

# Temporomandibular Degenerative Joint Disease

**Dr. Norman M.R. Thie**

BSc, MSc, DDS, MSc

Diplomate -American Board of Orofacial Pain  
Fellow – American Academy of Orofacial Pain  
Fellow – American Academy of Oral Medicine

**Director - TMD/Orofacial Pain Clinic  
Faculty of Medicine and Dentistry  
University of Alberta,  
Private office within Align Orthodontics**

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# Temporomandibular Disorders ("TMJ")

- **75%** of the general population will experience one or more TMD signs or symptoms in their lifetime.
- Most are temporary and fluctuate, requiring little or no professional intervention.
- **5-10%** of the population seek professional consultation and treatment.
- **2:1 Females : Males** in population studies
  - Similar to migraine headaches
  - However, approximately 90% presenting to a TMD clinic will be female, post-puberty, pre-menopausal

# Temporomandibular Disorders



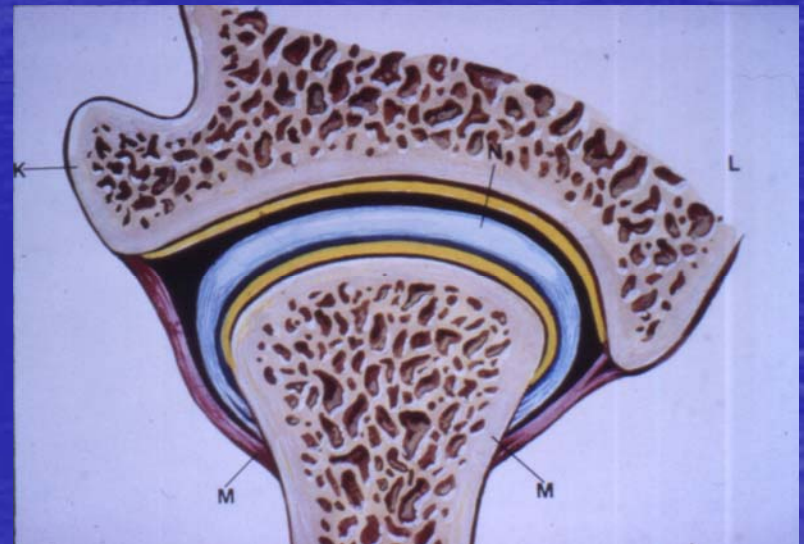
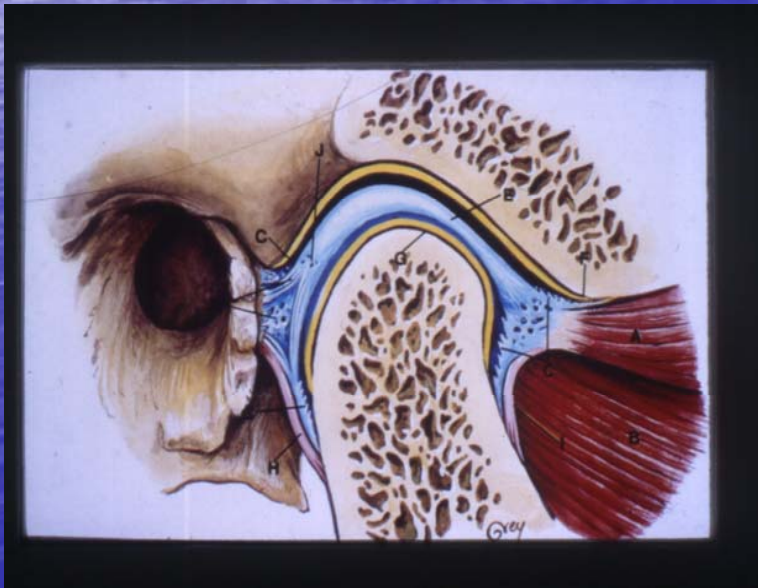
**Muscle  
Disorders**



**Joint  
Disorders**

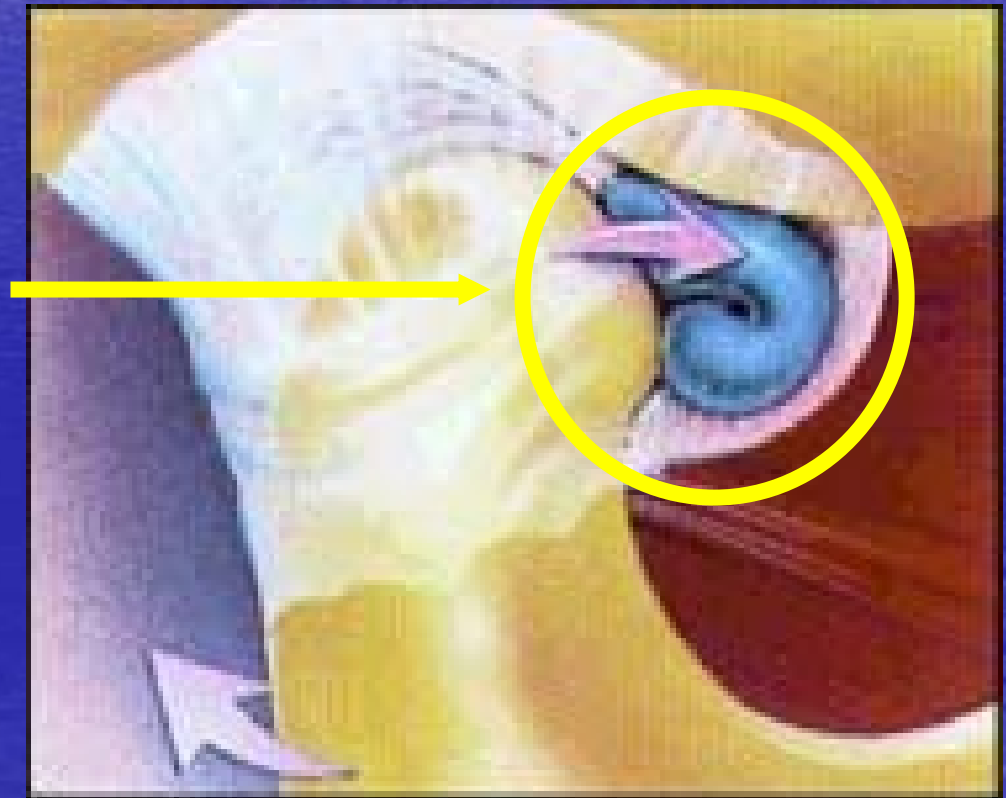
# Joint Disorders

- Impaired Movement
- Inflammation
- Degenerative Joint Disease



# Impaired Joint Movement

Internal Derangement  
- Disc displacement  
with & without  
reduction

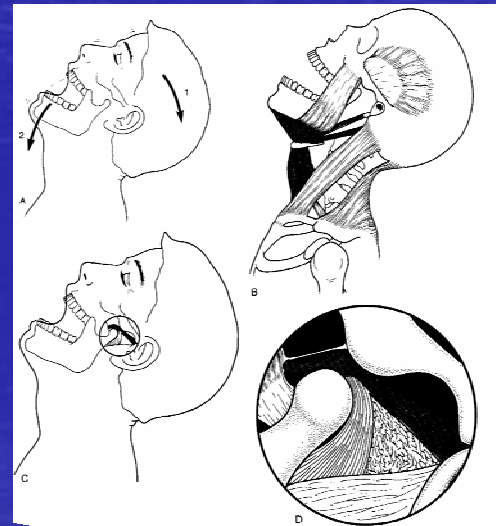
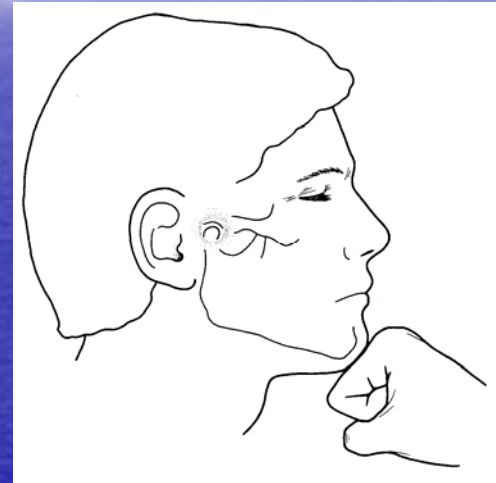


- Etiology

- Idiopathic

- direct trauma

- Motor vehicle accident



# Fallacy

**Diagnosis of TMJ internal derangement  
dictates the need for long-term  
treatment**

# Fact

**TMJ anatomic abnormalities are often irreversible but most stabilize within 5 years**

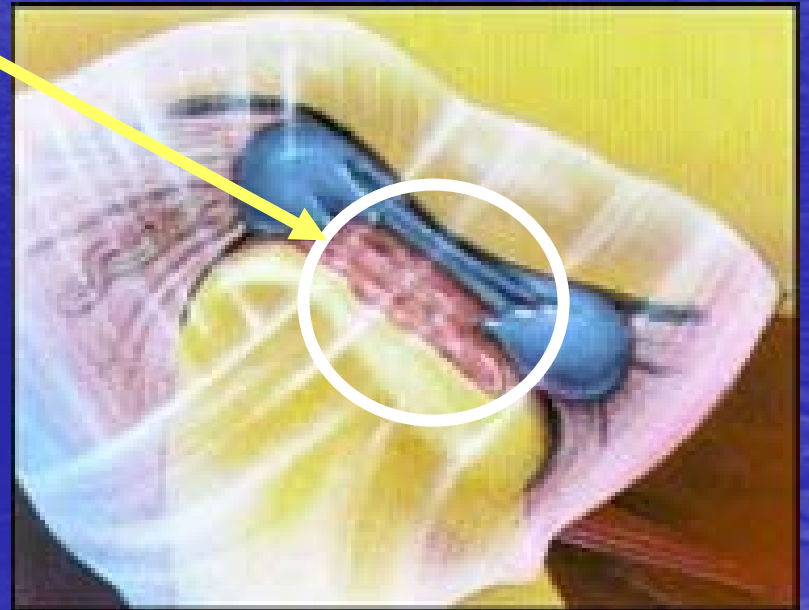
# TMJ Degenerative Joint Disease (DJD)

Manifestation of an imbalance btw an adaptive response (remodeling) & and a non-adaptive response (degeneration) of the joint(s)



# Degenerative Joint Disease (DJD)

breakdown of articular surfaces with acute or low grade inflammation



# Degenerative Joint Disease (DJD)

## Prevalence

- Autopsy results - 22% - 40% in the general population (most often asymptomatic)
- 8%-12% of patients in TMD practice & clinics
- Data support that women more prone than men
  - mean age 35 years
  - post-puberty ----- pre-menopause

# Degenerative Joint Disease (DJD)

- Etiology

## Secondary to age

Age related changes in articular tissues thought to facilitate pathogenesis of DJD

# Degenerative Joint Disease (DJD)

- Etiology

- Joint Loading and stress distribution

Repetitive **microtrauma** (eg. bruxism) implicated but remains debatable

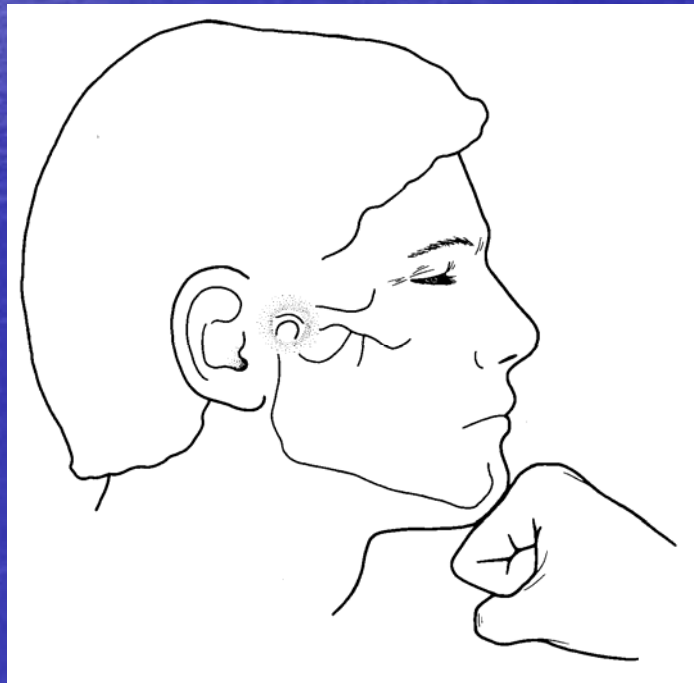
- increased rate of osteogenesis in subchondral bone evidenced as **sclerosis** radiographically

- Affected bone, of increased stiffness that makes articular cartilage more susceptible to compressive stress

# Degenerative Joint Disease (DJD)

- Etiology

**Major Trauma** - traumatically induced DJD



# Degenerative Joint Disease (DJD)

- Etiology

## Inflammatory/Histochemical Considerations

Articular cartilage is an estrogen-sensitive tissue

Using tamoxifen (estrogen antagonist) reduced the development of experimentally induced DJD in rabbits

**Therefore Females > Males??**

## Contribution of Occlusion (i.e. the way teeth fit together)

- Debatable
- The remodeling capacity of the TMJ demonstrates that the joint can accommodate and adapt to various occlusal conditions

Features such as **anterior open bite** are the **consequence of** rather than the etiology of

**TMJ DJD**



# Degenerative Joint Disease (DJD)

- Etiology

- Internal derangement

- particularly with disc deformation  
may progress to DJD



# Degenerative Joint Disease (DJD)

## Diagnosis

- Clinical history
- Clinical examination
- TMJ Imaging

- Symptoms
  - pain on movement or biting
  - reduced range of motion
  - joint tenderness to palpation
  - crepitus

- Clinical Findings

- radiographic diagnosis

- crepitus

- Joint tenderness

- open-bite

BUT!!! patients:

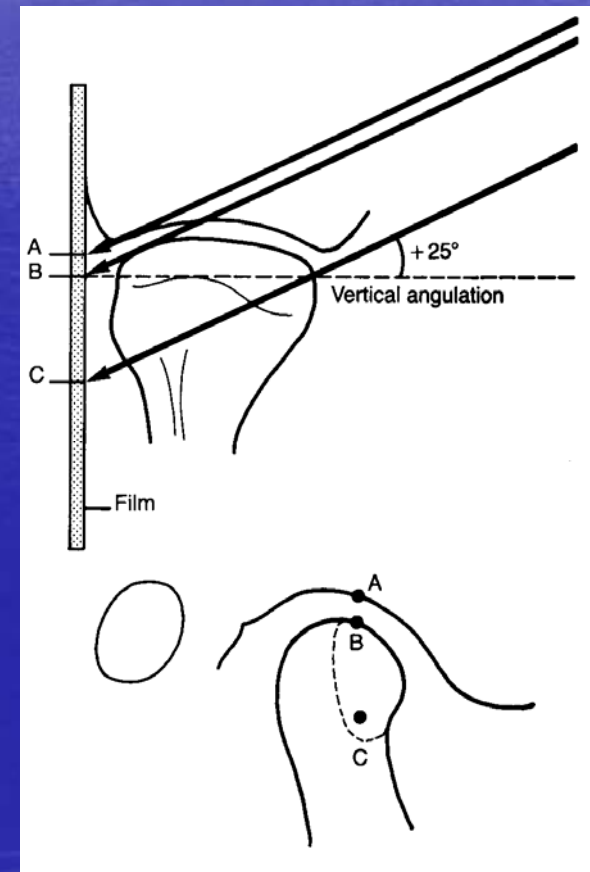
- may not have joint sounds

- may not have limited movement

- may not have bite changes

# Imaging Considerations

- **Transcranial, transpharyngeal, transmaxillary, transorbital, submental vertex** projections of the TMJs
- Suffer from:
  - **Image distortion**
  - **Superimposition**
- **Recommended for Screening only**



# Imaging Considerations

## Panoramic radiography

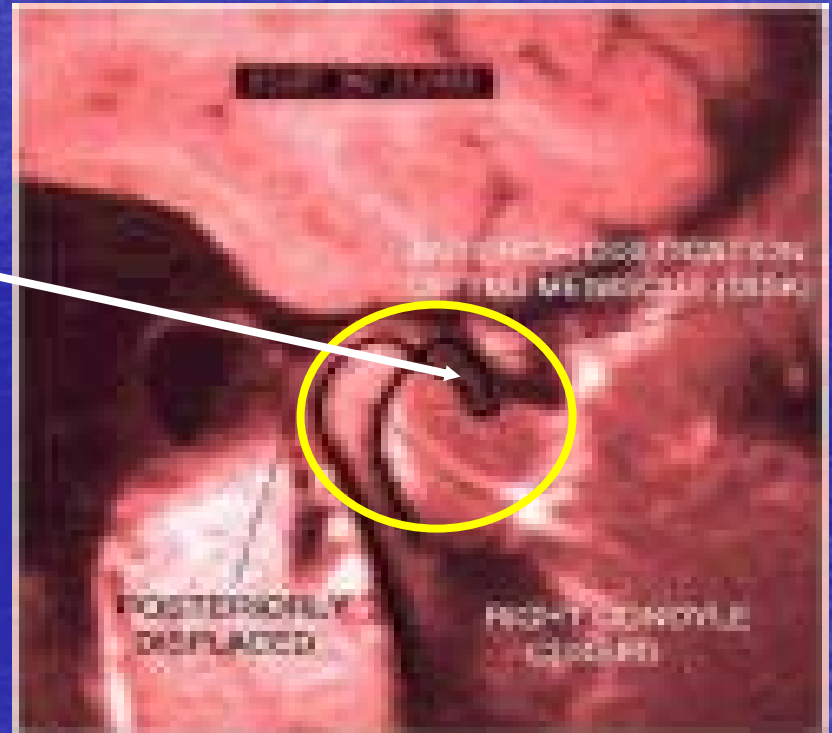
- Identification of fractures and gross pathologic changes of the maxilla and mandible
- **Subject to:**
  - Magnification
  - Superimposition
  - Loss of image sharpness



# Imaging Considerations

## Magnetic Resonance Imaging

- Confirms disc displacement but under diagnosis of osseous changes



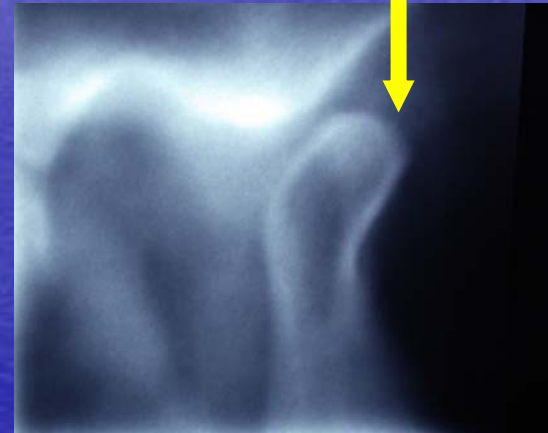
# Imaging Considerations

## Tomographic radiography and Cone Beam CT scanning

- Evaluate joint space



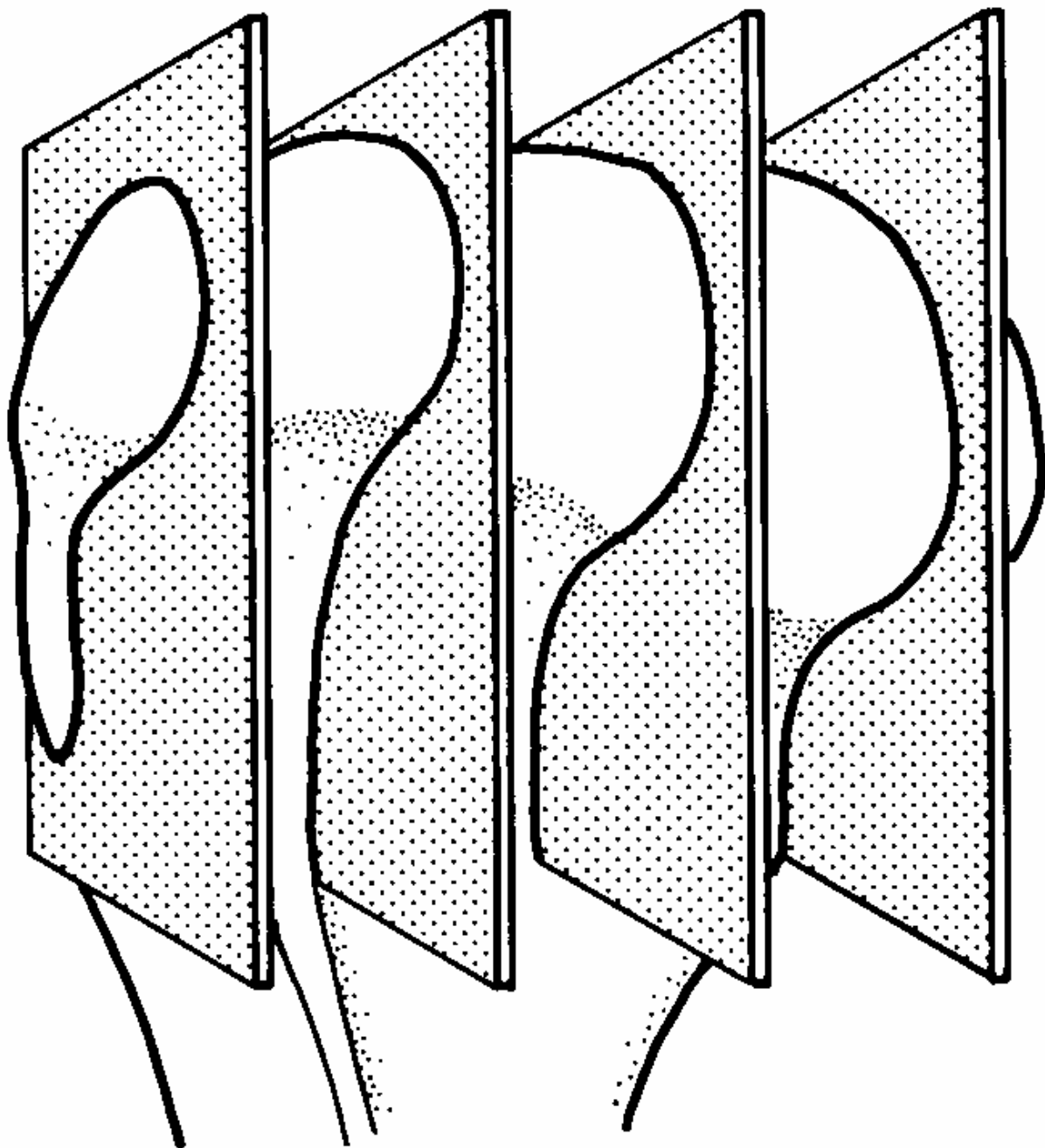
- Assess condylar mobility



- Depict bony changes

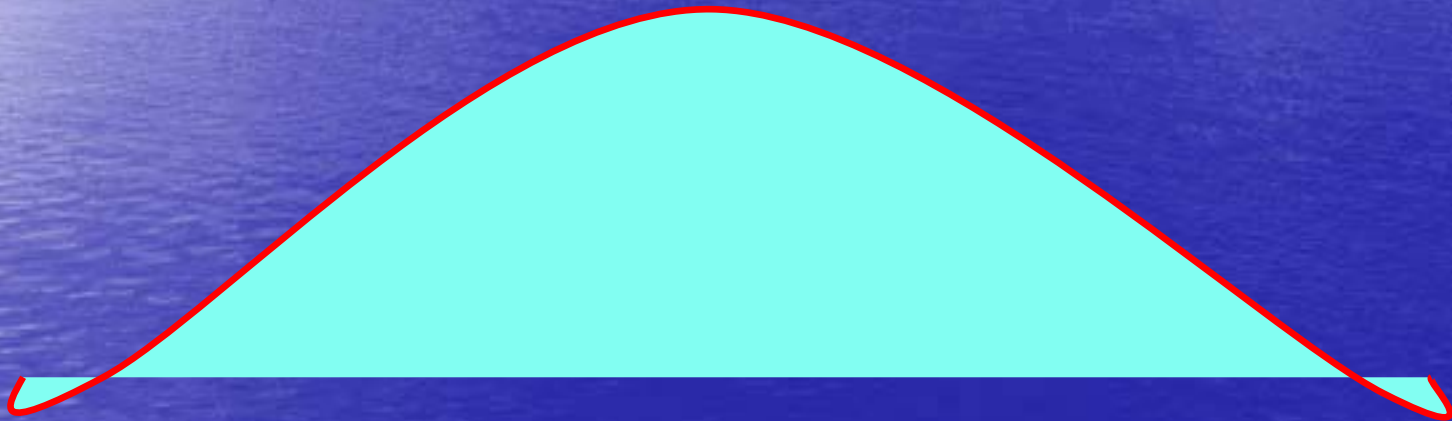


- Ideal for assessment of DJD



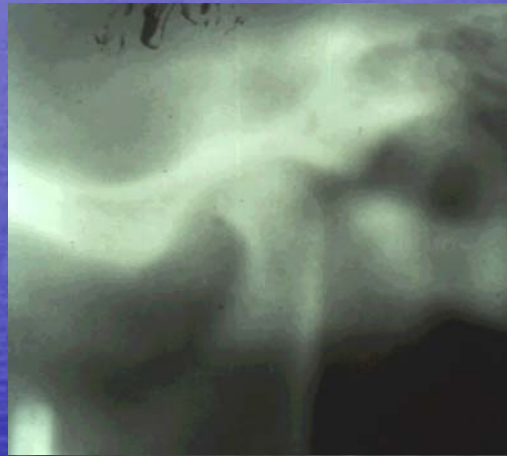
# Prognosis

Osteoarthritis in the TMJ stabilizes over time!!



destructive phase – reparative phase - healing  
(1 to 1.5 years)      (1 to 1.5 years)

# Prognosis



# Prognosis

## Residual symptoms

Mild restriction of movement and joint sounds (crepitus) remain in many patients after subjective symptoms subside

# Treatment

Treatment is focused on:

- Pain control
- Reducing overloading of the TMJ

# Treatment (Non Pharmacological Treatment)

## Palliative (Patient education)

- Management symptom directed, based on understanding that DJD runs a clinical course of 1 to 3 years, generally followed by natural regression of symptoms
- Advise that joints may be easily irritated, unnecessary mechanical stresses on the joint may be avoided by diet of softer, smaller food, avoid daytime parafunctional habits.

# Treatment (Non Pharmacological Treatment)

- Splint therapy



- It will not cause a direct effect on the inflammatory process, but prevents overloading of the TMJ,
- Reduce joint loading indirectly by reducing muscle hyperactivity

# Treatment (Pharmacological Treatment)

Pain control with:

- Acetaminophen
- Anti-inflammatories:
  - Ibuprofen (?), ASA (?), Diclofenac, Naproxen
  - Rofecoxib
  - Celecoxib
  - Mobicox
  - Relafen

# Treatment (Pharmacological Treatment)

Pain control with:

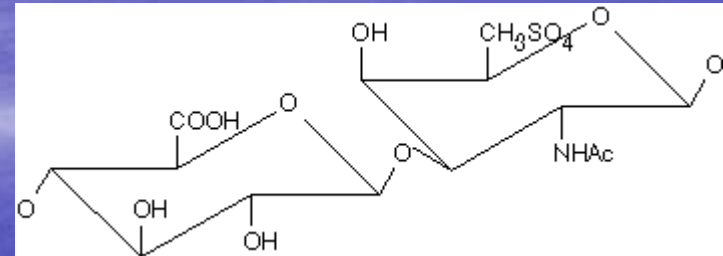
- Combination drugs (eg. Tylenol 3)
- Codeine Contin
- Oxycontin
- Glucosamine Sulphate

# Physical Therapy

- (TENS), ultrasound, stretching and massage.
- Exercises to maintain normal muscle/joint function and comfort, improve joint range of motion, increase muscle strength, develop normal coordination and stabilize the TMJs.

# Treatment (Pharmacological Treatment)

## Food Supplements Glucosamine sulphate

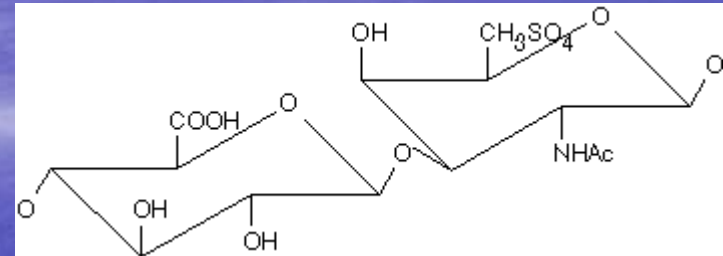


- A substance that naturally occurs in cartilage
- Not present in significant amounts in most diets.
- Sources are derived from the shells of shrimp, lobster, and crab, or may be synthesized.

# Treatment (Pharmacological Treatment)

## Food Supplements

### Glucosamine sulphate



-Important building block needed by the body to manufacture glycosaminoglycans found in cartilage.

Almost exclusively researched and used for the treatment of osteoarthritis

**Evaluation of Glucosamine sulphate compared  
to Ibuprofen for treatment of  
Temporomandibular joint Degenerative  
joint disease**

**A Randomized Double Blind Controlled 3  
month clinical trial**

**Norman M.R. Thie et al (2001)**

**Journal of Rheumatology 28:1347-55**

# Glucosamine Sulphate:

- Recommended as an adjuvant for TMJ  
DJD

# Glucosamine Sulphate:

- Recommended average dose 1500 – 2000mg per day
- Be careful with:
  - Different brands / different compounds

# Treatment (Surgical)

- Corticosteroid injections - can give short term relief
- Arthrocentesis
- Surgery is the last treatment option for patients with non-responsive severe pain and limited function (very rarely needed)

# Treatment considerations

Caution!!



Avoid major dental treatments, such as prosthodontics or orthodontics, until the degenerative process has stabilized.

# Occlusal Therapy

- Occlusal adjustment following healing may be required to re-establish functionally stable occlusion.
- Some patients require prosthodontic, orthodontic and/or orthognathic surgery once DJD has stabilized



# Conclusion

- The aim of treatment of DJD is to shorten its natural course AND make it more tolerable

# Conclusion

- TMJ DJD is a pathological response to mechanical stress placed on the articular surfaces of the joint
- FEMALES > MALES !!!!!!!