JOINT PAIN FACTSHEET

MUM IMS

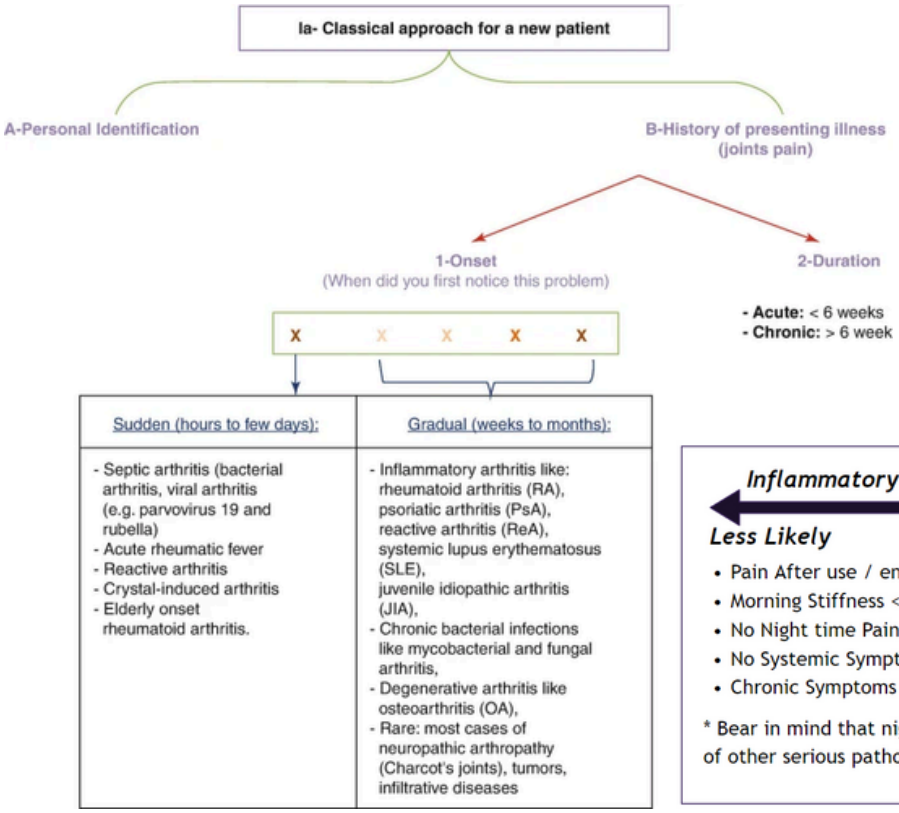
APPROACH TO JOINT PAIN

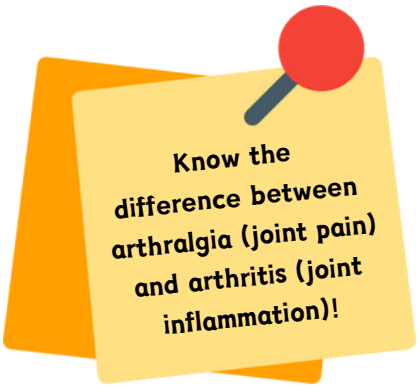
1 History

- Onset (sudden vs gradual)
- Duration (acute vs chronic)
- Patterns (small joint, large joint etc.)
- Symmetry (symmetrical, asymmetrical)
- Number of joints involved (mono-oligo-poly)
- Relieving and aggravating patterns
  - Joint pain better with movement → inflammatory
  - Joint pain better with rest → mechanical

Other important history

- Associated symptoms
- Constitutional symptoms
- Medication history
- Family history
- Functional impairment
- Social history: occupation, financial, education
- Systemic review





Inflammatory disease is :

Less Likely	*More Likely*
• Pain After use / end of the day	• Pain worse after rest / In morning
• Morning Stiffness < 30 mins	• Morning stiffness > 30mins
• No Night time Pain	• Night time pain*
• No Systemic Symptoms	• Systemic Symptoms*
• Chronic Symptoms	• Acute / Subacute presentation

* Bear in mind that night pain and systemic symptoms can be indicative of other serious pathology including cancer, infections and etc.

History: systemic review

ORGAN SYSTEM	POTENTIAL CLINICAL MANIFESTATION
Skin	Malar rash, photosensitivity, alopecia, sclerodactyly, periungual erythema, Raynaud's phenomenon, digital ulcers, psoriasis, purpura, nodules, genital lesions
HEENT: head, ears, eyes, nose, and throat	Mucosal ulcers or perforation, sicca, ocular discomfort or decreased visual acuity, change in hearing
Cardiorespiratory	Dyspnea, cough, hemoptysis, pleurisy or pericardial pain, edema, pulmonary emboli
Gastrointestinal	Reflux, dysphagia, abdominal pain, diarrhea, hematochezia, jaundice
Renal	Prior proteinuria, nephrolithiasis
Hematologic	Leukopenia, thrombocytopenia, anemia, fetal loss, deep vein thrombosis or pulmonary embolism, abnormal serologies
Neurologic	Neuropathies, weakness, transient ischemic attack, strokes, seizures, psychosis, cognitive deficits, temporal headaches
Family history: Ask about family history including various arthritides and other autoimmune diseases that tend to cluster in families.	
Social History: Identify high-risk practices such as intravenous drug abuse, multiple sexual partners, as well as risk factors for HIV, Hep B, Hep C, gonococcal, or chlamydial infection.	

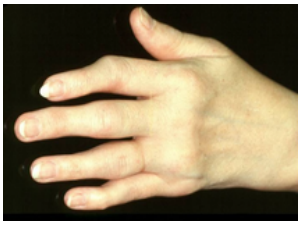
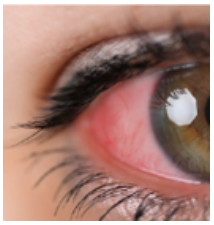
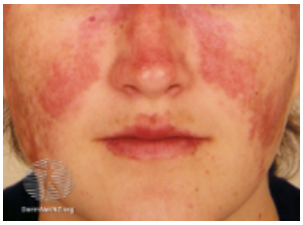
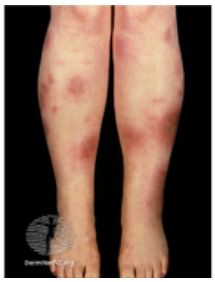
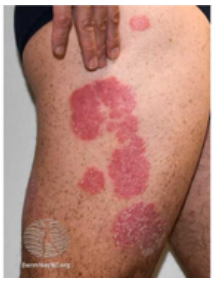
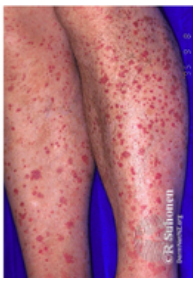
JOINT PAIN FACTSHEET

MUM IMS

APPROACH TO JOINT PAIN

2 Physical examination

- Synovitis / effusion
- Range of motion
- Extra-articular manifestations
  - Rheumatoid Nodules
  - Tophi
  - Rashes (psoriasis, vasculitis, viral exanthem, salmon pink rash)
  - Erythema nodosum (TB, sarcoid, IBD) → painful
  - Pustules (gonococcal)
  - Eyes: uveitis, conjunctivitis, episcleritis
  - Genital ulcerations / discharges

Questions to ask yourself #1: IS THE PROCESS ARTICULAR / NON-ARTICULAR?

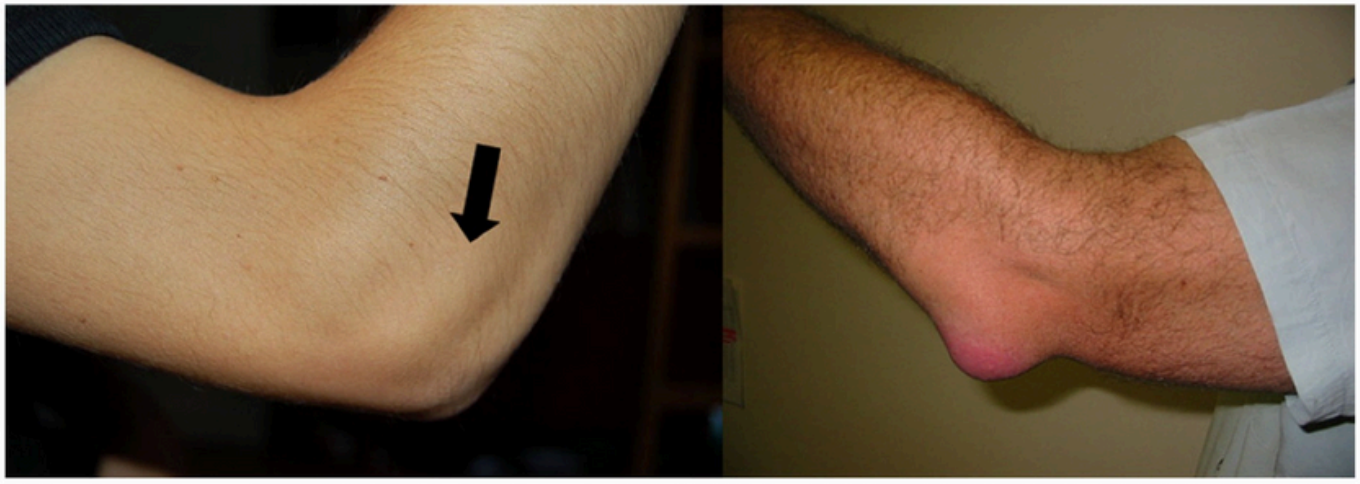
	Articular pain	Periarticular pain	Neurogenic pain	Referred pain
Definition	Originates within the joint itself	Originates in anatomical structures that are involved with joint motion but located outside the joint capsule	Originates from the compression or irritation of nerve roots or peripheral nerves	Symptoms felt at a distance from the anatomical origin
Enquiry	All joint movements are painful	Few selective movements painful	Dysaesthesic – aggravated by compression of the nerve or movement of spine	Unrelated to movement "visceral timing", poorly localized and may be improved by rubbing
Pain on motion	**Active and passive in several directions**	**Active > passive**	-	-
Range of motion	**Limited in both active and passive movement**	**Active movement (limited by pain) Passive movement (full)**	Normal	Normal
Resisted active movement	No effect	Pain on specific manoeuvres	No effect	No effect
Local palpation	Possible tenderness **over joint line**, capsular swelling, effusion and warm	Tenderness over affected **periarticular structure** (away from joint line)	Normal	Normal
Neurology	Normal	Normal	May be abnormal	Normal

JOINT PAIN FACTSHEET

MUM IMS

APPROACH TO JOINT PAIN

Figure 2 Elbow synovitis is an articular syndrome (note the joint line swelling) as opposed to olecranon bursitis which is a periarticular lesion.



Once determined articular,

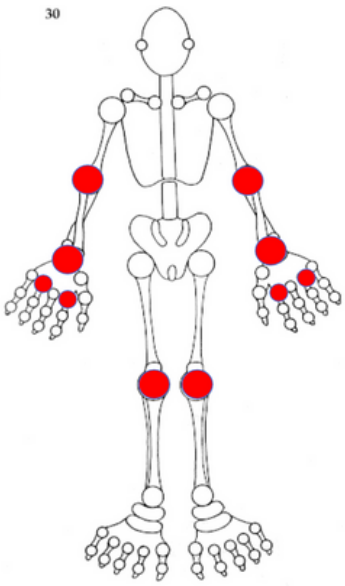
Questions to ask yourself #2: IS THE PROCESS INFLAMMATORY / NON-INFLAMMATORY?

	Inflammatory	Non-inflammatory (mechanical)
Early morning stiffness	> 0.5 - 1 hour	< 30 mins
Response of pain / stiffness to activity	Improves	Worsens
Maximum pain	Morning	Evening / night
Joint swelling	Mild - severe	None - mild
Warmth	Mild - severe	None - mild
Crepitus	-	Coarse
Erythema	+ / -	None
Systemic involvement	Commonly	None

JOINT PAIN FACTSHEET

MUM IMS

APPROACH TO JOINT PAIN



Once determined articular,

Questions to ask yourself #3: MONO- / OLIGO- / POLY-ARTICULAR?

- Mono-arthritis: 1 joint
- Oligo-arthritis: 2-4 joints
- Poly-arthritis: > 4 joints

Acute mono-arthritis

- Septic arthritis
- Crystal arthropathies (gout, pseudogout)
- Trauma (fracture, hemarthrosis)

Chronic mono-arthritis

- Mycobacterial infection
- Fungal infection
- Mono-articular presentation of RA
- Osteoarthritis

Oligo-arthritis

Inflammatory
- Seronegative spondyloarthropathies
  - Ankylosing spondylitis
  - Psoriatic arthritis
  - IBD-associated arthritis
  - Reactive arthritis

Non-inflammatory
- Osteoarthritis

Acute poly-arthritis

Infection
- Gonococcal
- Meningococcal
- Lyme disease
- Acute rheumatic fever
- Infective endocarditis
- Viral arthritis (rubella, Hep B/C, parvovirus, EBV, HIV)

Other inflammatory conditions
- Rheumatic arthritis
- Polyarticular & systemic JIA
- Acute sarcoid
- SLE
- Reactive arthritis
- Psoriatic arthritis
- Polyarticular gout

Chronic poly-arthritis

Inflammatory
- Rheumatic arthritis
- SLE
- Polyarticular gout
- JIA
- Systemic sclerosis
- CPPD
- Psoriatic arthritis
- Polymyalgia rheumatica
- Vasculitis
- Reactive arthritis
- Enteropathic arthritis
- Sarcoid

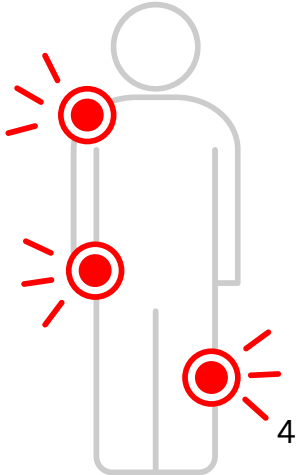
Non-inflammatory
- Osteoarthritis
- Chronic CPPD
- Fibromyalgia
- Hemochromatosis

Joint involvement patterns in polyarthritis

Migratory — Present few days in joints then remit and then appear in other joints
E.g. rheumatic fever, gonococcal, lyme, acute leukemia

Additive — Symptoms begin in some joints and added persist

Intermittent — Repetitive attacks with improvement in between
E.g. crystal arthropathy



JOINT PAIN FACTSHEET

MUM IMS

APPROACH TO JOINT PAIN

Joint involvement patterns in polyarthritis

Symmetrical / astmmetrical

Symmetry of the joints

Symmetrical arthritis

Inflammatory:	- RA, PsA, SLE, JIA (systemic and polyarticular types), adult onset Still's disease, Sjögren's syndrome - Other systemic rheumatic diseases: SLE, mixed connective tissue disease (MCTD), adult onset rheumatic fever, polymyalgia rheumatica, erosive inflammatory osteoarthritis, calcium pyrophosphate deposition disease (CPPD) (pseudo-RA type)
Infectious:	- Viral arthritis especially parvovirus arthritis - Lyme disease
Infiltrative:	- Sarcoid arthritis (acute type) - Amyloid arthropathy - Hemochromatosis arthropathy
Neoplastic:	- Primary infiltrative/paraneoplastic: Leukemia - Chemotherapy induced (classically post breast cancer therapy)
Endocrinal:	- Myxedematous arthropathy

Asymmetrical arthritis:

Inflammatory:	- ReA - PsA - Pauciarticular JIA - Oligoaricular or polyarticular gout - CPPD disease (pseudogout type)
Infectious:	- Bacterial arthritis - Bacterial endocarditis.

Alharbi, L. and Almoallim, H. (2021) "Skills in Rheumatology.", pp. 3–16. https://doi.org/10.1007/978-981-15-8323-0_1

Once determined articular,

Questions to ask yourself #4: ACUTE / CHRONIC?

Duration

- Acute: < 6 weeks
- Chronic: > 6 weeks

JOINT PAIN FACTSHEET

MUM IMS

APPROACH TO JOINT PAIN

Once determined articular,

Questions to ask yourself #5: AXIAL / PERIPHERAL?

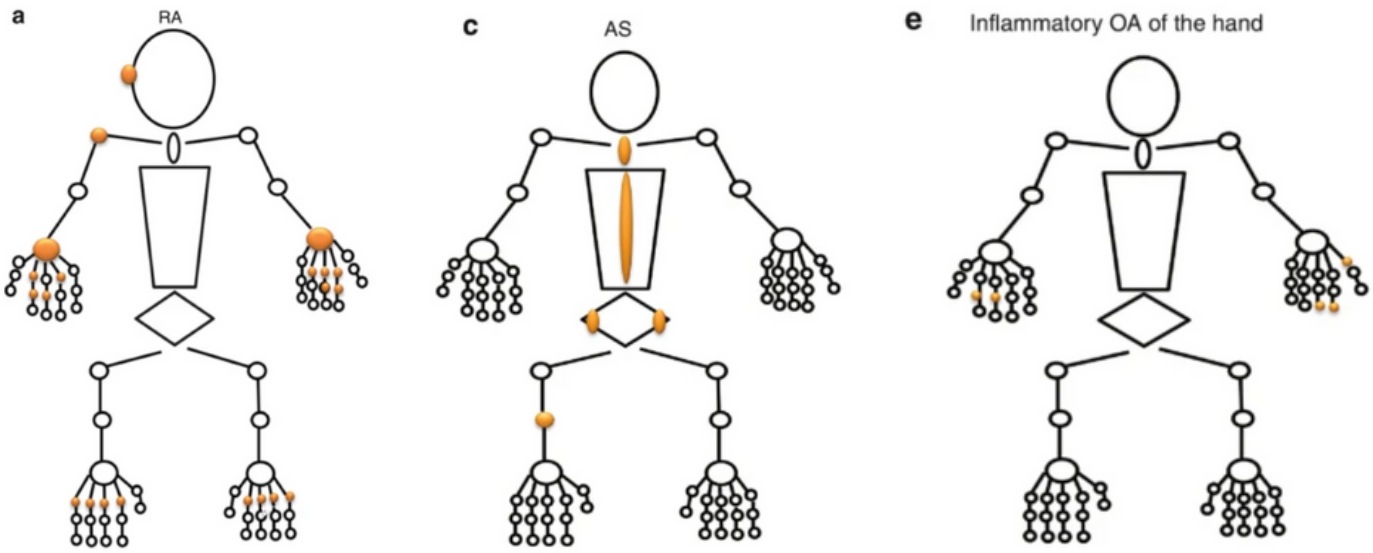
- If there is axial involvement, consider seronegative spondyloarthropathies

Table 12.2 Distribution of Joint Involvement in Polyarthritis

DISEASE	JOINTS COMMONLY INVOLVED	JOINTS COMMONLY SPARED
Gonococcal arthritis	Knee, wrist, ankle, hand IP	Axial
Lyme arthritis	Knee, shoulder, wrist, elbow	Axial
Rheumatoid arthritis	Wrist, MCP, PIP, elbow, glenohumeral, cervical spine, hip, knee, ankle, tarsal, MTP	DIP, thoracolumbar spine
Osteoarthritis	First CMC, DIP, PIP, cervical spine, thoracolumbar spine, hip, knee, first MTP, toe IP	MCP, wrist, elbow, glenohumeral, ankle, tarsal
Reactive arthritis	Knee, ankle, tarsal, MTP, first toe IP, elbow, axial	
Psoriatic arthritis	Knee, ankle, MTP, first toe IP, wrist, MCP, hand IP, axial	
Enteropathic arthritis	Knee, ankle, elbow, shoulder, MCP, PIP, wrist, axial	
Polyarticular gout	First MTP, tarsal, subtalar, ankle, knee	Axial
CPPD disease	Knee, wrist, shoulder, ankle, MCP, hand IP, hip, elbow	Axial
Sarcoid arthritis	Ankle, knee	
Hemochromatosis	MCP, wrist, ankle, knee, hip, feet, shoulder	

CMC, carpometacarpal; *CPPD*, calcium pyrophosphate dihydrate deposition; *DIP*, distal interphalangeal; *IP*, interphalangeal; *MCP*, metacarpophalangeal; *MTP*, metatarsophalangeal; *PIP*, proximal interphalangeal.

West, S.G. and Kolfenbach, J. (2020) Rheumatology Secrets. 4th edn. Elsevier.



(a) RA: rheumatoid arthritis
(c) AS: ankylosing spondylitis
(e) OA: osteoarthritis

Alharbi, L. and Almoallim, H. (2021) "Skills in Rheumatology.", pp. 3–16. https://doi.org/10.1007/978-981-15-8323-0_1.

JOINT PAIN FACTSHEET

MUM IMS

APPROACH TO JOINT PAIN

Once determined articular,

Questions to ask yourself #6: SYSTEMIC / LOCAL?

- Dry eyes, mouth
- Mucocutaneous lesions
- Photosensitivity

→ Connective tissue disease

- Renal stones → Gout
- Genital ulcers
- Dysuria

→ Reiter's syndrome, Gonococcal arthritis, Behcet's disease

- GI symptoms → Enteropathic arthritis
- Fever
- Weight loss

→ Inflammatory rheumatic diseases, Occult malignancy / infection

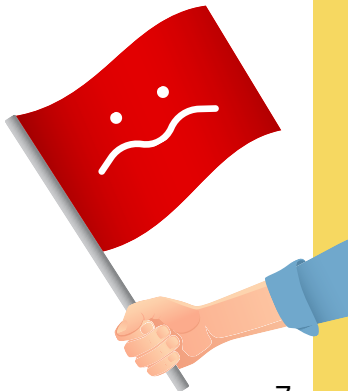
Diffuse aches and pains

Differential diagnosis

- Post-viral arthralgias and myalgias
- Soft tissue rheumatism
- Fibromyalgia
- Endocrine conditions: hypothyroidism, metabolic bone diseases
- Paraneoplastic syndrome
- CTD including myositis
- Hypermobility syndrome
- Benign arthralgias and myalgias

Red flags

- Age >50: paraneoplastic syndrome, PMR
- Constitutional symptoms: inflammatory disease, vasculitis, sepsis, malignancy
- Weakness: myopathy, endocrine diseases
- Gelling: inflammatory rheumatic diseases



JOINT PAIN FACTSHEET

MUM IMS

APPROACH TO JOINT PAIN

3 Investigations

- **Joint aspiration → important in the evaluation of mono-arthritis**
  - Diagnostic: establish underlying cause of arthritis (septic arthritis, crystal arthropathies, haemarthrosis)
  - Therapeutic: drain large effusions to relieve pain

	Noninflammatory (such as osteoarthritis)	Inflammatory (such as rheumatoid arthritis)	Septic	Hemorrhagic
WBC count (cells/microL)	<2000	2000 to 20,000	>20,000*	Up to 1 WBC for every 1000 RBCs
Percent neutrophils	<25%	50 to 75%	>75%	<50%¶
Crystal examination by polarized microscopy	Negative	May demonstrate uric acid or CPPD crystals	Negative	Bloody
Stain, culture for microorganisms	Negative	Negative△	May be positive (depending on organism, prior antibiotic exposure)	Negative

Sholter DE and Russell AS (2022) Synovial Fluid Analysis (UpToDate) Retrieved 23/4/2024 from https://www.uptodate.com/contents/synovial-fluid-analysis

Table 12–5 Characteristics of Synovial Fluid Crystals

Crystal	Shape		Compensated Polarized Light	Significance
Monosodium urate	Needles		Negative birefringence	Gout
Calcium pyrophosphate	Rhombic square, rods		Positive birefringence	Pseudogout

JOINT PAIN FACTSHEET

MUM IMS

RHEUMATOID ARTHRITIS

A chronic inflammatory joint disease of autoimmune nature, characterized by autoantibodies to immunoglobulin G (rheumatoid factor) and citrullinated proteins (ACPAs), peak incidence 60 years

Risk factors

- Genetics
- Female sex
- Smoking
- Obesity
- Microbiota

RA is not joint-limited but a systemic condition!

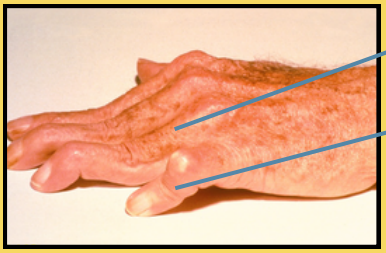
Extra-articular manifestations

- Rheumatoid nodules
- Sjogren's syndrome
- Ocular inflammation
- Interstitial lung disease
- Pleural involvement
- Pericardial & cardiac involvement
- Felty syndrome
- Lymphoma
- Rheumatoid vasculitis
- Neurological issues
- Renal issues (usually drug toxicity)
- Amyloidosis
- Pyoderma gangrenosum

Diagnosis

- ACR 1987 criteria: less useful
- ACR/EULAR 2010 criteria: more sensitive ★ excludes DIP, 1st CMCJ and 1st MTPJ
- Role of rheumatoid factor:
  - Sensitivity 60-80%; specificity 70%
  - Sero+ve patients tend to have more aggressive disease
  - Prognosticating RA
  - Predicting onset (preclinical RA)

Clinical features



Swan neck deformity
PIP hyperextension, DIP flexion

Boutonniere deformity
PIP flexion, DIP hyperextension

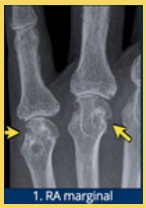
Wrist swollen and fixed

Ulnar deviation at MCP joints
Subluxation of MCP joints

Rheumatoid nodules

Imaging

- X-ray
  - Marginal erosions
  - Periarticular osteopenia
  - Joint space narrowing
  - Subluxation
  - Fused carpal bones (late stage)
- MRI
  - Synovitis (increase synovial thickening post-IV contrast use)
  - Tenosynovitis
- Ultrasound
  - Joint erosion
  - Tenosynvitis
  - Useful in early diagnosis



https://radiologyassistant.nl/musculoskeletal/arthritis/fractures-video-lesson

Treatment

- Early education & early treatment
- Treat to target strategy
- First line: methotrexate ± steroids
  - If don't work, biologic DMARDs, JAK-inhibitors