

# ARTHRITIS AND INFECTION

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# ARTHRITIS

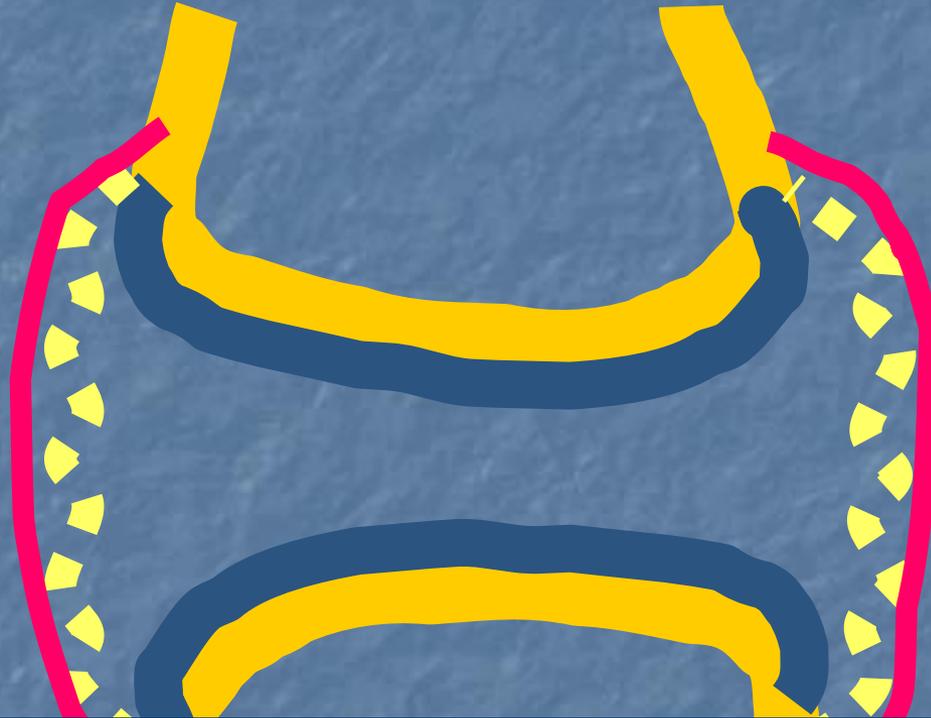
“INFLAMMATION OF A JOINT”

- Major cause of pain and disability
- Loss of work
  - 2.5 days/month
  - early retirement
- 14 million physician visits per year

# JOINT ANATOMY

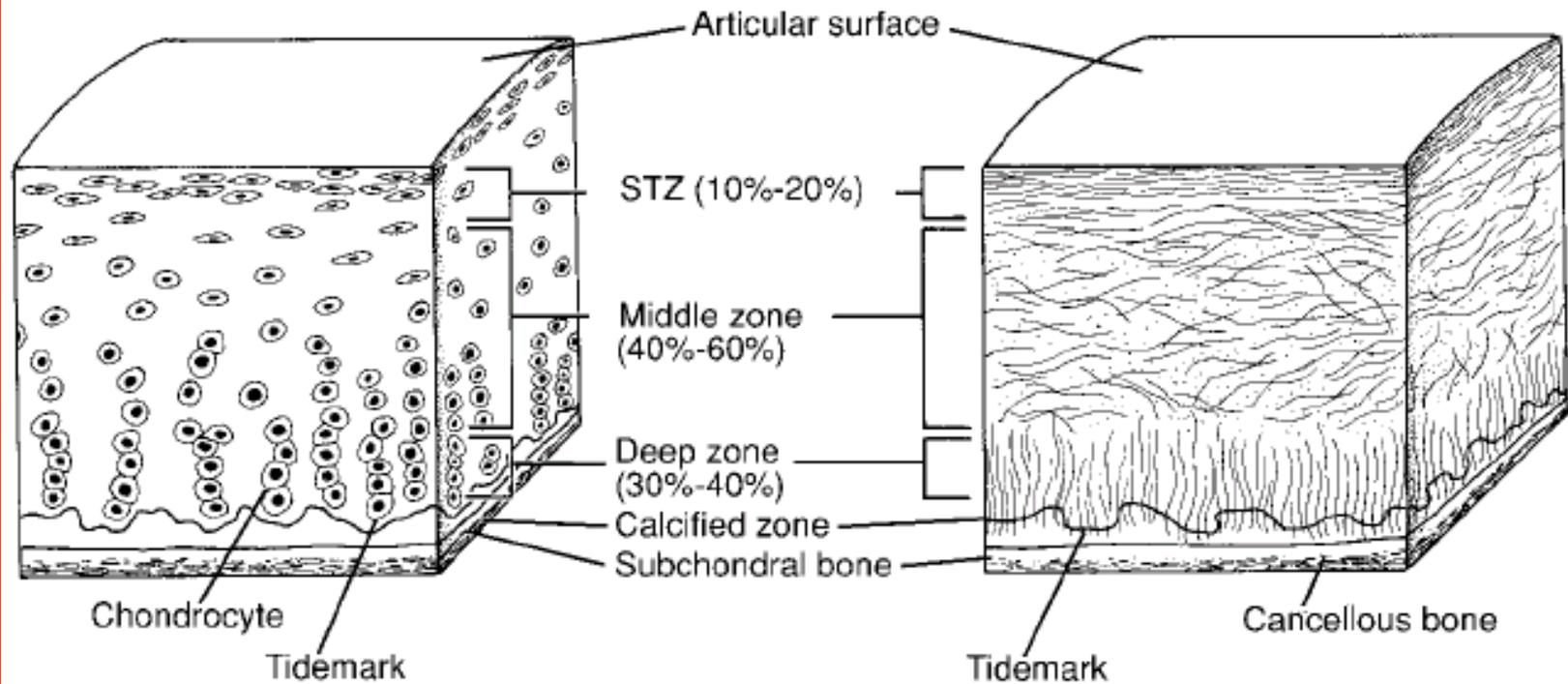
- Articular cartilage
- Synovium
- Capsule/Ligaments

# ARTICULAR CARTILAGE



- Acts as an shock absorber and spread the load onto subchondral bone
- Provides low friction for surface
- Avascular, aneural, alymphatic
- Composed of chondrocytes and extracellular matrix

# ARTICULAR CARTILAGE



# CHONDROCYTES

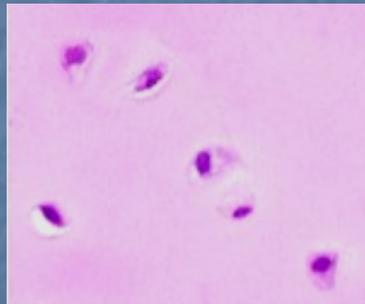
"sole living element in the articular cartilage"



proteoglycans



type II collagen



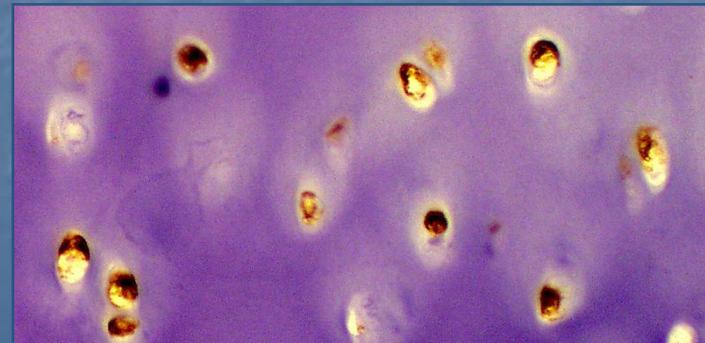
(5% wet weight)



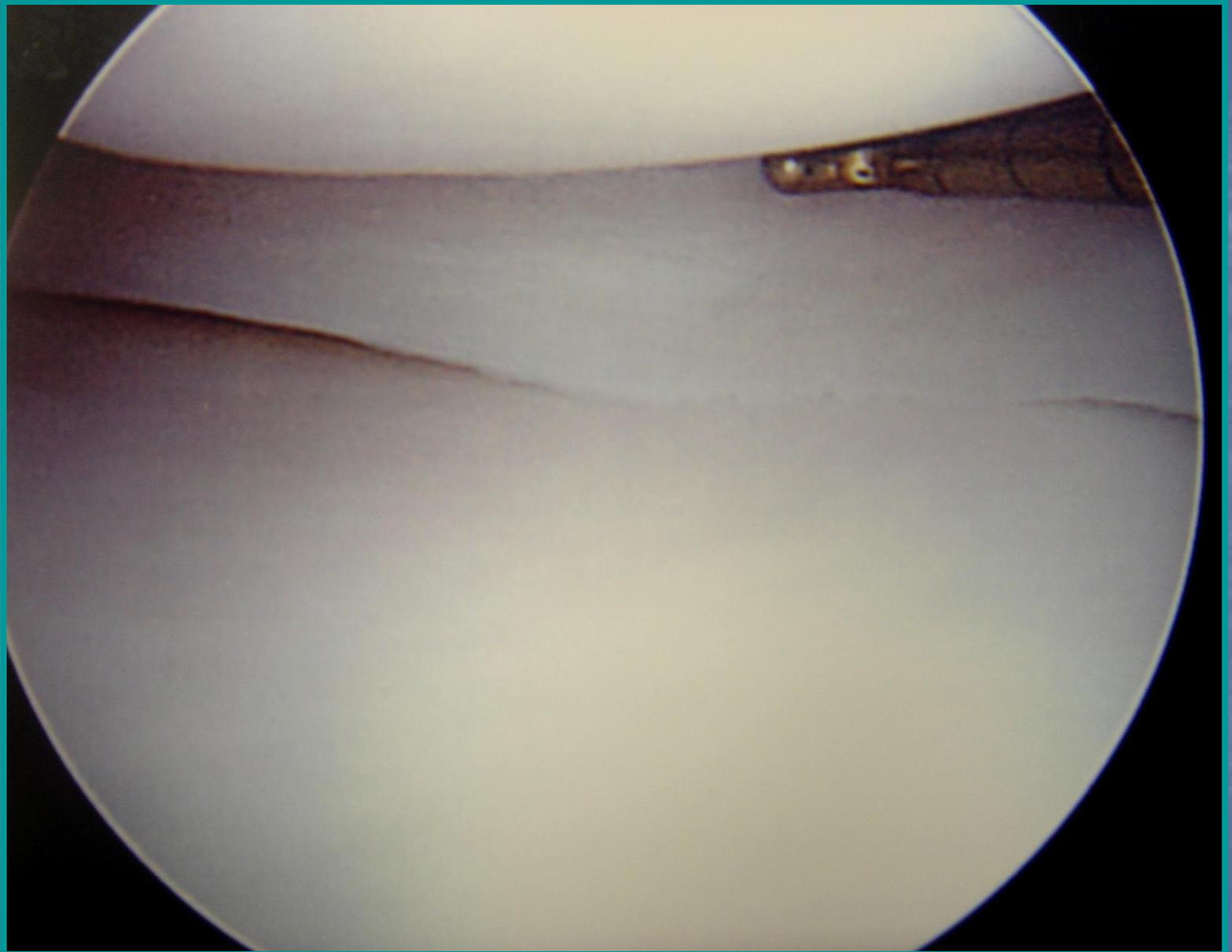
ECM



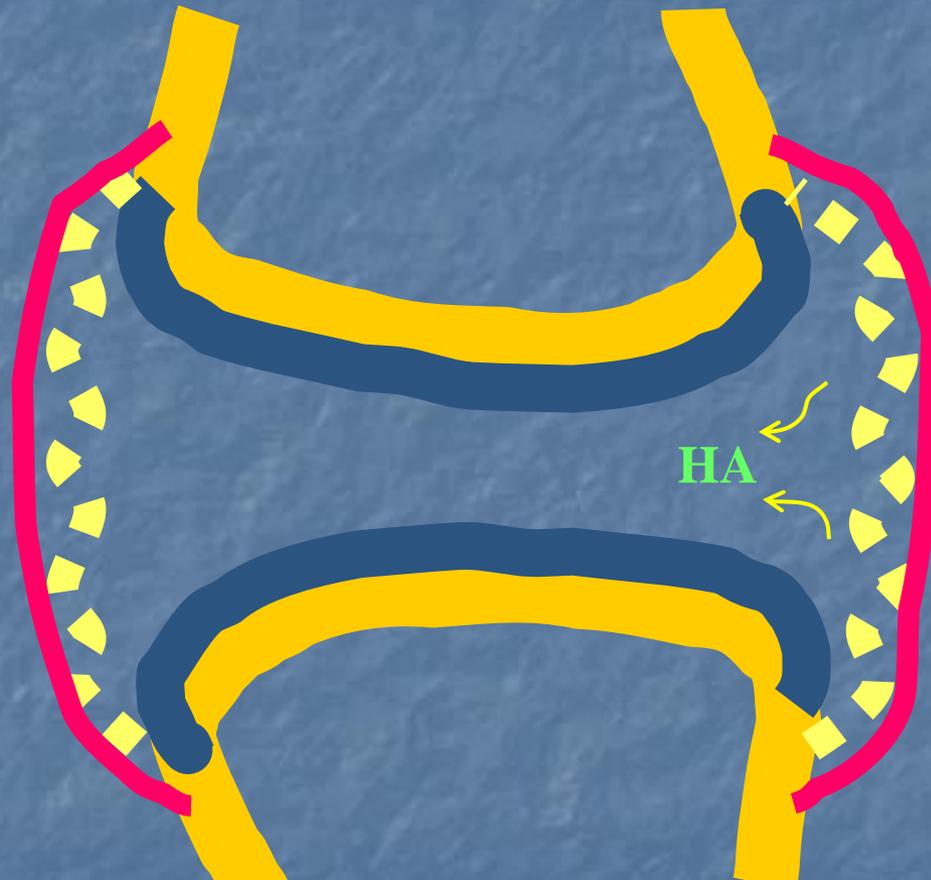
Enzymes



matrix metalloproteinase (MMP)



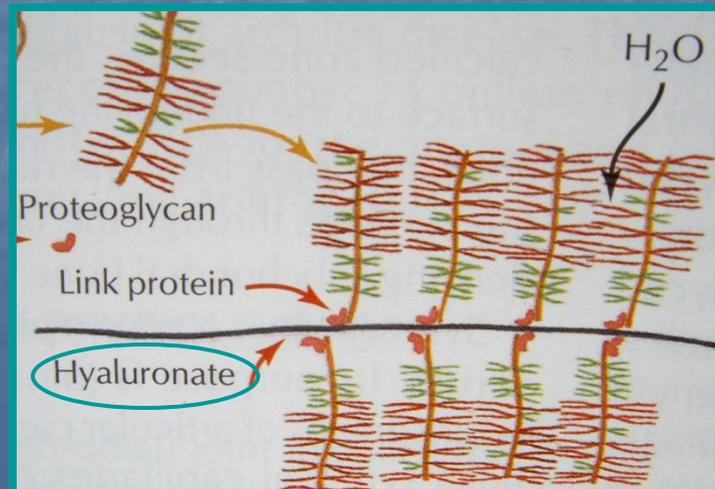
# SYNOVIUM

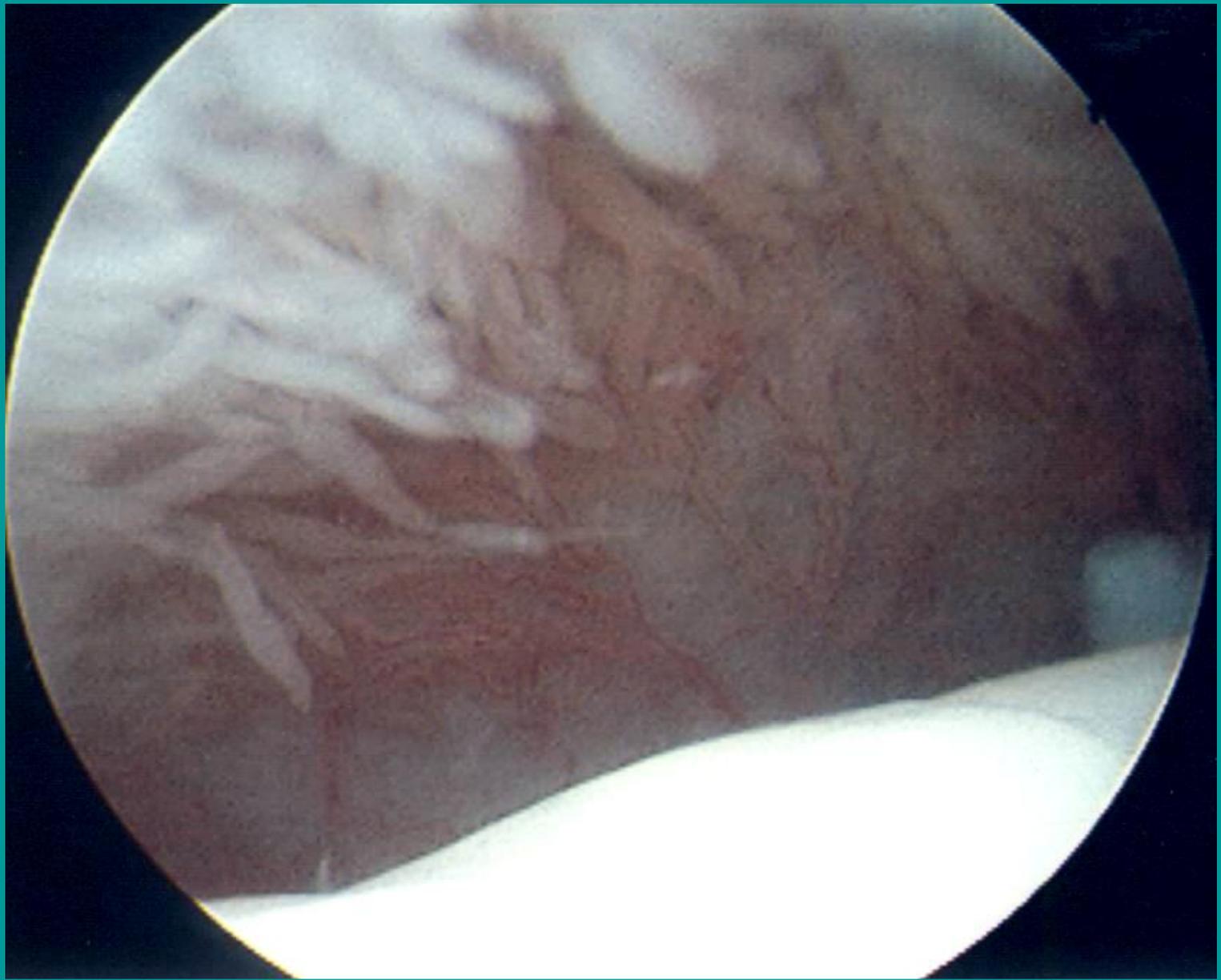


- Provides nutrients and lubricants

# HYALURONIC ACID

- Building core for proteoglycans
- Aids in lubrication for joint  
(inflamed joints are less viscous)

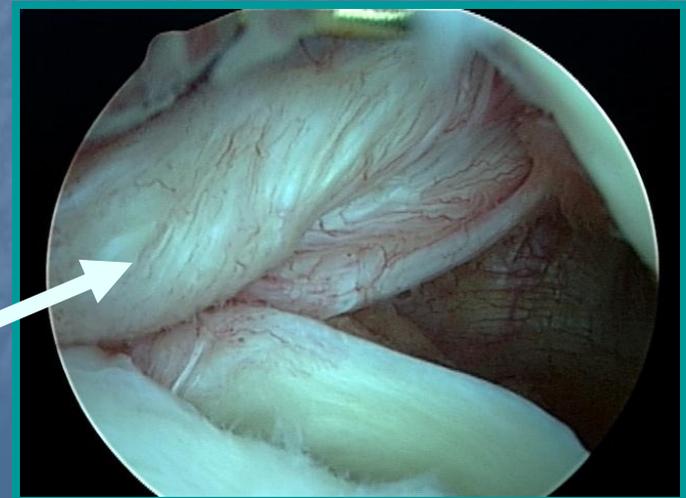




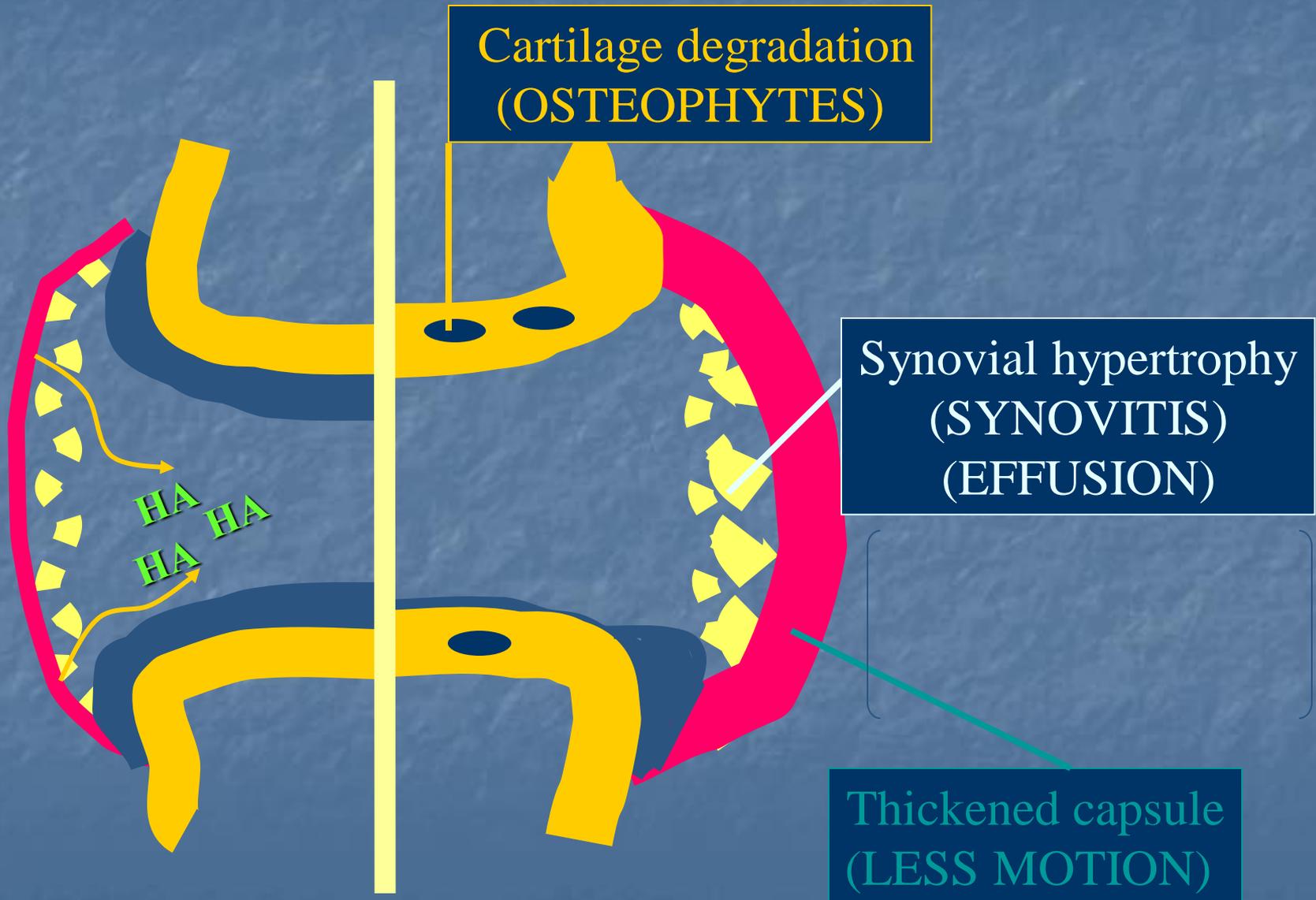
# CAPSULE AND LIGAMENTS

- Thick envelope around joints
- Ligaments – joint stability
  - Extra-articular
  - Intra-articular

ACL



# NORMAL vs ARTHRITIS



# ORGANIZATION

- Osteoarthritis
- Rheumatoid Arthritis
- Seronegative Arthropathy
- Crystalline Arthropathy

# OSTEOARTHRITIS

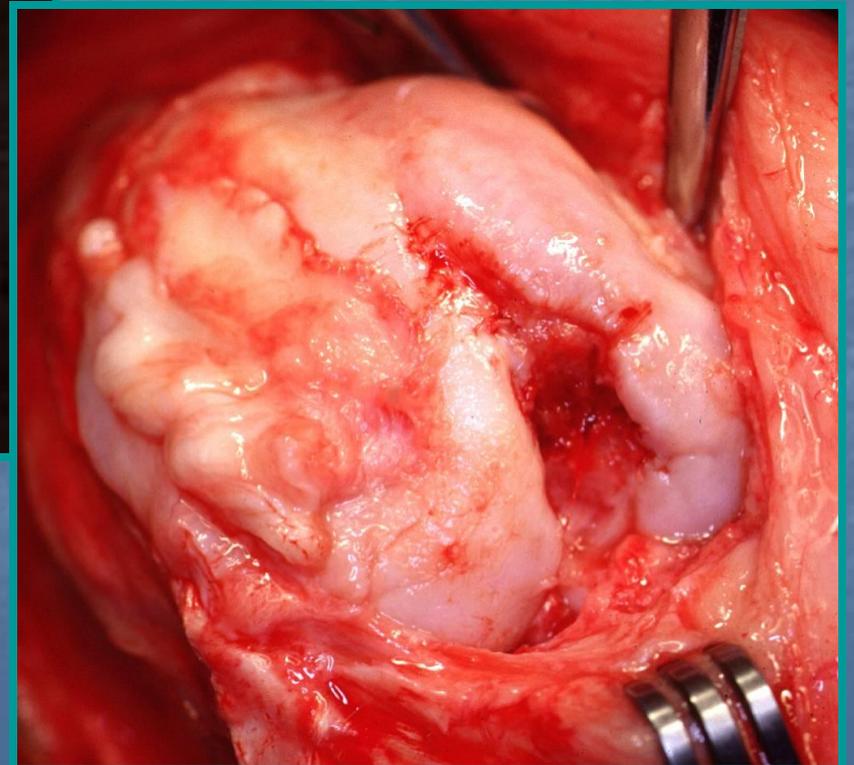
## OTHER TERMS

- Osteoarthrosis/Osteoarthropathy
- Hypertrophic Arthritis
- Degenerative Joint Disease

# OSTEOARTHRITIS

## DEGENERATION OF ARTICULAR CARTILAGE

- Primary - no obvious cause
- Secondary – condition that accelerates degeneration (e.g. DDH in children)
- Traumatic – secondary type from trauma (e.g. intra-articular fractures)
- Common in increased age



# OSTEOARTHRITIS

## CLINICAL PRESENTATION

- Pain
- Swelling
- Loss of motion
- Deformity
  - genu varum
  - genu valgum



# OSTEOARTHRITIS

## NON-OPERATIVE TREATMENT

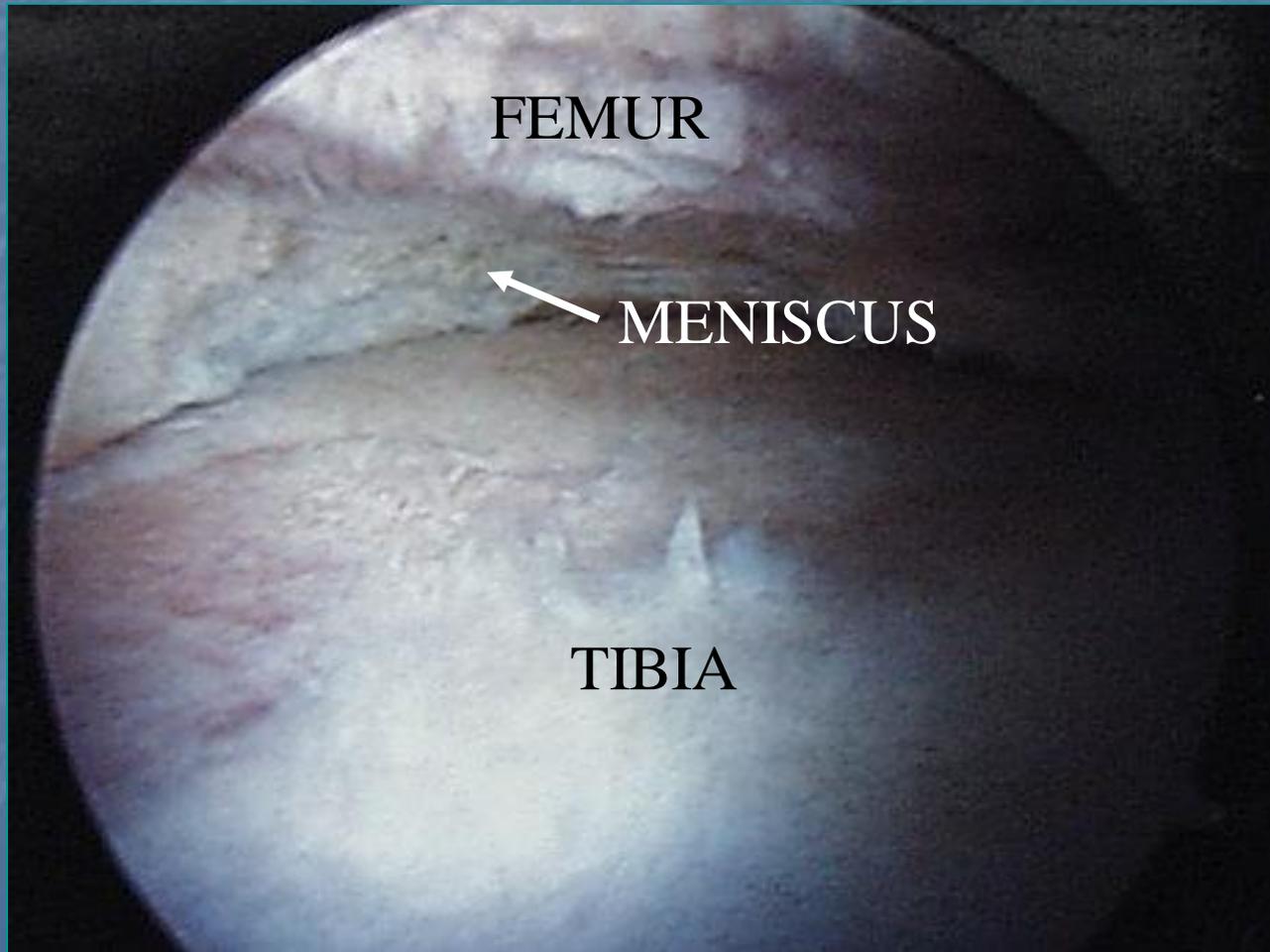
- Activity modification
- Physical therapy
- Unloader braces
- NSAIDs
- Glucosamine/Chondroitin Sulfate
- Cortisone injections
- HA injections

# OSTEOARTHRITIS

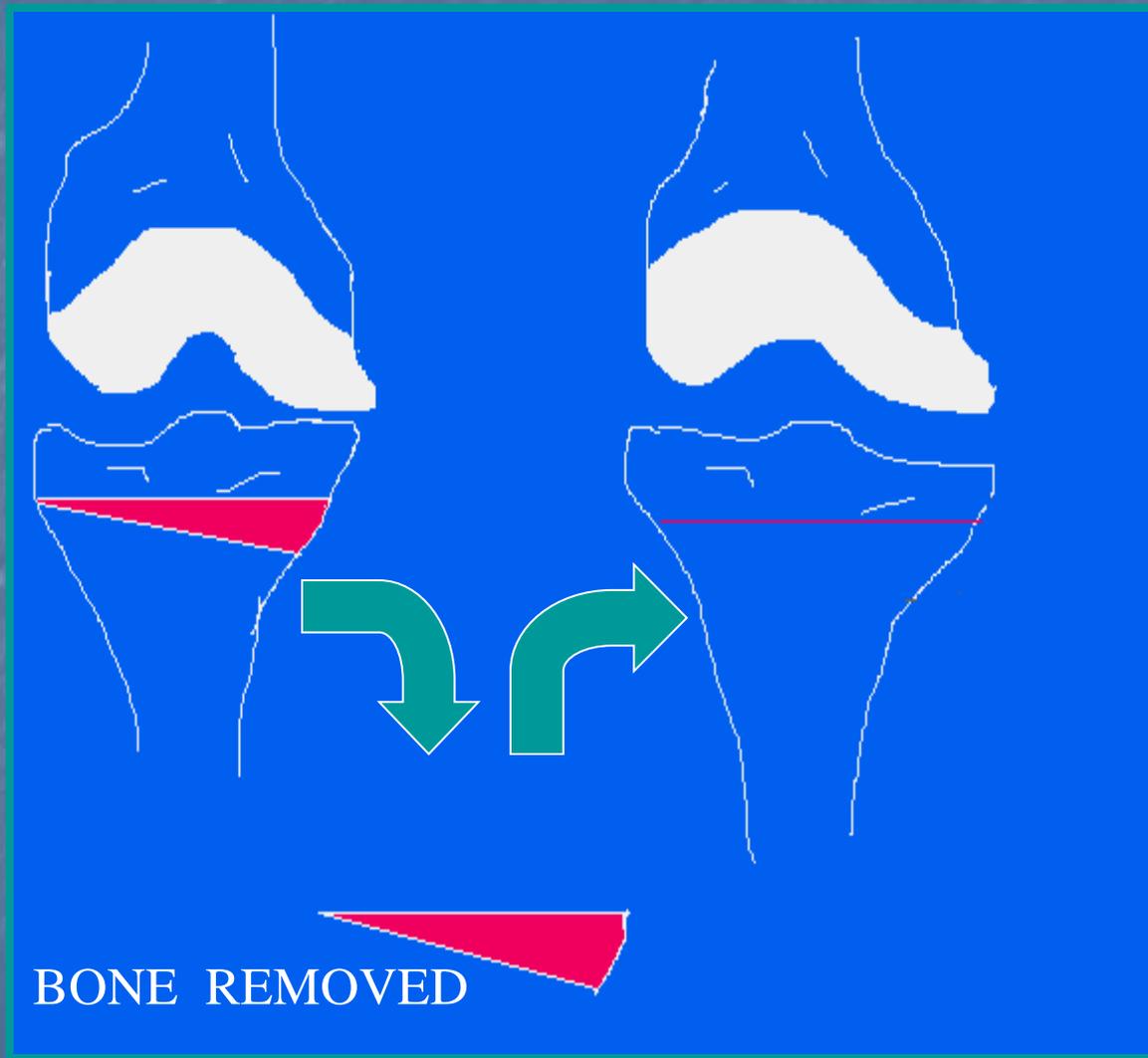
## SURGICAL TREATMENT

- Arthroscopic debridement/lavage
- Realignment procedures
- Joint Replacement

# ARTHROSCOPY



# OSTEOTOMY



# JOINT REPLACEMENT



# RHEUMATOID ARTHRITIS

- Autoimmune disease (HLA-R1/DR4)
  - T-cell interaction to synovium
  - Rheumatoid Factor
- Unknown cause
- Inflammatory reaction that destroys articular cartilage
- Female:Male – 2.5:1

# RHEUMATOID ARTHRITIS

## ARA CRITERIA

- Morning stiffness at least 1 hour
- At least 3 joints
- Hand arthritis (PIP, MCP, wrist)
- Symmetric joint swelling
- Subcutaneous nodules
- Positive RF
- Radiographic changes typical of RA

*Arthritis Rheum 31; 1988*

# RHEUMATOID ARTHRITIS

## RADIOGRAPHIC FINDINGS

- Osteopenia
- Uniform narrowing of joint height
- Subchondral bone erosion/cysts

# RHEUMATOID ARTHRITIS

## TREATMENT

- Patient education
- Protective splints/orthotics
- NSAIDs
- Prednisone
- Methotrexate
- Anti-TNF, Anti-IL1 medications
- Surgery – synovectomy/replacements/fusion of small joints

# SERONEGATIVE ARTHROPATHIES

- Multi-system inflammatory disorders that involves tendon/ligament insertions and spine and SI joints
- Negative RF
- HLA-B27 positive

# SERONEGATIVE ARTHROPATHIES

- Ankylosing Spondylitis
- Psoriatic Arthritis
- Reiter's Syndrome
  - (Reactive arthritis, conjunctivitis, urethritis)
- Inflammatory Bowel Disease
  - (Crohn disease, ulcerative colitis)

# CRYSTALLINE ARTHROPATHY

- Synovitis from deposits of crystals
- Gout
- Calcium pyrophosphate (CPPD)

# CRYSTALLINE ARTHROPATHY

## GOUT

- Uric acid
- Xanthine Oxidase (purine metabolism)
- Great toe
- Negative (yellow) crystals
- Colchicine, Allopurinol, Indocin

## PSEUDOGOUT

- Calcium pyrophosphate
- Genetic predisposition
- Knees and wrist joints
- Positive (blue) crystals
- Calcification seen on x-ray
- NSAIDs and activity modification

# SEPTIC ARTHRITIS

- Common in children, young adults, and immunocompromised older adults
- *S aureus* most common organism
- *H influenzae* type B in children
- Bacteria proliferation to immune response to destructive enzymes to cartilage breakdown

# SEPTIC ARTHRITIS

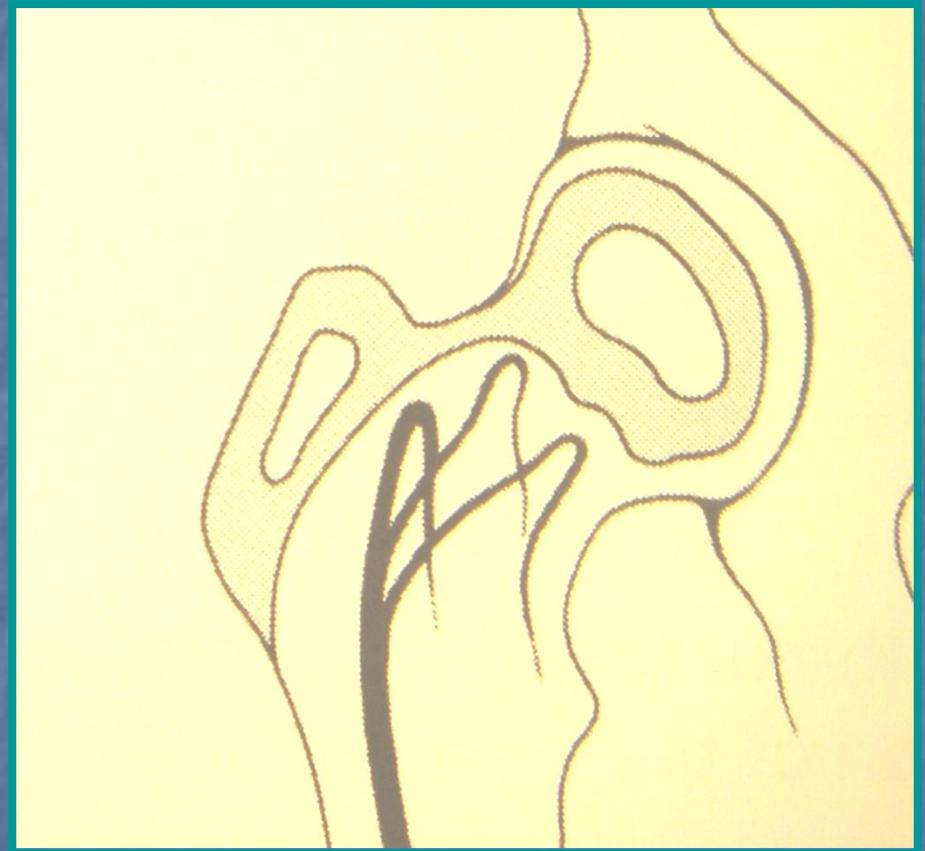
## CAUSES

- Typically single joint
- Hematogenous spread
- Direct inoculation (laceration, puncture)
- Extension for adjacent tissue (bursa, osteomyelitis)

NEONATE



OLDER CHILD



# SEPTIC ARTHRITIS

## PRESENTATION

- Fever, chills, night sweats, malaise
- Acute onset of joint pain
- Joint swelling, loss of motion, pain
- Knee pain in children THINK hip

# SEPTIC ARTHRITIS

## TREATMENT

- Antibiotics (*N gonorrhoeae*)
- Serial aspirations (knee)
- Emergent surgical irrigation/debridement

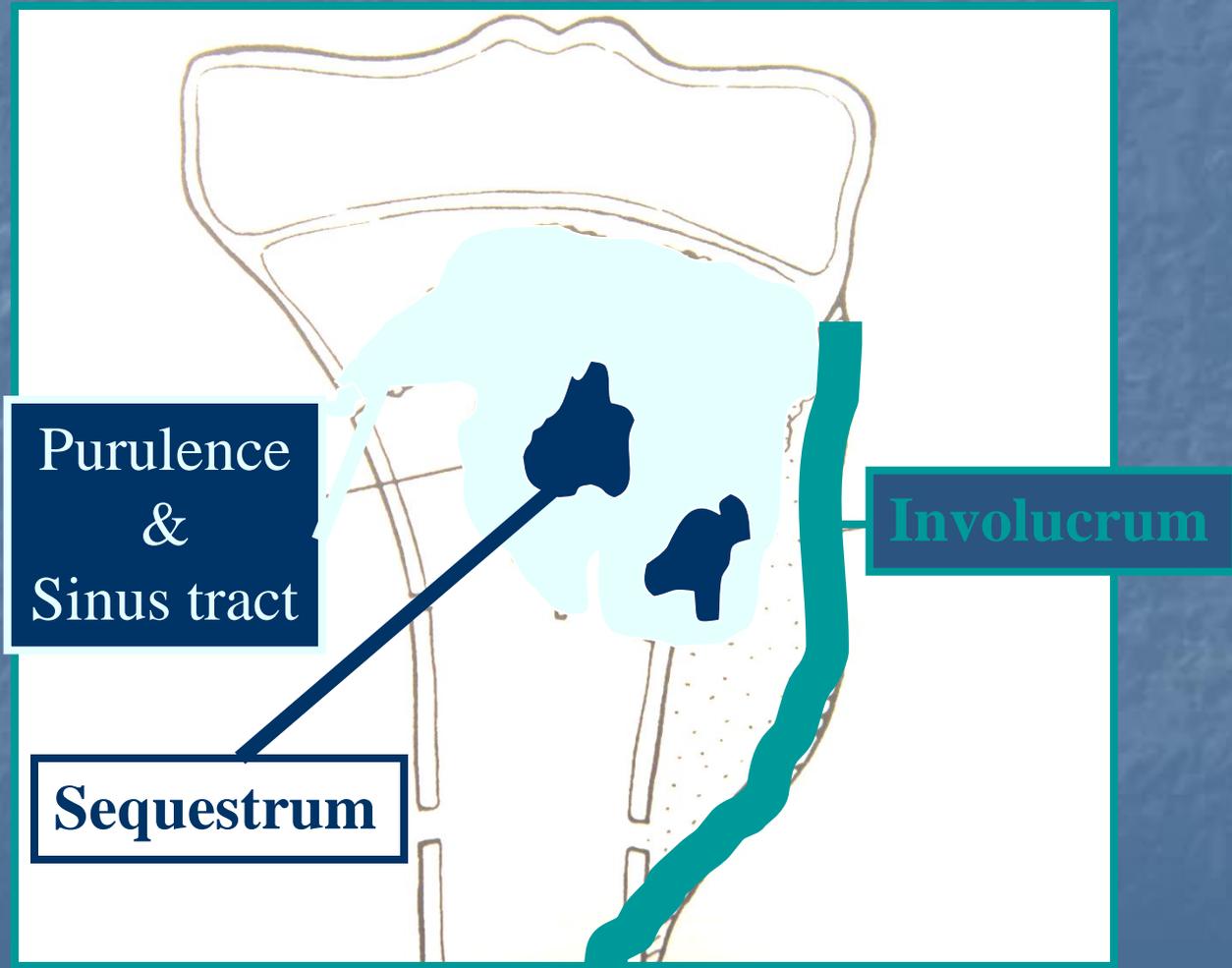
# OSTEOMYELITIS

- Infectious process that involves bone and medullary canal
- Traumatic
  - (open fractures, penetrating wounds)
- Operative
  - (joint replacement, ORIF, tumor resection)

# OSTEOMYELITIS

- Acute hematogenous
  - Less than 2 weeks
  - Lower extremity > Upper extremity
  - Serum values (ESR, CRP, WBC)
  - Bone scans better than radiographs
- Chronic hematogenous
  - Weeks to months
  - Sinus tract development
  - Diabetes mellitus
  - Can be seen on plain radiographs

# OSTEOMYELITIS



# SYNOVIAL FLUID SUMMARY

Normal	DJD	Gout	
Infection			
Clear	Cloudy	Cloudy	Cloudy
200 wbc	900 wbc	21K wbc	80K
wbc			
nl visc	< visc	< visc	< visc
No crystals	Crystals	Yellow (-)	No
crystals	(nonbirefringent)		

THANK  
YOU

