Osteoarthritis knee
overview

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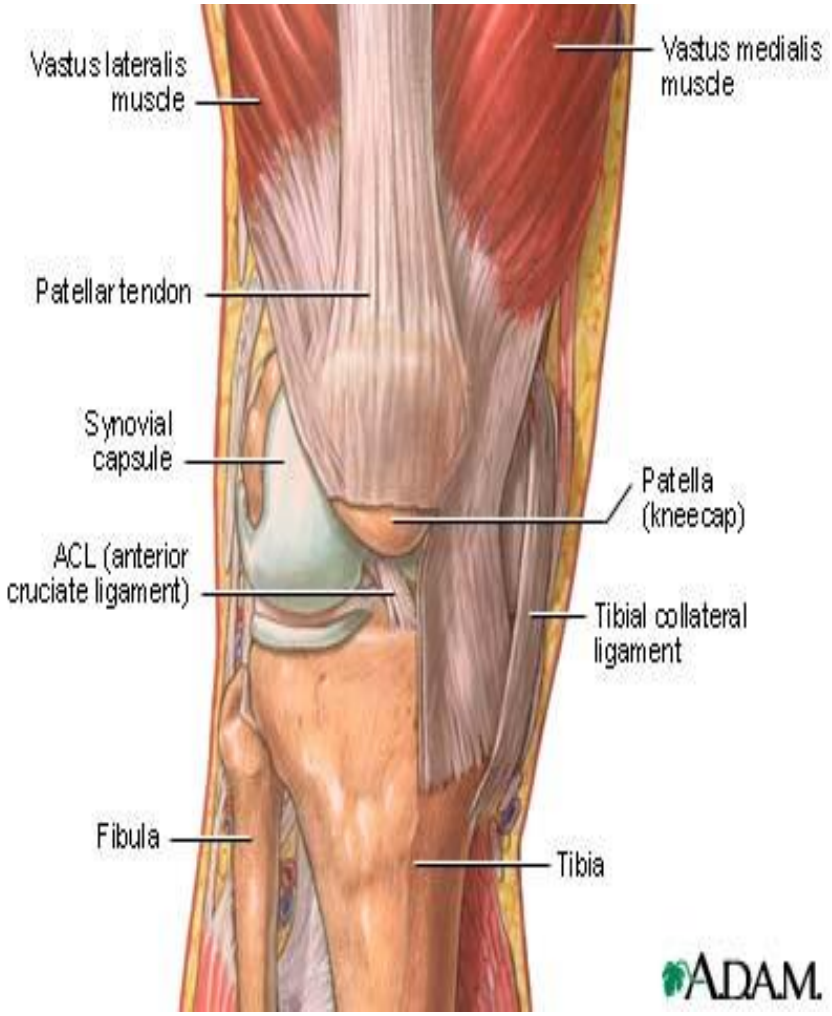
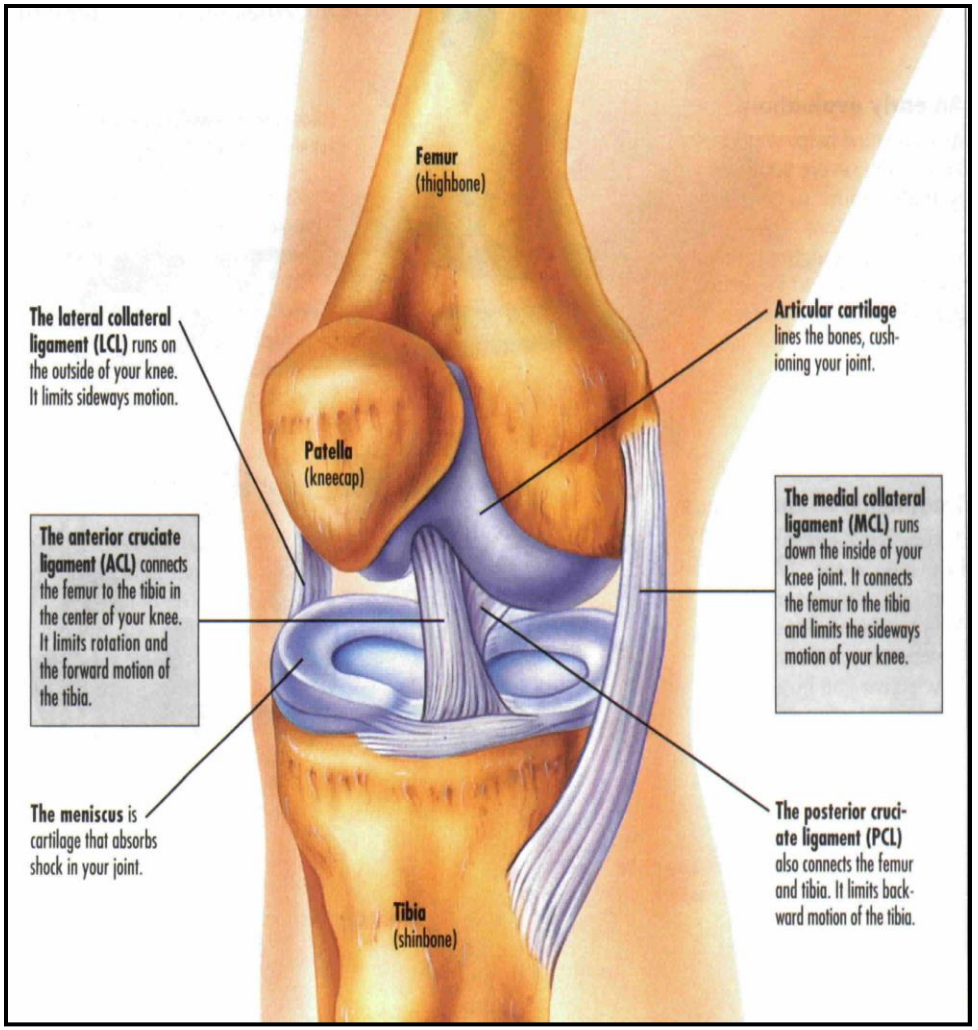
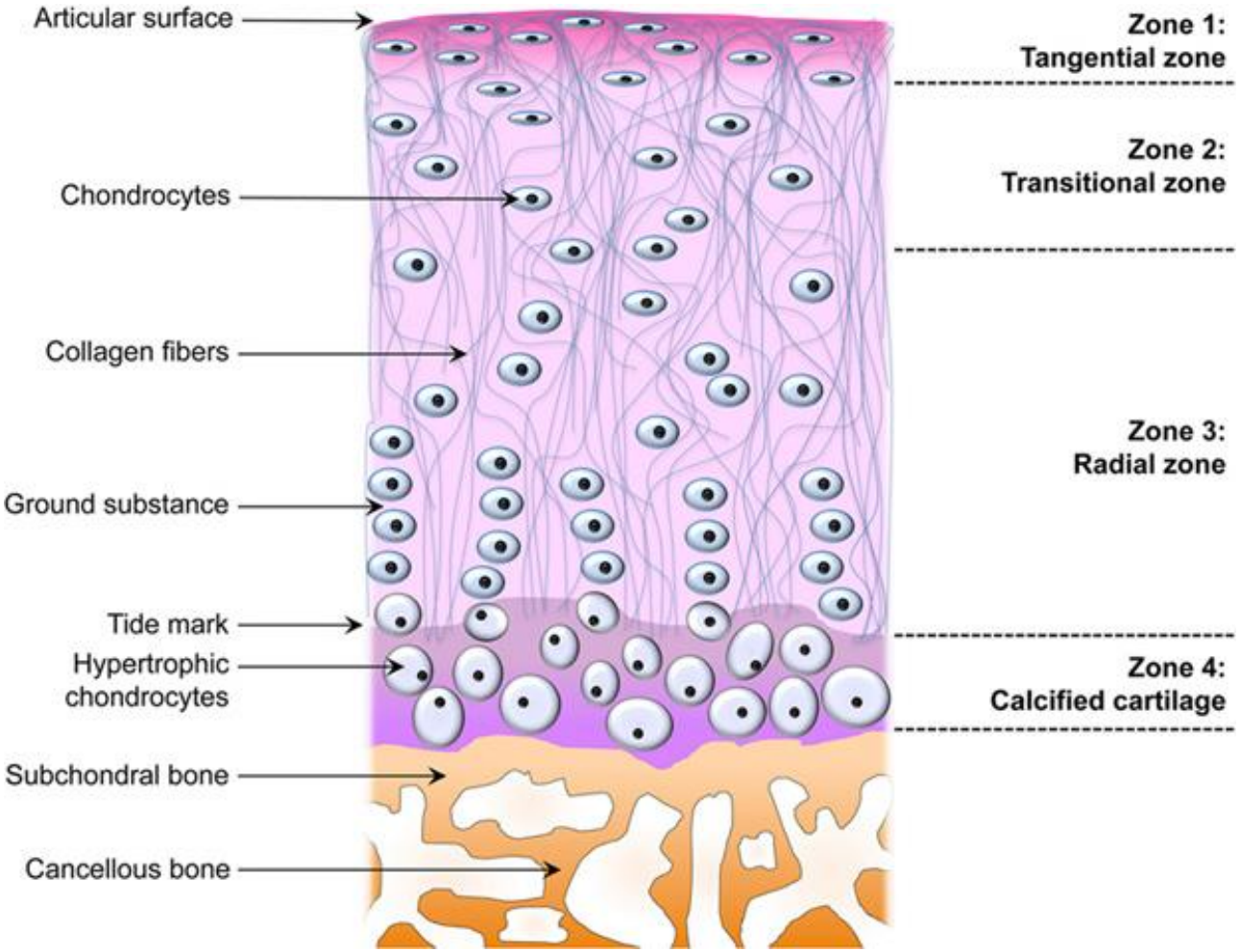
Anatomy


Vastus lateralis muscle
Vastus medialis muscle
Patellar tendon
Synovial capsule
Patella (kneecap)
ACL (anterior cruciate ligament)
Tibial collateral ligament
Fibula
Tibia
A.D.A.M.


Femur (thighbone)
The lateral collateral ligament (LCL) runs on the outside of your knee. It limits sideways motion.
Articular cartilage lines the bones, cushioning your joint.
Patella (kneecap)
The anterior cruciate ligament (ACL) connects the femur to the tibia in the center of your knee. It limits rotation and the forward motion of the tibia.
The medial collateral ligament (MCL) runs down the inside of your knee joint. It connects the femur to the tibia and limits the sideways motion of your knee.
The meniscus is cartilage that absorbs shock in your joint.
The posterior cruciate ligament (PCL) also connects the femur and tibia. It limits backward motion of the tibia.
Tibia (shinbone)

Articular cartilage

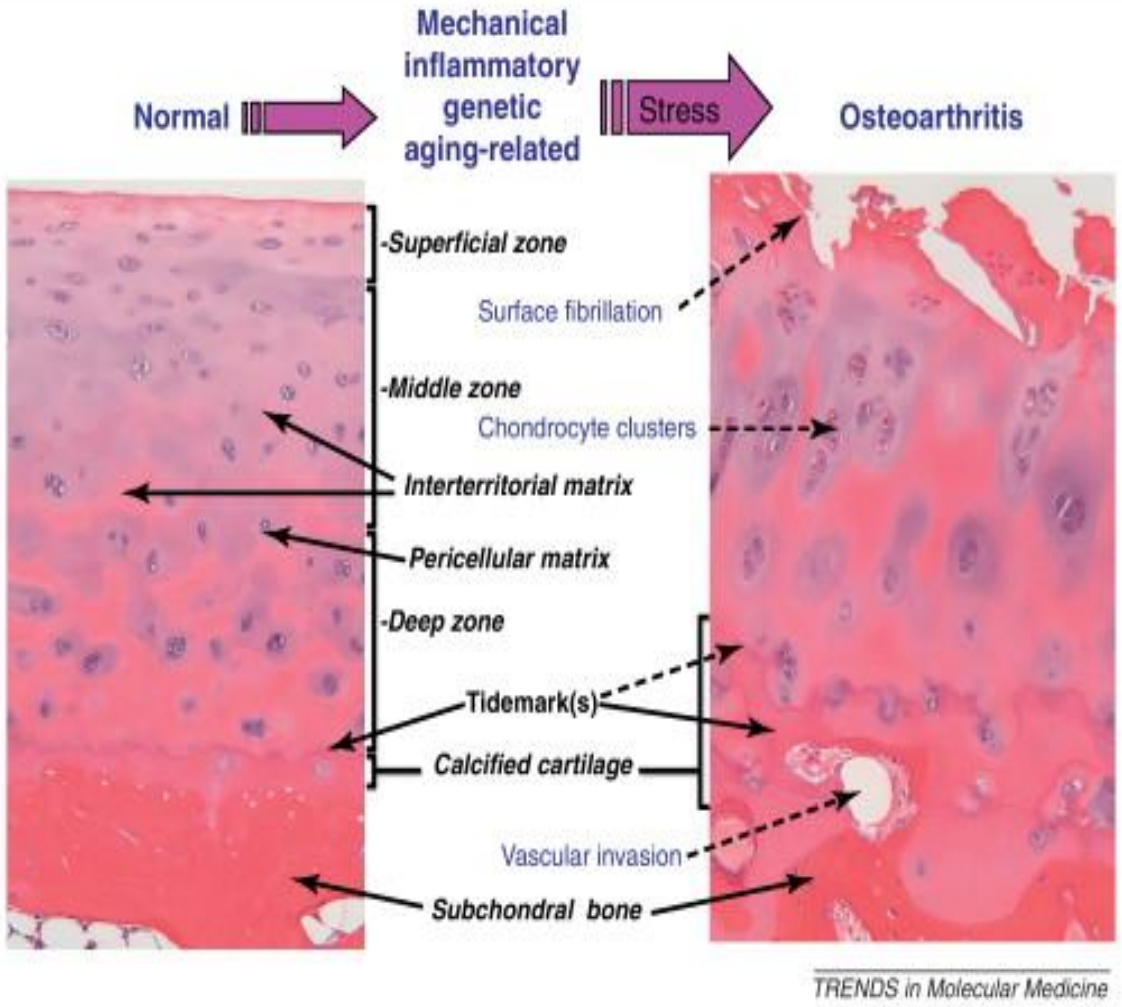


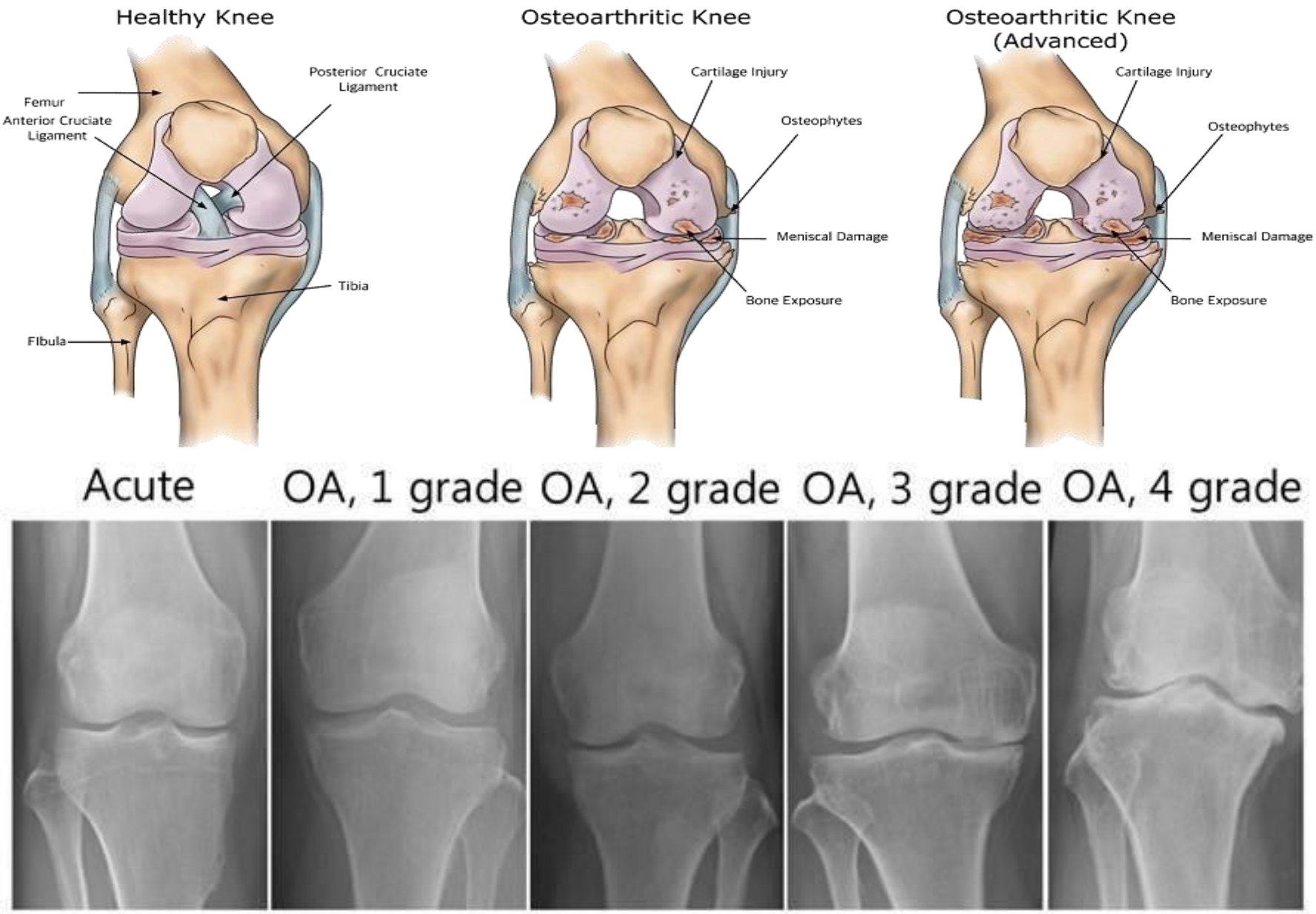
Osteoarthritis

Chronic, degenerative disorder of multifactorial aetiology, characterised by progressive **loss of articular cartilage** and **periarticular bone remodelling**, particularly large weight-bearing joint

- Loss of cartilage results in the loss of the joint space
- Progressive erosion of the damaged cartilage occurs until the underlying bone is exposed
- Subchondral bone responds with vascular invasion and increased cellularity, at areas of pressure

Pathology


Normal
Mechanical
inflammatory
genetic
aging-related
Stress
Osteoarthritis
-Superficial zone
Surface fibrillation
-Middle zone
Chondrocyte clusters
Interterritorial matrix
Pericellular matrix
-Deep zone
Tidemark(s)
Calcified cartilage
Vascular invasion
Subchondral bone
TRENDS in Molecular Medicine


Healthy Knee
Femur
Anterior Cruciate Ligament
Posterior Cruciate Ligament
Tibia
Fibula
Osteoarthritic Knee
Cartilage Injury
Osteophytes
Meniscal Damage
Bone Exposure
Osteoarthritic Knee (Advanced)
Cartilage Injury
Osteophytes
Meniscal Damage
Bone Exposure
Acute
OA, 1 grade
OA, 2 grade
OA, 3 grade
OA, 4 grade

Risk factors

- **Age**
- **Female**
- **Obesity (most important modifiable)**
- **Previous knee injury**
- **Lower extremity malalignment**
- **Repetitive knee bending**
- **High impact activities**
- **Muscle weakness**

Evaluation

History:

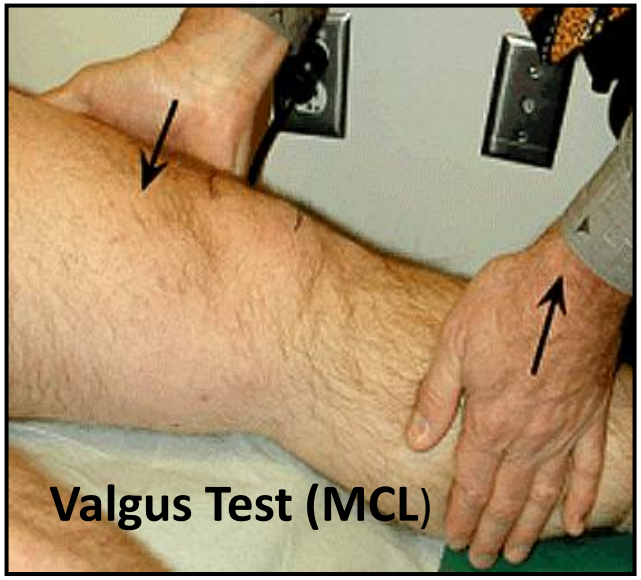
- Site/Severity: medial / lateral – pain score
- Onset: gradual, no acute trauma
- Character: ache, joint soreness
- Radiation: present / absent
- Alleviation: rest, medication
- Time: how many yrs/ recent episode
- Exacerbation: excessive effort
- associated: swelling / instability

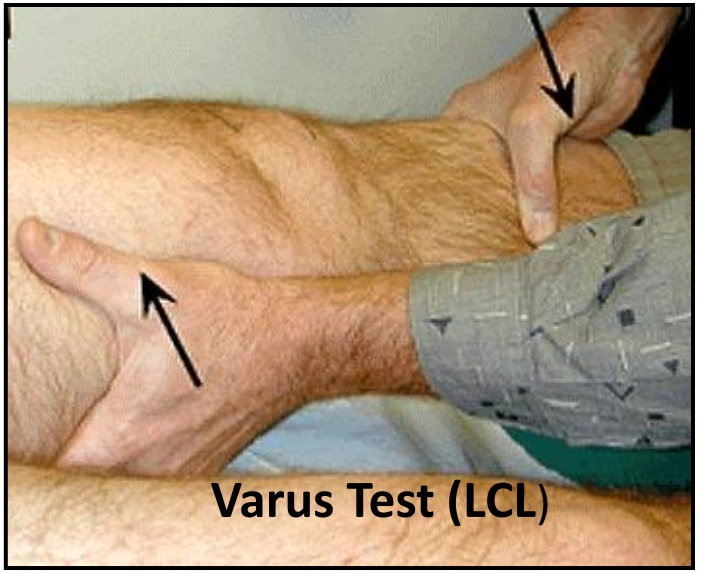
Evaluation

Physical Exam

- **Height, weight,BMI**
- **joint line tenderness**
- **ROM of knees: L and R**
- **Lachmann’s/valgus/varus stress testS**
- **Patellar mobility**
- **Genu varus (bowlegged) valgus alignment**
- **Type of gait (antalgic)**

Clinical Approach to Knee Pain





Differential Diagnosis of Knee Pain

Medial Pain

- OA
- MCL
- Meniscus
- Pes anserinus Bursitis

Lateral Pain

- OA
- LCL
- Meniscus
- Iliotibial band syndrome

Diffuse Pain

- OA
- Infectious arthritis
- Gout, pseudogout
- RA

Anterior Pain

- OA
- Patellofemoral syndrome
- Prepateller bursitis
- Quadriceps mechanism

Diagnosis of Knee OA

Classic Clinical Criteria

- **established by ACR, 1981**
- **sensitivity 95%, specificity 69%**

➢ **<u>knee pain</u> plus at least 3 of 6 characteristics:**

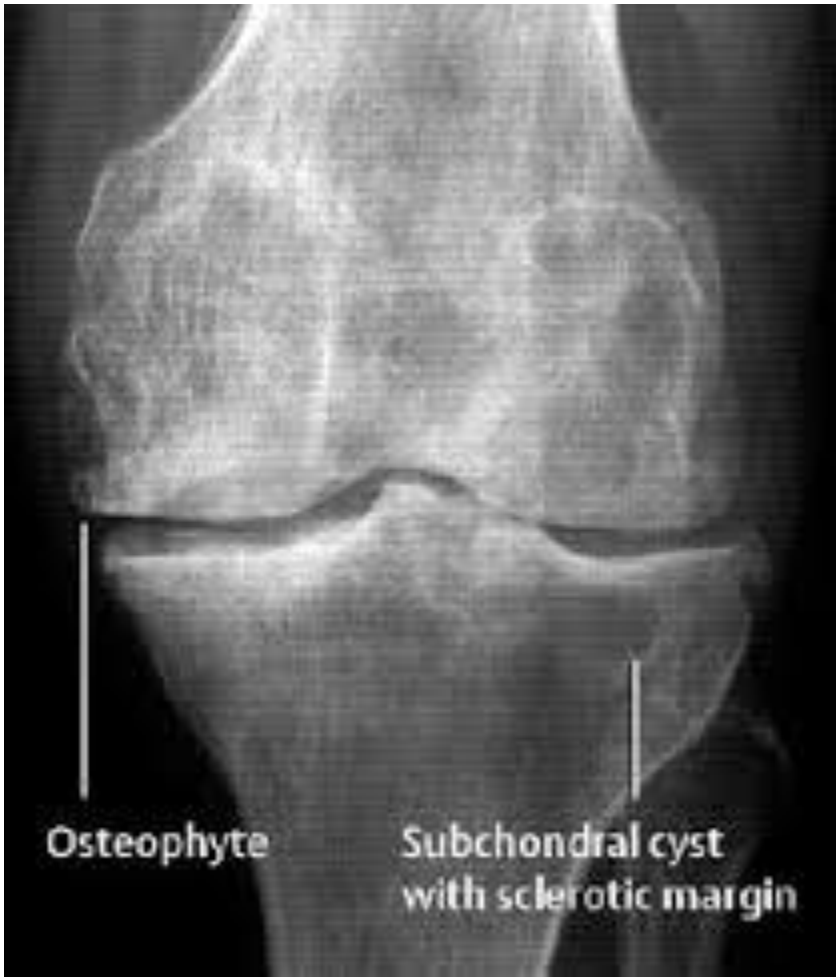
- **> 50 years**
- **Morning stiffness < 30 min**
- **Crepitus**
- **Bony tenderness**
- **Bony enlargement**
- **No palpable warmth** [5]

Diagnosis of Knee OA

- **Clinical symptoms**

- **Synovial fluid**
  1. **WBC<2000/mm^3**
  2. **Clear color**
  3. **High Viscosity**

- **X-rays**
  1. **Osteophytes**
  2. **Loss of joint space**
  3. **Subchondral sclerosis**
  4. **Subchondral cysts**



Treatment Guidlines

- **Basic principles:**
  - **Information / Education**

  - Weight loss if overweight

  - Exercise program

  water-based exercises

  quadriceps strengthening

  aerobic training such as walking,

Step 1

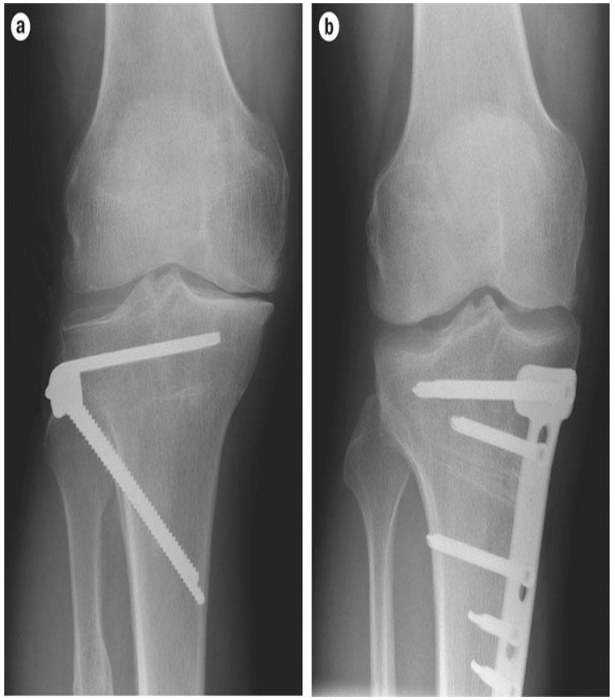
- **A- Non Pharmologic treatment:**

  - Evaluation of malalignment for correction

  - knee braces, foot orthoses or insoles

  - physical therapy

Correction of the malalignment with a) closed and b) open wedge osteotomy



Step 1

- **B-Pharmacologic treatment:**
  The aim is to establish a first chronic therapy that may improve or control symptoms or at least provide rescue analgesia.

- ***If symptomatic***:
  Paracetamol
  OR / AND
  Chronic SYSADOA (glucosamine sulfate or/and chondroitin sulfate

- ***If still symptomatic ADD***:
  Topical NSAIDs
  OR
  Topical capsaicin

STEP 2
Advanced pharmacological management in persistient symptomatic patient

Intermitent or continuous (longer cycles) oral NSAIDs

- **NORMAL GI RISK**

- Non selective NSAID (with PPI)
- Cox-2 selective NSAID (consider PPI)

- **INCREASED GI RISK**

- Cox-2 selective NSAID with PPI
- Avoid non-selective NSAIDs

Avoid NSAIDs in patients with renal impairment

STEP 2
Advanced pharmacological management in persistient symptomatic patient

In case of contraindications to NSAIDs, or if the patient is still symptomatic despite us of NSAIDs or was severely symptomatic**,**

intra-articular treatment may be applied

- Intra-articular hyaluronate
- Intraarticular corticosteroids

STEP 3
LAST PHARMACOLOGICAL ATTEMPTS IN SEVERE SYMPTOMATIC PATIENTS

- **Short-term weak opioids (tramadol**)

  - relieving pain and improving function but adverse events are significant

- **Antidepressants**

  - they alter pain neurotransmitters (i. e., serotonin and norepinephrine) centrally

  - central sensitization may play a role in the severity of osteoarthritis pain

Surgery

- ***Knee arthroscopy:***

  - symptomatic meniscal tear

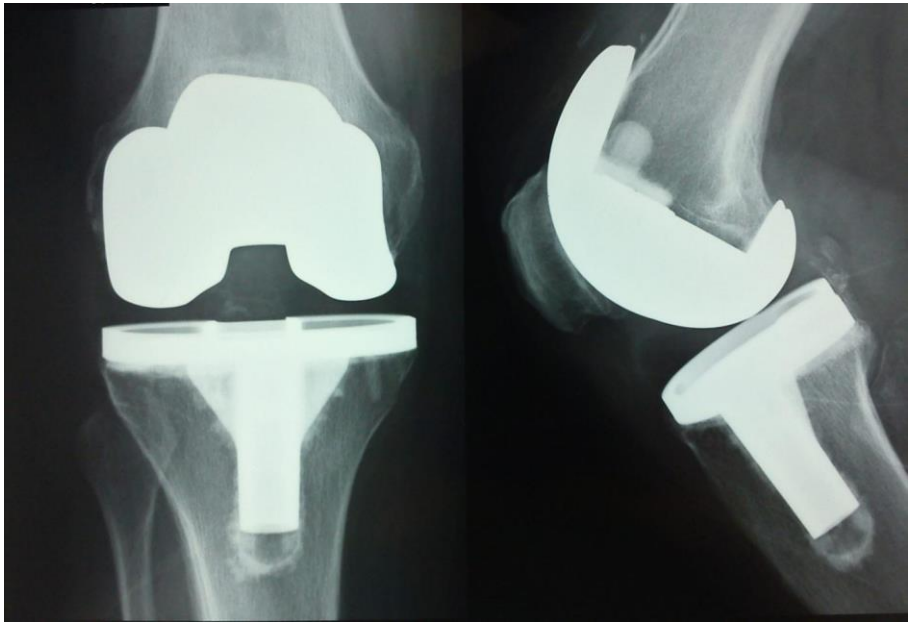
  - Ulcer drilling

  - debridment

  - knee lavage

STEP 4
END-STAGE DISEASE MANAGEMENT AND SURGERY

- Total joint replacement is very effective in relieving severe symptoms of knee OA



THANK YOU