



Septic Arthritis

Aspirate before antibiotics · Cartilage is destroyed in days, not weeks

TAP IT FIRST
then treat

SUSPECT IT IN EVERY HOT JOINT *a joint infection is a surgical emergency, not a rheumatology referral*

THE PRESENTATION

Acute monoarthritis — hot, swollen, exquisitely painful joint with **severe pain on passive movement** and a held position of comfort. **Knee is commonest**. Fever is present in only about half, so **its absence does not exclude the diagnosis**.

WHO IS AT RISK

Pre-existing joint disease, especially **rheumatoid arthritis** · prosthetic joint · age over 80 · **diabetes** · injection drug use · immunosuppression, including **TNF inhibitors** · recent joint injection or surgery · skin infection or bacteremia.

WHY THE URGENCY

Cartilage damage begins within days and is irreversible. Mortality is significant, and functional loss is common in survivors. **Delay to drainage is the modifiable factor** that determines outcome.

ASPIRATE THE JOINT *before antibiotics, unless the patient is septic and unstable*

Send	Interpretation
Cell count and differential	WBC > 50,000/mm³ with > 90% neutrophils strongly suggests infection — but the ranges overlap . Lower counts occur in early, partially treated, immunosuppressed and prosthetic joint infection, and crystal arthritis can exceed 50,000. Treat the clinical picture, not the threshold .
Gram stain and culture	Gram stain is positive in only about half , so a negative one changes nothing. Culture is the definitive test — and the reason to aspirate first.
Crystals	Crystals do not exclude infection and the two coexist. Finding urate or pyrophosphate is not permission to stop looking — always send culture as well.
Blood cultures	Take before antibiotics. Positive in a substantial proportion and may be the only microbiological yield. S. aureus growth mandates an echo to exclude endocarditis.

TREAT IT *antibiotics plus drainage — neither alone is sufficient*

- Empirical antibiotics immediately after aspiration**. **Vancomycin** to cover MRSA, plus a **third-generation cephalosporin** such as ceftriaxone. Use an **antipseudomonal** agent instead for injection drug use, immunosuppression, or hospital-acquired infection.
- Joint drainage is essential**. Options are **repeated closed needle aspiration**, **arthroscopic washout**, or **open arthrotomy**. Purulent material is not sterilized by antibiotics alone — this is a source-control problem.
- Involve orthopedics on the day**. **Hip and shoulder infections generally need surgical drainage** rather than serial aspiration, given the difficulty of adequate needle access.
- Narrow on culture**, then continue for roughly **2–4 weeks** depending on organism, joint and response — longer for **S. aureus**, and considerably longer for prosthetic joint infection.
- Reassess if not improving by 48–72 hours**: think **inadequate drainage**, resistant organism, an adjacent **osteomyelitis or abscess**, or the wrong diagnosis. **Repeat aspiration and imaging** rather than simply broadening the antibiotic.

TWO VARIANTS THAT BEHAVE DIFFERENTLY *and are commonly missed*

DISSEMINATED GONOCOCCAL INFECTION

The one to think of in a **young, sexually active patient**. Presents either as **purulent monoarthritis** or as the classic triad of **migratory polyarthralgia, tenosynovitis and pustular skin lesions**. **Synovial fluid cultures are frequently negative** — so send **NAAT from urethral, cervical, pharyngeal and rectal sites**. Responds well to ceftriaxone. **Ask the sexual history**, which is the step usually skipped.

PROSTHETIC JOINT INFECTION

Do not aspirate through cellulitic skin, and involve the original surgical team early. Thresholds for synovial white cell count are **much lower** than in native joints. Requires **multiple deep intraoperative samples** rather than swabs, prolonged therapy, and a decision between **debridement with implant retention** and **staged revision** based on timing and implant stability.

THE DIFFERENTIAL *what else presents as an acute hot joint*

Diagnosis	Discriminating features
Crystal arthritis	Gout or pseudogout. Previous identical attacks, tophi, chondrocalcinosis. Crystals on polarised microscopy — but this never excludes coexisting infection , so culture regardless.
Reactive arthritis	1–4 weeks after a gastrointestinal or genitourinary infection. Often oligoarticular with enthesitis, conjunctivitis or urethritis. Sterile synovial fluid .
Hemarthrosis	Trauma, anticoagulation, or bleeding disorder. Frankly bloody aspirate — and lipid globules suggest an intra-articular fracture.
Flare of inflammatory arthritis	Known rheumatoid or psoriatic disease. The dangerous overlap — these patients are at the highest risk of septic arthritis, and a flare and infection look identical. Aspirate rather than assuming a flare .
Adjacent infection	Osteomyelitis, bursitis or cellulitis overlying a joint. Bursitis spares passive movement , whereas septic arthritis causes severe pain through the arc of motion — a useful bedside discriminator.

PEARLS & PITFALLS

- Antibiotics alone do not cure a septic joint**. Pus in a closed space needs **drainage**, by repeated aspiration or arthroscopic washout; the decision to drain is as urgent as the decision to treat.
- Empiric doses: vancomycin 15–20 mg/kg q8–12h plus ceftriaxone 2 g daily**, narrowed on culture, and typically continued **3 to 4 weeks** with the oral switch guided by response.
- Aspirate before antibiotics** in the stable patient. A single dose given first can render cultures negative and leave you treating blind for weeks.
- Crystals do not exclude sepsis**. Gout and infection coexist, and this is a classic route to a missed diagnosis.
- No fever does not exclude it** — fever is absent in around half of cases.
- A synovial white count below 50,000 does not exclude infection**, particularly if partially treated, immunosuppressed, or a prosthetic joint.
- Antibiotics without drainage will fail**. Get orthopedics involved the same day, especially for hip and shoulder.
- Think gonococcal in the young adult** and send extragenital NAATs — synovial culture is often negative.

References: IDSA and BSR guidance on the management of the hot swollen joint and septic arthritis · IDSA guideline on prosthetic joint infection · CDC STI treatment guidelines for disseminated gonococcal infection.

Educational aid; verify doses against local protocol, susceptibilities and patient factors.

