Approach to Inflammatory Arthritis

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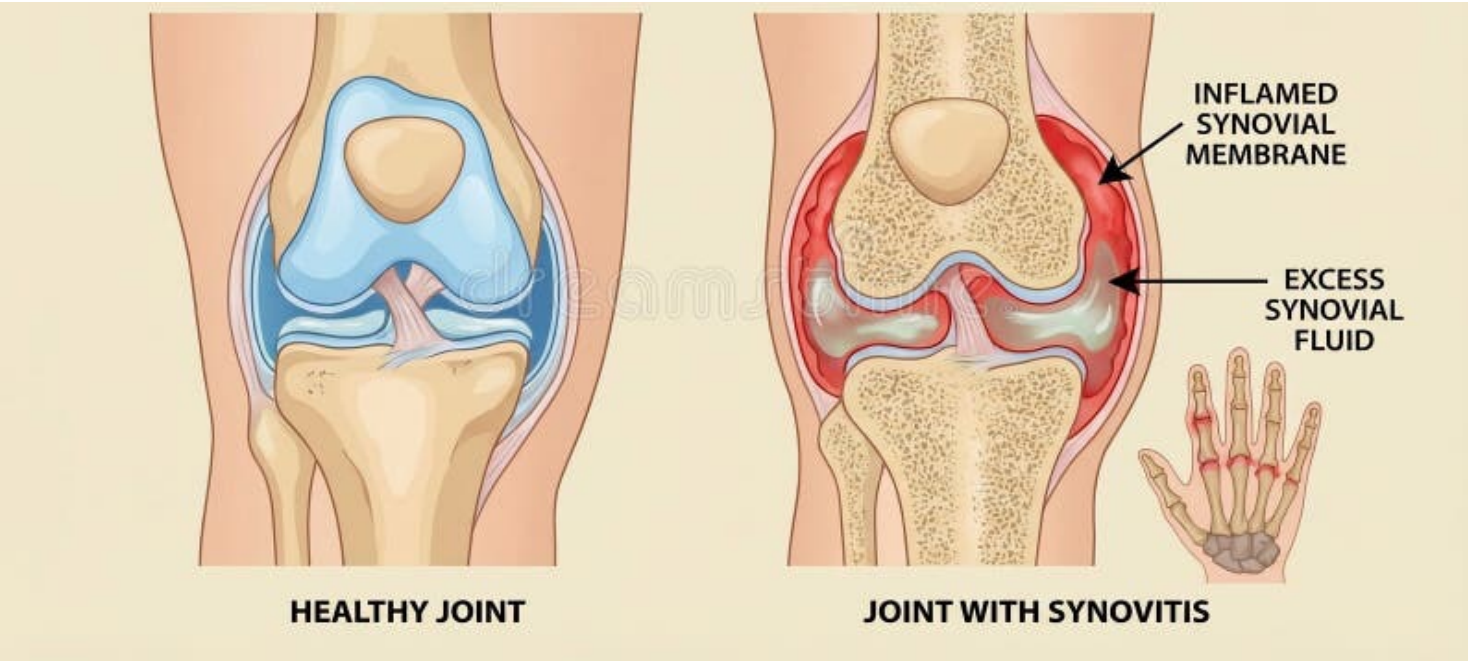
Learning Objectives

- Define inflammatory arthritis
- Recognize key clinical features
- Understand classification of inflammatory arthritis
- Develop a diagnostic approach to patient with joint pain
- Initial management principles
- Identify high risk cases and emergencies

What is Inflammatory Arthritis?

- Inflammation of joint lining (synovium) +/- periarticular structures



History in a Patient With Musculoskeletal Disease

- Pain
- Stiffness
- Limitation of motion
- Swelling
- Weakness
- Loss of function

- Onset, duration, and temporal pattern of arthritis
- Number of involved joints
- Symmetry of joint involvement
- Distribution of affected joints
- Distinctive types of musculoskeletal involvement
- Extra-articular manifestations

Physical Examination of Joints

Thorough assessment of the joints, periarticular soft tissues, tendons, ligaments, bursae, and muscles

Inspection

- Swelling
- Deformity
- Erythema

Palpation

- Tenderness
- Warmth
- Synovial Thickening
- Effusion
- Range of motion
- Crepitus
- Instability

Inflammatory vs Non-Inflammatory Arthritis

Inflammatory

- Morning stiffness > 30 min
- Improves with use
- Swelling
- Warmth
- Erythema
- Night-time pain

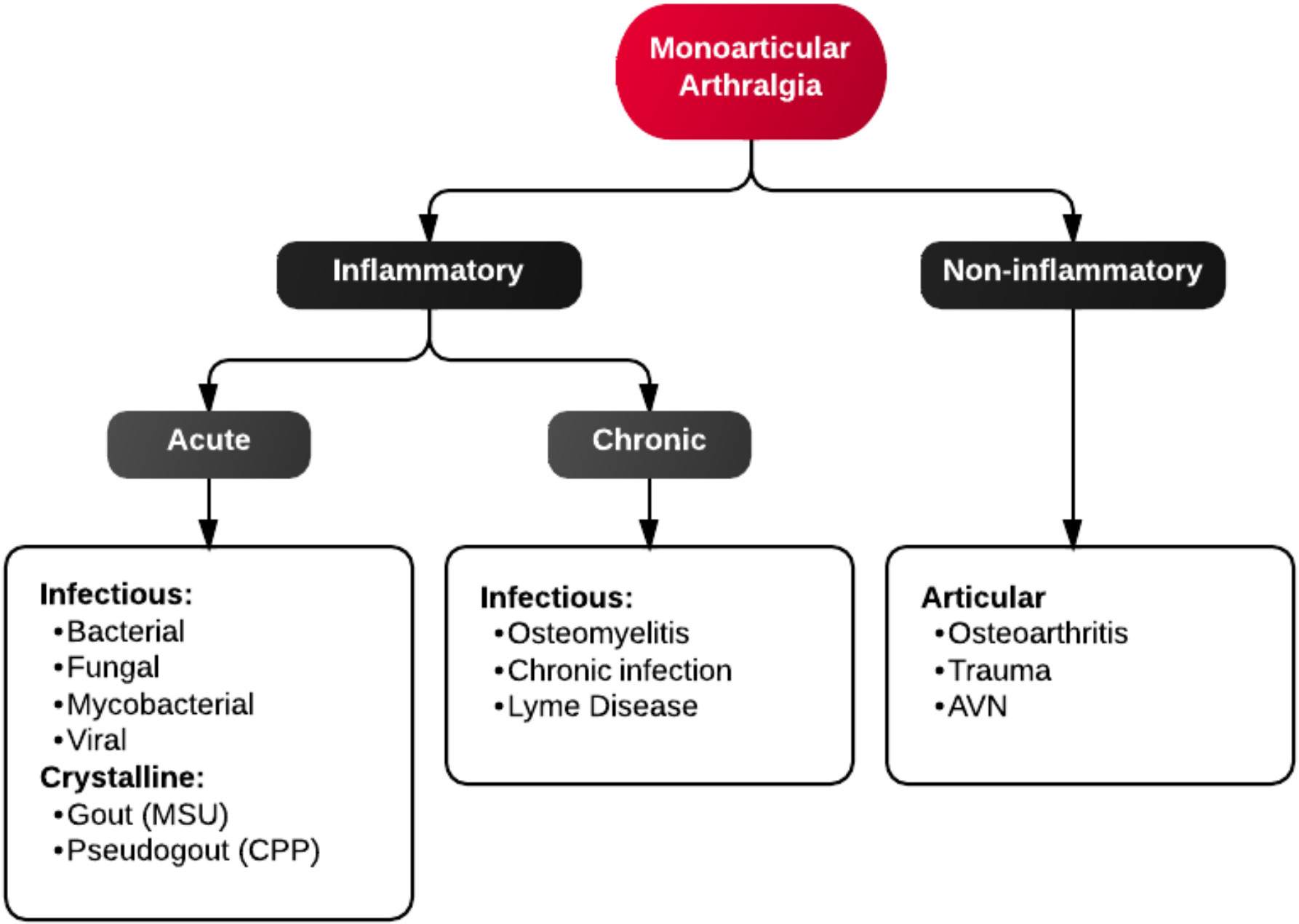
Non-inflammatory

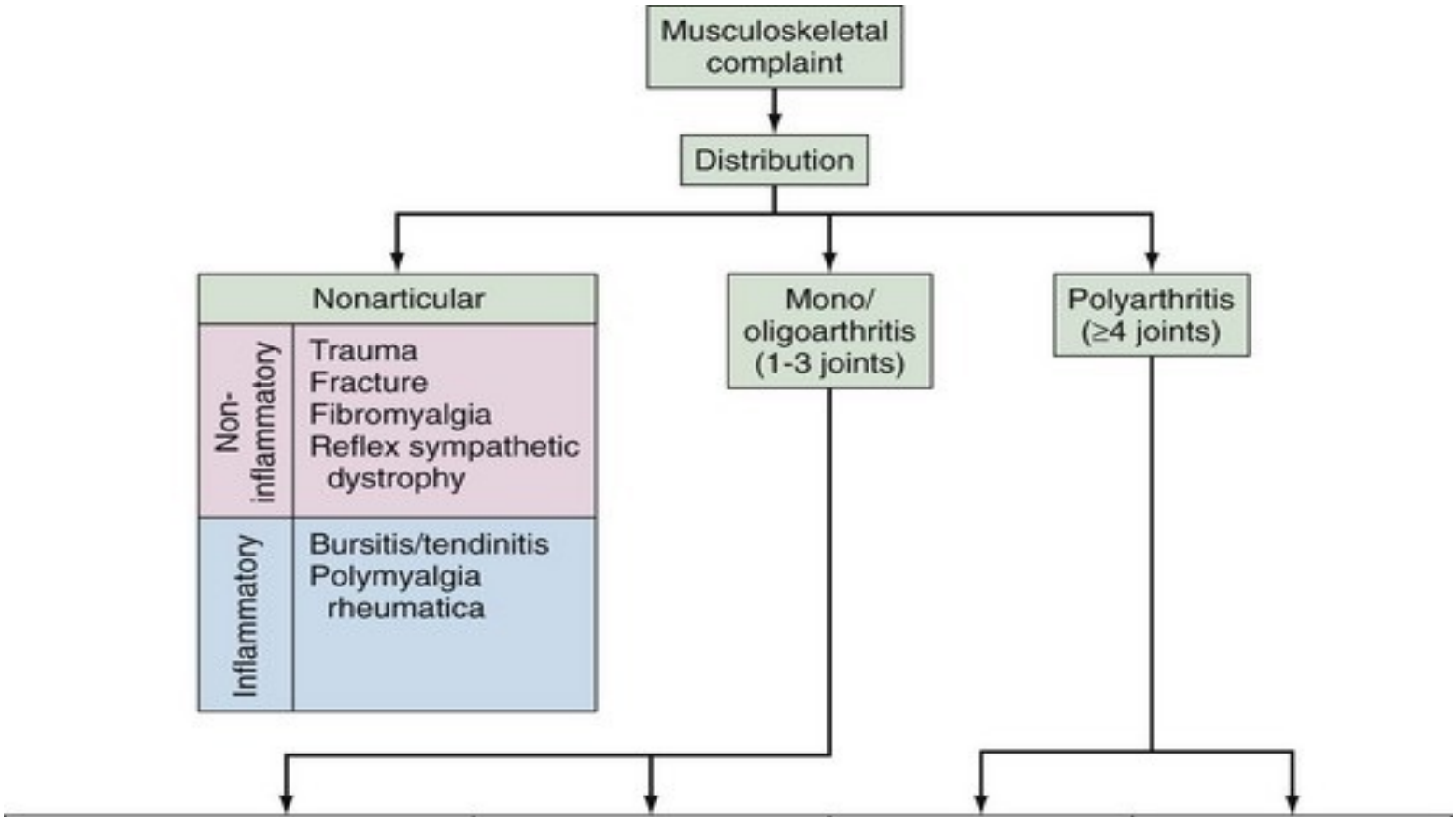
- Activity-related pain
- Minimal stiffness (5-10 min usually - gelling)
- Absence of swelling/warmth/erythema

Inflammatory Joint Disease

Classifying Inflammatory Arthritis

Onset	Duration	Inflammatory	Joint distribution	Pattern
• Sudden • Gradual	• Acute < 7days • Subacute 1-5 wks • Chronic > 6 wks	• Morning Stiffness > 30 min • Stiff after rest • Improves with use	• Mono • Oligo • Polyarticular	• Symmetric • Asymmetric • Upper extremity • Lower extremity • Spine


Monoarticular Arthralgia
Inflammatory
Non-inflammatory
Acute
Chronic
Infectious:
•Bacterial
•Fungal
•Mycobacterial
•Viral
Crystalline:
•Gout (MSU)
•Pseudogout (CPP)
Infectious:
•Osteomyelitis
•Chronic infection
•Lyme Disease
Articular
•Osteoarthritis
•Trauma
•AVN



	Acute	Chronic	Acute	Chronic
Non-inflammatory	Meniscal tear (internal derangement) Osteoarthritis flare Reflex sympathetic dystrophy	Osteoarthritis (hip or knee) Osteonecrosis Neuropathic arthritis Hemochromatosis Pigmented villonodular synovitis	Hemoglobin-opathies Amyloid arthropathies	Osteoarthritis (DIP, PIP, CMC1)
Inflammatory	Infectious arthritis Gout Pseudogout Reactive arthritis Chlamydial arthritis	Psoriatic arthritis Spondyloarthropathies Pauciarticular JIA Indolent infectious arthritis*	Viral arthritis Serum sickness Drug-induced arthritis Early onset of CTD Rheumatic fever Palindromic rheumatism RS3PE	Rheumatoid arthritis Undifferentiated polyarthritis Inflammatory osteoarthritis MCTD Lupus Scleroderma Polyarticular JIA Adult Still's disease

Question

A 42-year-old woman presents with 5 days of joint pain in both hands and wrists. The pain began abruptly and is associated with morning stiffness lasting 45 minutes. She reports mild fatigue but no fever or weight loss. Two weeks ago, her grandson had a febrile illness followed by a bright red facial rash.

Physical examination shows symmetric tenderness and mild swelling of the metacarpophalangeal and proximal interphalangeal joints bilaterally. No nodules or deformities are present.

Laboratory studies:

- Hemoglobin: 11.8 g/dL
- Leukocyte count: 4,200/μL
- Platelet count: 150,000/μL
- ESR: mildly elevated
- Rheumatoid factor: negative
- Anti-CCP antibodies: negative

Which of the following is the most likely diagnosis?

Which of the following is the most likely diagnosis?

A. Early rheumatoid arthritis

B. Systemic lupus erythematosus

C. Osteoarthritis

D. Acute parvovirus B19 infection

E. Reactive arthritis

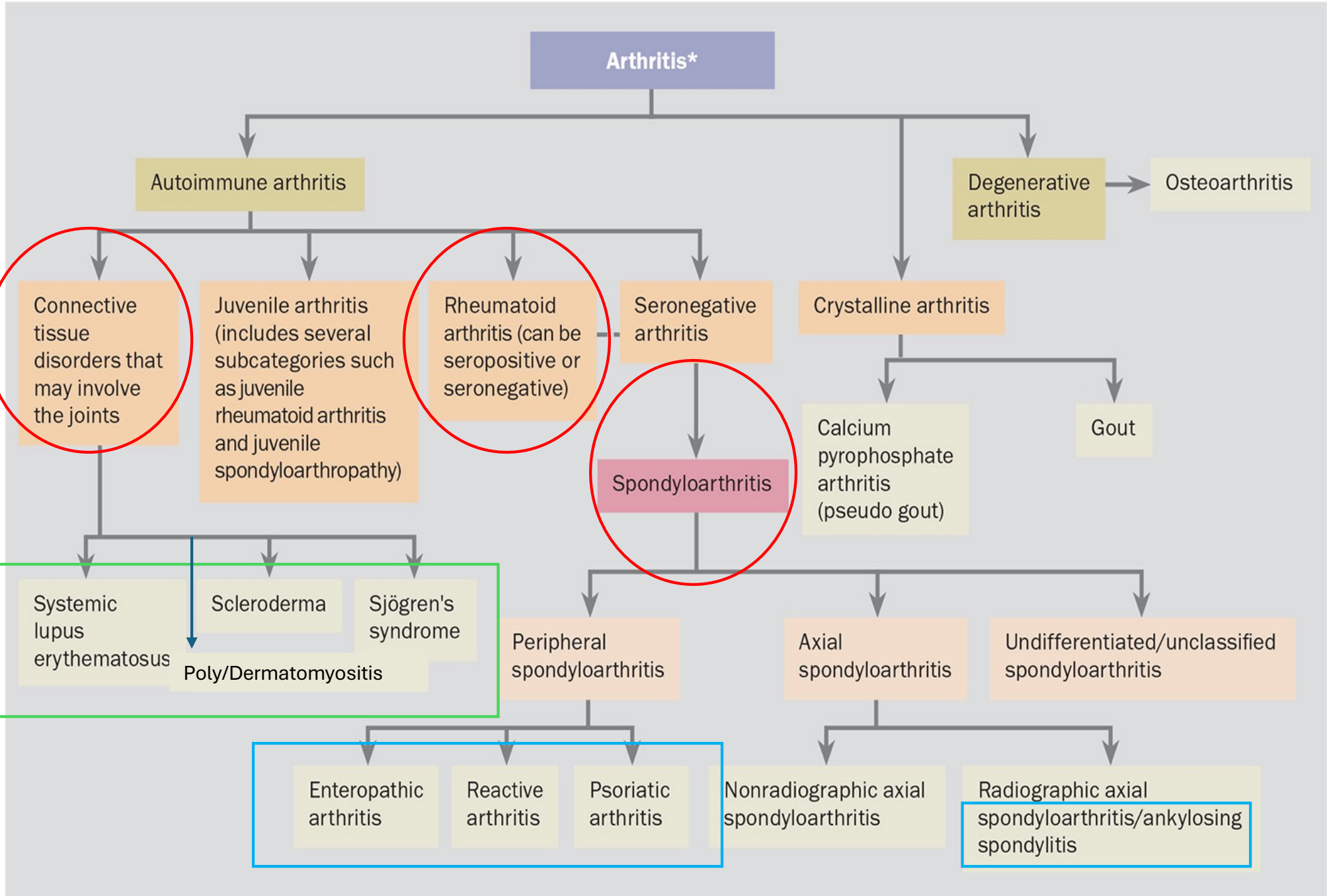
Common Causes of Inflammatory Arthritis

Chronic

- Rheumatoid arthritis
- Spondyloarthritis
- Connective Tissue Diseases

Acute

- Crystal arthritis
- Infection


Arthritis*
Autoimmune arthritis
Degenerative arthritis
Osteoarthritis
Connective tissue disorders that may involve the joints
Juvenile arthritis (includes several subcategories such as juvenile rheumatoid arthritis and juvenile spondyloarthropathy)
Rheumatoid arthritis (can be seropositive or seronegative)
Seronegative arthritis
Crystalline arthritis
Calcium pyrophosphate arthritis (pseudo gout)
Gout
Spondyloarthritis
Systemic lupus erythematosus
Scleroderma
Sjögren's syndrome
Poly/Dermatomyositis
Peripheral spondyloarthritis
Axial spondyloarthritis
Undifferentiated/unclassified spondyloarthritis
Enteropathic arthritis
Reactive arthritis
Psoriatic arthritis
Nonradiographic axial spondyloarthritis
Radiographic axial spondyloarthritis/ankylosing spondylitis

Common Extra-Articular Manifestations

- Pulmonary: ILD, pleuritis, pulmonary nodules
- Cardiac: pericarditis, myocarditis
- Vascular: Raynaud's, digital ischemia

- Skin: rheumatoid nodules, vasculitis, psoriasis
- Abdominal: GERD, IBD
- Renal: glomerulonephritis, amyloidosis
- Ophthalmologic: uveitis, scleritis, episcleritis, sicca symptoms

- Neurologic: peripheral neuropathy, mononeuritis multiplex
- Hematologic: Cytopenias, thrombocytosis
- Constitutional: fatigue, weight loss, low-grade fevers

When to refer- Common Indications

- Chronic Inflammatory Arthritis
- Unknown cause of arthritis
- Difficult to treat Gout
- Systemic Inflammatory Conditions
- Suspicion for Vasculitis
- Unknown chronic ESR elevation

Initial Labs

Screening tests for all types of inflammatory arthritis

- Erythrocyte sedimentation rate (ESR)
- C-reactive protein (CRP) (non-specific)
- CBC/CMP

- Rheumatoid factor (RF) and cyclic citrullinated peptide (CCP) Ab (selective cases)
- ANA (selective cases)

In the setting of joint pain and equivocal joint examination findings, an elevated ESR supports the presence of an inflammatory arthritis.

Role of Imaging

- X-ray first-line
  - Order only relevant joints
  - Low cost, widely available
  - Presence of specific erosions may be diagnostic
- Ultrasound for synovitis
  - Detect early inflammation, erosions
  - Ease of availability, low cost
  - Real-time images
- MRI for early disease
  - High sensitivity for synovitis, erosive changes
  - Expensive, time consuming
- CT Scan
  - Primarily for structural bony damage and for assessment of internal organs

Clues to Diagnosis on Plain Film Radiographs

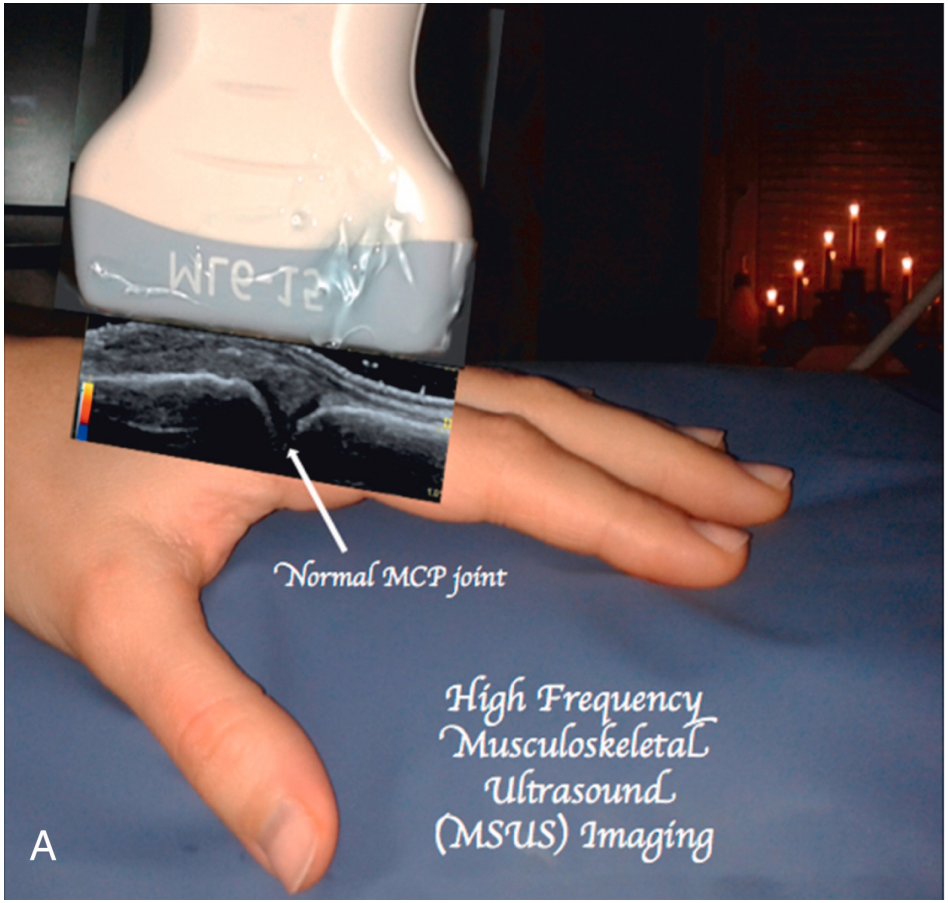
Finding	Disease Suggested
Juxta-articular osteopenia	Early RA
Joint-space narrowing	RA, PsA, or OA
Subchondral sclerosis	OA
Eburnation	OA
Entheseal calcifications	PsA, SpA
Bony erosions	RA, gout
Osteophytes	OA
Chondrocalcinosis	Pseudogout

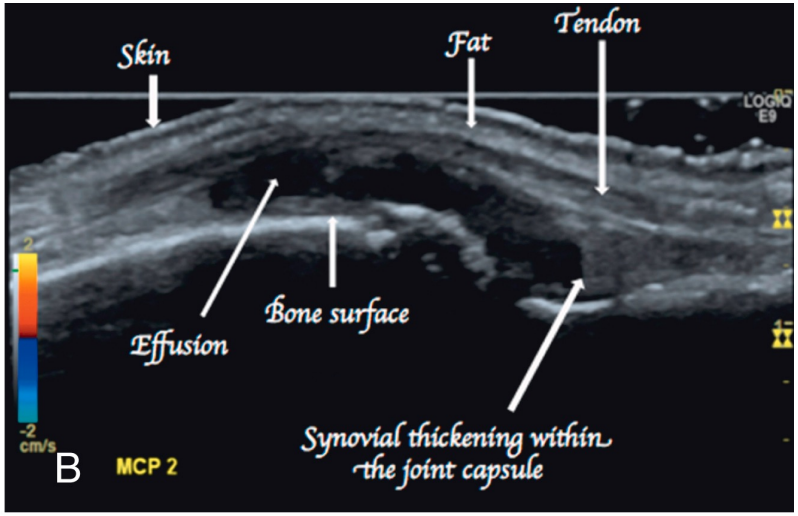
Most useful diagnostic tests for specific rheumatic diseases

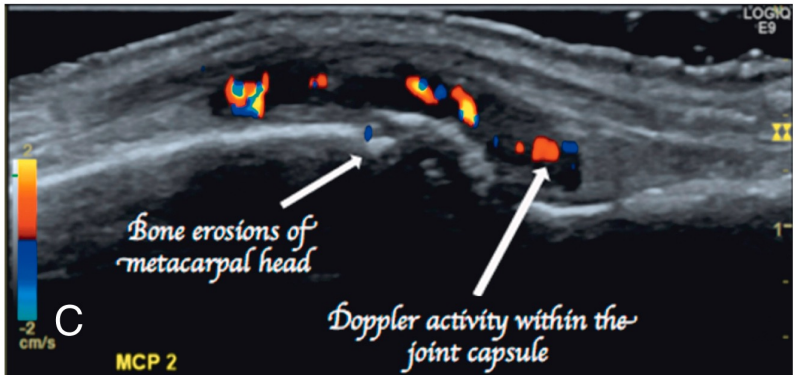
- Septic arthritis – Gram stain and culture of synovial fluid
- Gout or pseudogout – Polarized light microscopy to examine a drop of synovial fluid
- Osteoarthritis – Radiography of the affected joint – osteophytes and reduced joint space without erosions

- Ankylosing spondylitis (seronegative) – Sacroiliac joint radiography to demonstrate bilateral sacroiliitis
- Rheumatoid Arthritis – RF (not specific), CCP (more specific)
- Systemic lupus erythematosus (SLE)
  - Antinuclear antibody (ANA)
  - if positive, test for Smith (Sm) and double-stranded DNA antibodies, which are more specific for SLE
- Psoriatic Arthritis- Classic Xray changes: severe destruction of marginal and subchondral bone, new bone formation, pencil-in-cup deformity

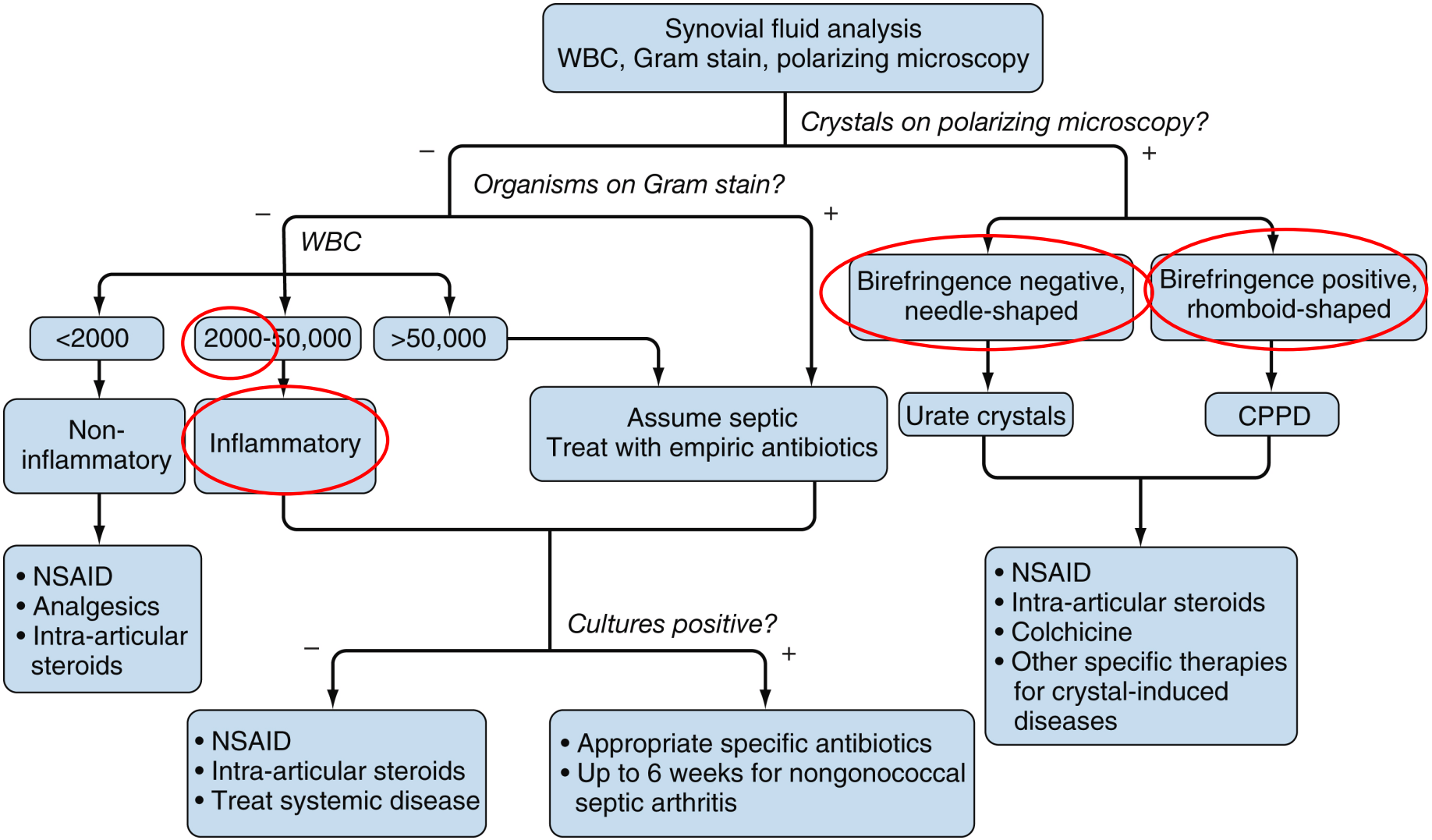
Synovitis Ultrasound Evaluation



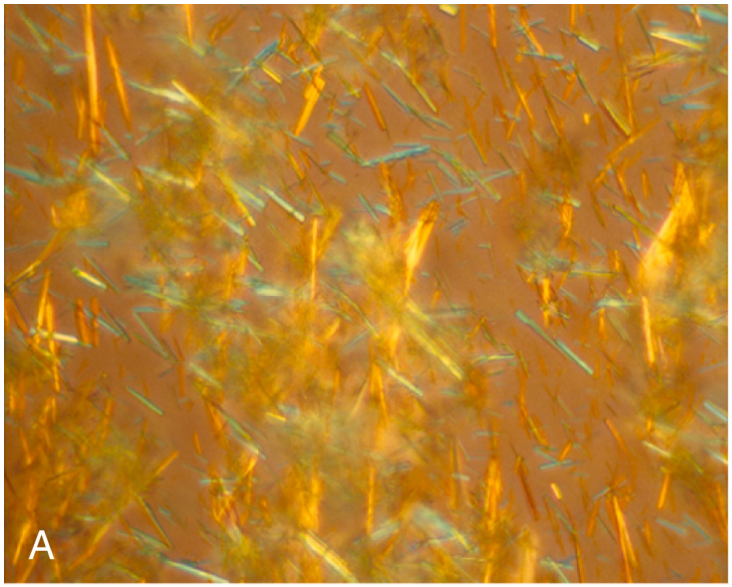


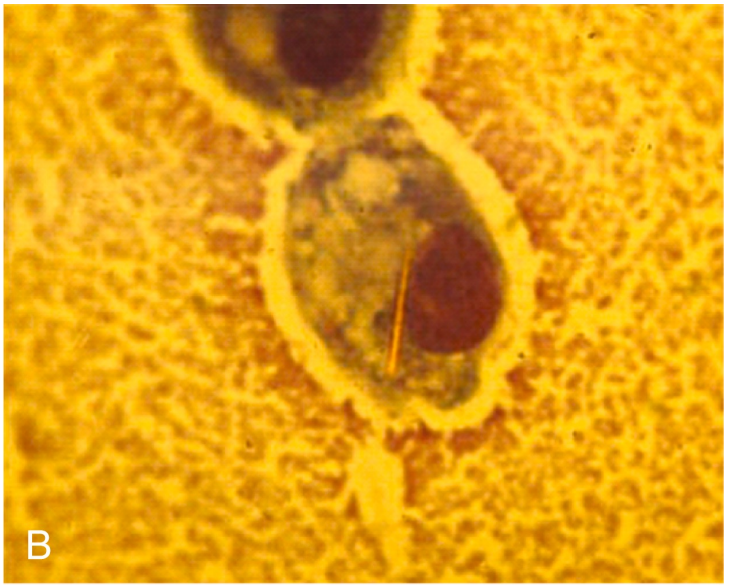


Synovial Fluid Analysis



Crystalline Arthritis



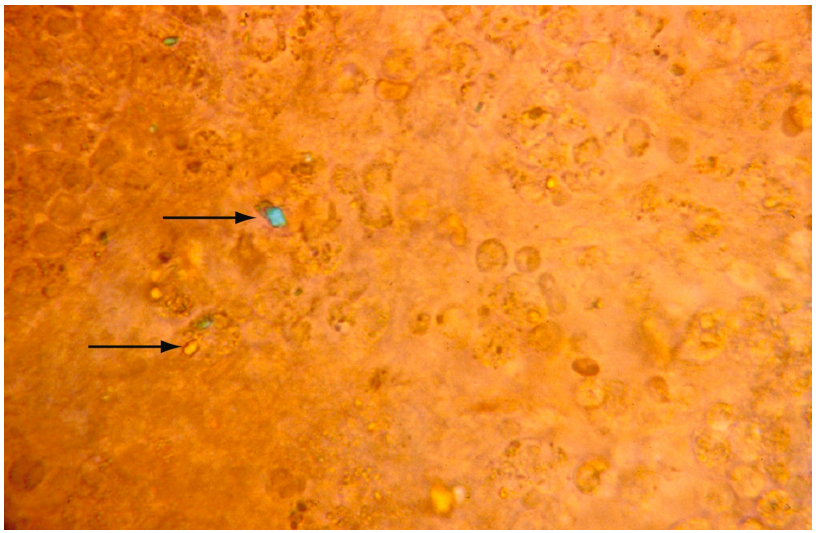


Urate crystals in a tophus

Gouty arthritis

Negatively birefringent

Needle shaped



Calcium pyrophosphate crystals

Pseudogout

Positively birefringent

Rhomboid shaped

Rheumatoid Arthritis Overview

- Chronic Polyarticular Symmetric Inflammatory Arthritis
- Small-joints of hands and feet, wrists
- Can affect any peripheral joint
- Affects MCP/PIPs

- Spares DIPs and spine (except C1-C2)
- Pre-op eval of every RA patient must include C spine Xrays with flexion and extension views to rule out Atlanto-Axial instability

- Seropositive or seronegative
- RF is sensitive, anti-CCP is specific

- Extra-articular disease- most common Pulmonary- RA nodules, ILD

Spondyloarthritis Overview

- Inflammatory Axial pain
- Sacroiliac joint usually involved first

- Peripheral arthritis : Chronic Oligoarticular Asymmetric
- Lower extremity predilection

- Enthesitis- characteristic
- HLA-B27 gene association

Crystal Arthritis

- Gout, CPPD most common
- Acute onset, mono/oligoarticular

- Usually self- resolving within 1-2 weeks
- Diagnosis requires crystals in synovial fluid

- Ultrasound may be used to visualize double contour sign in gout

- Respond well to NSAIDs typically
- Severe cases my need a course or local injection of steroids

Septic Arthritis

- Medical emergency
- Acute Monoarticular Inflammatory Arthritis

- Look for Risk factors- recent procedure, presence of systemic infection, joint hardware

- Prompt aspiration of synovial fluid, send for cultures
- Initiate antibiotics based on suspicion, donot wait for culture results

Initial Management of non-infectious arthritis

- NSAIDs
- Glucocorticoids, when appropriate
- Labs/Imaging as appropriate
- Avoid delaying diagnosis
- Defer DMARDs (Disease Modifying Anti-rheumatic Drugs) usually to the specialist

When to Refer to Rheumatology

- Persistent synovitis >6 weeks
- Diagnostic uncertainty
- Systemic involvement
- Inadequate response to usual treatment

Rheumatologic Emergencies

- Giant Cell Arteritis with new Vision deficit
- Necrotising Vasculitis
- SLE with Acute organ failure
- Diffuse Alveolar Hemorrhage
- Secondary antiphospholipid syndrome with new clots

Take Home Points

- Inflammatory vs Non-Inflammatory
- Pattern recognition is key
- Early treatment improves outcomes