CONDITION

Osteomyelitis in children

Osteomyelitis is a bone infection in a child, usually caused by bacteria spreading through the blood.

WHAT IT IS
Bone infection in a child

BODY SYSTEM
Bones and joints

MAIN SYMPTOMS
Bone pain, fever, swelling, reduced limb use

WHAT CAUSES IT
Usually bacterial infection spreading through blood

HOW IT IS DIAGNOSED
MRI, blood cultures, and sometimes bone sampling

MAIN TREATMENT
Antibiotics, with drainage or surgery when needed

CAN IT BE CURED?
Yes - prompt treatment usually clears infection

IS IT AN EMERGENCY?
Sometimes - sepsis signs or rapidly worsening illness

LONG-TERM OUTLOOK
Most children recover fully with timely treatment

Overview

Osteomyelitis is an infection inside a bone. In children, it most often happens when bacteria travel through the bloodstream and settle in an area of growing bone.

The long bones of the legs and arms are commonly affected. The pelvis, spine, feet, or other bones can also become infected. Sometimes the infection lies close to a joint and may occur alongside septic arthritis, which is an infection inside a joint.

Osteomyelitis can cause pain, fever, and difficulty using the affected limb. Babies may have less obvious symptoms, such as irritability or refusing feeds.

Prompt assessment matters because infection can form a pocket of pus, damage bone, or spread into the blood. With appropriate antibiotics like amoxicillin or doxycycline and, when

needed, drainage, most children recover without lasting problems.

Symptoms

Symptoms may begin suddenly over hours or days. In some children, especially those with infection in the pelvis or spine, they develop more gradually.

A child may have:

A baby may cry when being picked up or during a nappy change. They may keep one limb still rather than moving it normally. Fever can be absent, particularly in young babies or children with a weakened immune system.

Spinal osteomyelitis may cause back pain, stiffness, or reluctance to sit, stand, or bend. Pelvic infection may feel like pain in the hip, groin, abdomen, buttock, or thigh.

These symptoms can also occur with an injury, joint infection, or other conditions. The pattern of symptoms alone cannot confirm osteomyelitis.

- Pain or tenderness over one bone
- Fever or chills
- Swelling, warmth, or redness
- A limp or refusal to walk
- Reduced movement of an arm or leg
- Pain when the nearby joint moves
- Tiredness, irritability, or poor appetite

Causes and risk factors

Most childhood osteomyelitis is caused by bacteria. Staphylococcus aureus is the most common cause.

The bacteria usually reach bone through the bloodstream. A child may have had a minor skin or respiratory infection first, but often there is no clear starting point. The bloodstream route is especially common in younger children because growing bones have a rich blood supply.

Less commonly, infection enters the bone directly through:

Certain health conditions can change the risk or the types of bacteria involved. These include sickle cell disease, immune system problems, poor blood circulation, and long-term

intravenous access. Children who have recently had bone or joint surgery also need closer assessment if symptoms develop.

A knock or sports injury does not usually cause osteomyelitis unless the skin or bone was opened. However, an injury may draw attention to pain in an area where infection is already developing.

- A deep cut, puncture wound, or open fracture
- Surgery involving a bone
- An infection in nearby skin or soft tissue
- Medical hardware attached to or placed within bone

Diagnosis

A healthcare professional will ask when the symptoms began, whether the child has had a recent infection or injury, and whether they can use the affected limb. The examination looks for tenderness, swelling, limited movement, and signs that the child is generally unwell.

Blood tests can measure inflammation. C-reactive protein, often called CRP, and the erythrocyte sedimentation rate, or ESR, may rise during infection. These results help support the diagnosis and can be followed during recovery, but they do not prove that the bone is infected.

Blood cultures are used to look for bacteria growing in the bloodstream. When possible, they are collected before antibiotics begin. Urgent treatment should not be delayed in a seriously unwell child just to complete testing.

An X-ray may be the first image taken. It helps rule out a fracture or another bone problem, but it can look normal early in osteomyelitis.

MRI provides detailed pictures of bone, bone marrow, joints, and nearby tissue. It is usually the most useful scan for finding the infection and any abscess, which is a collection of pus. Younger children may need sedation or an anaesthetic to remain still during the scan.

Ultrasound can find fluid around a joint or under the outer covering of a bone. It cannot reliably show infection deep inside bone. Other scans may be considered when MRI is unavailable or cannot be performed.

Sometimes a needle or operation is used to collect fluid or a small bone sample. Growing bacteria from blood, fluid, or bone can identify the cause and guide antibiotic choice. Cultures may remain negative, especially if antibiotics were already given, so diagnosis can still be based on the examination, blood tests, and imaging.

Treatment and management

Osteomyelitis is treated with antibiotics. The first antibiotic is chosen to cover the bacteria most likely to cause the infection in the child's age group and local area. Treatment can then be adjusted if cultures identify a specific bacterium.

Children who are young, significantly unwell, unable to take medicine by mouth, or at risk of complications are commonly treated in hospital at first. Antibiotics may begin through a vein. When symptoms and inflammation are improving, many children can change to an oral antibiotic.

Treatment usually continues for several weeks. The exact length is based on the infected bone, the bacterium, whether an abscess or complication is present, and how quickly the child improves. It is important to complete the planned course, even when pain and fever have settled.

Surgery is not required for every child. Drainage or an operation may be needed if there is a sizeable abscess, infected or dead bone, an infection involving implanted hardware, or little improvement with antibiotics. A sample can be collected during the procedure.

Pain relief, rest, and temporary support for the limb may make movement more comfortable. Some children need physiotherapy after the acute pain improves, particularly if they have been avoiding movement for a while.

Follow-up usually includes checking pain, movement, temperature, and medicine tolerance. Repeat CRP or other blood tests may be used to confirm that inflammation is falling. Follow-up imaging is not always needed when a child is recovering as expected.

Complications

Complications are less likely when osteomyelitis is recognised and treated promptly. Possible problems include an abscess, infection in a nearby joint, or bacteria spreading into the bloodstream.

Sepsis is a serious reaction to infection that can affect circulation and organ function. It requires emergency treatment.

Damage near a growth plate can occasionally affect how a bone grows. This may lead to a difference in limb length or shape. A weakened bone can rarely fracture.

Infection can sometimes continue or return, becoming chronic osteomyelitis. Chronic infection may involve areas of damaged or dead bone and may need longer treatment or surgery. Persistent pain, a draining wound, or symptoms returning after treatment should be assessed.

Some antibiotics can cause diarrhoea, nausea, a rash, or other side effects. The child's care team may arrange blood tests during longer treatment courses, depending on the medicine being used.

Prevention

Most cases caused by bacteria spreading through the bloodstream cannot be reliably prevented. The infection often develops without an obvious wound or avoidable event.

Cleaning cuts and puncture wounds and seeking care for deep, contaminated, or bite wounds may reduce the chance of infection spreading from damaged skin. Follow the wound-care and follow-up instructions given after an open fracture or bone operation.

Children with medical hardware, sickle cell disease, or a weakened immune system may have specific plans for assessing fever or possible infection. These plans do not prevent every case, but they can support earlier recognition.

Osteomyelitis is not usually caught from another child. Everyday contact with someone who has it does not spread the bone infection.

Living with it and what to expect

Many children feel noticeably better within the first few days of effective treatment. Fever often settles before full movement returns. Pain, stiffness, and a limp may improve more gradually.

At home, antibiotics need to be given for the full planned course. If the child vomits doses, refuses the medicine, or develops troublesome side effects, contact the treating team rather than stopping or changing it without advice.

Return to nursery or school is based on how well the child feels, whether they can move safely, and whether medicines can be managed. Osteomyelitis itself is not generally contagious. A gradual return may be easier if tiredness or limited mobility continues.

Running, jumping, and contact sports may need to wait until the bone has recovered enough to handle the strain. The care team can advise when normal activity is safe, especially after surgery or when the infection has weakened the bone.

Most children regain normal use of the limb and have no long-term limits. Follow-up may continue for weeks or months. Longer monitoring can be needed when infection affected a growth plate, spine, joint, or large area of bone.

A return of fever, focal bone pain, swelling, or reduced limb use after improvement should be assessed. These symptoms do not always mean that the infection has returned, but they should not be ignored.

When to get medical help

Arrange urgent medical assessment the same day if a child has unexplained bone or joint pain with fever, cannot put weight on a leg, stops using an arm, or has increasing swelling and tenderness. Young babies with fever, unusual sleepiness, poor feeding, or reduced limb movement need prompt assessment even when there is no visible swelling.

Seek urgent advice during treatment if symptoms are not improving as expected, fever returns, pain worsens, or antibiotic doses cannot be kept down. A spreading rash or persistent diarrhoea also needs medical advice.

Call emergency services or go to an emergency department if the child:

Routine follow-up remains important even when recovery is going well. It helps confirm that movement is returning, the medicine has been completed, and there are no signs of growth or bone problems.

- Is difficult to wake, confused, or unusually floppy
- Has trouble breathing or is breathing very quickly
- Has pale, blue, blotchy, or unusually cold skin
- Develops rapidly worsening pain, swelling, or illness
- Has a seizure or collapses
- Shows signs of a severe allergic reaction, such as facial swelling or breathing difficulty

Common questions

Is osteomyelitis in children curable?

Yes. Most children are cured with appropriate antibiotics, with drainage or surgery when required. Recovery may take longer if there is an abscess, damaged bone, delayed treatment, or an unusual bacterium.

How does a child get osteomyelitis?

Bacteria most often travel through the bloodstream and settle in a growing bone. Less often, they enter through a deep wound, open fracture, nearby infection, or bone operation. There

may be no obvious original infection.

How long does treatment take?

Antibiotics are usually needed for several weeks. Some treatment may be given through a vein, followed by medicine by mouth. The duration is guided by the site, test results, complications, and response to treatment.

Can my child walk or go to school?

Gentle movement may be allowed as pain improves, but weight-bearing and sports restrictions differ according to the bone involved and whether surgery was needed. School can usually resume when the child feels well enough and can move safely.

Can osteomyelitis come back?

It can return, but this is not the usual outcome after successful treatment. New pain in the same area, swelling, fever, or reduced limb use should be assessed, even if treatment ended months earlier.

Is osteomyelitis contagious?

The bone infection itself is not usually contagious. It cannot normally be passed through school attendance, play, or everyday household contact.

Sources

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