where the necrosis is, how much tissue is affected, and what caused it. A small area found on a scan or biopsy may cause no clear symptoms.

Possible patterns include:

Some forms develop gradually. Osteonecrosis, also called avascular necrosis, is bone death caused by an interrupted blood supply. Early osteonecrosis may not hurt. Pain can develop over months as the bone weakens.

Other forms develop quickly. A severe infection that destroys soft tissue may cause rapidly increasing pain and swelling, sometimes before the skin looks badly affected.

- Skin or soft tissue: pain, swelling, warmth, numbness, blisters, an open wound, or skin that becomes purple, brown, or black
- Bone or joint: deep aching pain, stiffness, reduced movement, or pain when putting weight on the area
- Internal organs: pain in the affected area, nausea, vomiting, fever, weakness, or reduced organ function
- Loss of blood flow to a limb: sudden pain, pale or cool skin, tingling, numbness, or weakness

Causes and risk factors

Necrosis happens when cells can no longer get what they need to survive or are damaged beyond repair.

Loss of blood flow is a major cause. Blood carries oxygen and nutrients to tissue. A blocked artery, blood clot, severe pressure, twisting of an organ, or major injury can interrupt that supply. This is sometimes called ischemia . If tissue dies because of the interruption, the area may be called an infarct .

Infections can also cause necrosis. Some bacteria spread through tissue, damage blood vessels, or produce toxins. Necrotizing soft-tissue infections are uncommon but can progress

quickly.

Other causes include burns, frostbite, radiation, crushing injuries, certain chemicals, severe inflammation, and digestive enzymes leaking into tissue during pancreatitis.

Factors linked to particular forms of necrosis include:

Having a risk factor does not mean that necrosis will develop. In some people, especially those with osteonecrosis, no cause is found.

- Diabetes or narrowed arteries, which can reduce circulation
- Smoking, which damages blood vessels
- Long-lasting pressure on the skin, especially when movement is limited
- Major fractures or joint dislocations that disrupt a bone's blood supply
- Corticosteroid exposure and heavy alcohol use, which are associated with osteonecrosis
- Sickle cell disease, lupus, and some blood-clotting disorders
- Radiation treatment or some cancer treatments

Diagnosis

A healthcare professional will ask about symptoms, injuries, medical conditions, medicines, and when the problem began. They may check skin colour, temperature, pulses, sensation, movement, and signs of infection.

The tests used depend on the affected area. X-rays may show advanced bone damage, while MRI can detect earlier osteonecrosis. Ultrasound, CT scans, or blood-vessel imaging may help assess internal organs, soft tissue, or circulation.

Blood tests cannot usually confirm necrosis by themselves. They may show inflammation, infection, muscle damage, or reduced organ function. Samples from a wound or fluid collection may be tested for bacteria.

A biopsy removes a small tissue sample for examination under a microscope. It can confirm cell death and sometimes identify the cause. However, a biopsy is not always needed or safe. Necrosis may instead be confirmed by imaging, the appearance of tissue during surgery, or a combination of findings.

Treatment and management

There is no single treatment for all necrosis. Care focuses on stopping the cause, protecting

nearby tissue, and managing the damage that has already occurred.

If blood flow has suddenly stopped, urgent procedures or medicines may be used to restore circulation. The available approach depends on the blood vessel, organ, and cause of the blockage.

Bacterial infections are treated with antibiotics like amoxicillin or doxycycline . When an infection is destroying tissue quickly, surgery is often needed as well. Antibiotics cannot restore dead tissue or reliably reach areas without a working blood supply.

Debridement means removing dead or badly damaged tissue. This may allow a wound to heal and reduce the chance of continuing infection. Debridement can be done in several ways, from wound-care procedures to surgery. Extensive damage may require reconstruction, a skin graft, or, in severe limb cases, amputation.

Treatment for osteonecrosis depends on the bone involved and whether it has started to collapse. Options may include reducing strain on the joint, pain management, physical therapy, procedures that reduce pressure inside the bone, bone grafting, or joint replacement. Not everyone needs surgery.

Necrosis affecting an internal organ may require treatment for the underlying problem as well as support for the organ. For example, care might include draining infected fluid, removing damaged tissue, or treating a blocked blood vessel.

Follow-up is important even after the cause is controlled. Wounds, circulation, organ function, or bone structure may need to be checked over time.

Complications

Possible complications depend on the location and extent of the damage.

Necrotic tissue may become infected. An infection can spread into the bloodstream and cause sepsis, a dangerous whole-body response to infection. Necrosis in an internal organ can lead to bleeding, leakage from the bowel, or organ failure.

Bone necrosis can weaken the bone until it collapses. If this happens near a joint, arthritis, long-term pain, and reduced movement may follow.

Skin and soft-tissue necrosis can lead to scarring, slow-healing wounds, reduced sensation, or loss of part of a limb. Small, well-contained areas may heal without major lasting problems.

Prevention

Necrosis cannot always be prevented. Sudden blood clots, major injuries, inherited conditions, and some treatment-related causes may occur despite appropriate care.

You may be able to reduce certain risks by:

Do not stop corticosteroids like prednisone or hydrocortisone suddenly. They may need to be reduced gradually under medical supervision.

People with sickle cell disease or other conditions linked to osteonecrosis cannot remove the inherited risk. Regular care may help detect complications earlier.

- Not smoking and getting support to quit if needed
- Managing diabetes, cholesterol, and blood pressure
- Checking feet and skin regularly if you have poor circulation or reduced sensation
- Changing position regularly if illness or disability limits movement
- Getting prompt care for deep wounds, burns, frostbite, or signs of infection
- Using protective equipment to reduce serious injuries
- Discussing heavy alcohol use or long-term corticosteroid treatment during routine care

Living with it and what to expect

Necrosis itself is irreversible, but that does not mean the whole affected body part will continue to worsen. Once the cause is controlled, the area may become stable. The body can sometimes clear a small amount of dead tissue and heal around it.

Recovery may take weeks or months. Open wounds may need repeated dressing changes or debridement. Rehabilitation can help restore movement and strength after surgery, prolonged illness, or a period without using a limb normally.

Osteonecrosis often needs longer follow-up. Some areas remain stable, while others gradually weaken and collapse over months or years. Repeat imaging may be used to watch for structural changes. Persistent pain does not always mean that necrosis is spreading, but a clear change in pain or function should be assessed.

The effect on daily life ranges widely. A small skin lesion may heal with little lasting impact. Damage to a major joint may limit walking or work until it is treated. Extensive necrosis in the heart, brain, bowel, or another vital organ can cause permanent disability.

Routine follow-up may include wound checks, imaging, blood tests, circulation checks, or rehabilitation. Keeping these appointments helps identify infection, poor healing, or loss of function before it becomes more difficult to manage.

When to get medical help

Seek emergency help for symptoms that could mean a sudden loss of blood flow or a rapidly spreading infection. These include:

Contact a healthcare service promptly for a wound that is becoming darker, more painful, swollen, or foul-smelling. Pus, fever, spreading redness, or a wound that is not healing also needs timely assessment.

Arrange routine follow-up for ongoing joint or bone pain, reduced movement, or a scan report that mentions necrosis. If you already have diagnosed necrosis, report a new change in pain, skin colour, wound drainage, or function rather than waiting for the next planned visit.

- Sudden severe chest pain, trouble breathing, or heavy sweating
- New facial drooping, arm weakness, speech difficulty, or confusion
- A limb that suddenly becomes very painful, pale, cold, numb, or weak
- Severe pain that is much worse than the visible injury
- Rapid swelling, spreading redness, purple or black skin, or new blisters
- Fever with confusion, faintness, a very fast heartbeat, or difficulty staying awake
- Severe and persistent abdominal pain, especially with vomiting or a rigid abdomen

Common questions

Can necrosis heal on its own?

Dead cells cannot recover. A very small area may be cleared by the body, and nearby living tissue may heal or form a scar. Larger areas often need treatment, especially if circulation is poor, infection is present, or the affected structure has become unstable.

Is necrosis the same as gangrene?

Not exactly. Necrosis is the general medical term for tissue death. Gangrene usually describes a visible or extensive area of tissue death caused by poor blood flow, sometimes with infection. It most often affects a limb or the bowel.

Does necrosis always mean I need surgery?

No. Treatment depends on the location, size, cause, symptoms, and risk of complications. Some small or stable areas can be monitored. Surgery is more likely when dead tissue is infected, circulation needs restoring, a bone has collapsed, or an organ is at risk.

Is necrosis cancer?

Necrosis is not cancer. However, a fast-growing tumour can outgrow its blood supply and develop necrosis in its centre. Cancer treatments may also cause tumour cells to die. A report mentioning necrosis must be interpreted alongside the rest of the scan or biopsy findings.

Is necrosis contagious?

Necrosis itself cannot spread from one person to another. An infection that causes necrosis may be contagious in some circumstances, but many necrotizing infections come from bacteria already on the person's skin or in the body.

What does "necrosis" on a biopsy or scan mean?

It means the test found an area where cells or tissue have died. The word alone does not explain the cause or how serious it is. Its meaning depends on the organ involved, the size of the area, nearby findings, and your symptoms.

Sources

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