



MONOARTHRITIS

Diseases that commonly present **with 1 joint**:

- **Septic: bacterial**, mycobacteria
- **Crystal deposition**: gout, CPPD, hydroxyapatite deposition disease, calcium oxalate
- **Traumatic**: fx, internal derangement, hemarthrosis
- Other: OA, JA, **coagulopathy**, AVN bone, foreign-body synovitis, tumor....

Definition

Septic arthritis

is defined as the infection of 1 or more joints

Incidence: 2-10 cases per 100000 in
general population

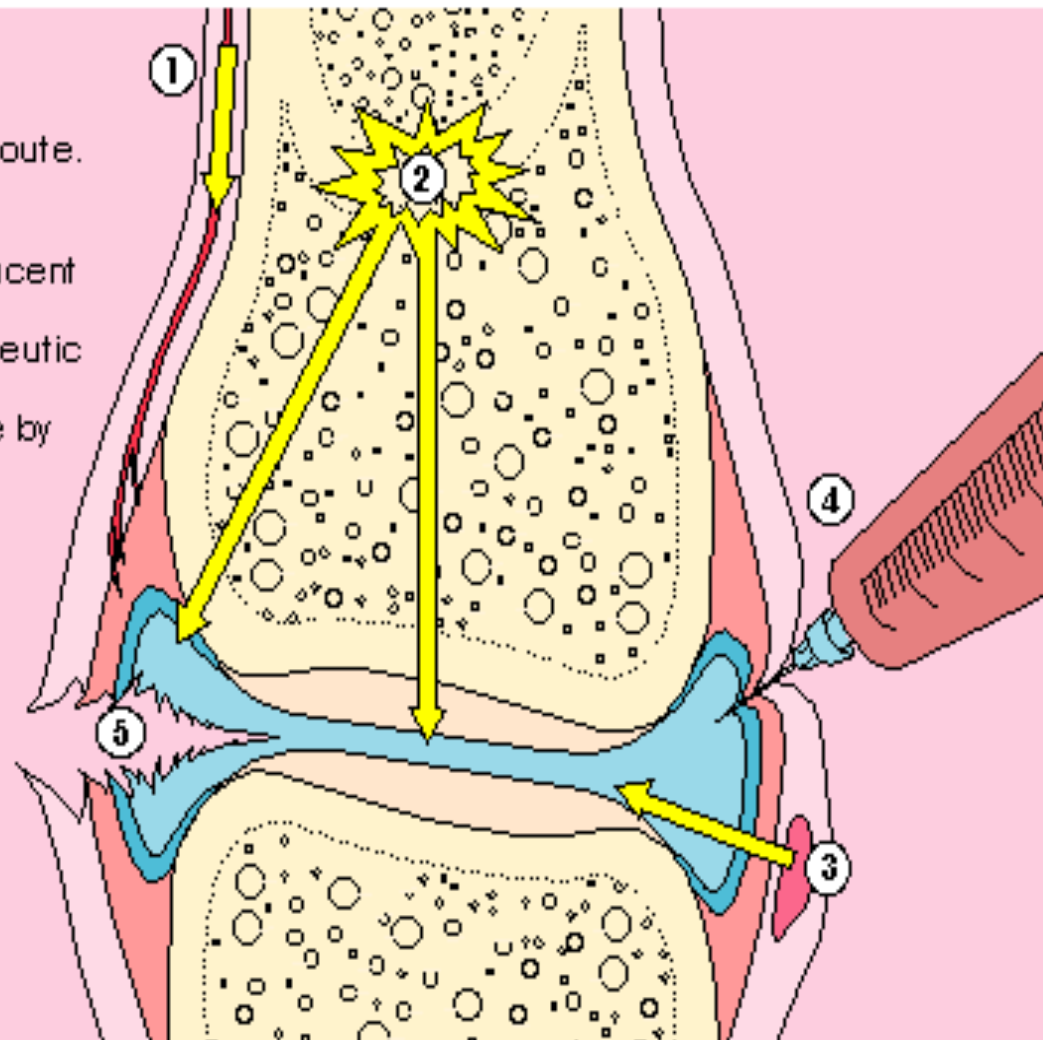
Ages peak: younger than 5 years and
older 64 years

only 15% were previously healthy adult

With expanding populations
and **increasing age**,
bone and joint infections,
especially those involving
devices, will have a growing
impact on healthcare resources

ROUTES BY WHICH BACTERIA CAN REACH THE JOINT

- 1 - The hematogenous route.
- 2 - Dissemination from osteomyelitis.
- 3 - Spread from an adjacent soft tissue infection.
- 4 - Diagnostic or therapeutic measures.
- 5 - Penetrating damage by puncture or cutting.



The bacteria **usually** enter the joint from the **bloodstream.**

Rarely, the infection follows a joint or soft tissue injection

**Septic arthritis after joint
aspiration 0.0002% of patients**

**Arthroscopic (<0.5% of
procedures)**

Polyarticular diseases occasionally p/w
one joint of onset

- RA
- Sarcoid
- ReA
- PsA
- IBD-arthritis
- OA.....

Risk factors :

existing joint problems

open wound

intravenous drug use

diabetes

excessive alcohol use as alcohol suppresses the
immune system

a weakened immune system

contact with non-sterilized needles

an infection elsewhere in the body

Risk factors for septic arthritis include:

Existing joint problems. Chronic diseases and conditions that affect your joints

Having an artificial joint. Bacteria can be introduced during joint replacement surgery, or an artificial joint may become infected if germs travel to the joint from a different area of the body through the bloodstream.

Taking medications for rheumatoid arthritis.

Skin fragility. Skin that breaks easily and heals poorly can give bacteria access to your body. Skin conditions such as psoriasis and eczema increase your risk of septic arthritis

Weak immune system.

Joint trauma.

Septic arthritis can also occur when a penetrating injury, such as an **animal bite or trauma**, delivers germs directly into the joint.

Septic arthritis usually presents as the
**abrupt onset of a hot, swollen,
and painful joint,**

but significant delays may occur with **low-
virulence organisms**, tuberculosis, and
prosthesis infection

The knee is involved
in 50 percent of
cases

although any joint
may get infected.

Diagnosis

should always be supported by
clinical, laboratory, and
imaging findings

Septic arthritis results in
rapid joint destruction
if not properly diagnosed and
treated

Early diagnosis is
essential to prevent
permanent damage to
the joint



Which is most important next step in patient's management?

1-Lab Test

2-Naproxen 500 /BD

3-X-ray knees

4-Aspiration

In all cases of suspected
native joint sepsis,

the joint should be
aspirated

Joint fluid analysis

Synovial fluid should be aspirated and examined for leucocytes, urate and pyrophosphate crystals and by Gram stain and culture

Microbiological sampling
should be done in all cases, to allow
for **targeted** antimicrobial
management

Organisms in septic arthritis

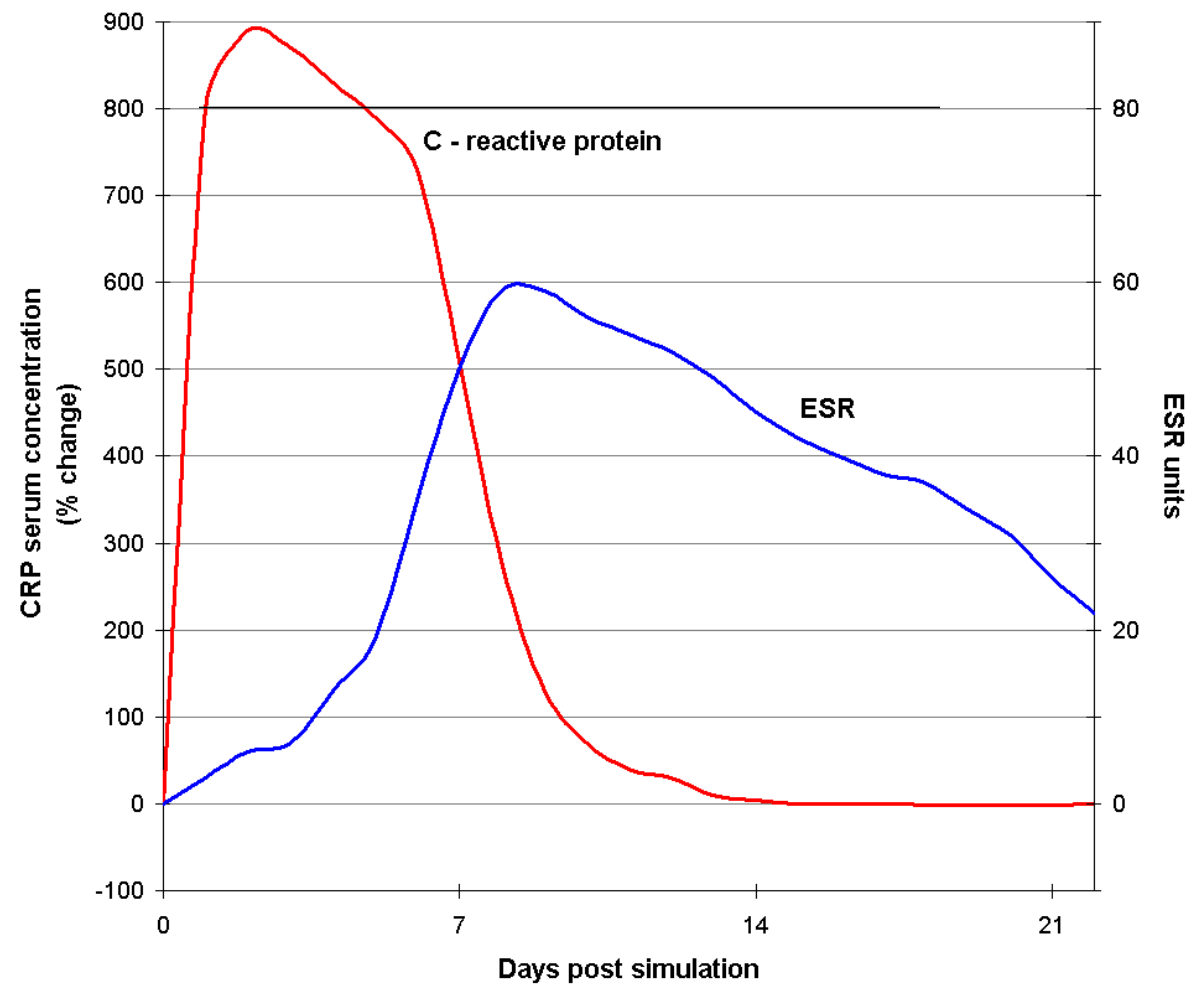
- Gram -positive cocci
 - *S. aureus*
 - *S. pyogenes*
 - *S. pneumoniae*
 - *S. viridans* group
- Gram-negative cocci
 - *N. gonorrhoeae* and meningitidis
 - *H. influenzae*
- Gram-negative bacilli
 - *E. coli*

Any bacteria may be involved, but various forms of *Staphylococcus* are the most common.

Nongonococcal bacterial arthritis is a potentially dangerous form of arthritis

Blood cultures are recommended in all patients with suspected SA and should be obtained **prior to antibiotic** administration whenever possible

Figure 1: CRP and ESR patterns of response



There is no threshold to accurately
diagnose SA or to differentiate SA from other acute arthritis,
although the likelihood of SA rises with increasing leukocyte count and
PMN percentage. SF leukocyte count $>100,000/\text{mm}^3$ or

$50,000\text{--}100,000/\text{mm}^3$ with $> 90\%$ PMN are suggestive of
infection.

Determination of SF glucose, lactate dehydrogenase (LDH), serum
procalcitonin (PCT) and/or lactate (if available) are suggested, especially

if previous initial data (including Gram stain) are inconclusive .

Low glucose levels and elevated LDH, lactate and PCT levels are common
in SA.

C-reactive protein (**CRP**), erythrocyte **sedimentation rate**, white blood cell (**WBC**) count and PMN percentage (A-III).

These tests are non-specific and cannot diagnose SA or differentiate it from other forms of arthritis, but their performance can be improved in conjunction with clinical data and other SF analyses.

They can also be used as a baseline for serial **monitoring** of treatment response, particularly **CRP**.

Imaging tests

Plain X-rays should be
done to **exclude other causes** of hot
joint, but are usually normal in early
septic arthritis

Although not usually helpful for a SA diagnosis,
they can show pre-existing joint or bone disease,
rule out other diagnoses, and can be used as
a reference image to assess future joint damage.
Additional imaging is not usually necessary

Antibiotics

All acute arthritis should be
considered infectious **until**
proven otherwise.

A high index of suspicion for infectious
arthritis is required because SA is a **medical**
emergency and should be **diagnosed as early**
as possible

As a general rule, patients
with
suspected or documented SA

should be admitted
to hospital

In all cases of suspected joint sepsis,
empirical antibiotic therapy should
be commenced **once**
appropriate cultures
have been taken

Degradation of cartilage
begins within 48 h as a result of
increased intraarticular pressure,
release of proteases and cytokines
from chondrocytes and synovial
macrophages

People who have
artificial joints are
also at **risk** of septic
arthritis.

Septic arthritis typically causes
extreme discomfort and difficulty
using the affected joint.

The joint could be swollen, red and
warm, and you might have a fever

If the initial Gram stain of the synovial fluid shows **gram-positive** cocci, vancomycin (30 mg/kg daily IV in two divided doses).

If the initial Gram stain of the synovial fluid shows **gram-negative** bacilli, we treat with a **third generation cephalosporin.....**

Total duration of antimicrobial treatment in adults without endocarditis: _____

- For large peripheral joints after drainage, we suggest **3-4 weeks** for S. aureus SA and gramnegative bacilli (GNB),

2-3 weeks for streptococcal arthritis and

1-2 weeks for gonococcal arthritis

- A longer duration is recommended for SA of axial joints **(6 weeks)** and SA with adjacent osteomyelitis and is also suggested for patients

Targeted antimicrobial therapy

In most cases, symptoms will **start
to improve** after a 1–2 full
days of treatment

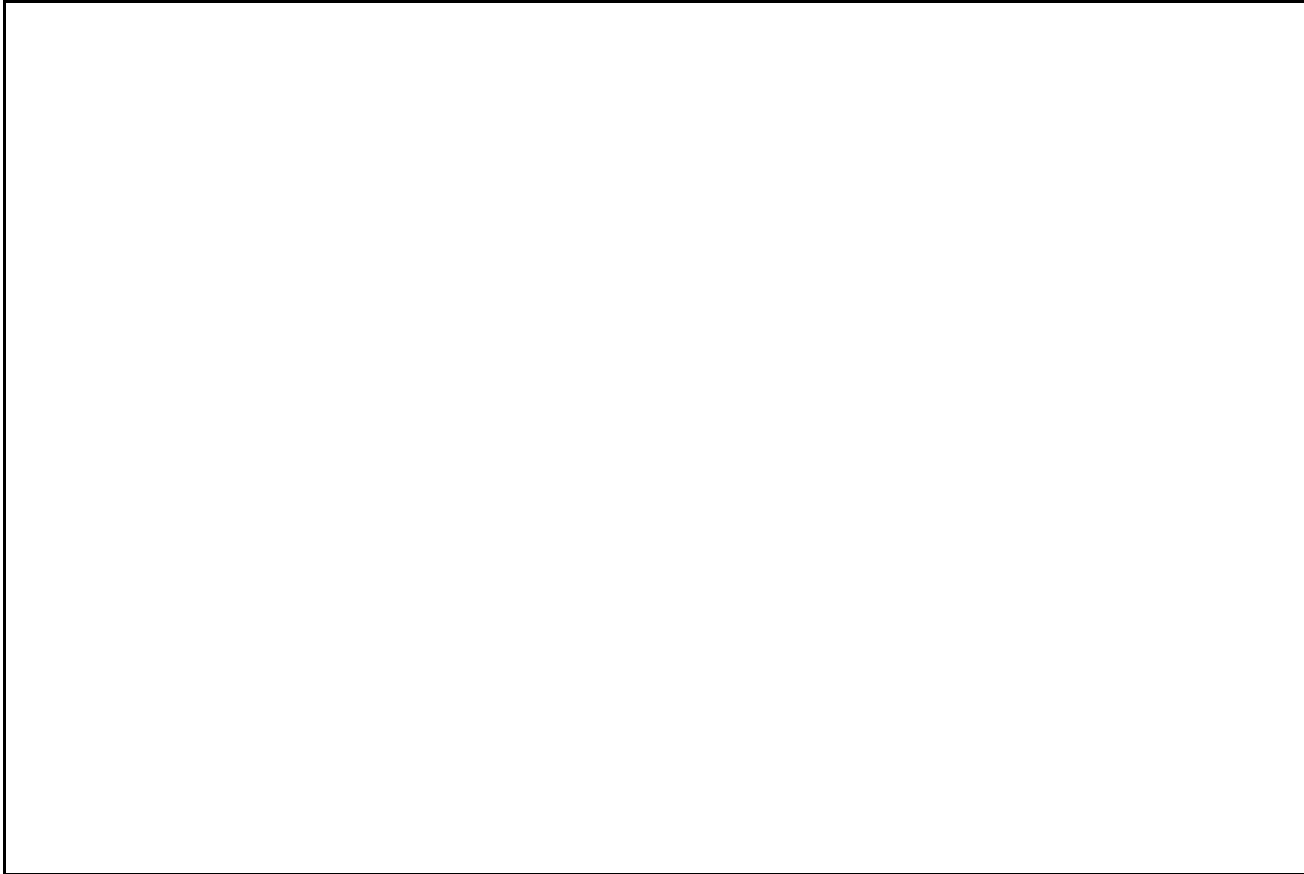
Early diagnosis and
prompt treatment
can prevent long term
complications

During home IV therapy, it is important to **monitor** yourself for signs of infection or inflammation at the site of the **IV line** (pain, redness, and swelling)

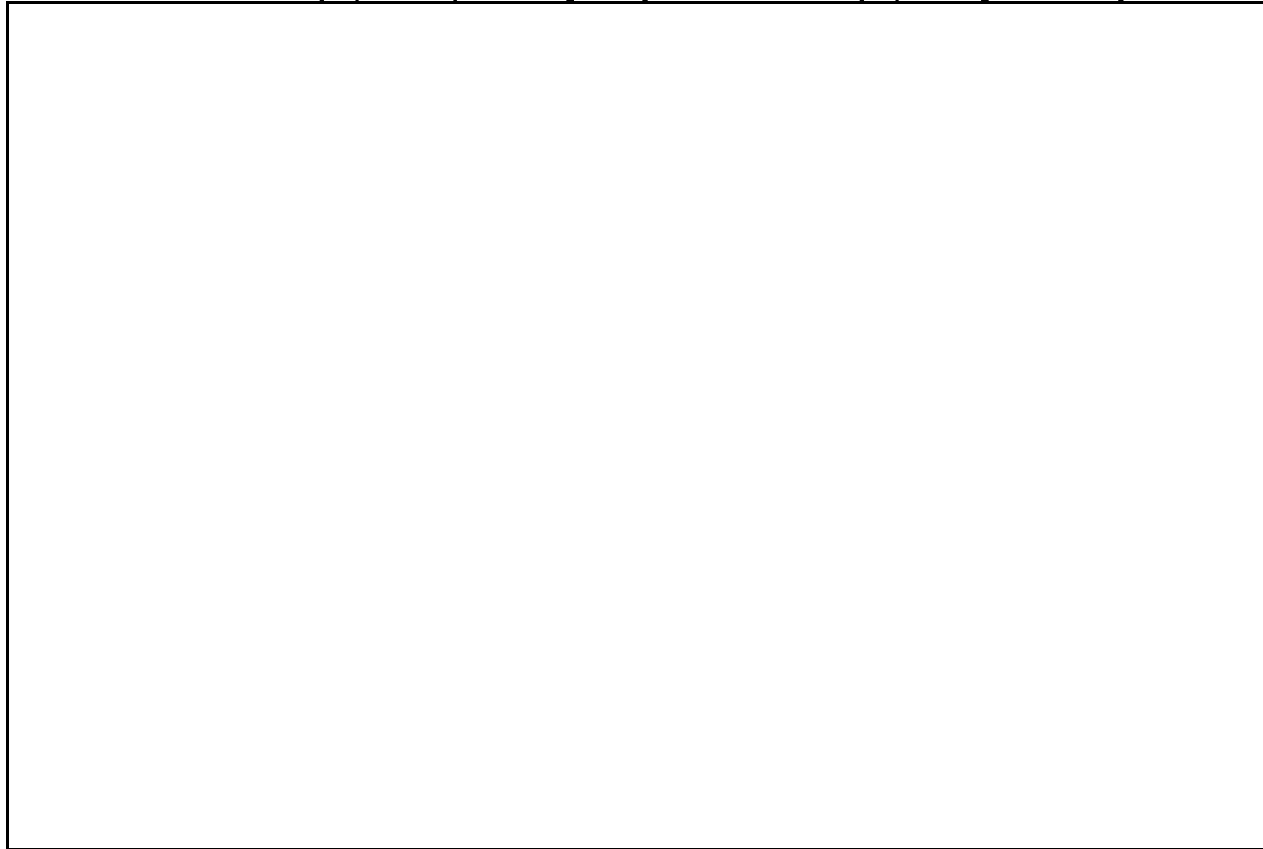
and **signs of a blood clot** in the vein (pain and swelling in the arm or armpit).

Early **partial weight bearing** is suggested for patients with knee SA, once the **pain is controlled**

Staphylococcal arthritis: wrists

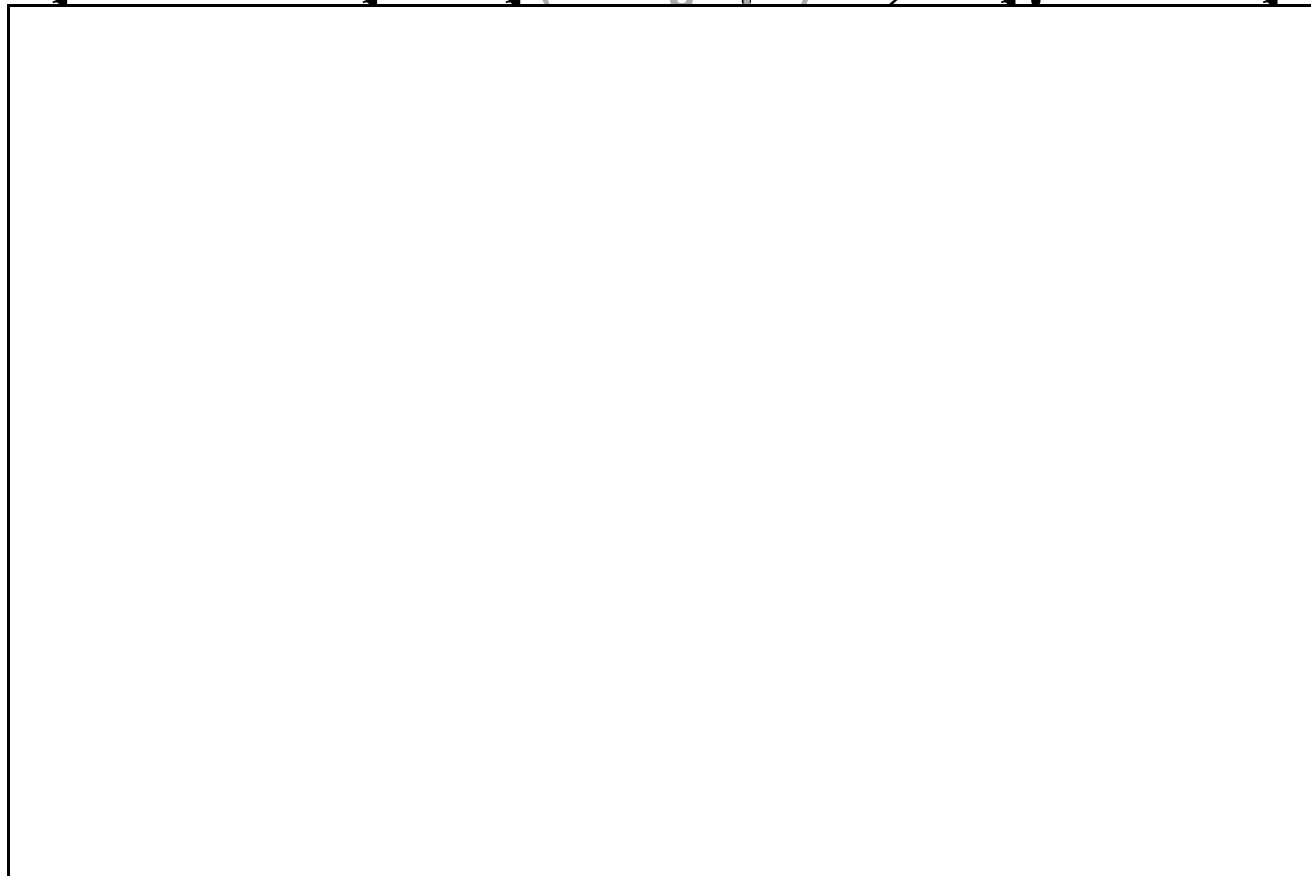


Septic arthritis: early and late changes, hip (radiographs)

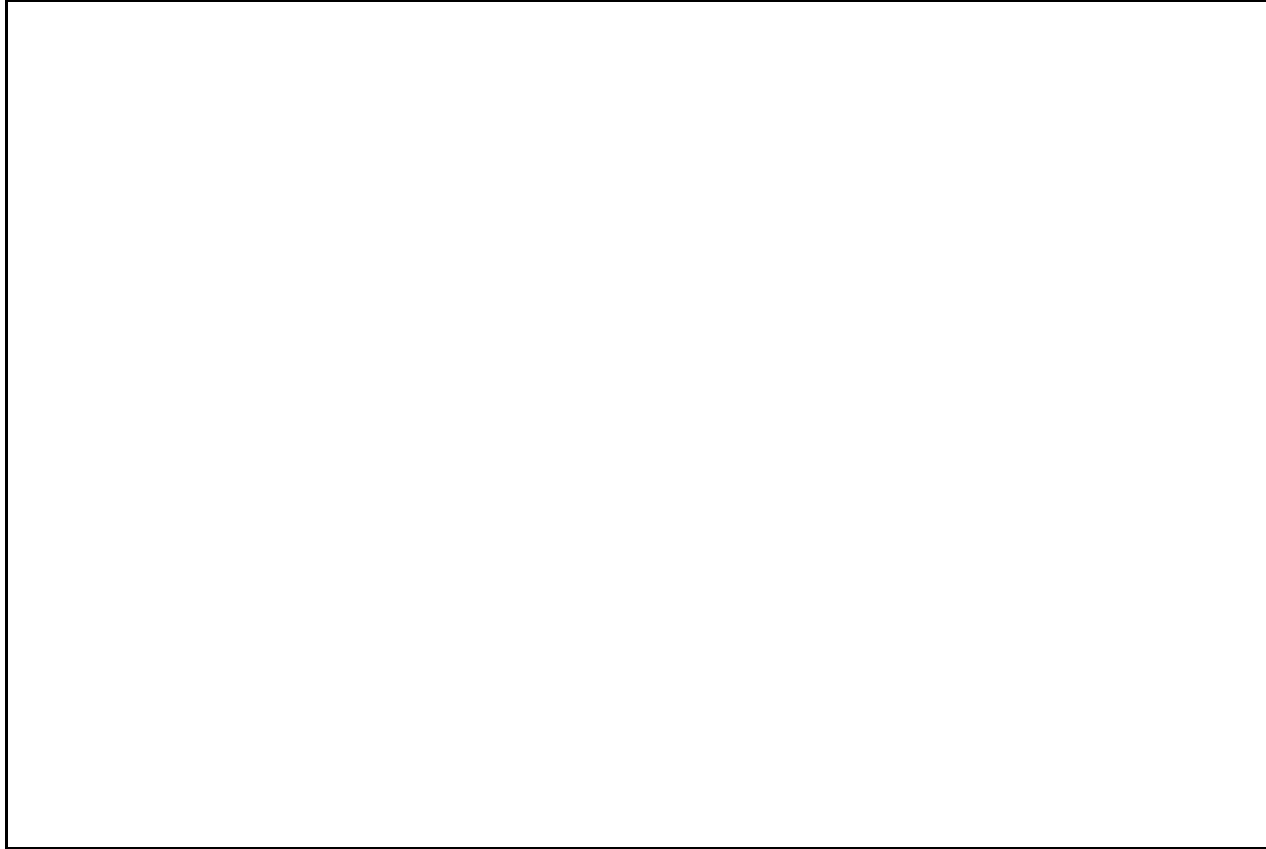


Septic discitis: early and late

18R2: Septic discitis. Early and late changes, lumbar spine (radiograph)



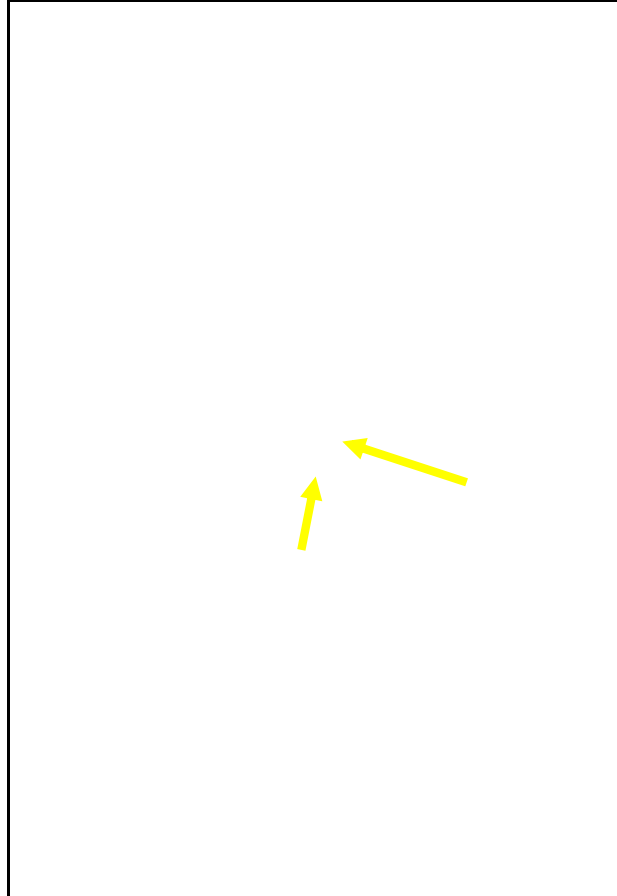
Pott's disease: thoracic vertebrae (radiographs)



Serological testing for Brucella

Molecular methods (broad-range, multiplex or specific polymerase chain reaction [**PCR**]) for SF analysis or tissue biopsy

Septic arthritis: sternoclavicular joint (technetium radioisotope scan)



SF should be
examined for crystals
to exclude
microcrystalline
arthritis in adults





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64 M with chronic gout presents with swollen right elbow of two days duration.

No trauma. Last gout attack involved right knee 4 months ago.

On exam, Temp 38.1. No LAD. Right elbow warm with minimal erythema.

MSK exam reveals fullness and tenderness over right olecranon process.

• A-Right elbow joint aspiration

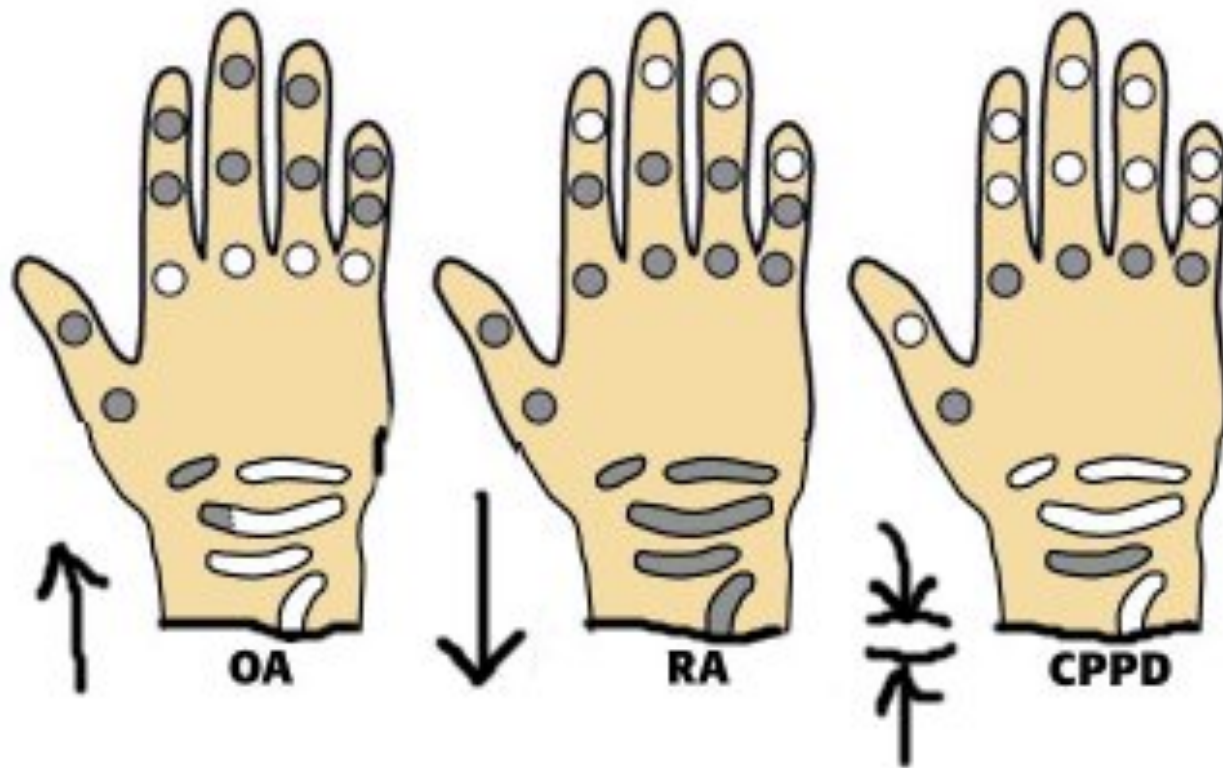
Which is most important next step in patient's management?

- B-Right olecranon bursa aspiration
- C- Radiography of right elbow and forearm
- D-Erythrocyte sedimentation rate

B- Immediate **aspiration** of olecranon bursa

- Olecranon bursitis may be **infectious, crystalline, or traumatic**
- Bursa aspiration is indicated for patients with acute olecranon bursitis to guide therapy
- **Trauma is the most common cause** of olecranon bursitis, but other causes must be **ruled out**.

Arthritis Comparison:



Gout of distal interphalangeal joints



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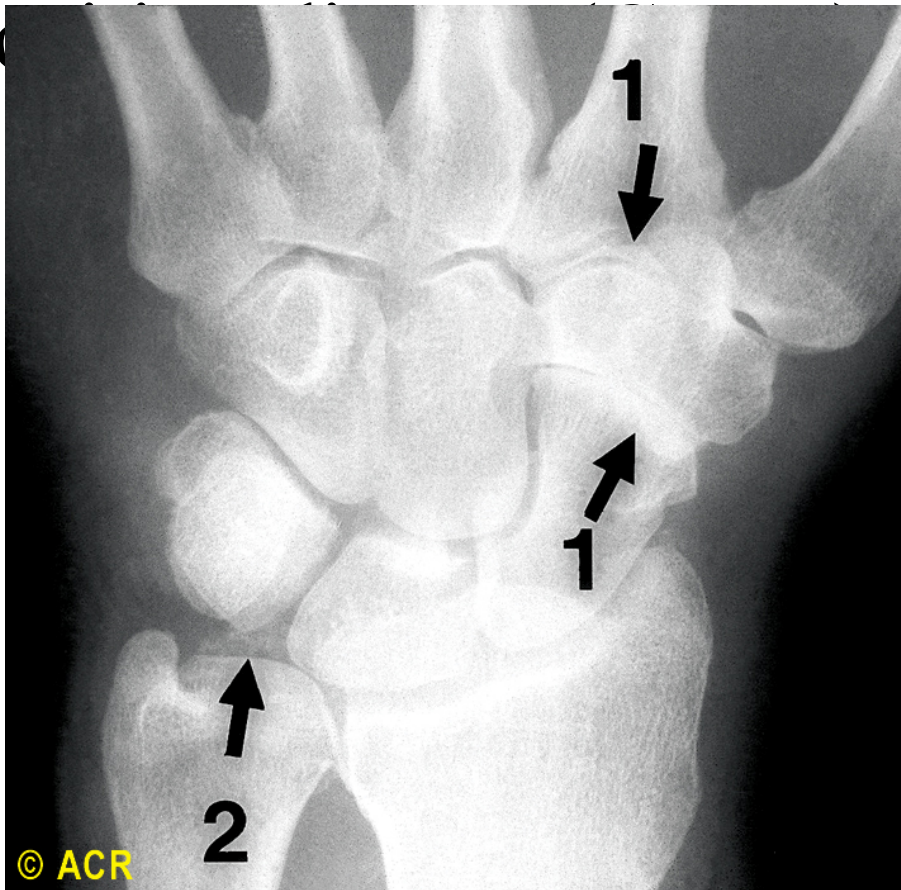
Septic prepatellar bursa





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Calcium pyrophosphate dihydrate deposits in the wrist



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Gonococcal Arthritis

Tenosynovitis, dermatitis, polyarthralgia syndrome

- Acute illness with fever, chills, malaise.
- Tenosynovitis
- Generalized arthralgia
- Dermatitis: **pustular** or vesicopustular



RECOMMENDATIONS FOR CLINICAL FOLLOW

Outpatient follow-up by orthopaedic and infectious disease specialists is suggested at **1-2 weeks, 4–6 weeks and 3** months after discharge

We suggest a follow-up period of at least **1 year** in adults at risk of long-term adverse outcomes and sequelae

Infectious arthritis

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