جـامعـة المعـرفـة
UNIVERSITY of ALMAAREFA

Osteoarthritis (OA)
Degenerative Joint Disease

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Objectives

- Identify OA and its predisposing factors
- Identify the signs and symptoms of OA
- Assess patients with OA with appropriate investigations
- Identify radiological signs of OA
- Outline the principles of management of a patient with OA

Definition

- (wear & tear)
- Degeneration (non-inflammatory) of synovial joints that causes slow progressive loss of articular cartilage and proliferation of surrounding bones → cause osteophytes
- Known by different names:
  - Degenerative Joint Disease, Osteoarthritis, Osteoarthrosis, Hypertrophic Arthritis and Degenerative Arthritis

Epidemiology

- Most commonly affected OA joints:
  - 1st CMCJ
  - IPJ
  - Cervical spine
  - Lumber spine
  - Hips
  - Knees
    - found in 70% of population >60 yrs
  - 1st MTPJ

http://www.dwarkaorthopaedics.com

Classification

most Common

Primary

- Unknown Etiology

Secondary

- Known Etiology

Classification

- Risk factors for **Primary OA**:
  - Age
  - Sex
  - Genetics

Causes of Secondary OA

- ↑**Mechanical stress**: Deformity. Malalignment. Obesity
- **Joint injury/Trauma**: Occupation daily repetitive trauma. Osteochondral defect, Sport injury
- **Hematological**: Sickle Cell Disease, Hemophilia
- **Infection**: Septic arthritis, Brucella, TB
- **Inflammatory** joint disease
- **Metabolic**: Gout, Pseudo gout, Paget's disease
- **Necrosis**: Perth`s disease, AVN, Steroids
- **Neuropathic**: DM, syphilis

limited RoM = stiffness

Pathophysiology

- Hyaline cartilage is Avascular, aneural and alymphatic
  - Receives nutrients and oxygen from synovial fluid via diffusion
- Composition of cartilage:
  - Water (75% of wet weight)
    - for nutrition and lubrication
  - Collagen esp. type II (15% of wet weight)
    - Provides tensile strength and stiffness
  - Proteoglycans (10%)
    - Provides compressive and elastic strength
  - Chondrocytes (1-5%): the only cell of cartilage
  - Non-collagenous proteins

Pathophysiology

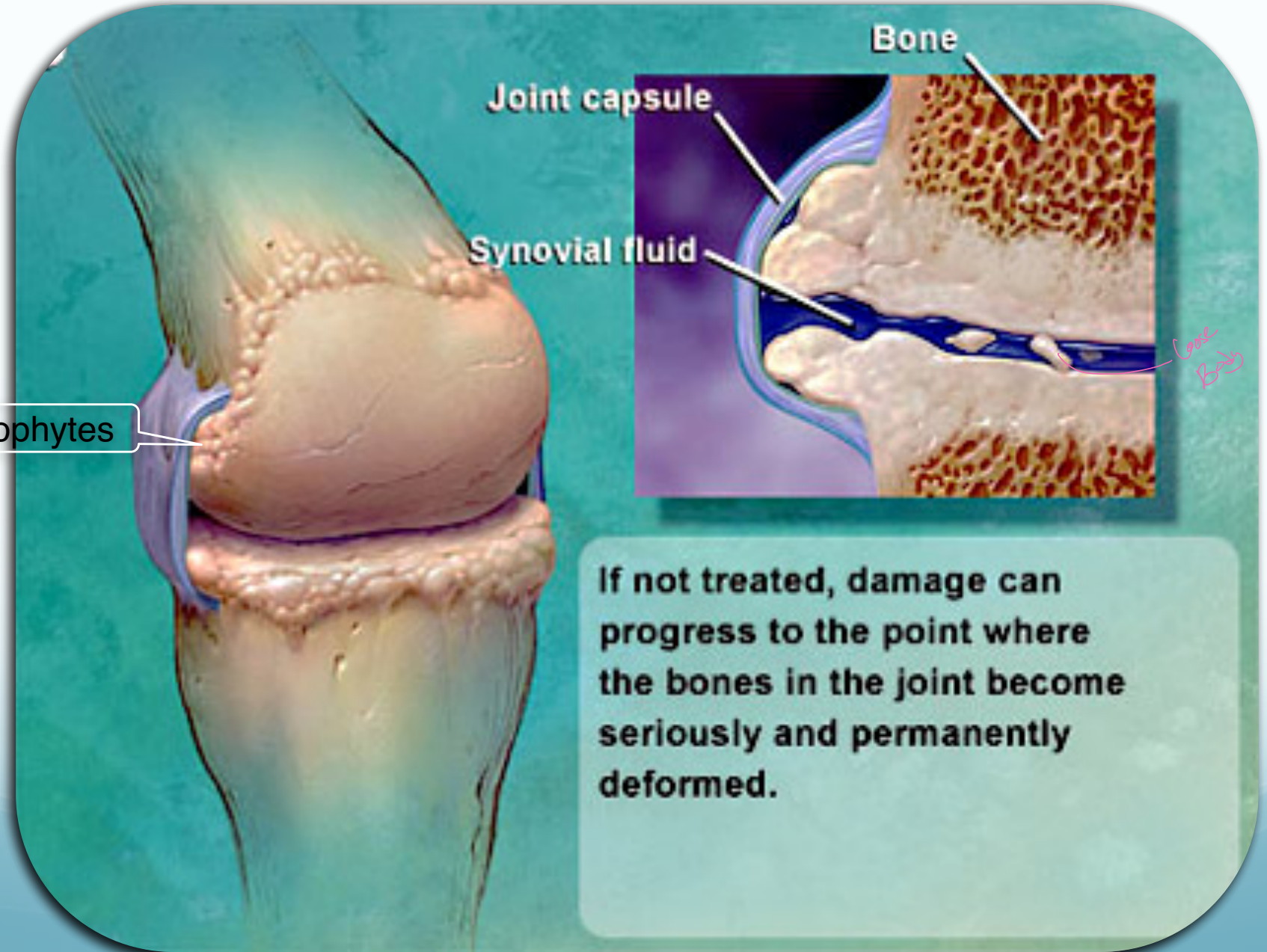
Histologic & Macroscopic Changes:

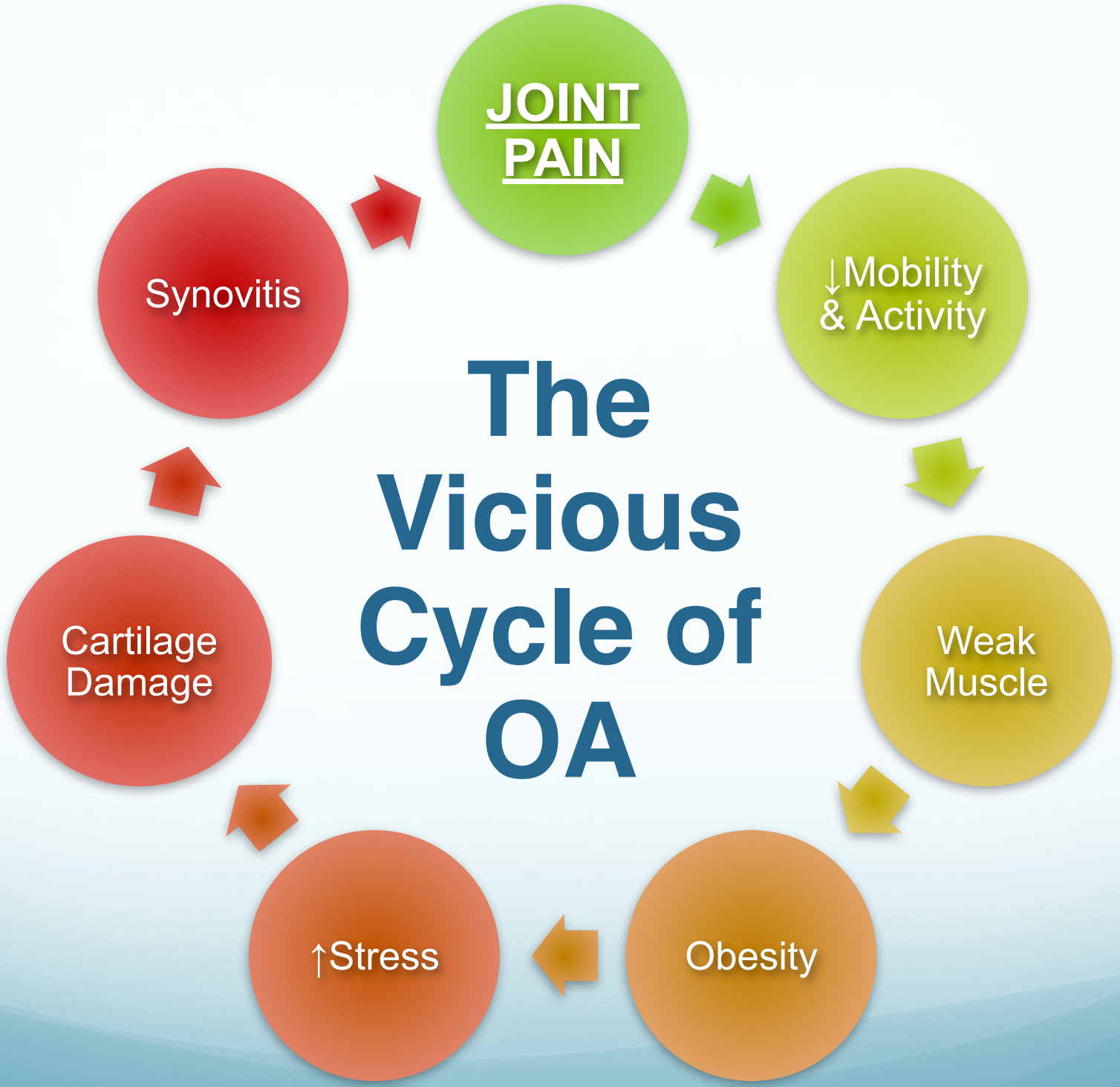
1. **Early**
   - Fibrillation & softening on weight bearing surfaces
   - Reduced cartilage height → ↓**joint space** → bone exposed
   - Remolding → **Subchondral Sclerosis** & eburnation

2. **Moderate**
   - Fissuring → synovial fluid into subchondral bone → **Subchondral Cyst**
   - Hypervascular synovium & subchondral bone → proliferation of adjacent cartilage → enchondral ossification → **Osteophyte**
   - Synovial & capsular thickening

3. **Advanced**
   - Progressive bone erosion → **Bone collapse**
   - Loss of height & ligamentous laxity → **Malalignment**
   - Fragmented osteophyte → **Loose Bodies**

Pathophysiology




JOINT PAIN
↓Mobility & Activity
Weak Muscle
Obesity
↑Stress
Cartilage Damage
Synovitis
The Vicious Cycle of OA

Presentation - History

- **Age & Gender**
- **Pain**: (SOCRATERS)
- **Functional affection**: Stiffness & Limited motion
- **Swelling**
- Crepitation
- Deformity
- Mechanical: instability, locking, catching
- **Previous History of Treatment**

Presentation - History

* Important to know how it affect the Pt life

- Knee:
  - Pain
    - when taking the Stairs
    - or getting up from sitting position
    - or when attempting full flexion (sitting in prayer)
- Hip:
  - Start-up
  - or Groin pain
  - Referred Pain in Knee and side of Thigh
- Shoulder:
  - Pain when reaching for high objects or combing hair

↳ with overhead activity

Presentation - Signs

- Knee:
  - Deformity: usually genovarus
  - Wasting of thigh muscles (Disuse atrophy due to pain
  - Warm
  - Joint-line tenderness
  - Swelling: May have swelling at back of knee (Baker's– popliteal cyst)
  - Crepitus
  - Limited range of motion,
  - Effusion

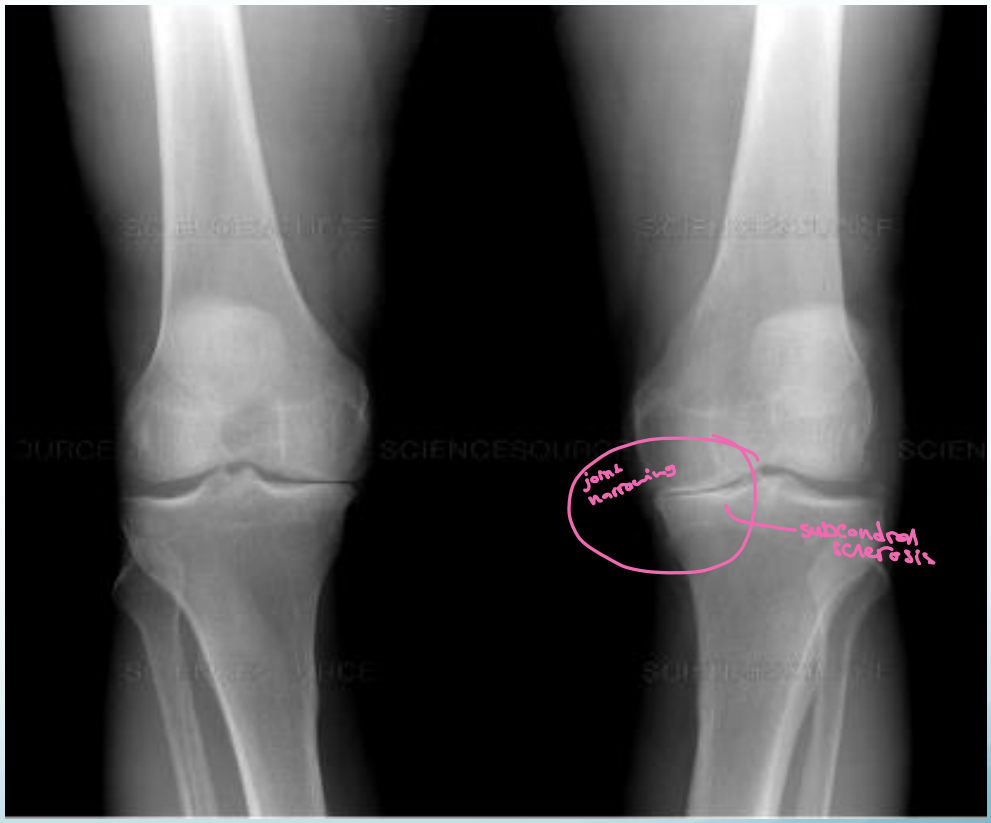
Presentation - Signs

- Hip:
  - Reduced ROM(painful)
  - Antalgic or Trendelenburg gait
- Shoulder:
  - Swelling
  - Reduced range of motion

http://newcastleshoulderandelbow.com.au

Investigations

- X-ray:
  - AP Bilateral Weight-bearing view and lateral
  - Findings:
    - Joint space narrowing
    - Subchondral sclerosis
    - Subchondral cysts
    - Osteophytes formation
    - Loose bodies
    - Deformity



https://www.sciencesource.com

X-ray

Normal Knee

http://www.webmd.com/osteoarthritis

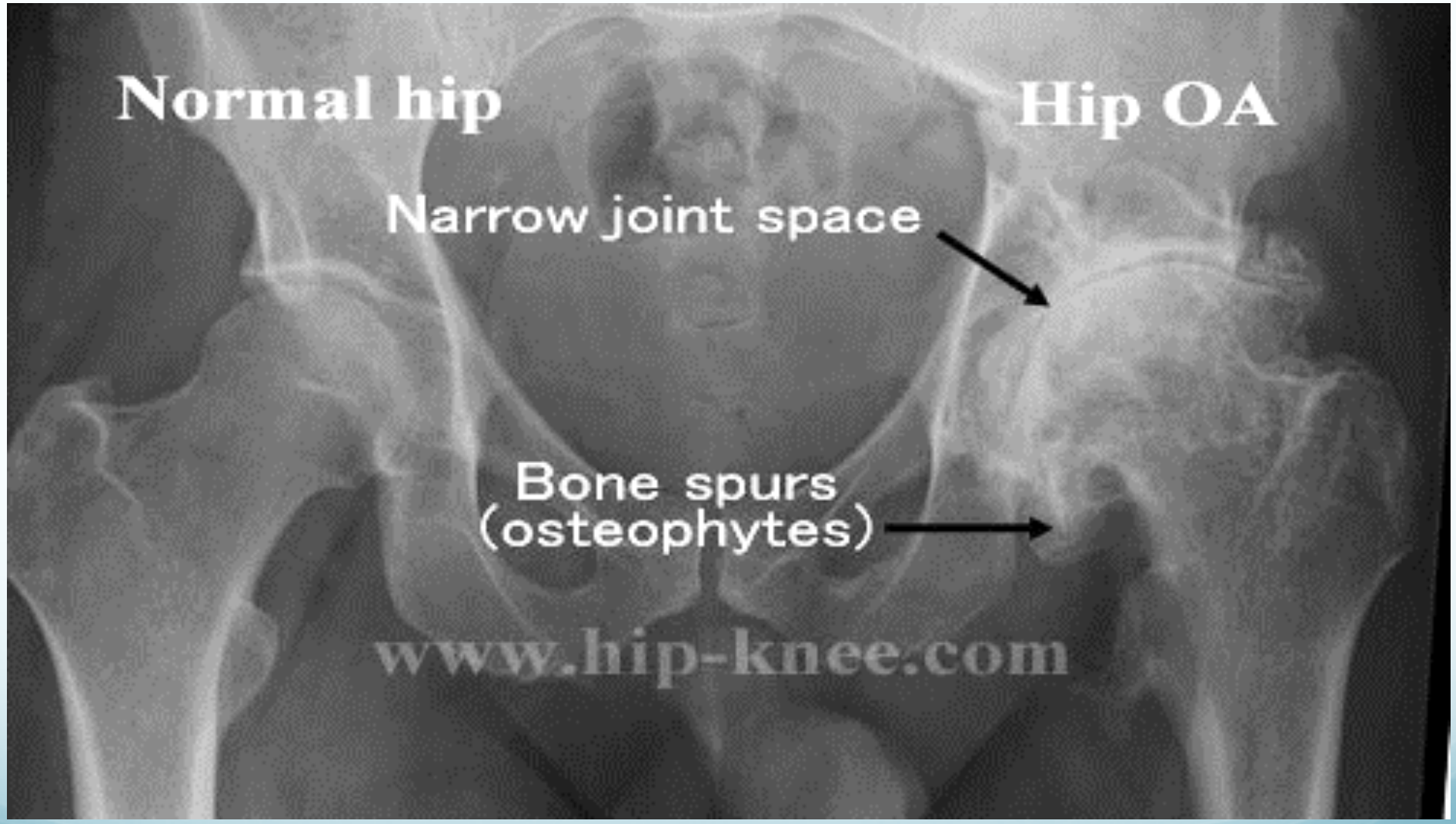
OA Knee

https://www.sciencesource.com /www.physio-pedia.com

X-rays

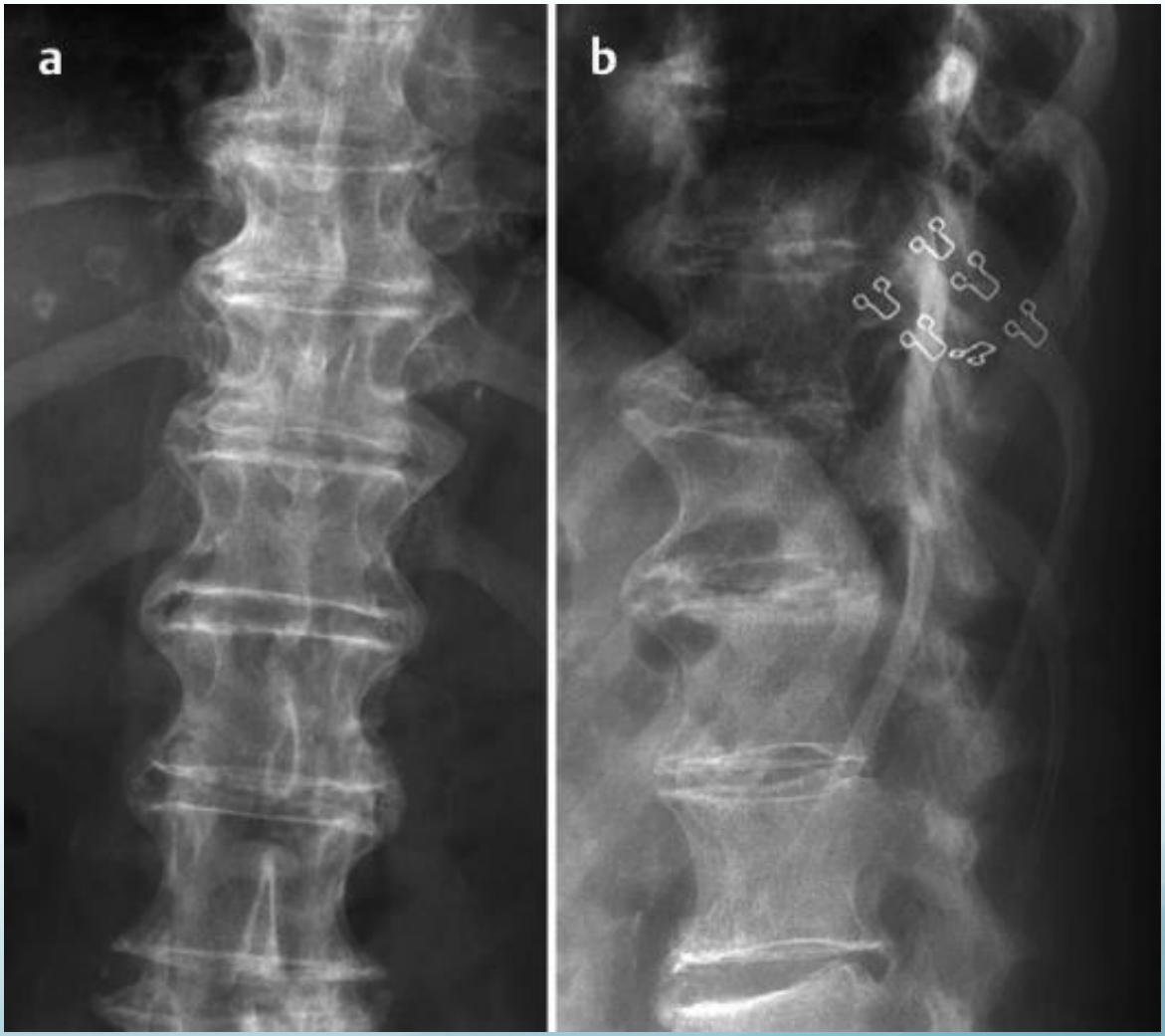
http://www.jocr.co.in/wp/2018/01/10/2250-0685-1014

X-rays


Normal hip
Hip OA
Narrow joint space
Bone spurs
(osteophytes)
www.hip-knee.com

X-rays

pivonkahealth.com



https://eref.thieme.de

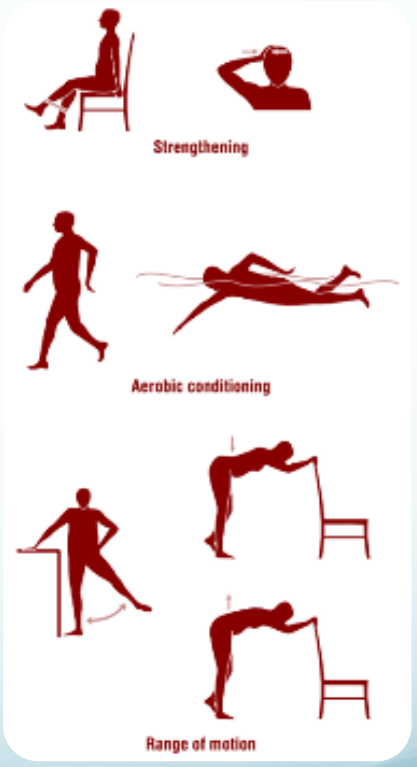
Treatment

- No known cure for OA
- Aims of Treatment:
  - Control Pain
  - Improve joint function
  - Maintain normal body weight
  - Restore lifestyle
  - Slow disease progression

if the pt said that it dose not affect his life so leave it.

Conservative Treatment

- Non-Pharmacological:
  1. Adjust daily activities
  2. Walking Aids
  3. Warm / Cold packs
     - ↳ stiffness to restore the ROM
     - ↳ swelling or acute
  4. Weight loss programs, BMI > 25
     1. Diet & low-impact aerobic
  5. Physical Therapy
     1. Improve ROM
     2. Supervised strengthening exercises



Conservative Treatment

- Pharmacological
  - NSAIDs
  - Topical analgesics
  - Glucosamine and chondroitin no strong evidance
    - Placebo effect (30%)
  - Injections:
    - Hyaluronic acid to improve viscosity of joint in early stages?
    - Corticosteroid injections this is a strong evidance on it
      - In advanced cases, may increase rate of degeneration
    - Platelet Rich Plasma (PRP) injection??
    - Stem-cell injections???

"but it affect cartelage so we don't use it only if the pt doesn't fit for the surgery" for longtime it destructs the joint.

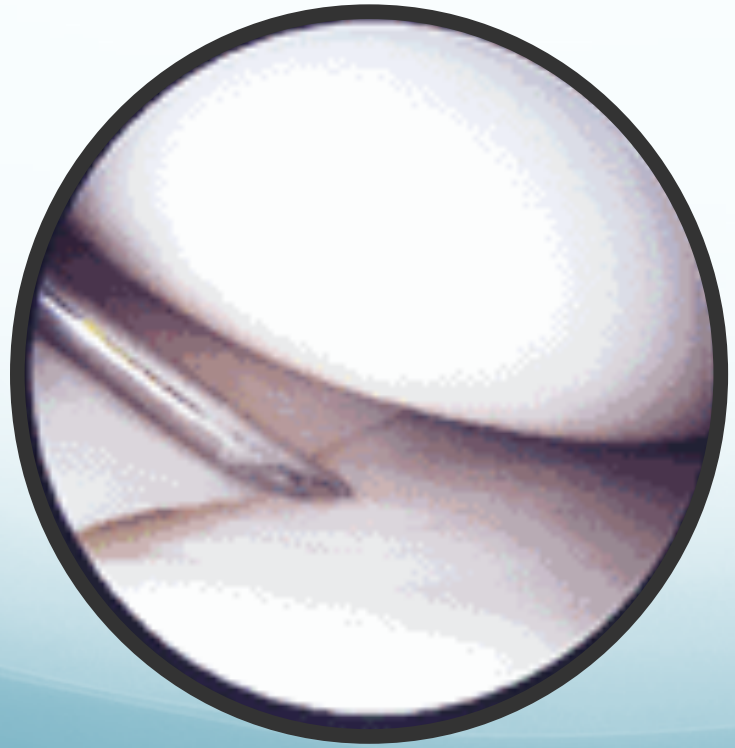
Operative Treatment

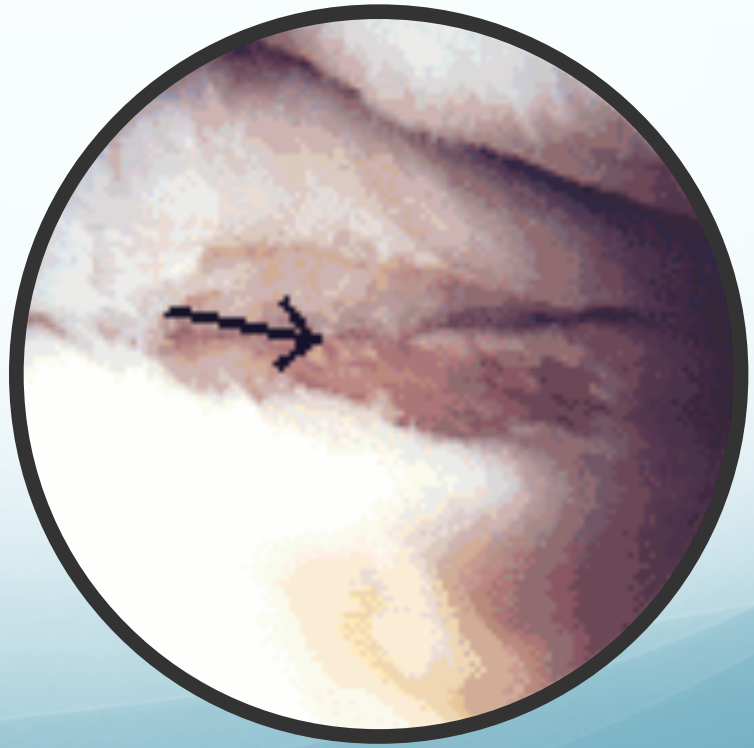
- Indications:
  - Severe joint pain
  - Functional Disabilities
  - Deformity, angular deviations or instability
- Types:
  - Arthroscopy debridement remove osteophyte
  - Corrective Osteotomy to offload the area "usually we do it in younger pt"
  - Arthroplasty partial or total knee replacement
  - Arthrodesis (in small joints)

"fusion"
no joint anymore "we stop the movement to prevent the pain"

Treatment

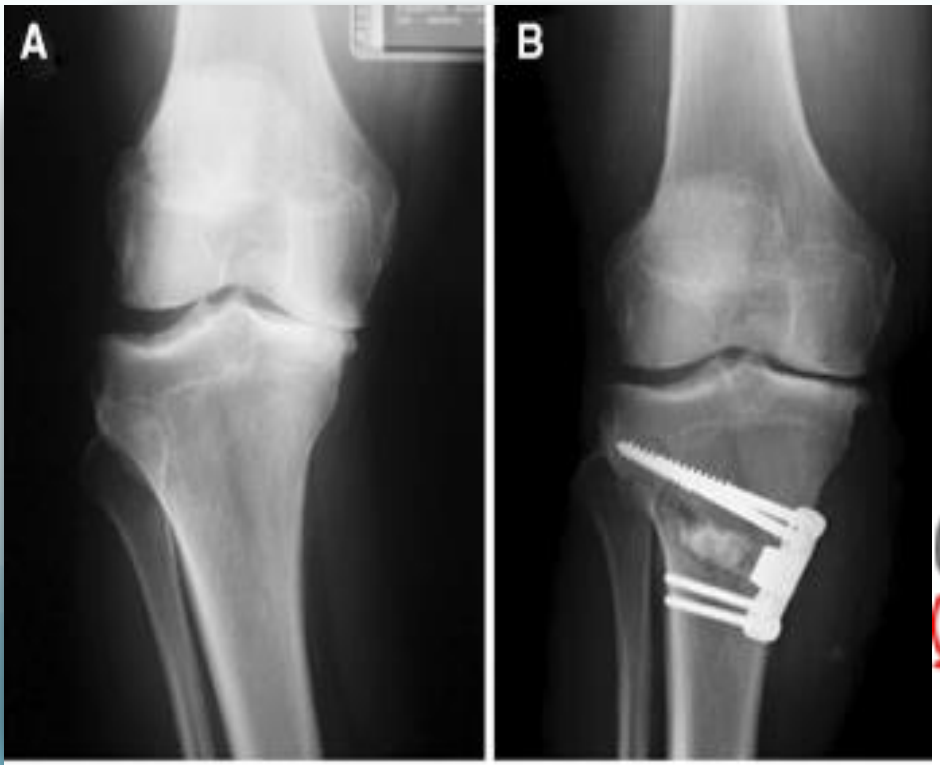
- **Arthroscopy debridement:**
  - Controversial
  - Evidence of meniscus & labral degenerative tear
  - No deformity



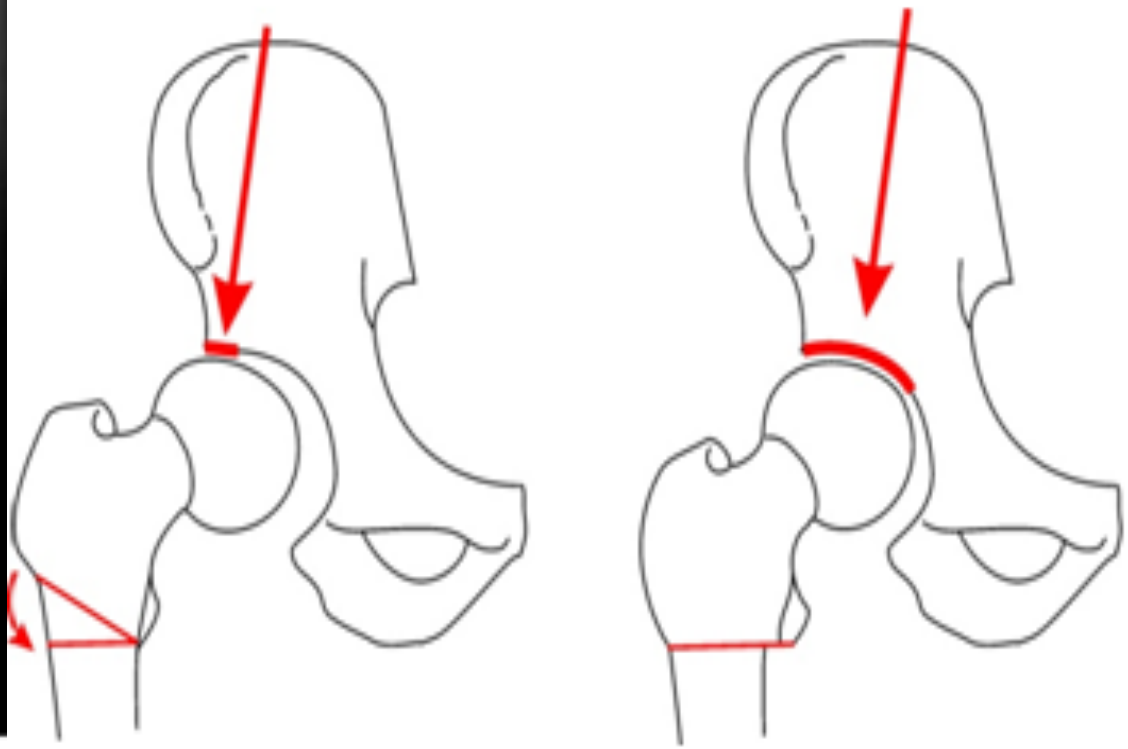


Treatment

- **Corrective Osteotomy**
  - Realign to normal anatomical axis
  - Redistribute the stress(mechanical Wt) across joint
  - In younger thin active patients with mobile joint & mild to moderate OA



Preop 1 Month postop



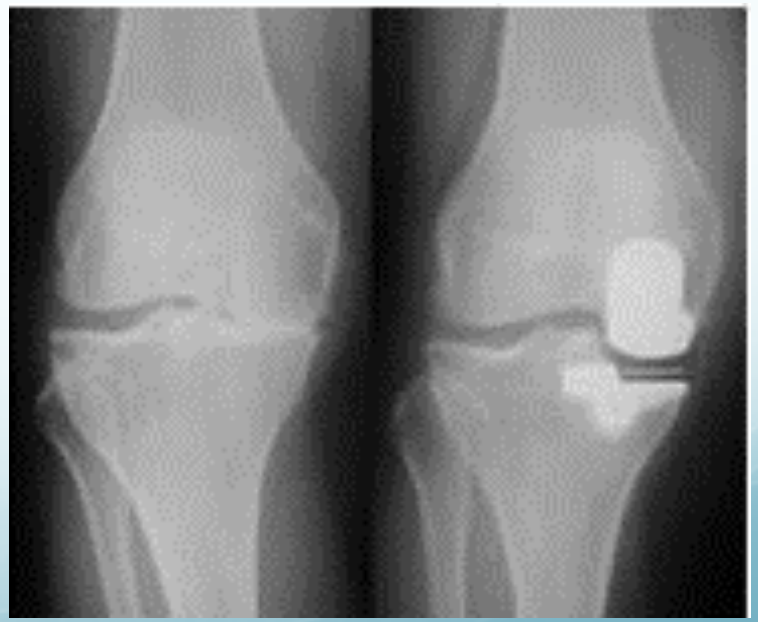
http://www0.sun.ac.za/ortho/

Treatment

- Partial Arthroplasty
  - Replacing part of the joint with prosthesi
  - Indication
    - Uni-compartmental OA only in Lower-demand old thin patients
  - Contraindications
    - Abnormal geometry
    - Bone stock deficiency
    - Infected joint
    - Inflammatory arthritis
    - Stiff joint

lateral or medially

because I treated one are if the whole joint is stiff so i did nothing.

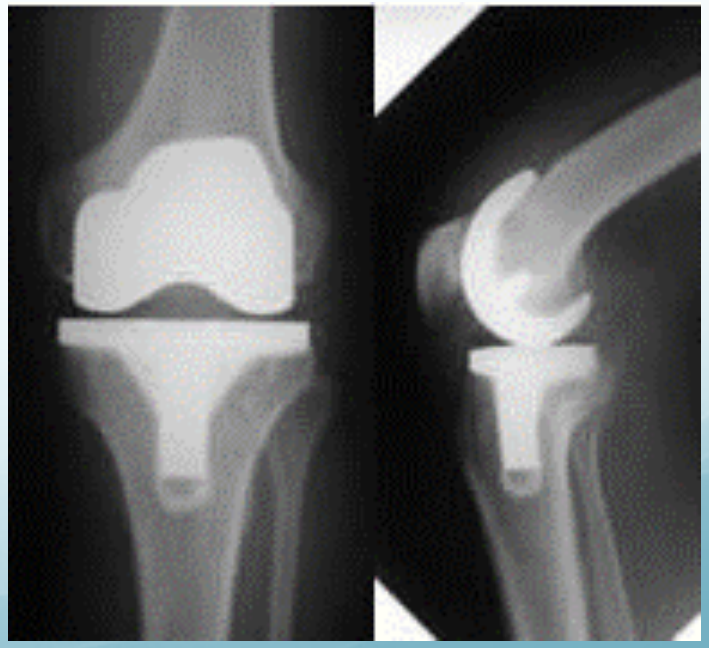


http://www.kneeandhipsurgery.co.uk

Treatment

most of pt we do for them.

- **Total joint Arthroplasty**
  - Indicated:
    - All compartments affected with painful deformed stiff joint
  - Contraindication:
    - Infected joint
    - Neuropathic joint



http://www.kneeandhipsurgery.co.uk

Treatment

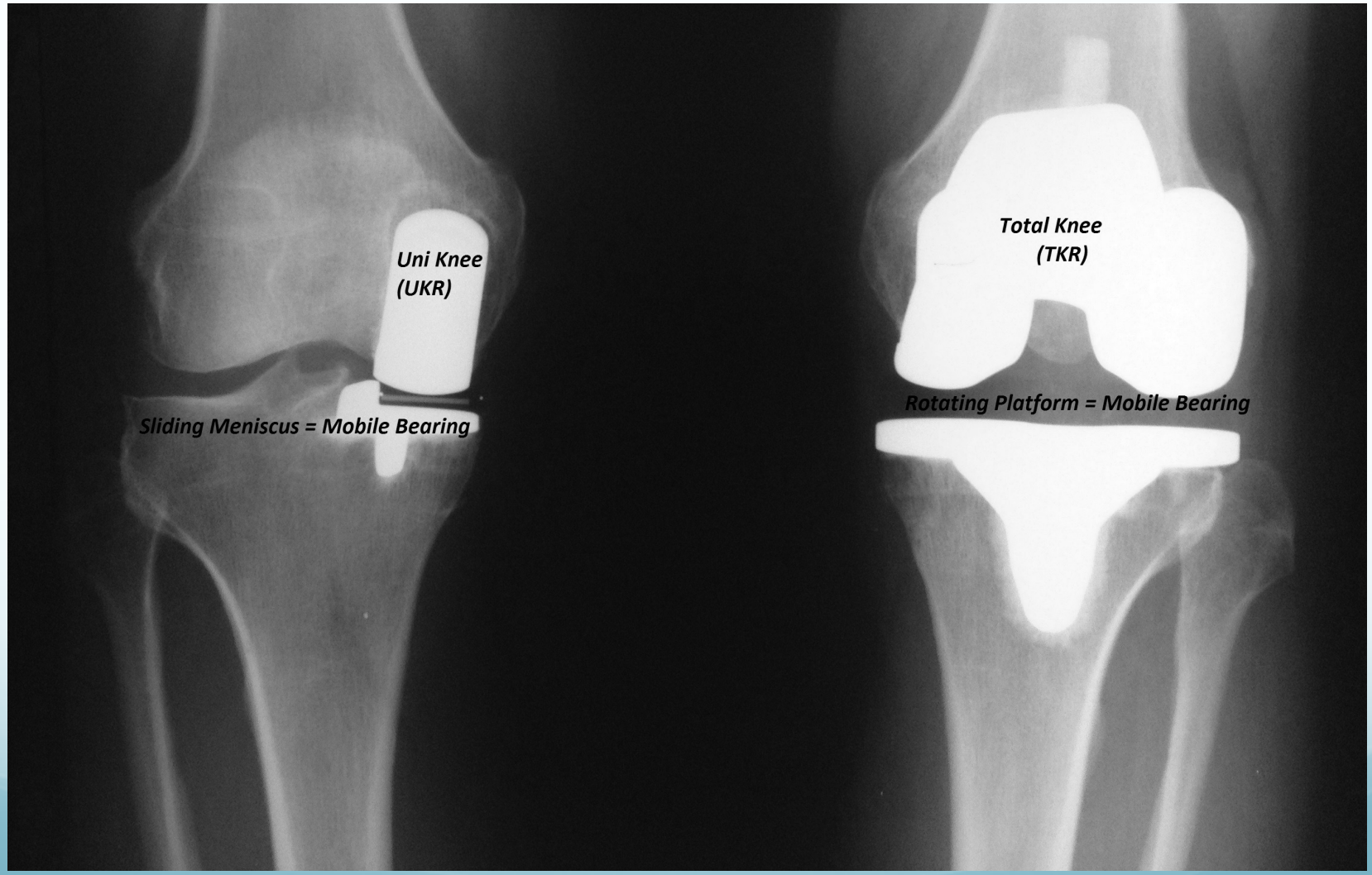
- Total joint Arthroplasty (Knee):

www.dreamstime.com/

http://www.scottsdalejointcenter.com/

Treatment

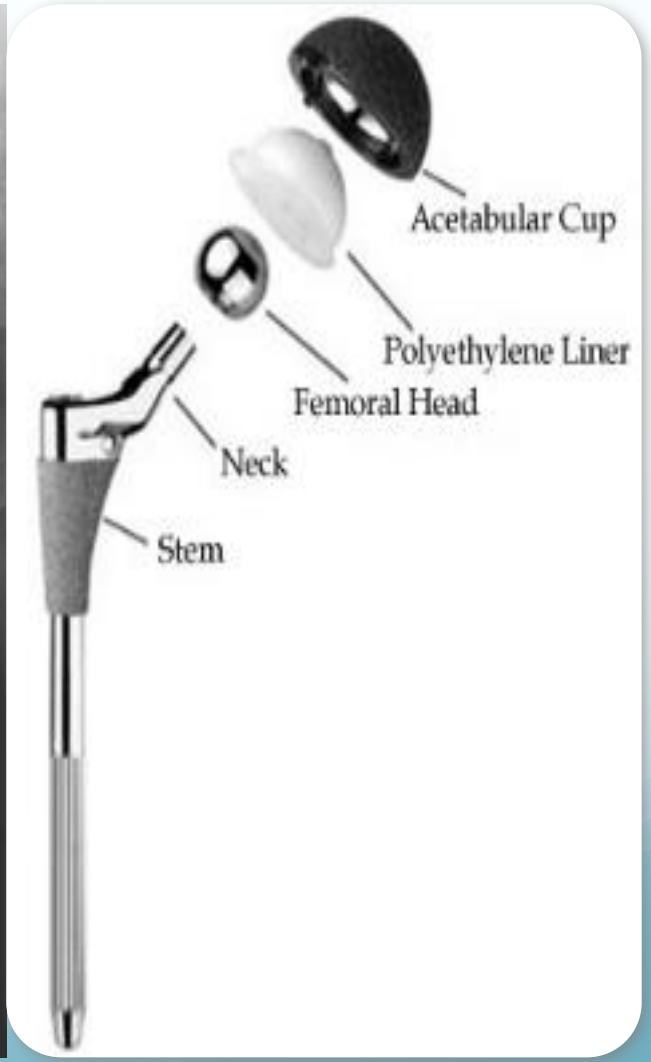
- Total joint Vs Partial joint Arthroplasty:



http://www.scottsdalejointcenter.com/

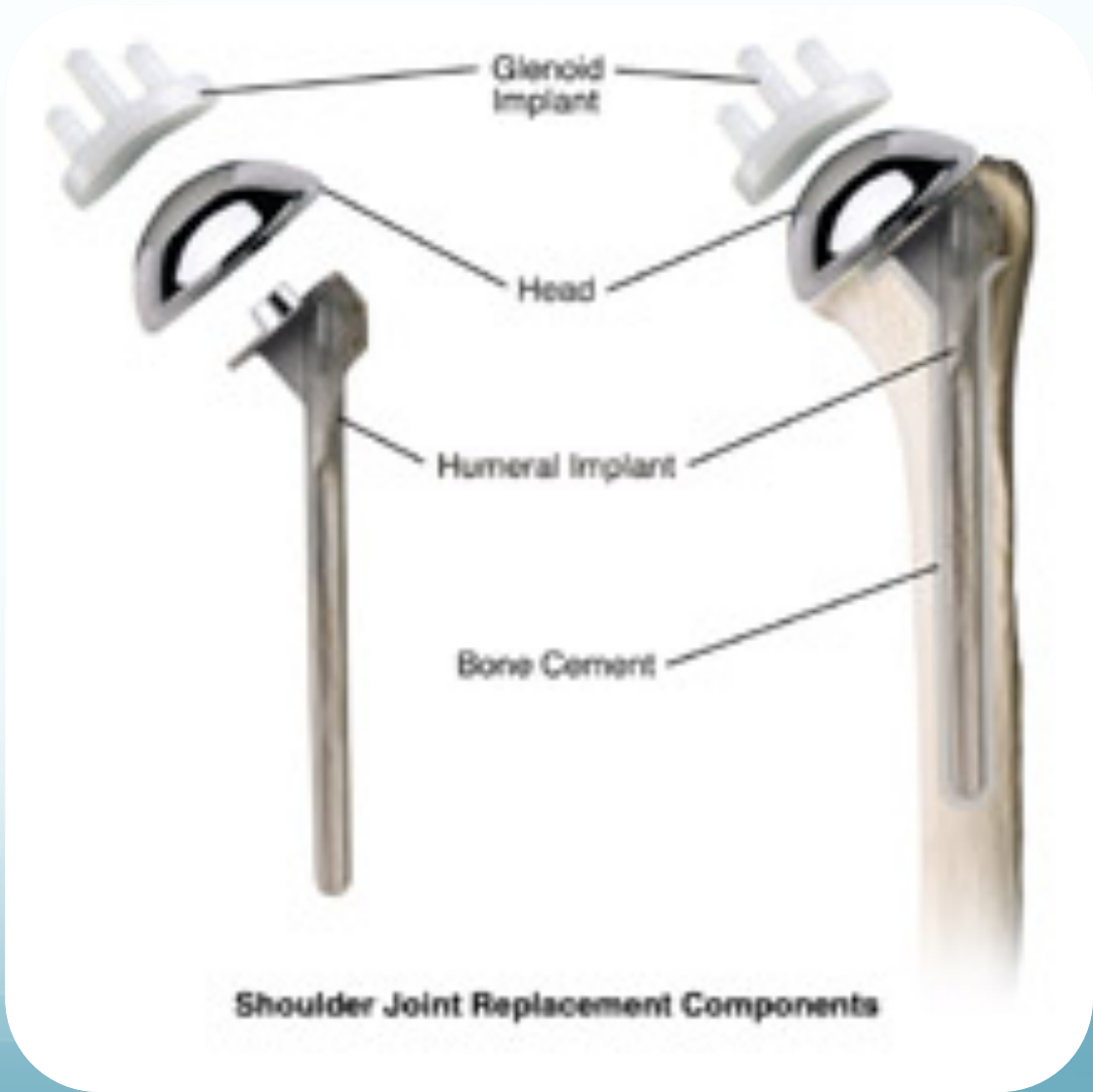
Treatment

- Total hip Arthroplasty:



Treatment

- Total shoulder Arthroplasty:



Treatment

- **Arthrodesis / Fusion**
  - Indicated more in small joints:
    - Metatarso/ Metacrpo-phalangeal
    - Interphalangeal
  - Contraindication:
    - Adjacent or contralateral OA joint

near other leg

because the load is increased in the other joint

https://www.pinterest.com/pin/390194755200981592/

Summary

- Osteoarthritis is a degenerative progressive disabling disease
- Any joint can be affected
- Weight control & Change lifestyle & Early treatment delays its deterioration
- Joint replacement provides pain-free improved function