

Approach to joint pain

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OBJECTIVES

- ◉ To know the pathophysiology of joint pain .
- ◉ To list common causes of joint pain
- ◉ To provide a systematic approach to the investigation and differential diagnosis of patients presenting with joint pain.
- ◉ To describe diagnosis and treatment of the important joint problems
- ◉ To describe referral criteria for common joint problems

OVERVIEW

- ⊙ **Joint pain** can have multiple causes, a reflection of the diverse joint diseases, which arise from inflammation, cartilage degeneration, crystal deposition, infection, and trauma.
- ⊙ The initial aim is to localize the **source** of the joint symptoms and to determine the **type of pathophysiologic** process responsible for their presence.
- ⊙ The differential diagnoses are generated in large part from the **history and physical examination**.
- ⊙ **Laboratory test** results serve primarily to confirm clinical

PATHOPHYSIOLOGY

ARTHRITIS VS. ARTHRALGIA

ARTHRITIS

- DIAGNOSIS
- Joint pain
- Inflammatory
 - Swelling
 - Redness
 - Tenderness
- Limitations in range

ARTHRALGIA

- SYMPTOM
- Joint pain
- Non-inflammatory
- Pain **without** swelling
- “achiness”



THERE MAY BE:

- ⊗ Only a single joint involved (mono-articular).
- ⊗ Oligo- or pauciarticular arthritis- affection of 2-4 joints
- ⊗ Polyarthritis- affection of 5 or more joints

THE PAIN MAY OCCUR :

- ⦿ Only with activity , suggesting a mechanical problem (eg, osteoarthritis, tendinitis).
- ⦿ At rest, suggesting inflammation (eg, crystal disease, septic arthritis).
- ⦿ There may or may not be fluid within the joint (effusion).

PATHOPHYSIOLOGY

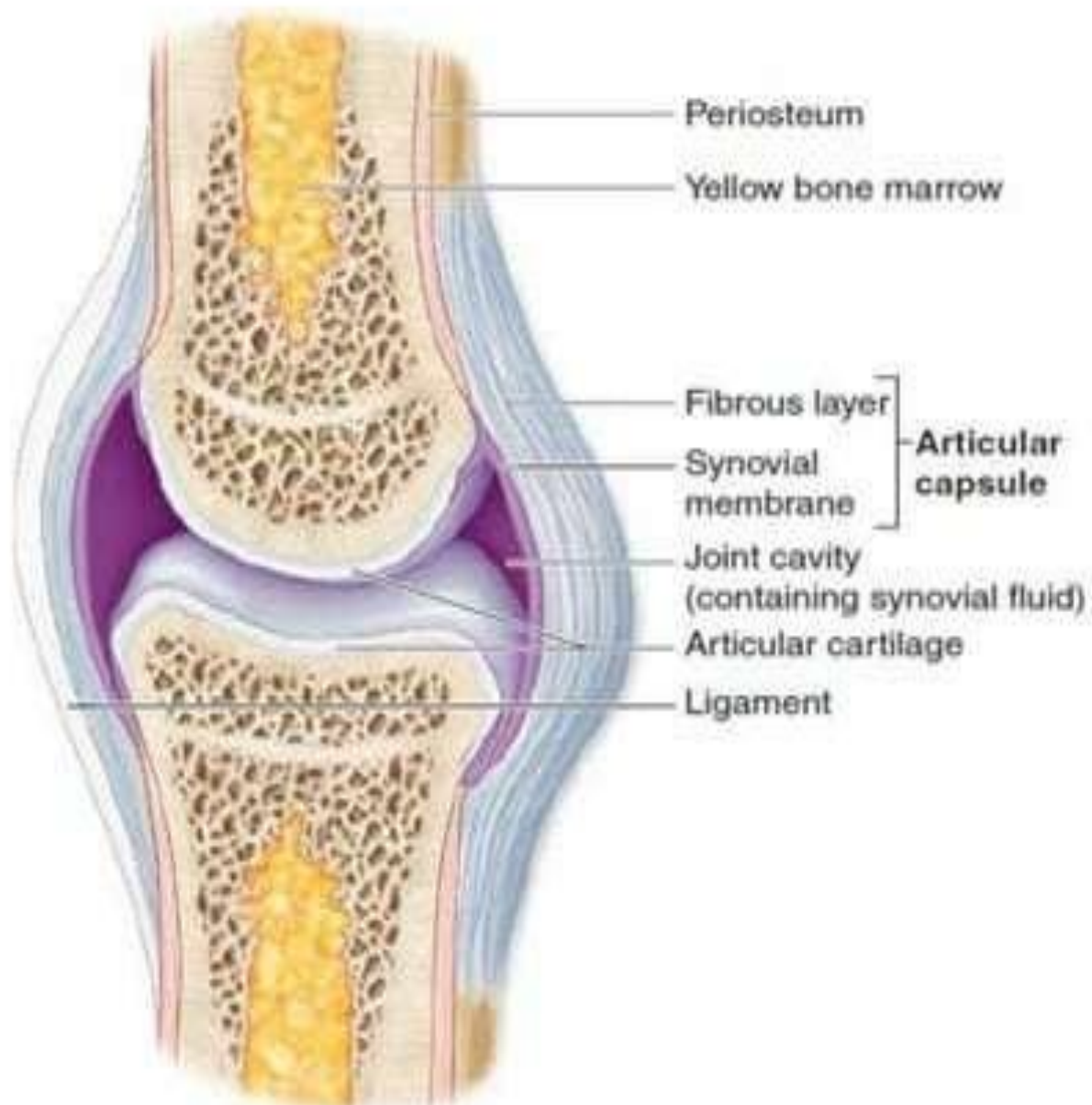
Joint pain may arise anatomically from:

□ 1- Structures within the joint (intra-articular):

Sources of pain within the joint include the joint capsule, periosteum, ligaments, subchondral bone, and synovium, **but not the articular cartilage, which lacks nerve endings**

Eg. • Synovium-synovitis

- Joint capsule-capsulitis



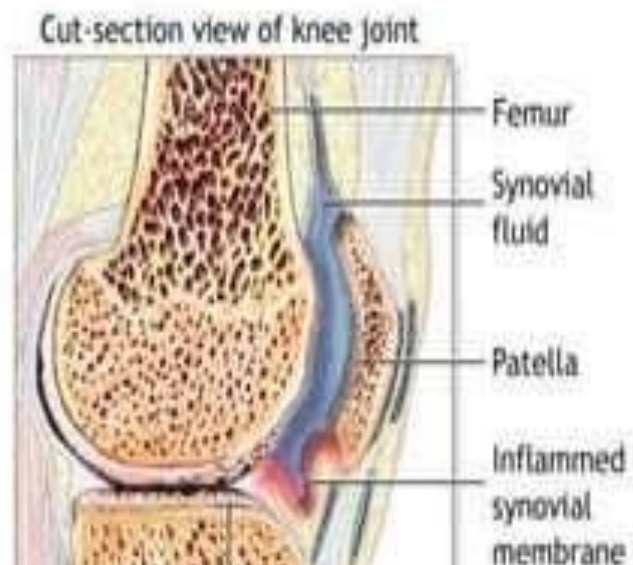
PATHOPHYSIOLOGY

- ❑ 2-Structures adjacent or around to the joint (per-articular)
 - Bursa-bursitis
 - Tendon sheath-tenosynovitis
 - Tendon-tendonitis
 - Insertion of tendon, ligament-enthesitis
 - Extra-articular disorders (eg, polymyalgia rheumatica, fibromyalgia).
- ❑ 3-Referred Pain from more distant site (eg. Bone)

● basic pathophysiologic types of joint disease.

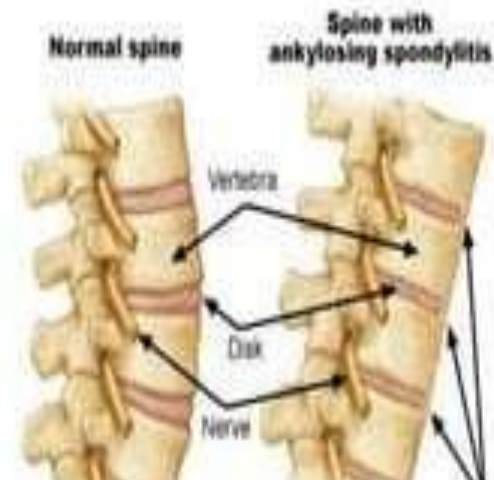
1-SYNOVITIS

- The synovial membrane is the principal site of inflammation in persons with rheumatoid arthritis (RA) and many other inflammatory arthritis's



2-ENTHESITIS

- The enthesis is the transitional zone where collagenous structures such as tendons and ligaments are interwoven into bone.
- Other examples of entheses include the interface between cortical bone and the periosteum and that between vertebral bodies and the annulus fibrosus.
- The enthesis is the principal site of pathology in the seronegative spondyloarthropathies.
- new bone formation(periostitis)
- gradual ossification of syndesmoses (eg, the sacroiliac joints)
- syndesmophyte formation along the outer fibers of the



3-CRYSTAL DEPOSITION

- The deposition of crystals in articular structures may lead to symptomatic joint disease. The responsible crystals include monosodium urate, calcium pyrophosphate dihydrate, basic calcium phosphate (including hydroxyapatite), and calcium oxalate.
- Monosodium urate crystal
- Calcium pyrophosphate crystal

GOUT: THE PROTOTYPICAL CRYSTAL DEPOSITION ARTHROPATHY



4-INFECTIOUS ARTHRITIS

- The synovium may become the seat of acute or chronic infections related to bacterial, fungal, or viral organisms. These infections almost always arise from blood-borne organisms and may be part of a systemic infection. The infection is based in the synovium.



5-STRUCTURAL OR MECHANICAL JOINT DERANGEMENT

- ◉ Degeneration of the articular cartilage is the principal pathologic feature of osteoarthritis. It occurs in response to both local and host factors. **Local factors include the following:**
 - ◉ Previous joint trauma (eg, meniscal tears)
 - ◉ Congenital or developmental joint alterations (eg, congenital hip dysplasia and slipped capital femoral epiphysis)
 - ◉ Alterations of the subchondral bone (eg, osteopetrosis, avascular necrosis, and Paget disease)
 - ◉ Alterations of supporting structures (eg, hypermobility)
 - ◉ Cartilage derangements (eg, ochronosis and crystal deposition)

⊙ Host factors include the following:

- ⊙ Genetic traits
- ⊙ Obesity
- ⊙ Occupation

- ⦿ Inflammatory arthritis is characterized by inflammation affecting joint structures, such as the synovium, synovial cavity, and enthuses.
- ⦿ No inflammatory arthritis is joint disease resulting primarily from alterations in the structure or mechanics of the joint.
- ⦿ Arthralgia is characterized by joint tenderness, but abnormalities of the joint cannot be identified.
- ⦿ Such patients may have a syndrome of altered pain sensation (eg, fibromyalgia) or an early rheumatic syndrome whose clinical signs are not yet apparent or are too subtle for detection (eg, arthralgia

ETIOLOGY OF JOINT PAIN

⊙ Mono-articular Pain

- ⊙ **Trauma** (overuse - fractures - hemarthrosis).
- ⊙ Internal derangement or intra-articular trauma (Meniscus injury - ligament tear)
- ⊙ **Infectious or Septic arthritis** (eg, bacterial, fungal, viral, mycobacterial, spirochetal, parasitic).
- ⊙ **Reactive arthritis** (Aseptic inflammatory arthritis).
- ⊙ **Crystal-induced disease** (gout or pseudogout)
- ⊙ **Periarticular syndromes** (eg, bursitis, epicondylitis, fasciitis, tendinitis, tenosynovitis)

ETIOLOGY OF JOINT PAIN

- ⊙ Mono-articular Pain

- ⊙ Uncommon Causes :

- Avascular necrosis (H/O corticosteroid use or sickle cell anaemia)
- Neuropathy (Charcot 's Joint).
- Osteoarthritis
- Osteomyelitis
- Lyme disease.
- Paget's disease (Osteitis deformans)
- Tumor

ETIOLOGY OF JOINT PAIN

• Poly-articular Joint Pain

Acute polyarticular arthritis is most often due to the following:

- Infection (usually viral)
- Flare of a rheumatic disease

Chronic polyarticular arthritis in adults is most often due to the following:

- RA (inflammatory)
- Osteoarthritis (noninflammatory)

Chronic polyarticular arthritis in children is most often due to the following:

- Juvenile idiopathic arthritis

APPROACH

I - History

- Symptoms of joint disease

☐ Pain

➤ Inflammatory joint disease

- present both at rest and with motion.
- It is worse at the beginning than at the end of usage.

➤ Non-inflammatory joint disease (ie, degenerative, traumatic, or mechanical)

- Occurs mainly or only during motion
- Improves quickly with rest.
- Patients with advanced degenerative disease of the hips, spine, or knees may also have



APPROACH

I - History

Symptoms of joint disease

□ Stiffness

- It is a sensation of tightness when attempting to move joints after a period of inactivity.
- It typically subsides over time.
- Its duration may serve to distinguish inflammatory from non-inflammatory forms of joint disease.
- With inflammatory arthritis, the stiffness is present with early morning that last at least 1HOUR
- With non-inflammatory arthritis, mechanical arthritis tend to occur after

APPROACH

I - History

Symptoms of joint disease

□ Swelling

- With inflammatory arthritis, joint swelling is related to synovial hypertrophy, synovial effusion, and/or inflammation of periarticular structures. The degree of swelling often varies over time.
- With noninflammatory arthritis, the formation of osteophytes leads to bony swelling. Mild degrees of soft tissue swelling do occur and are related to synovial cysts, thickening, or effusions.



APPROACH

I - History

Symptoms of joint disease

□ Limitation of motion

- Loss of joint motion may be due to structural damage, inflammation, or contracture of surrounding soft tissues.
- Patients may report restrictions on their activities of daily living, cutting toenails, climbing stairs, or combing hair.

□ Weakness

- Muscle strength is often diminished around an arthritic joint as a result of disuse atrophy.
- Weakness with pain suggests a musculoskeletal cause (eg, arthritis, tendonitis) rather than a pure myopathic or neurogenic cause.
- Manifestations include decreased grip strength, difficulty rising from a chair or

APPROACH

I - History

Symptoms of joint disease

☐ Fatigue

- Is usually synonymous with exhaustion and depletion of energy in patients with arthritis.
- With inflammatory polyarthritis, the fatigue is usually noted in the afternoon or early evening.
- With psychogenic disorders, the fatigue is often noted upon arising in the morning and is related to anxiety, muscle tension, and poor sleep.

Historical features important to the differential diagnosis include the following:

- 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

I – History

Temporal pattern of arthritis

➤ The onset of symptoms can be abrupt or insidious.

❖ With an **abrupt onset** - develop over minutes - hours. This may occur in:

- Trauma
- Crystalline
- synovitis

❖ With an **insidious pattern**- develop over weeks-months.

- It is typical of most forms of arthritis, including rheumatoid arthritis (RA) and osteoarthritis.

➤ Duration of symptoms is considered either

- acute or chronic. Acute is less than 6 weeks in duration
- chronic is 6 or more weeks in duration.

I – History

Temporal pattern of arthritis

The temporal patterns of joint involvement are migratory, additive or simultaneous, and intermittent.

- With a migratory pattern, inflammation persists for only a few days in each joint .
- With an additive or simultaneous pattern, inflammation persists in involved joints as new ones become affected.
- With an intermittent pattern, episodic involvement occurs, with intervening periods free of joint symptoms .

I - History

- **Number of involved joints**
- Monoarthritis is the involvement of one joint.
- Oligoarthritis is the involvement of 2-4 joints.
- Polyarthritis is the involvement of 5 or more joints.

Symmetry of joint involvement

- Symmetric arthritis is characterized by involvement of the same joints on each side of the body. This symmetry is typical of RA and SLE.
- Asymmetric arthritis is characteristic of psoriatic arthritis, reactive arthritis (Reiter syndrome), and Lyme arthritis.

I - History

❖ Distribution of affected joints

- The distal interphalangeal joints of the fingers are usually involved in psoriatic arthritis, gout, or osteoarthritis but are usually spared in RA.
- Joints of the lumbar spine are typically involved in ankylosing spondylitis but are spared in RA.

❖ Distinctive types of musculoskeletal involvement

- Spondyloarthropathy involves entheses, leading to heel pain (inflammation at the insertions of the Achilles tendon and/or plantar fascia), tendonitis, and back pain (sacroiliitis and vertebral disc insertions).
- Gout commonly involves tendon sheaths and bursae, resulting in superficial

Extra-articular manifestations

❖ Constitutional symptoms

- suggest an underlying systemic disorder.
- not expected in patients with degenerative joint disease.

❖ Skin lesions

- may indicate the specific diagnosis of a number of rheumatic diseases.
- Examples include SLE, scleroderma, & psoriasis.

❖ Ocular symptoms or signs

- Episcleritis and scleritis - associated with RA
- anterior uveitis with ankylosing spondylitis
- iridocyclitis with juvenile RA.

Common Causes of Acute Monoarthritis

BACTERIAL INFECTION OF THE JOINT SPACE

I	Non-gonococcal : S. aureus, BHSC, S. pneumonia, G-ve.
II	Gonococcal : preceded by migratory tenosynovitis+ Skin lesions

CRYSTAL-INDUCED ARTHRITIS

I	Gout (monosodium urate crystals)
II	Pseudogout (calcium pyrophosphate dihydrate crystals)

TRAUMA

Differential Diagnosis of Chronic Monoarthritis

Ch. Inflammatory MA

- Infection
 - Non-gonococcal septic arthritis
 - Gonococcal
 - Chronic Lyme disease
 - Mycobacterial
 - Fungal
 - Viral
- Crystl-induced arthritis
 - Gout
 - Pseudogout
 - Calcium apatite crystals
- Monoarticular presentation of oligoarthritis or polyarthritis
 - Spodyloarthropathy
 - Rheumatoid arthritis
 - Lupus & other systemic autoimmune diseases
- Sarcoidosis
- Uncommon or Rare
 - Familial Mediterranean fever
 - Amyloidosis

Ch. Non-inflammatory MA

- Osteoarthritis
- Internal derangments (e.g. torn meniscus)
- Chondromalacia patellae
- Osteonecrosis
- Uncommon or rare
 - Neuropathic (Charcot) arthropathy
 - Sarcoidosis
 - Amyloidosis

Differential Diagnosis of Oligoarthritis

Acute Oligoarthritis

- **Infection**
 - Disseminated gonococcal infection
 - Non-gonococcal septic arthritis
 - Bacterial endocarditis
 - Viral
- **Postinfection**
 - Reactive arthritis
 - Rheumatic fever
- **Spondyloarthropathy**
 - Reactive arthritis
 - Ankylosing spondylitis
 - Psoriatic arthritis
 - Inflammatory bowel disease
- Oligoarticular presentation of rheumatoid arthritis, SLE, adult Still disease or other polyarthritis
- Gout and pseudogout

Chronic Oligoarthritis

- **Inflammatory Causes**
- **Common**
 - Spondyloarthropathy
 - Reactive arthritis
 - Ankylosing Spondylitis
 - Psoriatic arthritis
 - Inflammatory bowel disease
 - Atypical presentation of rheumatoid arthritis
 - Gout
- **Uncommon or rare**
 - Subacute bacterial endocarditis
 - Sarcoidosis
 - Behcet disease
 - Relapsing polychondritis
 - Celliac disease
- **Non-inflammatory Causes**
- **Common**
 - Osteoarthritis
- **Uncommon or rare**

Approach

II – Physical Examination

The musculoskeletal examination helps distinguish joint **inflammation** (eg, RA) from joint **damage** (eg, degenerative joint disease).

It can also help reveal the **site** of musculoskeletal involvement (eg, synovitis, enthesitis, tenosynovitis, bursitis) and the **distribution** of joint involvement.

II – Physical Examination

- ✓ **General** : general condition, fever, pulse, BP
- ✓ **Joint Examination** should include: inspection, palpation, range of motion & special tests. (ask, look, feel, move)
- ✓ **Articular or extra-articular**
- ✓ **Joint Inflammation** : swollen, red, , tender, hot
- ✓ **Functional impairment**
 - Passive and active movement
 - Crepitus during active or passive range of motion
 - Instability

extra-articular features



13 Immemorandum

Butterfly Rash



Oral Ulcers



Tophi

Raynaud's Phenomenon



Raynaud's Phenomenon

1.

3.

2.

Fingers become white due to lack of blood flow, then blue.



II – Physical Examination

❑ Swelling and ecchymosis :

Indicate a fracture, complete ligament or tendon tear.



☐ Laxity (hypermobility)

THE BEIGHTON SCORE



One point for each thumb



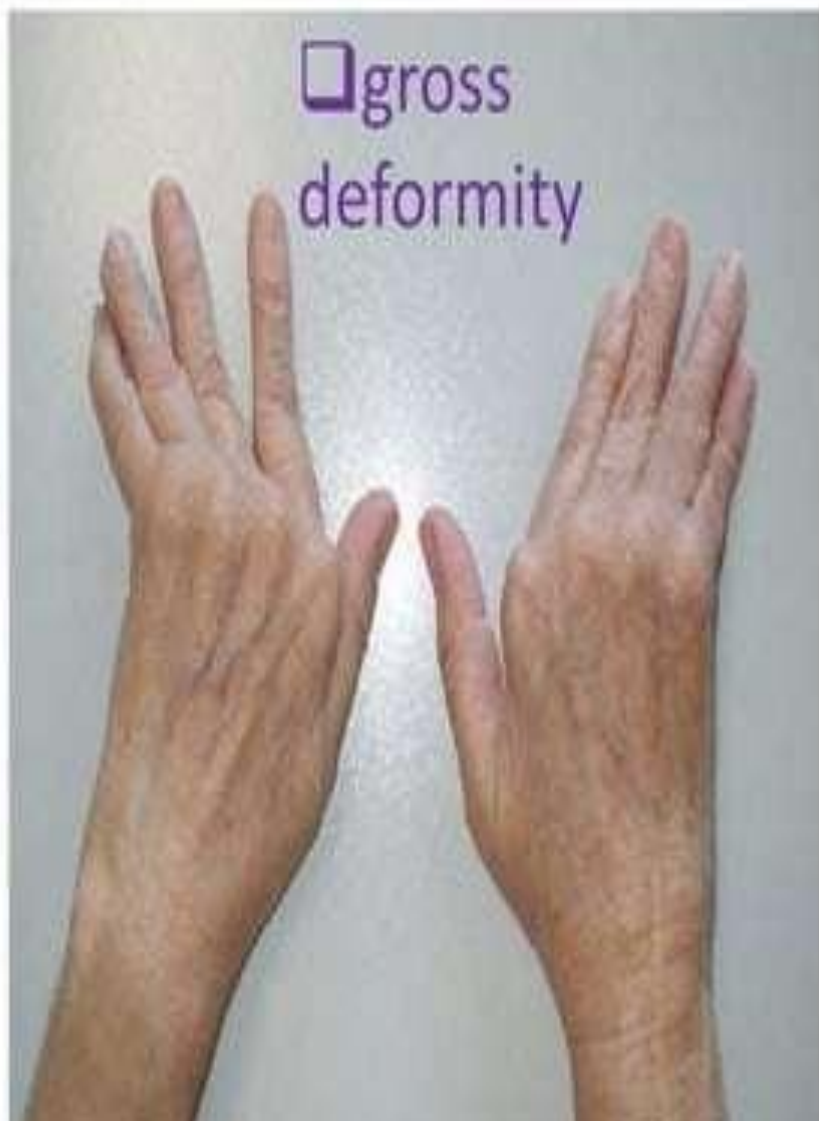
One point for each finger + 90°



One point for each elbow + 10°



☐ gross deformity



- ❑ tendon or muscle dysfunction
- ❑ Crepitus : indicates a derangement of bone, cartilage, or menisci.

Types of crepitus

Bone Crepitus

two fragments of a fracture are moved against each other

Crepitus of bursitis

the inflammation of one or more bursae (small sacs) of synovial fluid in the body

Joint Crepitus

the affected joint is passively moved with one hand, while the other hand is placed on the joint to feel the crepitus.

Crepitus of tenosynovitis

the inflammation of the fluid-filled sheath (called the synovium) that surrounds a tendon.



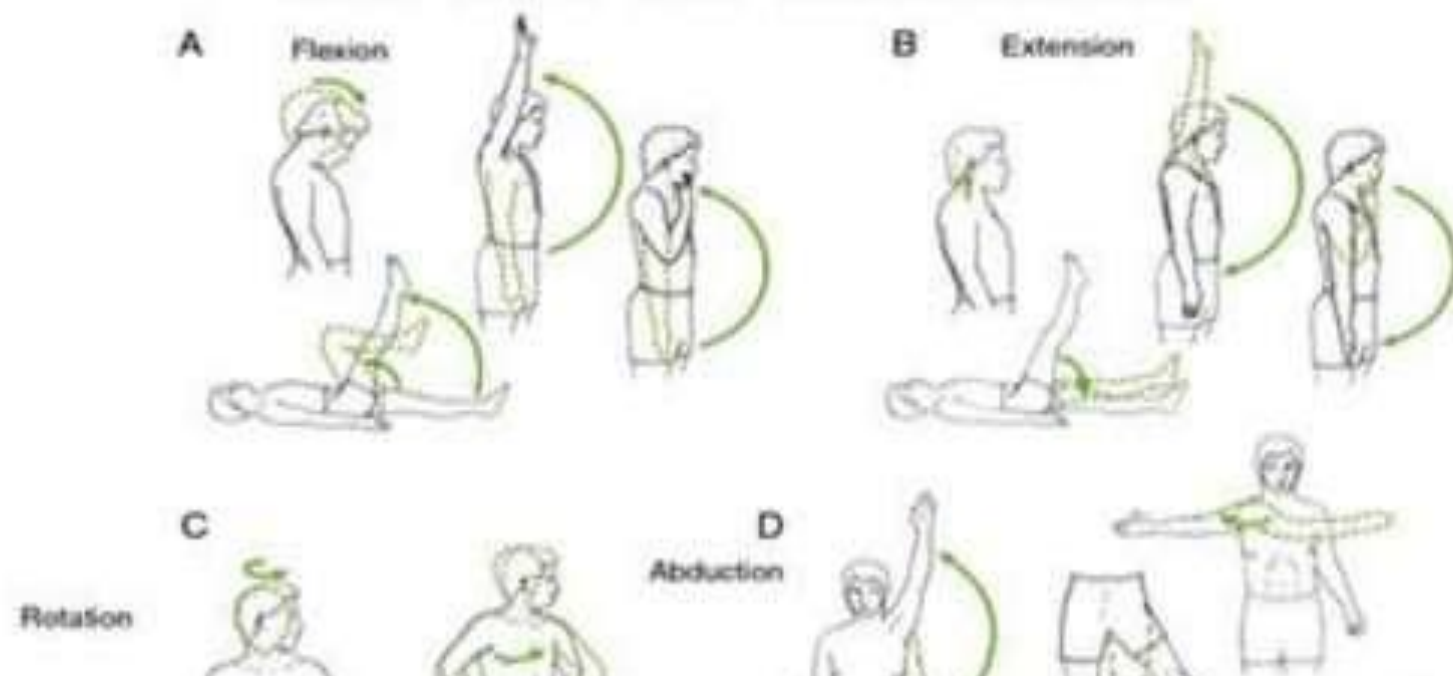
❑ If the **joint volume** is increased
should determine
whether this is tissue
hypertrophy
or a **joint effusion**.



❑ Range of motion (ROM) should be assessed as well.

- Increased ROM may indicate an unstable joint.
- Decreased ROM may represent effusion, capsule fibrosis, or bony abnormality .

RANGE OF MOTION



"Red flags"

(signs that should prompt an urgent work-up) on physical examination include

- ❑ warmth, erythema, and swelling of the joint,* this signifies the need to consider such diagnoses as infection, rheumatic process, and crystal-induced arthropathy.
- ❑ Other joints (including spine)
- ❑ Extra-articular features : e.g. nails pitting, tenosynovitis, ears nodules conjunctivitis & mouth ulcers

III- Investigations

Laboratory Studies

Blood tests

1. Haematology

(FBC)

- Neutrophilia
- Neutropenia
- lymphopenia
- Hb and platelet



2.Biochemistry

✓ Uric acid

- Serum levels of uric acid are usually raised in gout but a normal level does not exclude it
- elevated serum uric acid does not confirm the diagnosis

✓ erythrocyte sedimentation rate (ESR)

✓ C-reactive protein (CRP)

- useful marker of infection and inflammation, and are more specific than (ESR). An exception is in autoimmune connective tissue diseases, such as SLE and systemic sclerosis, where CRP may be normal but the ESR raised in active disease. Accordingly, an elevated CRP in a patient with lupus or systemic

3. Immunology

✓ Rheumatoid factor (RF)

- Positive RF occurs in a wide variety of diseases and some normal adults particularly with increasing age. Although the **poor specificity** about **70%** of patients with **RA** **test positive**.
- **High RF titres** are associated with **more severe disease**

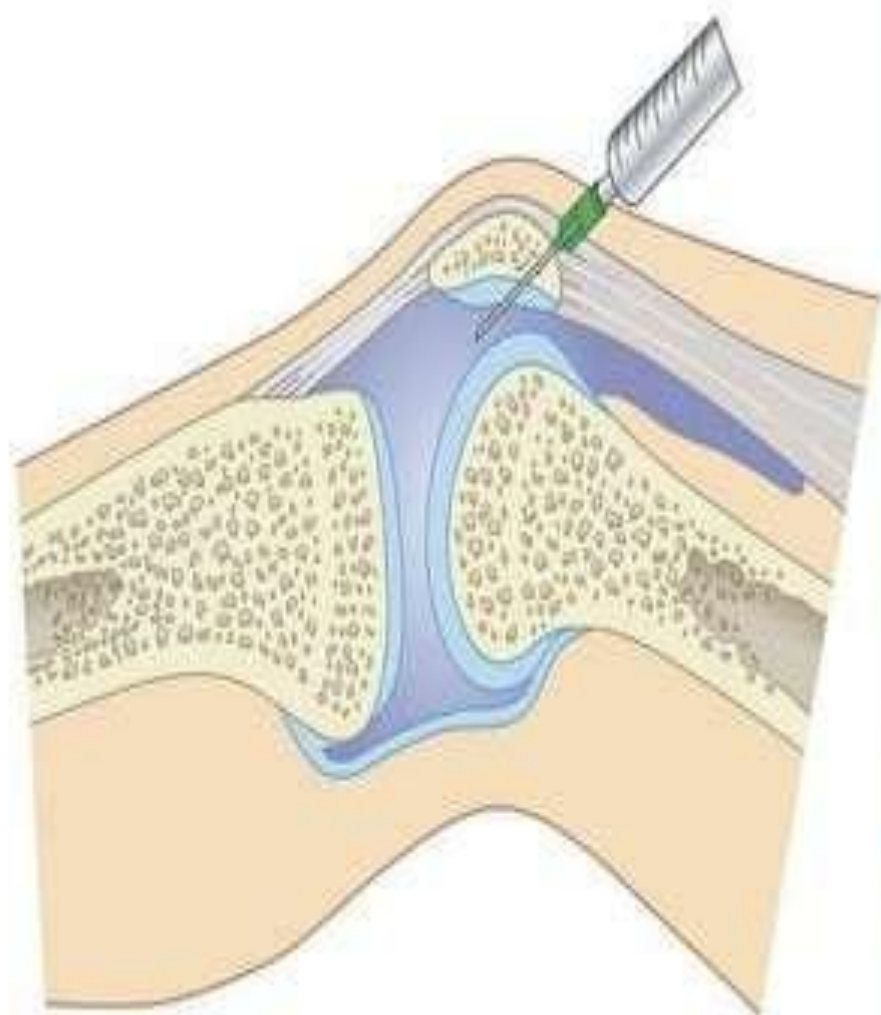
✓ Antinuclear antibodies

- ANAs are **not** associated with disease severity or activity.
- Indication: suspected of having **SLE** or other autoimmune connective tissue diseases
- ANA has **high sensitivity for SLE (100%)** but **low specificity (10–40%)**.
- A negative ANA virtually excludes SLE but **a positive result does not confirm it**.

Joint aspiration

• Arthrocentesis (Synovial fluid Analysis)

- Arthrocentesis is urgently indicated when there is a warm, red joint with effusion, especially when there is no history of trauma.
- Another time to consider arthrocentesis is when a significant effusion is present.
- The aspirated synovial fluid should be sent for the "3 Cs":
 - Cell count
 - Crystals : FOR Gout or pseudogout
 - *Compensated polarized light microscopy to examine a drop of synovial fluid for intracellular urate crystals (gout) OR calcium pyrophosphate dihydrate crystals (pseudogout)
 - Culture (gram stain):FOR Septic arthritis



Synovial Fluid Analysis

	WBC/mm ³	Color	Viscosity
Normal	< 150	Colorless/Straw	High
Noninflammatory	< 3,000	Straw/Yellow	High
Inflammatory	> 3,000	Yellow	Low
Septic (purulent)	> 50,000	Pus/Mixed	Mixed



Diagnostic Imaging

DIAGNOSTIC IMAGING

Key indicators

- Bony tenderness
- Inability to bear weight
- Gross deformity
- Skeletal immaturity
- Age





Plain film

Computed
Tomography

Arthrography

Magnetic
Reasonance
Imaging

Ultrasonography

Plain films

- Plain radiography is the least expensive imaging modality and is most useful for clarifying the nature of joint abnormalities already noted during the physical examination.
- The appearance of joints on plain radiographs is often distinctive for various forms of arthritis though these characteristic changes may not be apparent early in the disease course.
- Plain radiographs are also useful for monitoring the progression of chronic arthritides (eg:osteoarthritis

Looking for:

Fat pad sign

Osteophytes

Obvious Fracture

Erosion

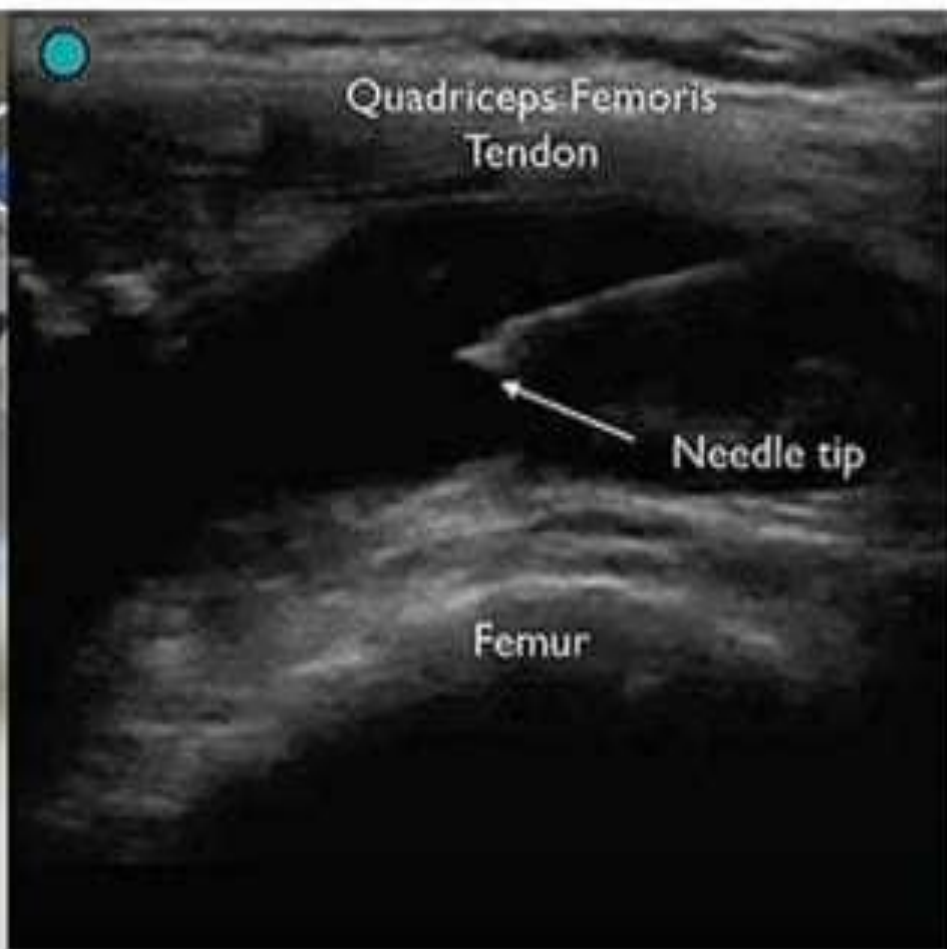
Mal alignment

Loss Of Joint space

A widened joint epiphysis

Ultrasonography

- Musculoskeletal ultrasonography uses ultrasonic waves to image soft tissues, including tendons, bursae, ligaments, and components of the joint.
- It is performed by a specifically trained rheumatologist or radiologist and involves an examination with multiple views and positionings of the joint.
- It is safe and does not involve any exposure to radiation.
- Joint aspirations and injections are greatly facilitated if performed with ultrasound guidance, because this ensures correct positioning of the needle.



Computed tomography

- Computed tomography (CT) obtains cross-sectional images of skeletal structures.
- In a patient with a painful joint, CT is most useful for the following applications:
 - Assessing trauma of the spine and pelvis
 - Evaluating arthritis in axial joints (eg, sacroiliac, atlantoaxial, and sternoclavicular)
 - Evaluating pain in complex joints in which overlying structures obscure plain radiography views (eg, ankle, wrist, and temporomandibular joints)
 - Evaluating degenerative disc disease of the spine and possible disc herniations

Joint effusion



widening of the left SIJ



Magnetic resonance imaging

- Magnetic resonance imaging (MRI) is the best modality for assessing soft tissue and spinal cord elements.
- It is of greatest use for assessing rotator cuff tears, spinal stenosis, ligamentous or meniscal abnormalities of the knee and wrist joints, osteonecrosis (ie, avascular necrosis of bone), stress fractures, osteomyelitis, and subchondral bone injury in osteoarthritis or meniscal tears.



Arthrography

- Arthrography is most useful for defining abnormal communication between the synovial space and adjacent bursae and soft tissue (ie, popliteal cysts or rupture of the rotator cuff with communication between the glenohumeral joint space and the subacromial bursa).



Rheumatoid arthritis

Early radiographic changes : soft tissue swelling and periarticular demineralization.

Later changes: include uniform loss of joint space and bony erosions

Advanced changes: include diffuse bony erosions, joint subluxation, and foreshortening of digits.



Gout

- Acute gouty arthritis is indicated by soft tissue swelling.
- Degenerative changes of the involved joint are common.



Infectious arthritis

- X-rays may be normal in the very early stage of the disease
- Joint effusion may be seen
- Juxta-articular osteoporosis due to hyperaemia
- Narrowing of the joint space due cartilage destruction in the acute phase
- Destruction of the subchondral bone on both sides of a joint
- If left untreated, reactive juxta-articular sclerosis and, in severe cases, ankylosis will develop with gas formation on special bacterial infection .



Osteoarthritis

- **Early radiographic changes** in osteoarthritis include small osteophytes at joint margins, focal narrowing of joint spaces, subchondral bony sclerosis in the segment affected by joint-space loss, and an absence of periarticular demineralization.
- **Later changes** include large and more extensive osteophytes, more pronounced focal joint-space narrowing, subchondral bone cysts with sclerotic margins, and the formation of bony ossicles (in soft tissues adjacent to the joint or within the joint cavity).
- **Advanced changes** include extensive joint-space loss





EVALUATION

EVALUATION

Polryathralgia

Complete history
and physical
examination

Fibromyalgia or
multiple sites of bursitis or
tendinitis

Synovitis ?

Tender Points ?

Symptoms
> 6 weeks
?

Systemic
Rheumatic
Disease

Viral arthritis
Early Systemic
Rheumatic Disease

Viral arthralgia
Osteoarthritis
Soft tissue
abnormality
Hypothyroidism
Neuropathic Pain
Metabolic Bone Pain

Consider :
LFT.
Hepatitis B& C
serology.
Radiograph.
TSH.
Calcium.
Albumin.
Alkaline

Check:
CBC.
ESR.
RF.
Anti
CCP/ANA.
Creatinine.
Urinalysis.
Joint
aspiration.

Check:
CBC
LFT

IV-Management

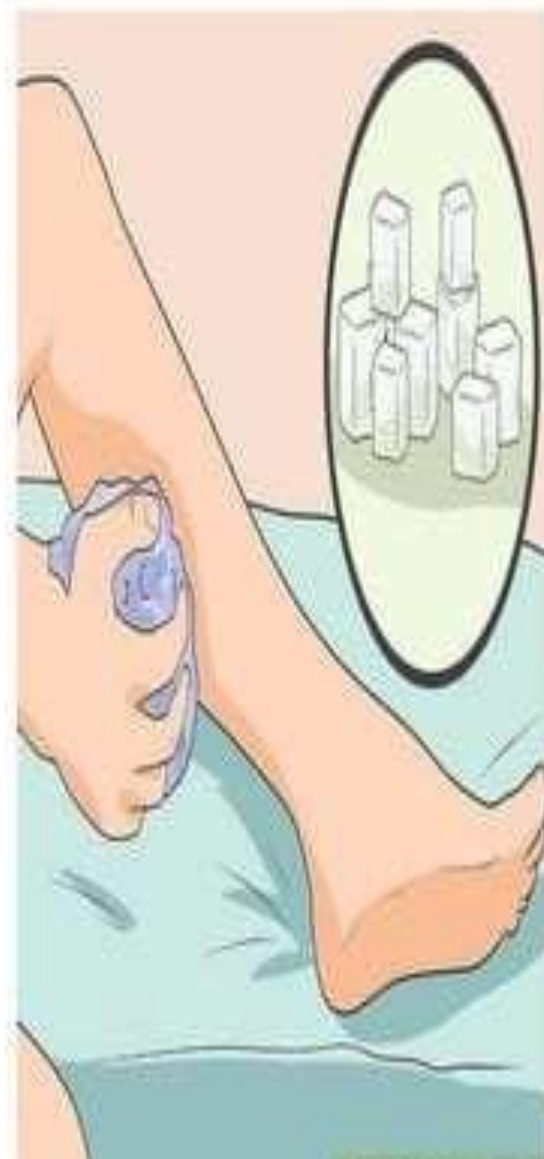
Non-pharmacological Therapies

Acute Joint Pain

I- Physical Modalities.

- to limit swelling and pain associated with trauma or arthritis usually consists of the components of the mnemonic PRICE:
- **Protection** with a brace or wrap,
- **Rest** to avoid activities that cause pain or an increase in swelling,
- **Icing** 15 minutes several times per day,
- **Compression** with an elastic wrap,
- **Elevation** of the joint above the level of the heart.
- These are all potential modalities and all are not always used





Massage Therapy
for Arthritic Pain Relief

Nonpharmacological Therapies

Acute Joint Pain

- **II - Education and Behavior Changes.**
 - May be necessary to return to activity without harming the affected joint.
 - The patient may engage in other activities to maintain strength and endurance and at the same time protect the joint.
 - Swimming and stationary cycling are commonly recommended allow for joint pain (lower extremity exercise without weight bearing).
- **III- Office Interventions**
 - Several interventions may greatly reduce pain and protect the affected joint. Taping, splinting, and casting, if appropriate, will help to immobilize the joint or minimize pain with activity.
 - Intra-articular injections: effective to reduce pain and inflammation.



IV-Management

Non-pharmacological Therapies

Chronic Joint Pain

I- Physical Modalities

- Improper or excessive exercise can hasten joint damage and increase osteoarthritis symptoms.
- walking program showed functional improvement and a decrease in arthritis pain .
- Swimming pool therapy will help limit stress on weight-bearing joints.
- Physical therapists can teach safe exercises to maintain strength, range of motion, and help prevent functional decline.

IV-Management

Non-pharmacological Therapies

Chronic Joint Pain



II- Office Interventions

- Intra-articular steroid injections: provide short-term pain relief lasting several weeks
- The clinical benefit is improved when effusion is present and aspiration of synovial fluid at the time of injection is successful .

III- Education and Behavior Changes

- Education on what to expect from the disease has been shown to improve outcomes in chronic disease states, including arthritis .
- Behavior changes, such as positioning, work pacing, and diet leading to weight loss, may improve symptoms.



Corticosteroid injection for knee osteoarthritis



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IV-Management pharmacological Therapies

Analgesics:

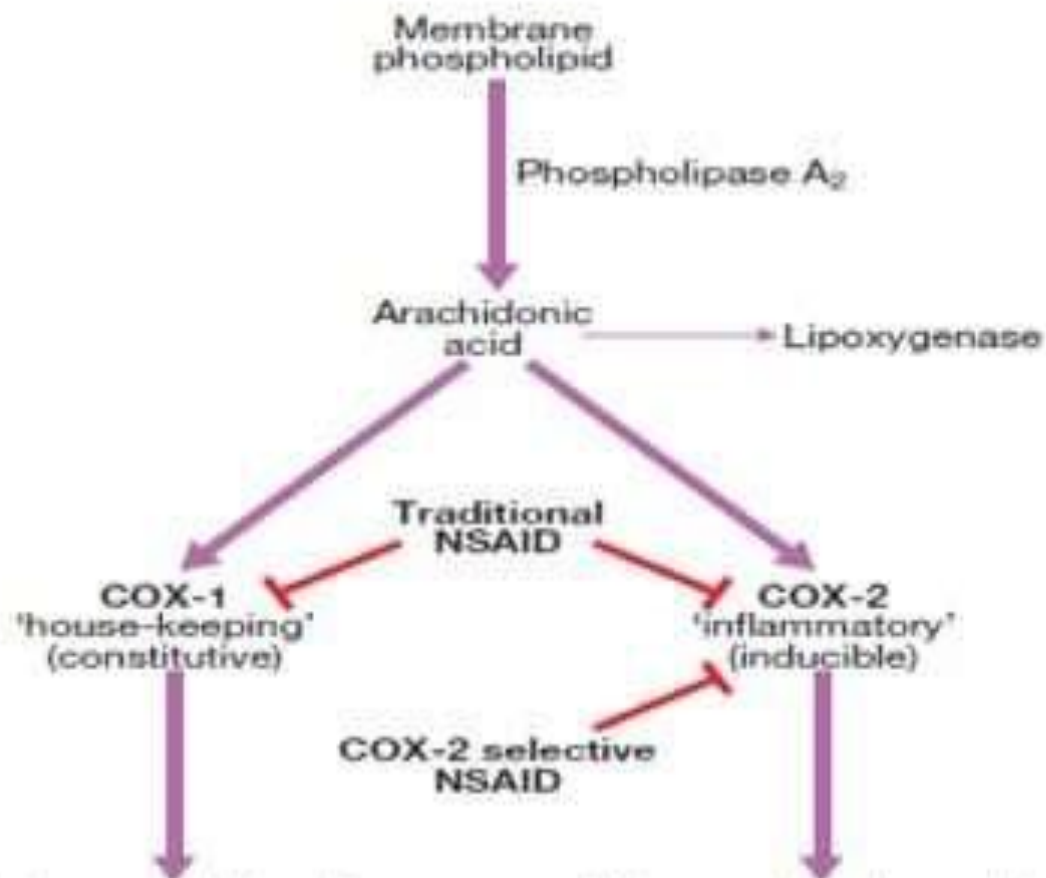
- Acetaminophen (paracetamol)
- NSAIDs and COX-2 Inhibitors.
- Opioids.



Adjuvants & Concomitant Therapies

- **Muscle relaxants** in combination with NSAIDs are commonly used in the treatment of muscle spasm and injury. Their primary side effect is sedation.
- **Topical medications** are very useful for the treatment of acute pain. Acetaminophen (paracetamol): in doses up to 4 g per day is widely

Mechanism action of NSIDS





Risk factors for NSAID-induced ulcers

- Age > 60 yrs*
- Past history of peptic ulcer*
- Past history of adverse event with NSAID
- Concomitant corticosteroid use
- High-dose or multiple NSAID
- High-risk NSAID (see [Box 25.31](#))

*The most important risk factors.

Recommendations for the use of NSAID

- Use with caution in patients with cardiovascular disease
- Use the lowest dose for the shortest time possible to control symptoms
- Avoid NSAID in patients on warfarin
- Allow 2–3 weeks to assess efficacy. If response is inadequate, consider trial of another NSAID
- Never prescribe more than one NSAID at a time
- Co-prescribe proton pump inhibitor for patients with risk factors for gastrointestinal adverse effects

Adjuvant and Concomitant Therapies

Diagnosis	Therapy
Septic joint	Antibiotics
Gout	Colchicine, allopurinol
Muscle Spasm	Muscle relaxants
Associated neuropathic pain	Topical capsaicin, anti-depressants
Associated muscle pain	Topical or oral NSAID, topical lidocaine
Rheumatoid arthritis	DMARDs, ^a steroids
Osteoarthritis	Glucosamine

^a DMARD, disease-modifying antirheumatic drug.



Slow-Acting antirheumatica drugs indication :

1-persistent synovitis more than 6 wk.

2-sever extra-articular disease [vasculitise ,scleritise renal involvement].

3-steroid-sparing effect [polymyalgia rheumatica resistant to low-dose Corticosteroid].

4- Inflammatory myositis.

24 Disease-modifying antirheumatic drugs

Drug	Maintenance dose	Monitoring ^a			Indications
		FBC	LFTs	Other	
Methotrexate	10–25 mg weekly orally	✓	✓		RA, PsA, AxSpA, JIA
Sulfasalazine	2–4 g daily orally	✓	✓		RA, PsA, AxSpA, JIA
Hydroxychloroquine	200–400 mg daily orally	–	–	Visual function	RA, SLE
Leflunomide	10–20 mg daily orally	✓	✓	BP	RA, JIA, PsA
Azathioprine	1–2.5 mg/kg daily orally	✓	✓		SLE, SV
Apremilast	30 mg twice daily orally	–	–	–	PsA
Tofacitinib	5 mg twice daily orally	✓	✓	Infection	RA
Baricitinib	2–4 mg daily orally	✓	✓	Infection	RA
Cyclophosphamide	2 mg/kg daily orally 15 mg/kg IV	✓	✓	eGFR	SLE, SV
Mycophenolate mofetil (MMF)	2–4 g daily orally	✓	✓	–	SLE, SV
Gold (myocrisin)	50 mg 4-weekly IM	✓	–	Urinalysis	RA
Penicillamine	500–1500 mg daily orally	✓	✓	Urinalysis	RA
Ciclosporin A	3–5 mg/kg daily orally	–	–	BP, eGFR	RA, PsA

IV-Management

pharmacological Therapies

Adjuvants & Concomitant Therapies

- Intra-articular injection of corticosteroid may be considered for suppression of inflammation and/or anesthetic for relief of pain.
- Aspiration of fluid from a joint is sometimes considered for relief of pain caused by swelling.
- Tricyclic antidepressants and antiepileptics modulate pain signals .
- Glucosamine and chondroitin may be used to improve osteoarthritis symptoms. Glucosamine may also slow joint space narrowing

Referral

- Prompt referral should be made whenever there is concern about:
 - The diagnosis
 - Discomfort in prescribing certain medications
 - Minimal progress with the treatment plan.
- When inflammatory arthritis is diagnosed or suspected, immediate referral to a rheumatologist is recommended for confirmation of diagnosis and initiation of disease-modifying

Referral

- Physical medicine and rehabilitation specialists are specifically trained to help maximize physical function and quality of life if this is an issue.
- Significant disability should prompt referral to an orthopedic specialist for evaluation of possible joint replacement or debridement.
- Pain clinics may provide assistance with medication management.

Joint Pain Treatment Algorithm

Pharmacologic

Analgesia

Acetaminophen

NSAIDs/ COX-2
Specific inhibitors

Tramadol

PRN Opioids

Long acting
opioids

Adjuvant

Tricyclic Antidepressants
Antibiotics
Anti-epileptics
Colchicine
Topicals
Muscle Relaxants
Glucosamine

Nonpharmacologic

Physical
Modalities

Education
and
Behavior Changes

Office
Interventions

Prompt, appropriate referral :

- Rheumatology.
- Physical Medicine & Rehabilitation
- Pain Clinic
- Orthopedics

Surgical procedure

Procedure	Indication
Soft tissue release Carpal tunnel Tarsal tunnel Flexor tenosynovectomy Ulnar nerve transposition Fasciotomy	Median nerve compression Posterior tibial nerve entrapment Relief of 'trigger' fingers Ulnar nerve entrapment at elbow Severe Dupuytren's contracture
Tendon repairs and transfers Hand extensor tendons Thumb and finger flexor tendons	Extensor tendon rupture Flexor tendon rupture
Synovectomy Wrist and extensor tendon sheath (+ excision of radial head) Knee synovectomy	Pain relief and prevention of extensor tendon rupture in RA, resistant inflammatory synovitis Resistant inflammatory synovitis
Osteotomy Femoral osteotomy Tibial osteotomy	Early OA of hip Unicompartmental knee OA

Excision arthroplasty

First metatarsophalangeal joint (Keller's procedure)

Radial head

Lateral end of clavicle

Metatarsal head

Painful hallux valgus

Painful distal radio-ulnar joint

Painful acromioclavicular joint

Painful subluxed metatarsophalangeal joints

Joint replacement arthroplasty

Knee, hip, shoulder, elbow

Painful damaged joints in OA and RA

Arthrodesis

Wrist

Damaged joint: pain relief, improvement of grip

Ankle/subtalar joints

Damaged joint: pain relief, stabilisation of hindfoot

Fracture repair

Hip arthroplasty

External fixation

Intramedullary nailing

Screw, plating and wiring

Fractured neck of femur

Multiple fractures, open fractures

Tibial and femur fractures

Wrist and other fractures

Other procedures

Nerve root decompression

Spinal stenosis, nerve



THANK YOU