CONDITION

Bacterial arthritis

Learn how bacterial arthritis affects a joint, which symptoms need urgent care, and how doctors diagnose, treat, and monitor the infection.

WHAT IT IS
Bacterial infection inside a joint

BODY SYSTEM
Bones and joints

MAIN SYMPTOMS
Joint pain, swelling, warmth or redness, stiffness

WHAT CAUSES IT
Bacterial infection

HOW IT IS DIAGNOSED
Joint aspiration with Gram stain and culture

MAIN TREATMENT
Antibiotics and joint fluid drainage

CAN IT BE CURED?
Yes, antibiotics and drainage clear infection

IS IT AN EMERGENCY?
Sometimes, confusion signals body-wide infection

LONG-TERM OUTLOOK
Prompt treatment lowers but cannot eliminate lasting damage or recurrence

Overview

Bacterial arthritis is an infection caused by bacteria inside a joint. It is also called septic arthritis . The infection can affect a natural joint or a joint that has been replaced with an artificial implant.

Bacteria can enter a joint through the bloodstream, a wound, surgery, an injection, or an infection in nearby tissue. Once inside, they can cause intense inflammation. This can damage cartilage, the smooth tissue that helps the joint move, sometimes within a short period.

The knee is commonly affected, but bacterial arthritis can develop in the hip, shoulder, ankle, wrist, elbow, or other joints. One joint is often involved, although several joints may be affected. Babies and young children may have less specific symptoms, especially when the hip is infected.

Bacterial arthritis requires prompt medical assessment. Treatment usually involves antibiotics and removal of infected joint fluid. Early treatment helps control the infection, protect the joint, and reduce the chance that bacteria will spread through the body.

Other conditions, including gout, inflammatory arthritis, Lyme arthritis, and injuries, can also cause a painful swollen joint. Symptoms alone cannot confirm the cause.

Symptoms

Symptoms often begin quickly, although infections involving artificial joints may develop more gradually. Affected joints may be:

Fever, chills, tiredness, or a general feeling of illness may occur. However, a normal temperature does not rule out bacterial arthritis. Older adults, babies, and people with weakened immune systems may have little or no fever.

A baby or young child may refuse to move an arm or leg, limp, avoid standing, cry when a joint is moved, feed poorly, or become unusually irritable. A hip infection may cause pain in the groin, thigh, or knee rather than obvious swelling at the hip.

Gonococcal arthritis is caused by the bacterium that causes gonorrhea. It may produce pain that moves between joints, inflammation around tendons, or a small number of skin spots or pustules. Genital symptoms may be absent.

Seek urgent, same-day medical care for a new hot, swollen, or severely painful joint, particularly with fever, recent surgery, an artificial joint, a weakened immune system, or difficulty walking. An emergency department is often the most appropriate setting because joint testing and treatment may be needed quickly.

Call emergency services for possible signs of a serious body-wide infection, such as confusion, fainting, severe breathing difficulty, blue or mottled skin, or extreme weakness.

- Very painful, including with small movements
- Swollen, warm, or red
- Stiff or difficult to move
- Unable to support weight normally

Causes and risk factors

Many types of bacteria can cause joint infection. Staphylococcus aureus is an important cause.

Other possibilities include streptococci, gram-negative bacteria, and Neisseria gonorrhoeae , which causes gonorrhea. The likely bacterium varies with age, health history, exposure, and how the infection reached the joint.

Bacteria may travel through the bloodstream from an infection elsewhere in the body. Possible starting points include infected skin, a urinary infection, pneumonia, or an infected heart valve. Sometimes the original source is not found.

Bacteria may also enter directly through:

Anyone can develop bacterial arthritis. Risk is higher in people with an artificial joint, previous joint surgery, rheumatoid arthritis, advanced osteoarthritis, diabetes, kidney or liver disease, or a weakened immune system. Medicines that suppress the immune system can also increase risk.

Other risk factors include injection drug use, recent bloodstream infection, fragile or infected skin, and older age. Sexually active people may be at risk of gonococcal infection depending on their sexual exposure. Babies and young children are also vulnerable because infections can spread through the bloodstream.

Having a risk factor does not mean that a painful joint is infected. Likewise, bacterial arthritis can occur without an obvious risk factor.

- A puncture, bite, or open wound near the joint
- Joint surgery or replacement
- An injection into the joint
- A fracture or other injury that opens the joint
- Infection of nearby bone, skin, or soft tissue

Diagnosis

A clinician will ask when symptoms began, which joints are affected, and whether there has been fever, injury, infection, surgery, injection, or sexual exposure. They will also review medicines, medical conditions, artificial joints, and recent antibiotic use.

The most important test for a suspected natural-joint infection is usually joint aspiration , also called arthrocentesis. A clinician uses a sterile needle to remove fluid from the joint. Ultrasound or another imaging method may help guide the needle, especially for deep joints such as the hip.

The fluid is examined for:

A culture attempts to grow and identify the bacterium. This can guide antibiotic like amoxicillin or doxycycline selection, but cultures are not always positive. Finding gout crystals does not completely rule out an infection because both problems can occur together.

Blood tests may measure white blood cells and markers of inflammation, such as C-reactive protein. These tests can support the assessment and help track response to treatment, but no routine blood test can confirm or exclude bacterial arthritis by itself.

Blood cultures may identify bacteria circulating in the bloodstream. Testing for gonorrhea or other infections may be appropriate based on symptoms and exposure. Clinicians may collect samples from genital, throat, rectal, urine, skin, or wound sites.

X-rays can show joint damage, an artificial implant, or another explanation for symptoms. Ultrasound can detect fluid. MRI or CT may be used when the joint is difficult to assess or when infection in nearby bone or soft tissue is a concern.

When a person is medically stable, clinicians generally try to collect joint fluid and blood cultures before antibiotics. If there are signs of sepsis or serious instability, testing should not cause a harmful delay in antibiotic treatment.

- Bacteria on a Gram stain and culture
- The number and types of white blood cells
- Crystals associated with gout or pseudogout
- Other features suggested by the clinical situation

Treatment and management

Bacterial arthritis is generally treated in a hospital, at least at first. Management depends on the affected joint, the suspected bacterium, culture results, the presence of an artificial implant, and the person's overall health.

Antibiotics are started promptly. Initial treatment usually covers the bacteria considered most likely while test results are pending. The treatment may then be narrowed when cultures identify the organism and show which antibiotics are likely to work.

Antibiotics may first be given through a vein. Some people can later change to oral medicine when they are improving and an effective oral option is available. The total treatment period varies. It should be determined by the treating team rather than by a single schedule for every patient.

Infected fluid also needs to be removed. Depending on the joint and clinical situation, this may involve repeated needle aspiration or surgery. Arthroscopic surgery uses a small camera and

instruments inserted through small cuts. Open surgery uses a larger incision and may be needed for certain joints, extensive infection, or infection that has not improved with other drainage.

An artificial joint infection often requires specialist care from orthopedic surgeons and infectious-disease clinicians. Treatment may involve cleaning the joint while retaining some implant parts, replacing the implant in one or more operations, or another approach based on the implant and infection.

Pain relief is part of care. Once the infection is controlled, guided movement and physical therapy can reduce stiffness and help restore strength. The joint may need brief rest during the most painful stage, but prolonged immobility can make recovery more difficult.

Gonococcal arthritis requires antibiotics that treat gonorrhea. Testing and treatment for other sexually transmitted infections may also be advised. Recent sexual partners may need evaluation through appropriate clinical or public health services.

Do not use leftover antibiotics or stop prescribed treatment early without speaking with the treating team. Taking antibiotics before joint fluid is collected can make the responsible bacterium harder to identify, although urgent treatment should never be delayed when a person is seriously ill.

Complications

The inflammation caused by infection can damage cartilage and nearby bone. Some people are left with pain, stiffness, reduced movement, or weakness even after the bacteria have been cleared.

Bacteria can enter the bloodstream and cause sepsis , a dangerous body-wide response to infection. Infection can also spread to bone or other tissues. In children, infection near a growing bone may affect growth.

An artificial joint infection may loosen or damage the implant and can require more than one operation. Infection can also return after treatment, particularly when bacteria remain on implanted material or when the original source has not been controlled.

Prompt diagnosis, drainage, and effective antibiotics lower these risks but cannot eliminate them completely.

Follow up

Follow-up after bacterial arthritis is important. The care team may monitor pain, swelling, temperature, wound healing, joint movement, and the ability to walk or use the limb. Blood tests may be repeated to check whether inflammation is decreasing.

Take antibiotics exactly as directed and discuss missed doses, vomiting, diarrhea, rash, or other possible side effects with the treating team. Keep follow-up visits even if the joint feels better. Some infections return gradually.

Physical therapy or a home exercise plan may be recommended once movement is considered safe. Recovery can take time, especially after hip infection, surgery, prolonged illness, or infection involving an artificial joint.

Contact the treating team promptly if pain, swelling, warmth, drainage, or fever returns. Increasing difficulty moving the joint also needs reassessment. These concerns are different from routine follow-up for gradually improving stiffness or weakness.

Seek urgent care for rapidly worsening joint symptoms or new fever during treatment. Seek emergency care for confusion, fainting, severe breathing difficulty, or other signs of serious illness.

Prevention depends on the situation. Helpful measures may include treating skin or other infections, caring for wounds, avoiding injection drug use, and following surgical wound instructions. Safer-sex practices and recommended testing can reduce the risk of gonococcal infection. Routine antibiotics before dental or other procedures are not appropriate for everyone with an artificial joint; discuss individual circumstances with the relevant clinician.

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