



# Introduction to Rheumatology

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# Lecture Outline

- Introduction to rheumatology and its clinical relevance
- Overview of key rheumatologic diseases
- Approach to joint pain: inflammatory vs mechanical
- Clinical relevance of the patterns and distributions of joint involvement
- Basic pathology of rheumatic diseases
- Key dermatological manifestations of rheumatologic diseases
- Principles of treatment: NSAIDs, corticosteroids, DMARDs, biologics, urate-lowering therapy

# Overview of key rheumatological diseases



## Inflammatory Arthritis

RA, psoriatic arthritis, reactive arthritis, ankylosing spondylitis



## Connective Tissue Disease

SLE, systemic sclerosis, inflammatory myopathies, Sjögren syndrome



## Crystal Arthropathy

Gout and calcium pyrophosphate deposition disease



## Degenerative Disease

Osteoarthritis and periarticular mechanical disorders



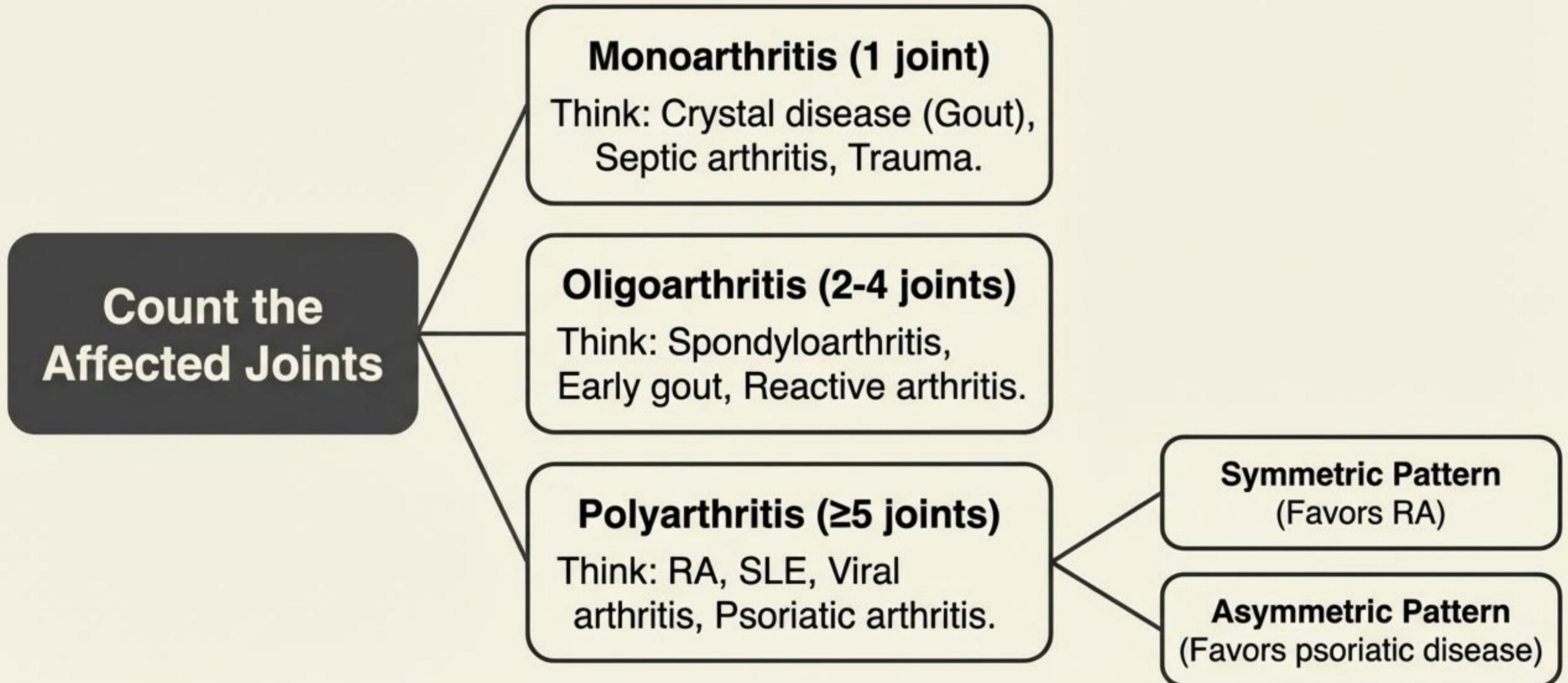
## Vasculitis

ANCA vasculitis, GCA, Behcet's disease

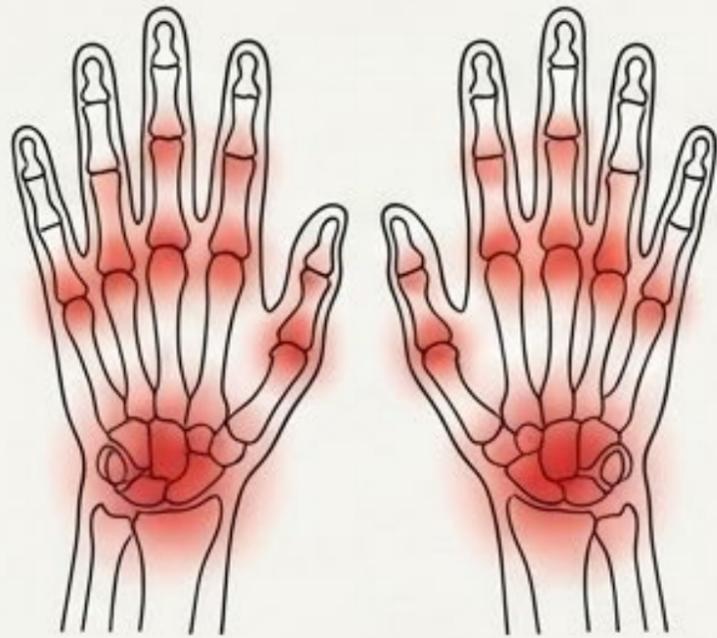
# The First Branch Point: Inflammatory vs. Mechanical

Inflammatory		Mechanical
> 30-60 min; improves with movement	<b>Morning Stiffness</b>	< 30 min; gelling after rest
Often worse after rest or at night	<b>Pain Pattern</b>	Worse with use; relieved by rest
Warmth, swelling, tenderness, effusion	<b>Exam Findings</b>	Bony enlargement, crepitus, limited ROM
Fatigue, fever, weight loss, rash	<b>Systemic Clues</b>	Usually absent
RA, gout, psoriatic arthritis	<b>Classic Examples</b>	OA, tendinopathy, bursitis

# The Diagnostic Funnel: Joint Count & Symmetry

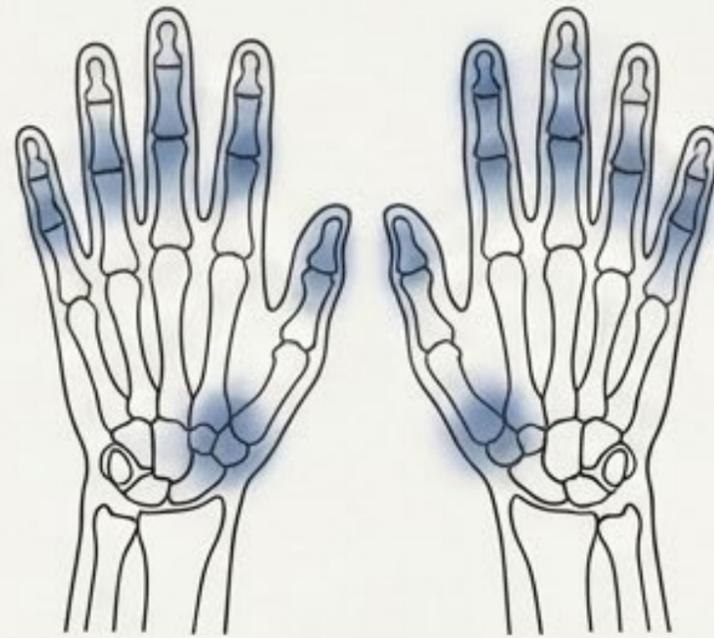


# The Anatomy of Distribution



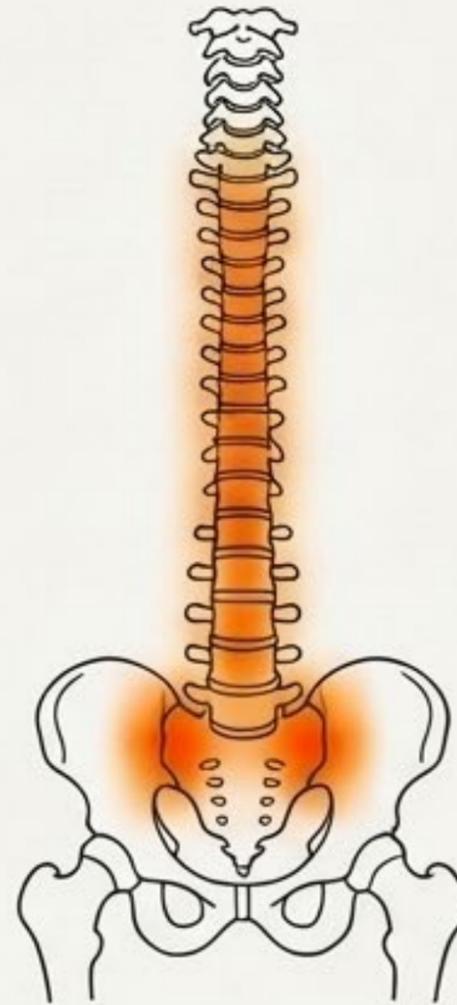
## RA Signature

Small joints of hands/wrists (MCP, PIP).



## OA Signature

DIP involvement, 1st CMC.



## SpA Signature

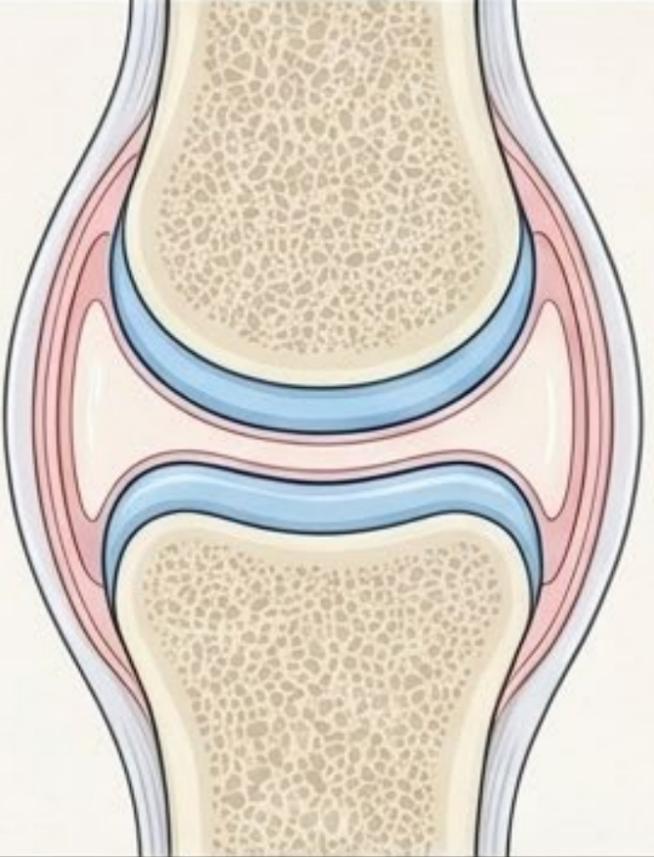
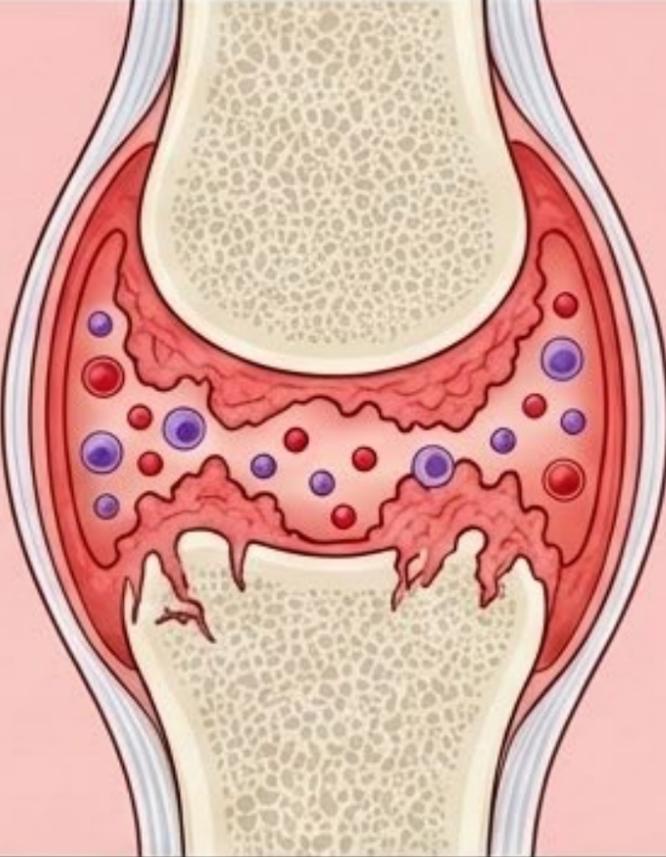
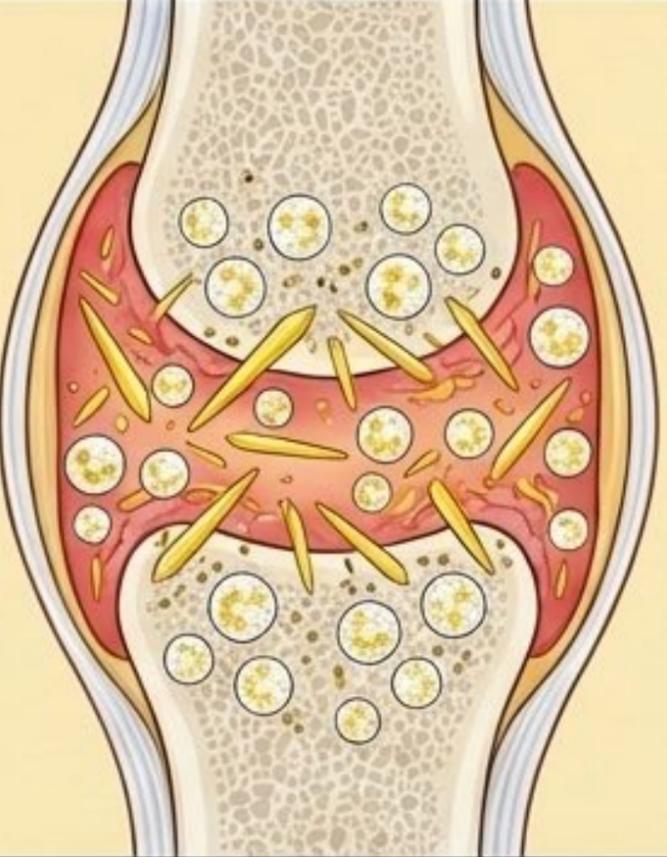
Axial spine and sacroiliac joints.



## Gout Signature

First MTP joint.

# Pathology Dictates Presentation

Normal	Rheumatoid Arthritis	Osteoarthritis	Gout
 A cross-section of a normal joint showing two bones with a clear, well-defined joint space. The articular surfaces are covered by a smooth, blue layer of cartilage. The synovial lining is thin and smooth, and the joint space is filled with clear synovial fluid.	 A cross-section of a joint affected by Rheumatoid Arthritis. The joint space is significantly narrowed. The articular surfaces are eroded and irregular. The synovial lining is thickened and inflamed, with a dense collection of inflammatory cells (represented by red and purple dots) forming a pannus that erodes the underlying cartilage and bone.	 A cross-section of a joint affected by Osteoarthritis. The joint space is narrowed, and the articular surfaces are irregular and fragmented. There is significant bony remodeling and osteophyte formation (bone spurs) extending from the joint margins. The synovial lining is relatively normal but the overall joint structure is severely degenerated.	 A cross-section of a joint affected by Gout. The joint space is filled with a dense, red, inflammatory exudate. Numerous yellow, needle-shaped urate crystals are visible, causing acute inflammation and a neutrophilic response.
<p><b>Normal</b></p> <ul style="list-style-type: none"><li>• Intact cartilage and smooth synovial lining.</li><li>• Clear, well-defined joint space.</li></ul>	<p><b>Rheumatoid Arthritis</b></p> <ul style="list-style-type: none"><li>• Chronic, systemic inflammatory synovitis.</li><li>• Pannus formation erodes cartilage and bone.</li></ul>	<p><b>Osteoarthritis</b></p> <ul style="list-style-type: none"><li>• Progressive cartilage degradation and loss.</li><li>• Bony remodeling and osteophyte formation.</li></ul>	<p><b>Gout</b></p> <ul style="list-style-type: none"><li>• Acute inflammation from urate crystal deposition.</li><li>• Intense neutrophilic response in the joint.</li></ul>

**RA**

# Rheumatoid Arthritis (RA) – Part 1

## Definition

Chronic autoimmune synovitis causing symmetric polyarthritis. Without treatment, persistent synovitis leads to erosion and deformity.



## Clinical Manifestations

Morning stiffness > 1 hour; swelling of MCP, PIP, and wrists; notable sparing of the DIP joints.

Female-to-male 3:2, typically fourth and fifth decades.

# Rheumatoid arthritis





Figure 1



Figure 2



**OA**

# Osteoarthritis (OA)

## Definition

Degenerative joint disease characterized by focal cartilage loss and compensatory osteophyte formation.

## Clinical Manifestations

Pain is gradual, activity-related, and worse after weight-bearing. Brief stiffness after rest. Exam reveals crepitus and bony enlargement (Heberden nodes at DIP, Bouchard nodes at PIP).  
Typically females after the age of 50.



# Gout: Crystal Arthritis

<b>Definition</b>	<b>Clinical Manifestations</b>
<p>Deposition of monosodium urate triggering intense, abrupt neutrophilic flares.</p>	<p>Abrupt, exceptionally painful monoarthritis. Initial attack often strikes the 1st MTP (podagra). Presence of tophi in chronic cases; typically males 20 years after puberty.</p>



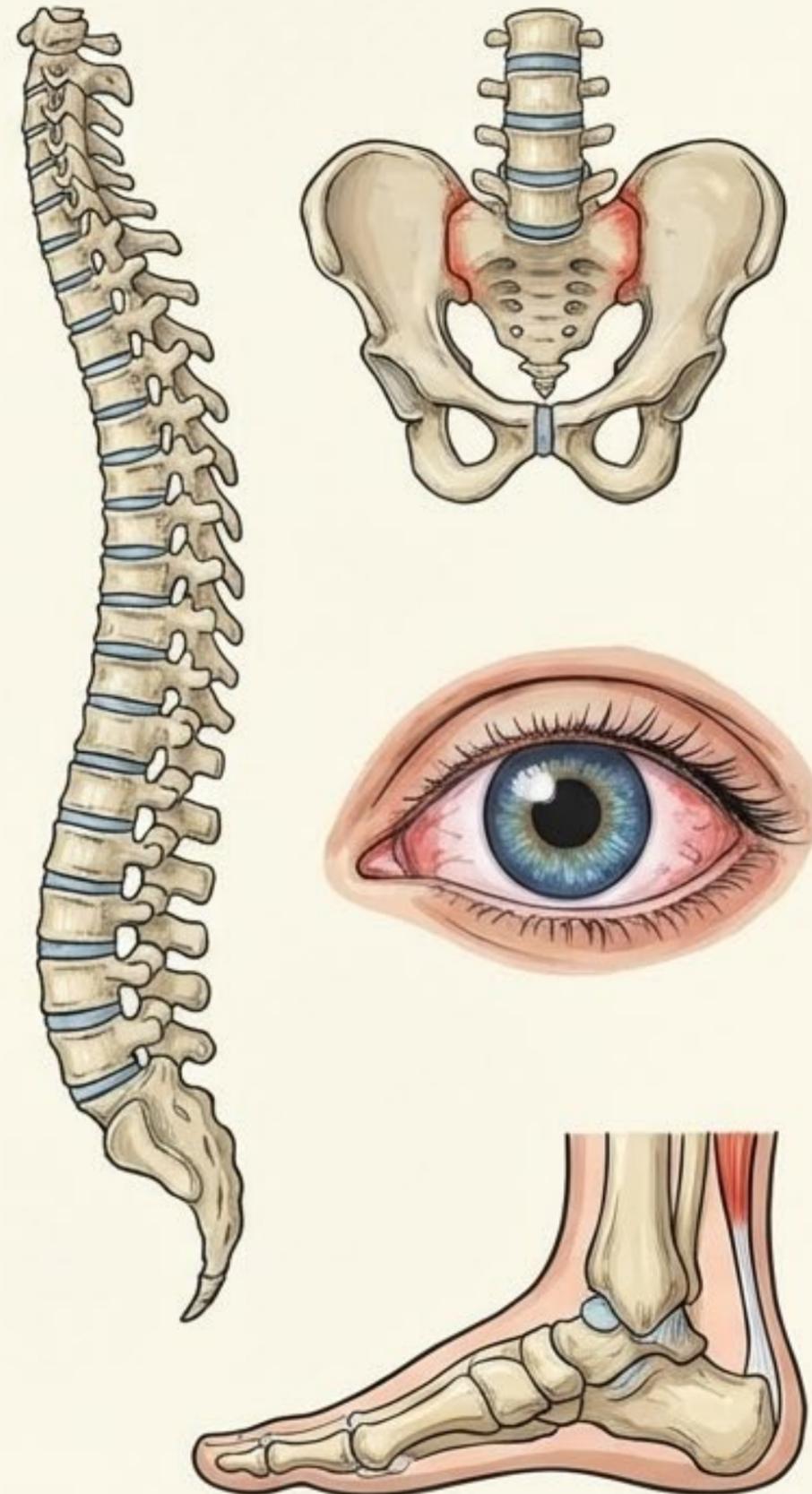
# SpA Spondyloarthritis (SpA)

## Definition (Core Pathology)

Inflammation of the axial skeleton, sacroiliac joints, and entheses (tendon insertions), often starting in young adults.

## Clinical Manifestations (Key Bedside Clues)

Typically males 16-40 years of age.  
Inflammatory back pain (nocturnal, morning stiffness)  $\pm$  asymmetric lower-limb arthritis.  
Look for heel pain (Achilles enthesitis), dactylitis (sausage digits), a red painful eye (uveitis), or a history of psoriasis/IBD.





## Final Stage of AS with Severe Kyphosis of Thoracic and Cervical Spine

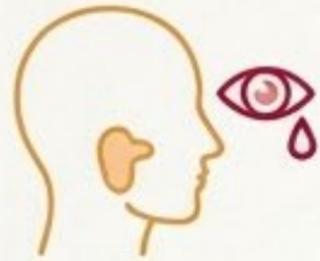
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Unable to look ahead while walking  
(,patient cannot see the sun')





# Connective Tissue Diseases (CTDs)



## Sjögren Syndrome

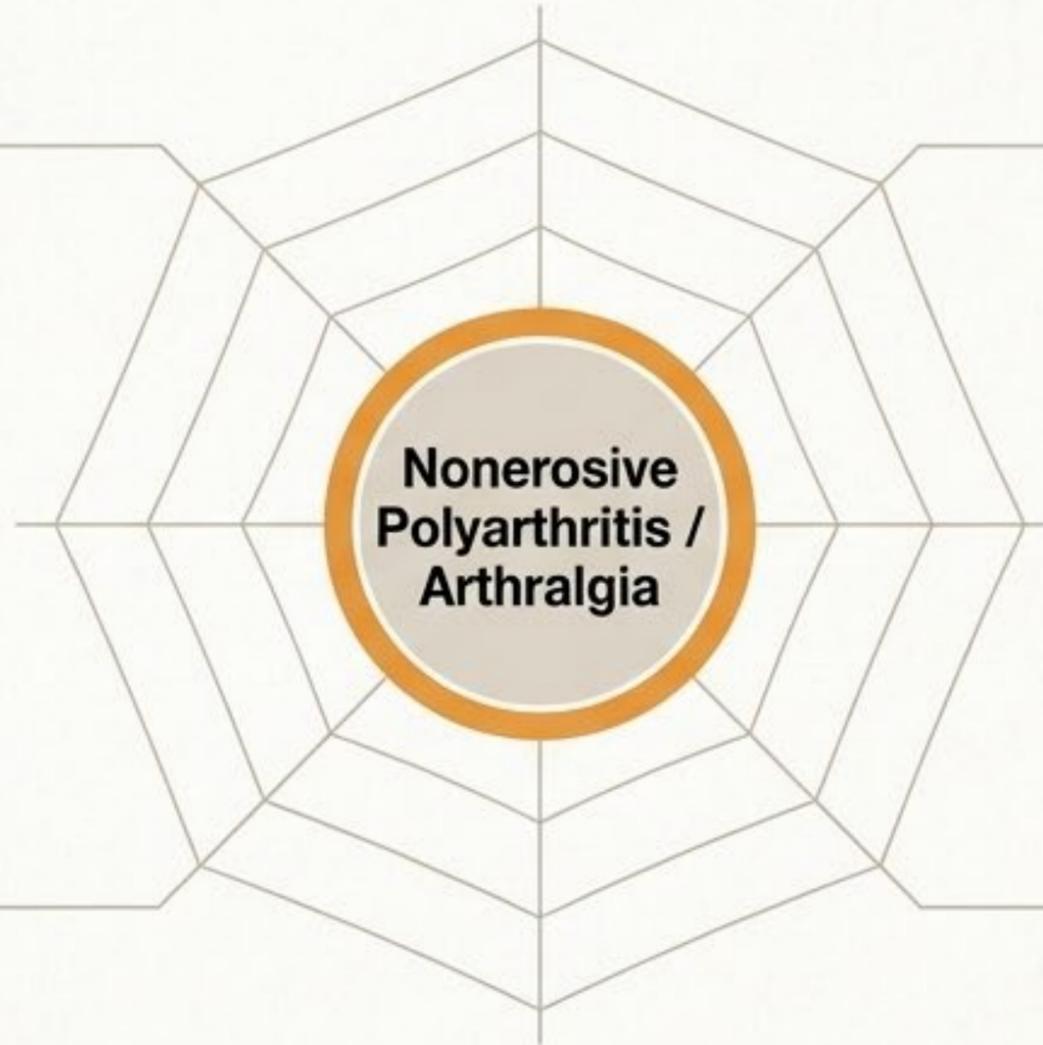
Look for extreme dry eyes/mouth and parotid enlargement (can coexist with RA or SLE)



## Inflammatory Myopathies

Look for proximal muscle weakness, Heliotrope/Gottron rashes, and elevated CK.

## The Systemic Radar



Nonerosive  
Polyarthritits /  
Arthralgia



## Systemic Lupus Erythematosus (SLE)

Look for photosensitivity, malar rash, oral ulcers, serositis, nephritis, and hematologic cytopenias



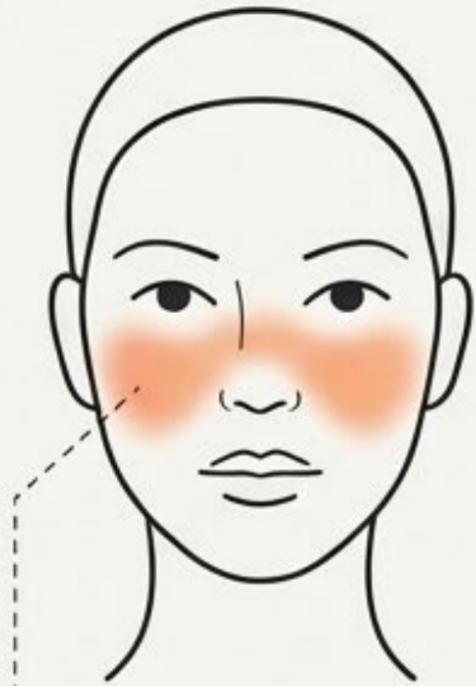
## Systemic Sclerosis

Look for Raynaud phenomenon, skin tightening (sclerodactyly), GI dysmotility, and pulmonary involvement.

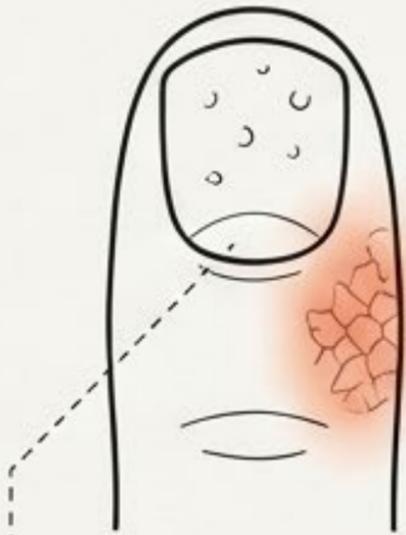
**Rule: Think systemically beyond the joint.**

# Key Dermatologic Manifestations

Skin is often the quickest clue to a systemic rheumatic diagnosis



**Malar rash / extreme photosensitivity**  
→ SLE



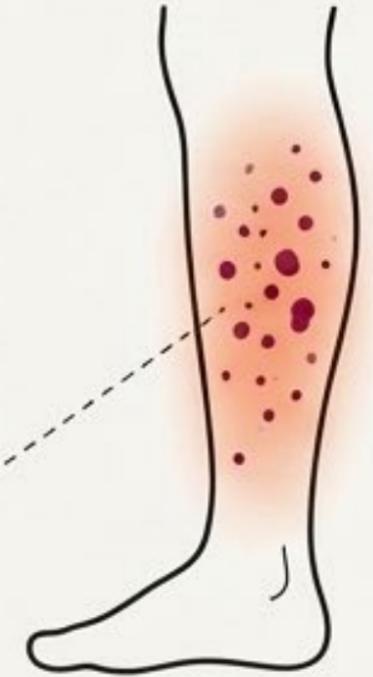
**Silvery plaques / nail pitting**  
→ Psoriatic Arthritis



**Nodular Tophi**  
→ Chronic Gout



**Sclerodactyly and digital ischemia**  
→ Systemic Sclerosis



**Palpable purpura or livedo**  
→ Systemic Vasculitis

**Note:** The following slides are reserved for clinical photographs of these manifestations.



Discoid lupus



Malar rash(butterfly rash)



Inter-articular dermatitis

# SLE

# VASCULITIS



Livedo Reticularis

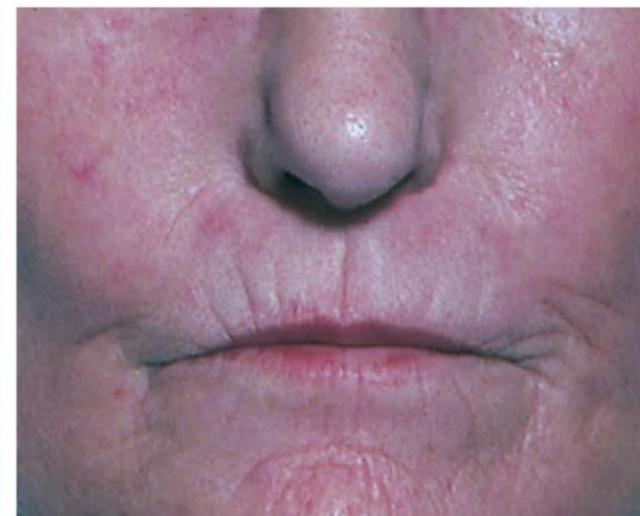
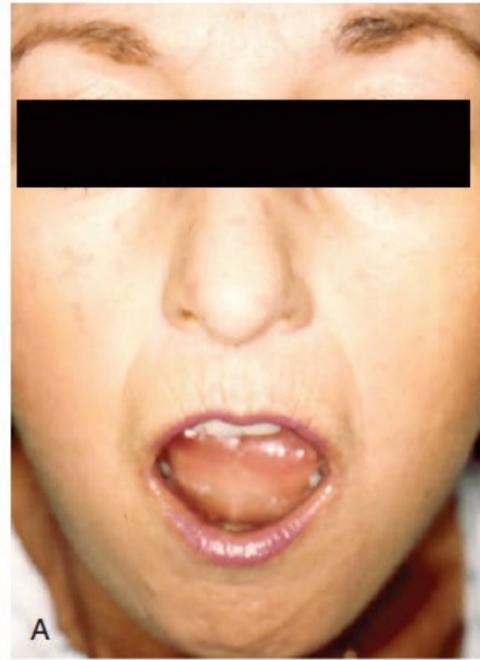


Purpura



Raynaud's phenomenon

# Systemic sclerosis (scleroderma)





# Rheumatoid arthritis



Figure 1: Rheumatoid nodules are superficial lesions in the deep subcutaneous tissues, commonly found on the olecranon.



# Gout



# The Arthritis Blueprint

The Arthritis Blueprint Matrix

Pathology	RA	OA	Gout	SpA	SLE / CTD
Key Clues	Symmetric small joints (MCP, PIP, wrists, MTP)	DIP, PIP, 1st CMC, knees, hips, spine	Often monoarticular (1st MTP, midfoot, knee)	Axial spine/SI joints ± asymmetric lower-limb	Nonerosive polyarthritis/arthralgia
Pathology	Autoimmune synovitis, pannus formation, cartilage/bone erosion.	Degenerative cartilage loss, osteophytes, subchondral sclerosis.	Monosodium urate crystal deposition (tophi), acute inflammation.	Chronic inflammation, enthesitis, new bone formation (syndesmophytes).	Autoimmune, immune complex deposition, widespread tissue inflammation, vasculitis.

# Management Strategies for Rheumatological Diseases

## Symptom Control

(Bridging Therapy)

### NSAIDs

Rapid symptom relief (inflammatory and mechanical). Useful for acute gout, OA flares, SpA.

- Risks: GI bleeding, renal dysfunction, CV risk.

### Corticosteroids

Highly effective bridge or flare treatment (oral, IM, IV, intra-articular).

- Risks: Minimize duration due to infection, osteoporosis, and hyperglycemia risks.

## Disease Modification

(Long-Term Structural Preservation)

### csDMARDs

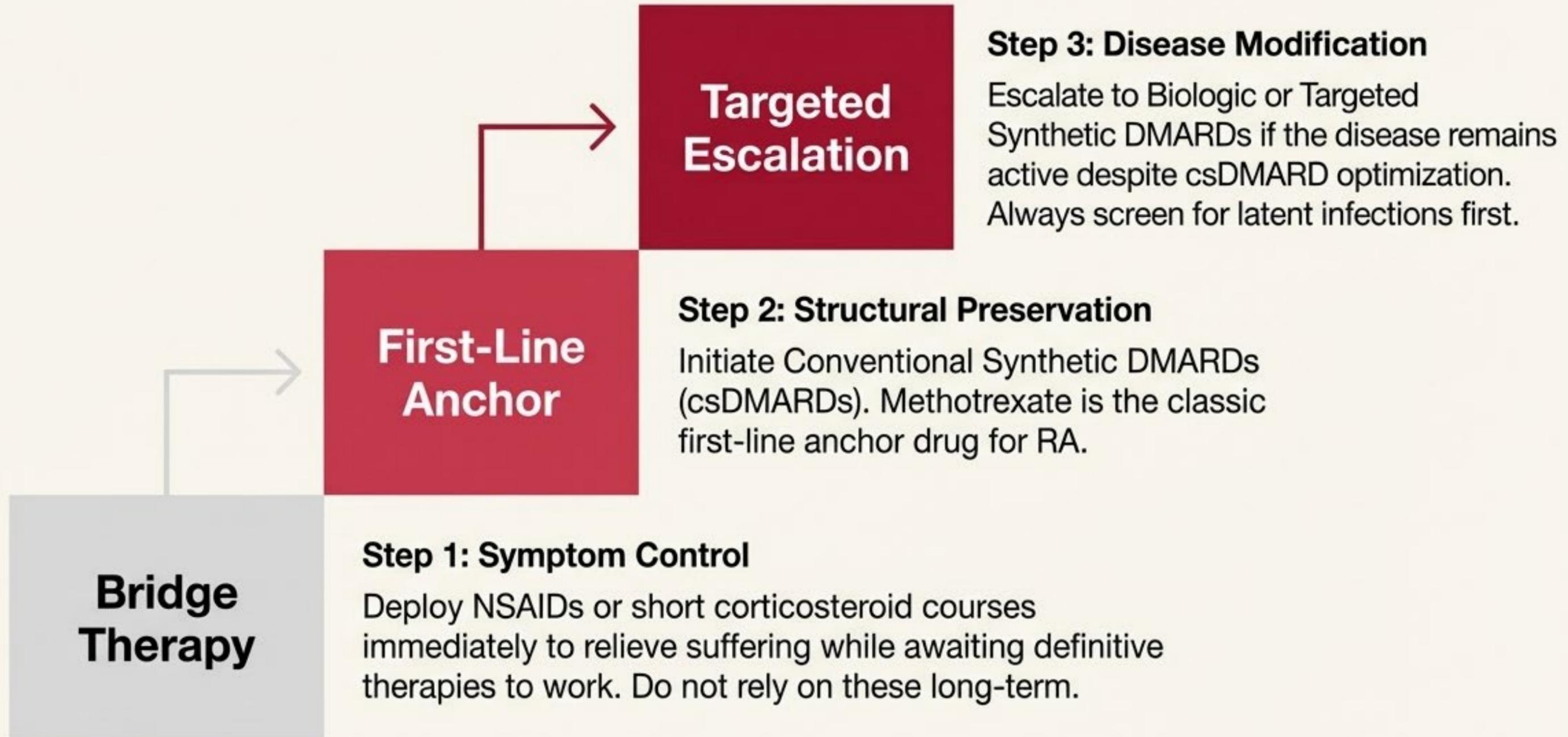
(Methotrexate, sulfasalazine, hydroxychloroquine). Used early in RA to prevent damage. Requires lab monitoring.

### Biologics/Targeted Therapies

(TNF inhibitors, IL-6 blockade, JAK inhibitors). Used when csDMARDs fail.

- Risks: Strict screening for infection (TB/hepatitis) before starting.

# The Inflammatory Step-Up Approach



# Urate-Lowering Therapy (ULT) Strategies

Treat the flare today; lower urate to prevent the next one.

## Today (Acute Flare)

Silence the inflammation with NSAIDs, Colchicine, or Corticosteroids.

### Clinical Pearl

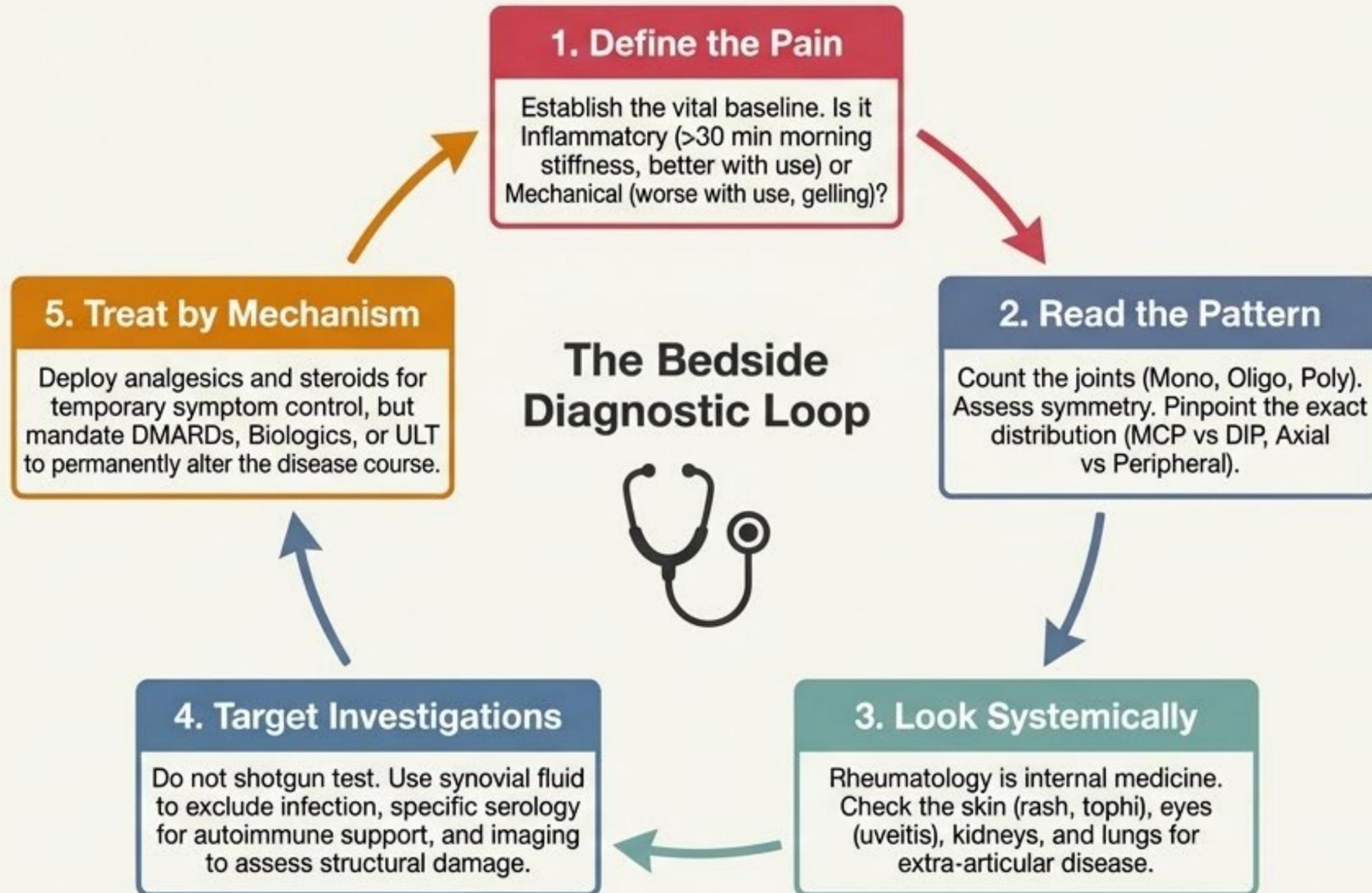
Prophylaxis with low-dose colchicine or NSAIDs is required when starting ULT to prevent paradoxical early flares.

## Tomorrow (Long-Term ULT)

Goal is a sustained serum urate below the saturation threshold.

- **First-line:** Xanthine oxidase inhibitors (Allopurinol; Febuxostat as alternative).
- **When to initiate:** Recurrent flares, presence of tophi, radiographic damage, or chronic gout burden.

# Approach to the patient with joint pain



Thank you