

My Jaw Hurts! What do I do?  
An Overview of Diagnostic  
Techniques, Examination, and  
Management Strategies in  
Orofacial Pain

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# All of the following are first-line treatments for TMDs EXCEPT

 When poll is active, respond at [PollEv.com/seenapatel085](https://PollEv.com/seenapatel085)

 Text **SEENAPATEL085** to **22333** once to join

Occlusal  
splints

Soft-food  
diet

Full-mouth  
rehabilitation

Physical  
therapy

# Goals for management of TMDs

Reduce  
pain

Reduce  
adverse  
loading

Restore  
function

Resume  
normal daily  
activities

# Treatment approaches

- ▶ 1. Apply conservative therapies first
  - ▶ Self-management
  - ▶ Behavioral modification
  - ▶ Physical therapy
  - ▶ Medications
  - ▶ Orthopedic appliances
  
- ▶ Avoid the early use of aggressive, irreversible and complex treatments
  - ▶ Complex occlusal therapy
  - ▶ Surgery





ADA American Dental Association®

America's leading advocate for oral health

- ▶ “Initially the dentist should select the least invasive and most reversible therapy that may ameliorate the patient's pain and/or functional impairment.”
- ▶ “Before restorative and/or occlusal therapy is performed, the dentist should attempt to reduce, through the use of reversible modalities, the neuromuscular, myofascial and temporomandibular joint symptoms.”

# Conservative therapy

- ▶ Apfelberg DB et al. 1979: 90 patients with TMD followed over 10 years.
- ▶ 64 treated with conservative therapy alone.
- ▶ Conservative therapy included: jaw rest, heat application, analgesics, and anti-inflammatory medication
- ▶ 90% had symptom relief.

# Conservative Therapy

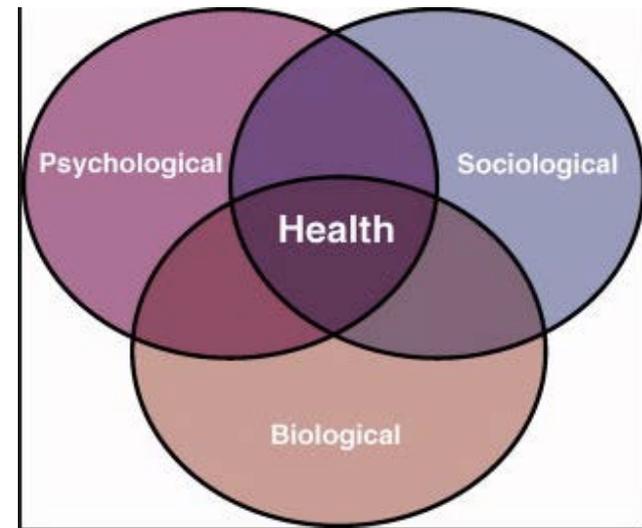
- ▶ Okeson & Hayes 1986: 110 patients surveyed 2-8.5 years later, after receiving treatment for TMD.
- ▶ Types of treatment received:
  - ▶ Occlusal splint
  - ▶ Relaxation therapy
  - ▶ Diazepam before bedtime
  - ▶ Limited, selective grinding of the teeth
- ▶ 85.5% reported complete pain relief or much less pain.
- ▶ 79.1% reported tx received was completely or considerably helpful.

# Conservative Therapy

- ▶ Oyetola EO et al. 2017: 55 patients presented to a University-based teaching hospital in Nigeria over 1 year
- ▶ All patients experienced pain in the TMJ
- ▶ Other signs: clicking, jaw deviation, attrition, limited mouth opening
- ▶ 6 weeks of conservative therapy was successful

# Create a problem list

- ▶ Identify perpetuating contributing factors
  - ▶ Parafunctional habits
  - ▶ Trauma
  - ▶ Anatomic relationships
  - ▶ Pathophysiologic conditions
  - ▶ Psychosocial conditions



# 17 yo female presenting with jaw pain and clicking

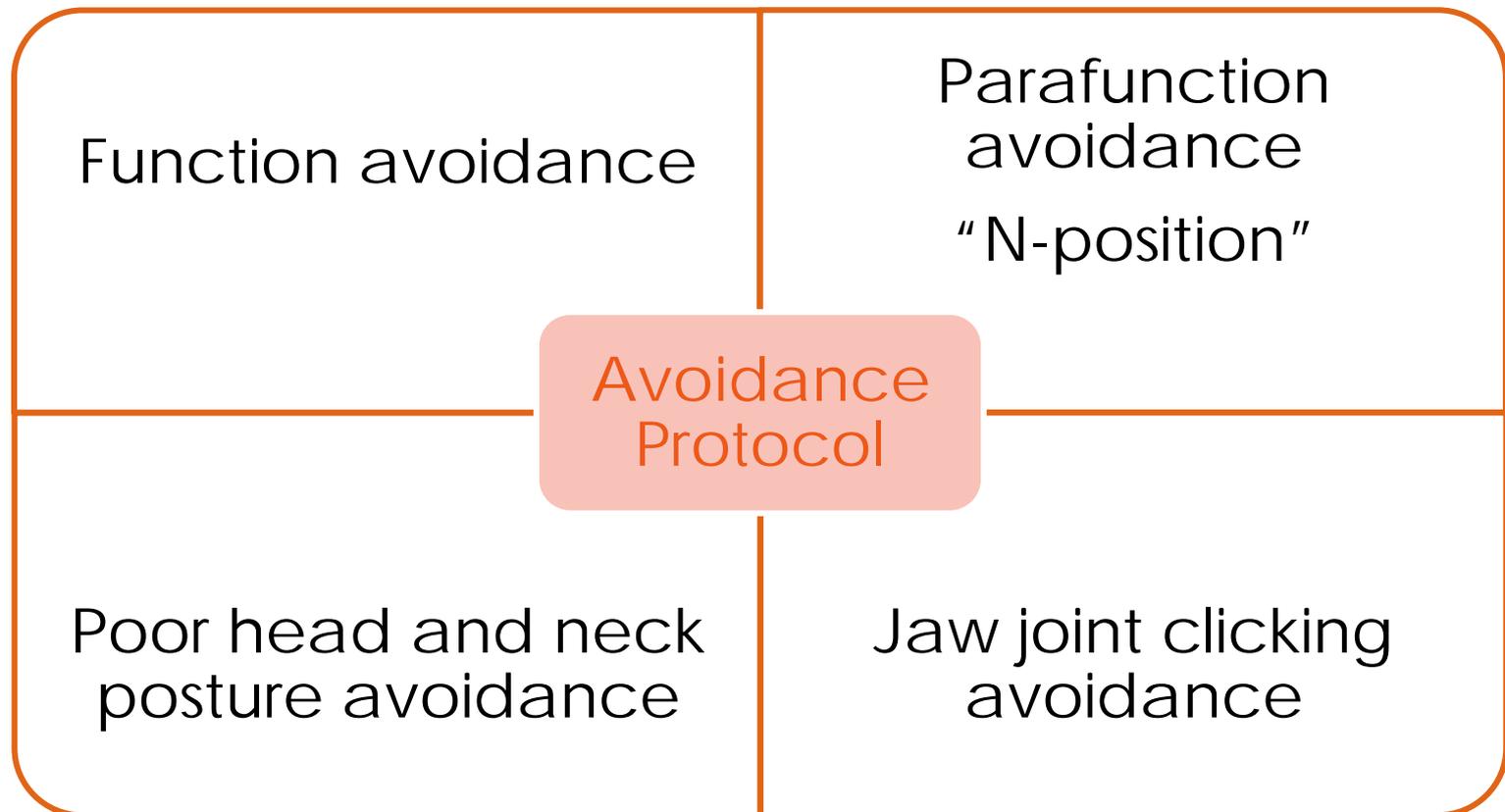
Onset	2 months ago
Location	Right and left TMJs
Quality	Sharp pain
Frequency	Daily
Attack duration	5 minutes
Severity	6/10
Ameliorating factors	Keeping the mouth closed
Exacerbating factors	Chewing
Associated symptoms	Jaw muscles are also sore

# Treatment Protocols: Differentiate Simple and Complex cases

## “Myofascial Protocol”

Education	Identify and avoid harmful activities to the jaw	Increase local blood flow in the painful muscles	Stretch stiff and painful muscles	Encourage a daily, non-impact exercise program
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# General Treatment Protocols



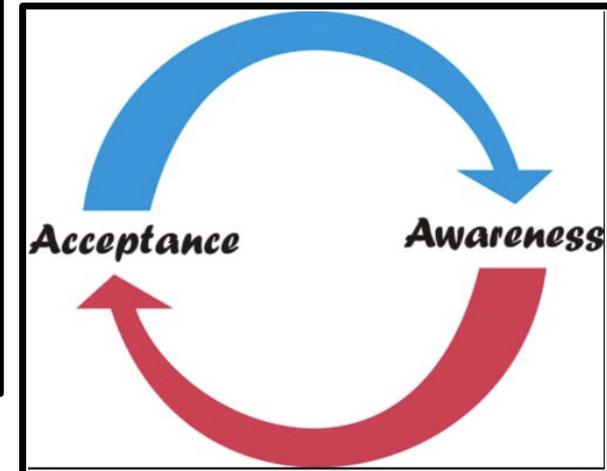
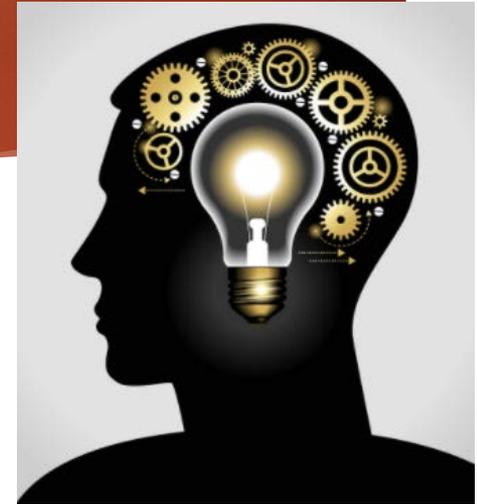
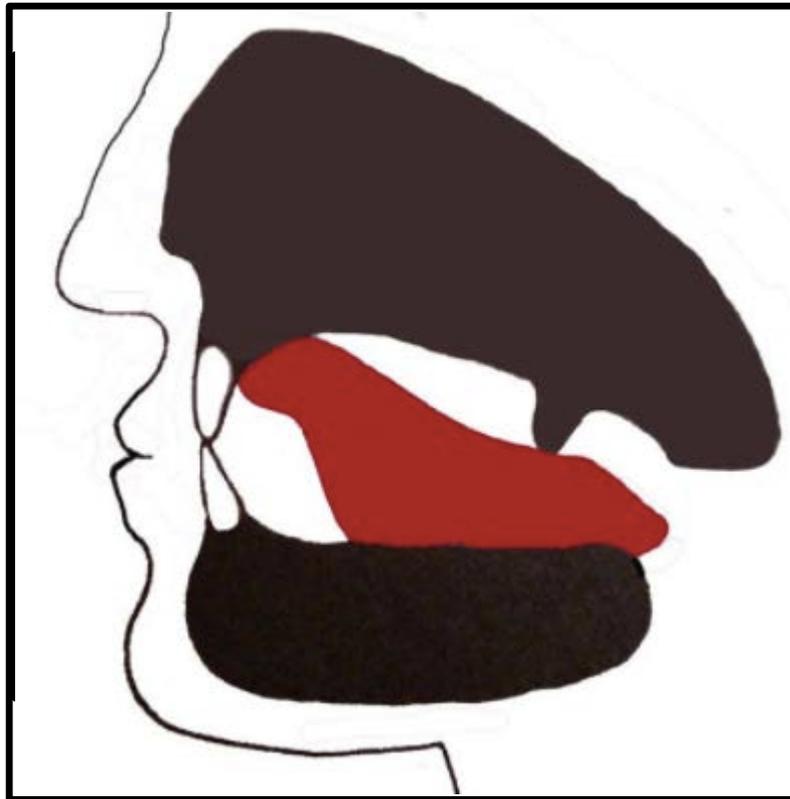
# Function avoidance

Strict avoidance of clicking or crunching the jaw

Do NOT open the jaws wide while chewing and talking

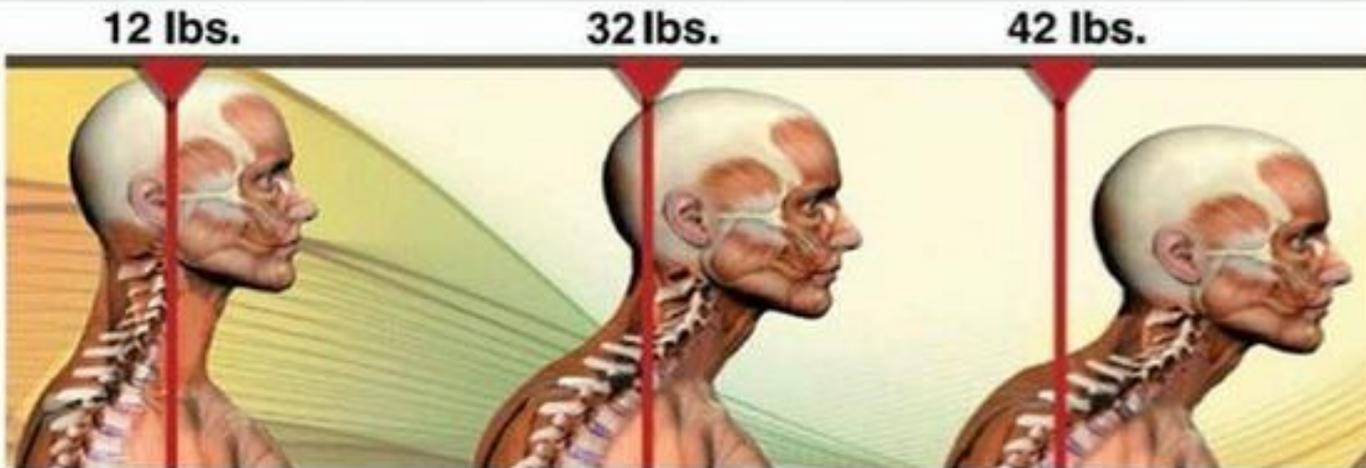
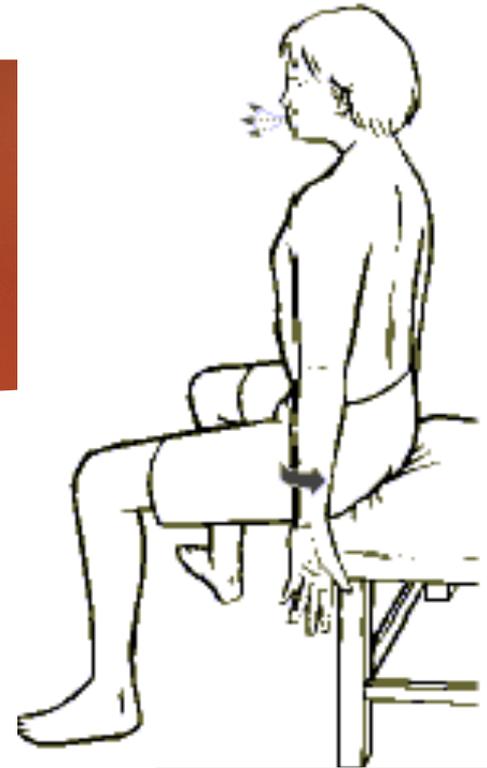
Limit this to 2-3 times per day.

# Parafunction avoidance



# Posture

- ▶ Teach the patient what appropriate posture is
- ▶ Shoulders back and down
- ▶ Stomach in

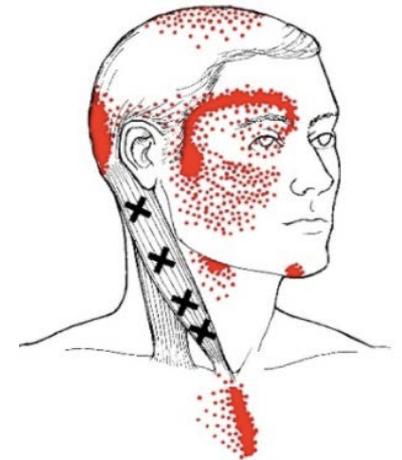


Who do you think has the worst postural habits?



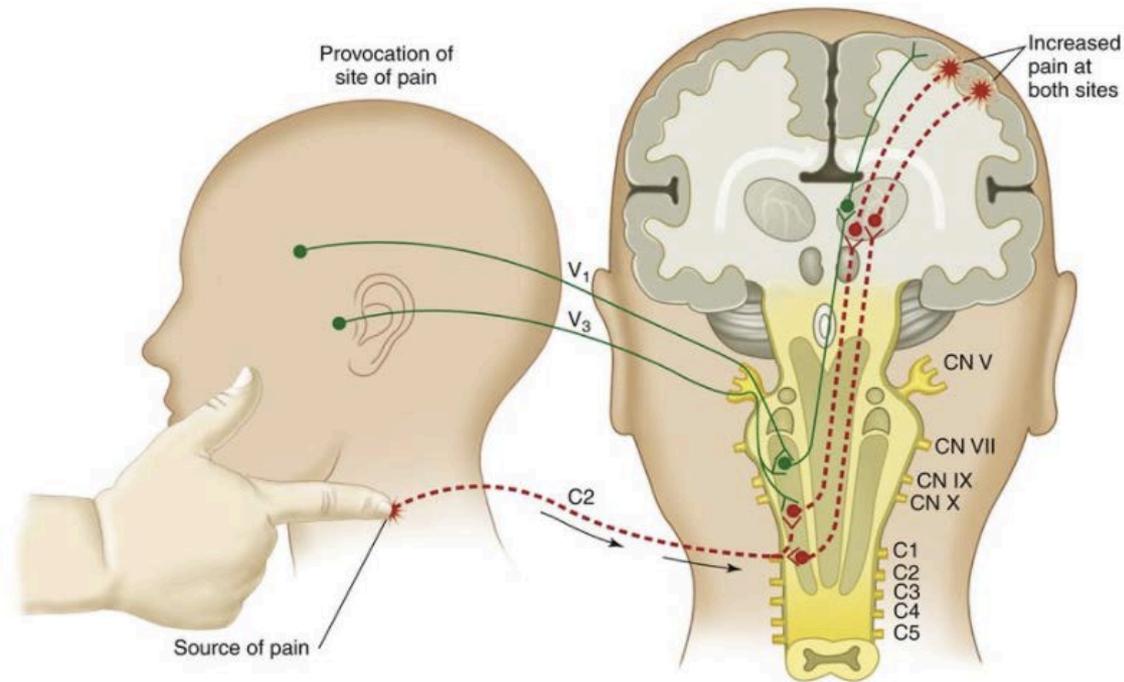
# Why should appropriate neck posture be emphasized?

- ▶ 52 year-old woman with chronic neck pain, headaches, jaw pain, sinus pain, facial pain
- ▶ 1) Headaches: throbbing pain, once a month, associates with sinus infection
- ▶ 2) Neck pain: associated with headache and sinus infection
- ▶ 3) Ear pain, pressure, fullness



# Relationship between the neck and masticatory muscles

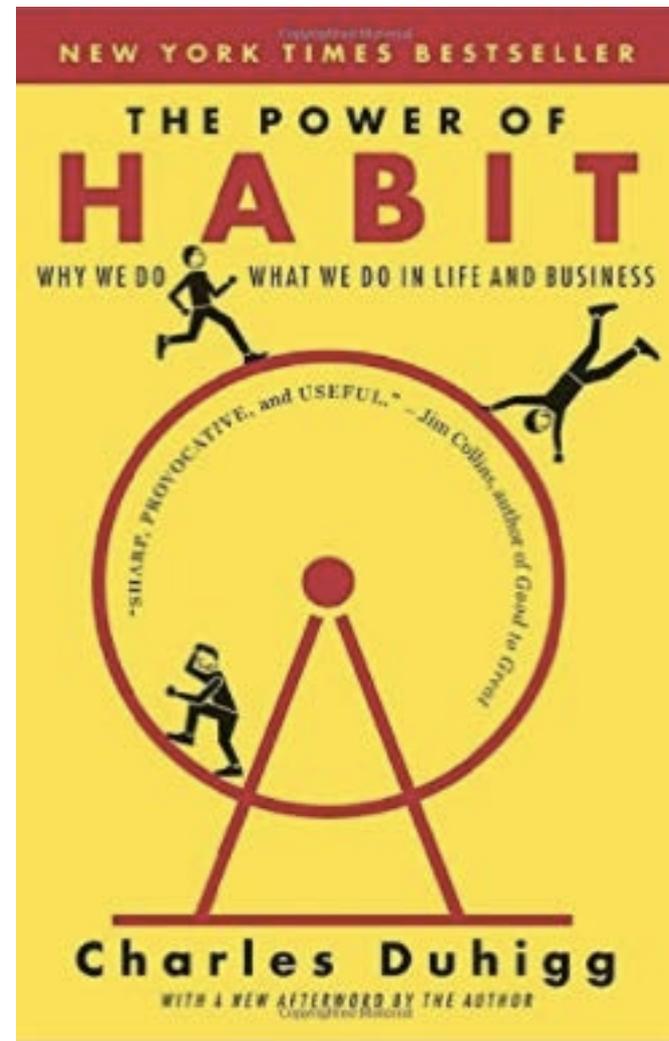
- ▶ 1) Afferent input from cervical structures converges on trigeminal motor neurons in the trigeminal brainstem complex
- ▶ 2) Masticatory muscles contract when cervical muscles contract (co-contraction)



# Other habit avoidance



“Belief is a critical element of such a change...”



# General Treatment Protocol

## ▶ Thermal therapy

- ▶ Increases blood flow, relaxes muscles
- ▶ A) Hot bath/shower therapy: 3 times per week for 3 weeks
- ▶ B) Local hot pack therapy: 20 minutes up to 3 times per day
- ▶ C) Ice pack therapy



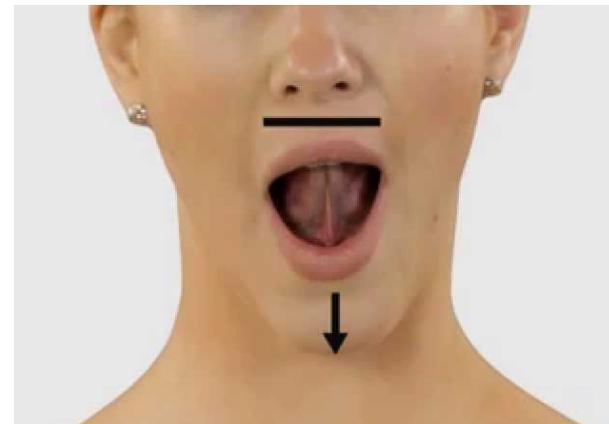
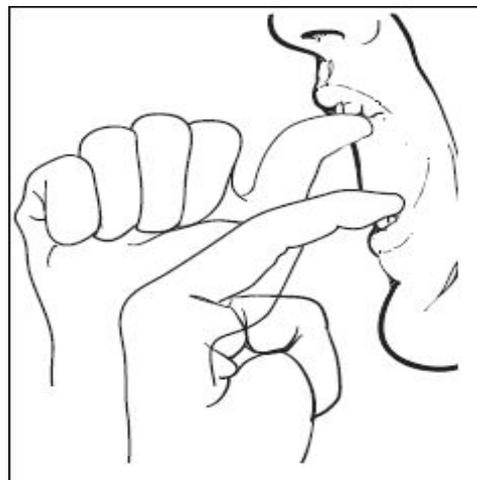
# Myofascial stretching

- ▶ A) "N-stretch", Passive jaw stretch
- ▶ Hold each stretch for 6 seconds, repeat 6 stretch 6 times, repeat all of this every 2 hours

- ▶ B) "Chin-chest" stretch
- ▶ Hold each stretch for 6 seconds, repeat 6 stretch 6 times, repeat all of this every 2 hours

- C) Exercise therapy

# Myofascial stretching



# Limitations

- ▶ Compliance
- ▶ Adherence
- ▶ Long-term follow-up

# 18 yo female presents with jaw pain and jaw clicking

- ▶ 1) Implement the myofascial protocol:
  - ▶ Demonstrate N-position
  - ▶ Demonstrate N-stretch
  - ▶ Guided opening exercise
- ▶ 2) Implement the avoidance protocol:
  - ▶ Avoidance of clicking
  - ▶ Soft-food diet
- ▶ 2 week follow-up: 90% resolution of the clicking noise and 100% resolution of the pain

# Myogenous Disorders

1. MYALGIA/  
MYOFASCIAL PAIN
2. TENDONITIS
3. MYOSITIS/TRISMUS

# 40 yo female presents with pain

- ▶ 1) Jaw pain
- ▶ 2) Neck pain
- ▶ 3) Headaches

Onset	15 years ago
Location	Masseters, back of head, neck
Quality	Severe ache
Frequency	Daily
Attack duration	Constant
Severity	5/10
Ameliorating factors	Flexeril, acupuncture, sleep, rest
Exacerbating factors	Any jaw function

# Exam

## Palpations

Upper trap R	1
Upper trap L	2 (refers upwards)
Lateral capsule R	2
Lateral capsule L	1
Dorsal capsule R	3
Dorsal capsule L	3
Superficial masseter R	1
Superficial masseter L	2 (refers around the area)
Temporalis Tendon R	0
Temporalis Tendon L	0

# Range of Motion

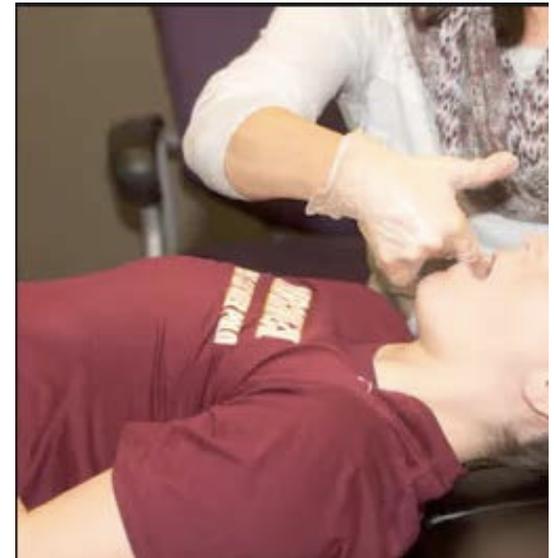
- ▶ Pain-free Opening: 34 mm
- ▶ Passive Opening: 37mm with no pain, soft-end feel
- ▶ RT Laterotrusive: 11 mm
- ▶ LFT Laterotrusive: 10 mm
- ▶ Opening Path: straight
- ▶ TMJ noise: none detected

# 1. Patient education and self-management

- ▶ A. Myofascial protocol
- ▶ B. Avoidance protocol
- ▶ C. Myofascial stretching
- ▶ D. Daily exercises

## 2. Physical therapy

- ▶ Relieve musculoskeletal pain and restore normal function
- ▶ Reduce inflammation
- ▶ Strengthen muscle activity
- ▶ Promote the repair and regeneration of tissues



# The effectiveness of physiotherapy in the management of TMD: A systematic review and meta-analysis

Paco M, Peleteri B, Duarte J et al. J Orofacial Pain Headache. 2016; 30(3): 210-220.

Inclusion: RCTs assessing effects of physiotherapy regardless of blinding

Participants: Diagnosis of TMD

Types of Interventions: PT-manual therapy, dry needling, exercise

Outcomes assessed: pain and/or mandibular function

Various pain scales used; pre- and post-tx scores assessed

# The effectiveness of physiotherapy in the management of TMD: A systematic review and meta-analysis

Types of disorders:

1 study: disc displacement with and w/o limitations of mouth opening

4 studies: muscle disorders

1 study: disc displacement with reduction + muscle disorders

Treatment: ranged from 1 day to 6 weeks (mean: 5 weeks)

1 study: Dry needling only

PT sessions: 9-15 treatments

Manual therapy

# The effectiveness of physiotherapy in the management of TMD: A systematic review and meta-analysis

## Results:

- 1) Carmeli et al 2001: mobilization exercises vs. soft flat plane splint; dx: anteriorly displaced discs; conclusions: exercises are more effective than splint
- 2) Craane et al 2012: PT vs. control; ADD with reduction; conclusion: no differences between groups
- 3) Craane et al 2012: PT vs. control; masticatory muscle pain; no significant differences between groups except elevated PPT for masseter and temporalis in treatment groups
- 4) Kalamir et al 2012: myofascial therapy (IMT), IMT + self-care, vs. no treatment; chronic myogenous TMD; no differences in ROM; lower pain scores in both tx groups vs. control; IMT + self-care had more improvement by 1 year

# The effectiveness of physiotherapy in the management of TMD: A systematic review and meta-analysis

## Results:

5) Kalamir et al. 2013: short-term effects of self care vs. myofascial therapy; chronic myogenous TMD; differences pain scores were statistically significant but not clinically significant

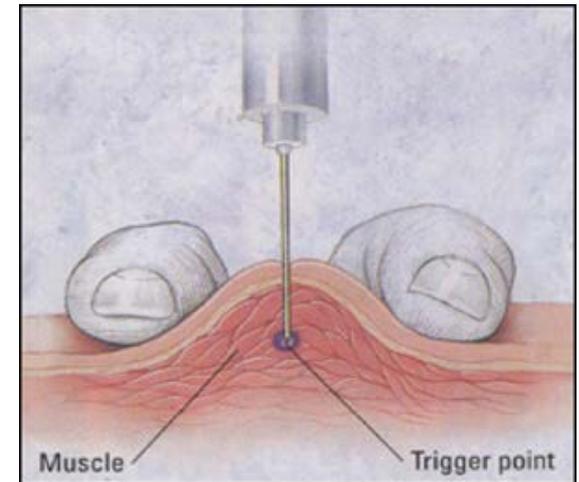
6) Tuncer et al 2013: manual therapy + home therapy vs. home therapy alone; TMD; combination therapy was more effective

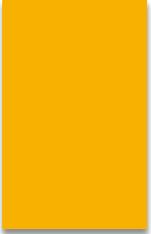
7) Fernández-Carnero et al 2010: Dry needling in the masseter; myofascial TMD; dry needling group showed improvement in pain and ROM compared to placebo

### 3. Office-based myofascial physical medicine procedures

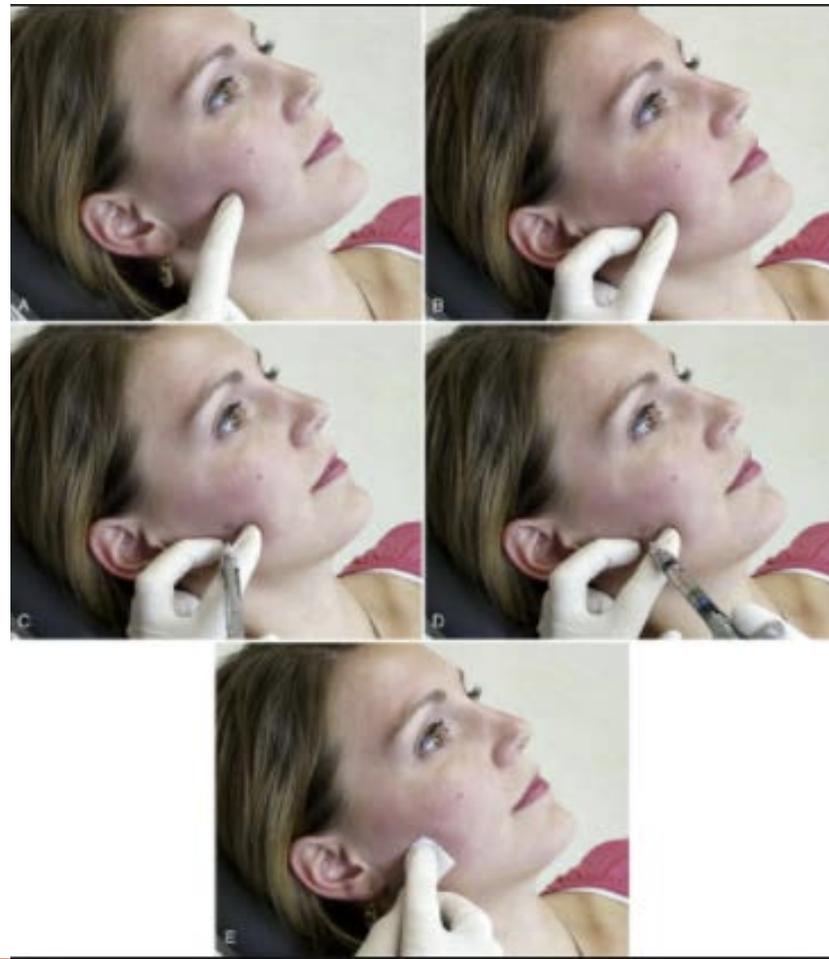


- ▶ A) Vapocoolant assisted myofascial stretching
- ▶ B) Trigger-point injection assisted stretching





# Trigger point injections



## 4. Occlusal appliances

- ▶ Primary indication:
  - ▶ Moderate levels of attrition
  - ▶ Cheek ridging
  - ▶ Moderate, bilateral tenderness upon palpation of the jaw closer muscles

# Occlusal appliance: what?

- ▶ 1. Full coverage vs. partial coverage
- ▶ 2. Repositioning vs. non-repositioning
- ▶ 3. One arch vs. double arch

# Occlusal appliances: what?

- ▶ Full arch, hard, acrylic stabilization splint
  - ▶ Maxillary arch
  - ▶ Mandibular arch
- ▶ Non-repositioning
- ▶ One arch



Serves as a behavioral changing device that makes the patient aware of any oral parafunction

# Full-arch Stabilization appliance

- ▶ Posterior teeth contact the splint evenly and simultaneously
- ▶ Anterior/canine guidance
- ▶ When upright, the posterior tooth contacts should be more prominent than the anterior tooth contacts



Okeson, Jeffrey P. *Management of Temporomandibular Disorders and Occlusion*, 7th Edition. Mosby, 052012.

VitalBook file.  
Kreiner M, Betancor E, Clark GT. Occlusal stabilization appliances. Evidence of their efficacy. *J Am Dent Assoc.* 2001;132(6):770-777.

# Occlusal appliances: What?

- ▶ Partial coverage devices
  - ▶ Anterior bite plane devices
  - ▶ Posterior coverage only



# Occlusal appliances: When?

- ▶ When should occlusal appliances be worn?
  - ▶ 1. Night-time
  - vs.
  - ▶ 2. Day-time

# Occlusal appliances: WHY?

- ▶ 1) Protect teeth from further attrition ✨
- ▶ 2) Reduce pressure on sore teeth ✨
- ▶ 3) Maybe change the patient's parafunctional habits ✨
- ▶ 4) Provide a stable occlusion for patients missing bilateral, posterior tooth contacts ✨
- ▶ 5) Reduce clenching-induced ear ache ✨
- ▶ 6) Reduce joint loading
- ▶ 7) Reduce painful clicking and/or episodic locking

# Occlusal appliances: limitations

- ▶ Full-arch stabilization splint:
  - ▶ Few clench more on the appliance
  - ▶ Bite change
  - ▶ Effect may be short-lived
  - ▶ Some may lock in the setting of anterior disc displacement with reduction
- ▶ Partial coverage device:
  - ▶ Bite change
  - ▶ May increase joint pain
- ▶ Mandibular repositioning splint
  - ▶ Bite change



# Splint-induced malocclusion

- ▶ 29 yo m  
inability
- ▶ Symptoms
- ▶ Reports
- ▶ 1 year  
his dentist (partial coverage splint)



# Stabilization appliances: Evidence

- ▶ Overall, the data consistently suggest that occlusal appliances impact symptom level far more than “tincture of time”
- ▶ They have similar efficacy to other forms of pain relieving therapy
- ▶ Studies measuring masseter activity during sleep suggest at least a short-term change in clenching/bruxism with oral appliance of any type
- ▶ Data do not support one method over another for initial management

# Does bruxism have to stop or be modified in order to have pain relief?

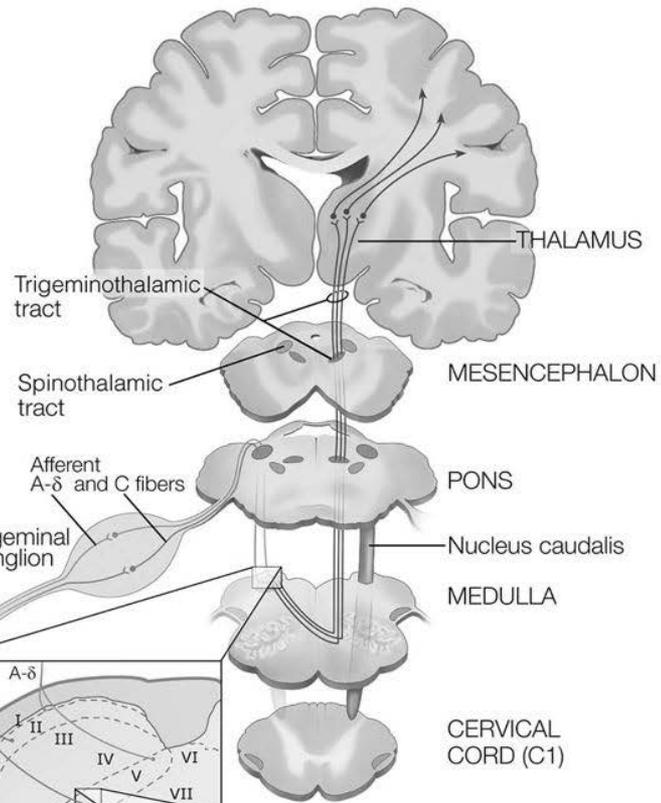
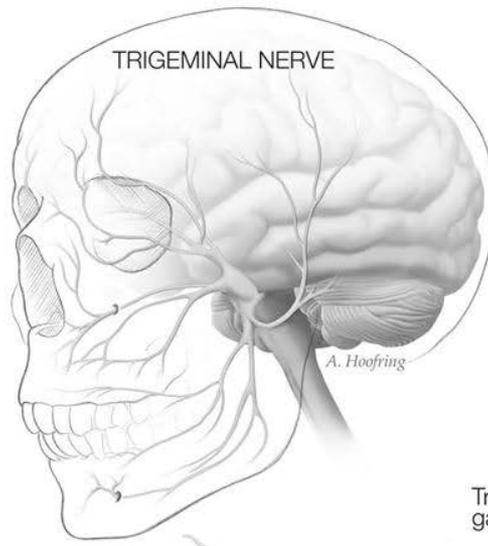
- ▶ The therapeutic value of the appliance is NOT dependent on whether it “stops” bruxism
- ▶ 88% of patients wearing a stabilization appliance showed wear patterns on the appliance, but still had pain relief (over a 10-week period)
- ▶ No appliance will stop bruxism behavior

# Partial coverage appliances: evidence

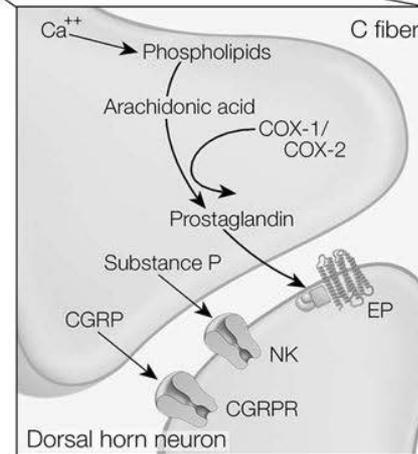
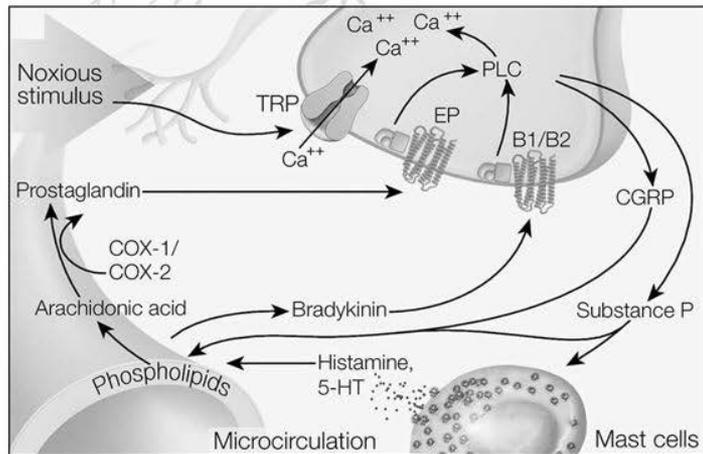
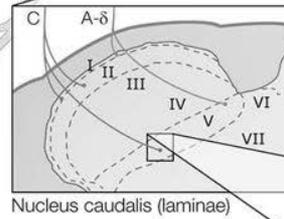
- ▶ Very little clinical trial data on the efficacy of partial coverage devices
- ▶ Patients have improved more with a stabilization splint vs. an anterior bite plane device (small study)
- ▶ Is the NTI more effective than a stabilization splint?

## 5. Pharmacologic therapy

- ▶ It is critical to understand pain mechanisms in order to select the most appropriate medication for the condition you are treating.
- ▶ Ensure the diagnosis is correct.
- ▶ Let's review.



Noxious stimulus



## 5. Pharmacologic therapy: Topical Medications

- 1) Voltaren gel 1%
  - 2) Ketoprofen 20% in PLO or Lipoderm (compounded)
  - 3) Lidocaine 5% patch
- Indications: acute TMJ capsulitis/synovitis, arthritis, myogenous pain

## 5. Pharmacologic Therapy: Systemic Medication

- ▶ Muscle relaxants
  - **Indications: acute, masticatory muscle spasm**
    - ▶ Cyclobenzaprine: 10-30 mg po before sleep
    - ▶ Baclofen 10 mg, 5 mg TID (up to 80 mg/day)
    - ▶ Metaxalone: 800 mg TID-QID (max 3200 mg/day)
    - ▶ Methocarbamol: 500-1000 mg QID
    - ▶ Tizanidine: 4 mg hs (max 24 mg/day)
    - ▶ Carisoprodol: 350 mg TID

## 5. Pharmacologic Therapy: Systemic Medication

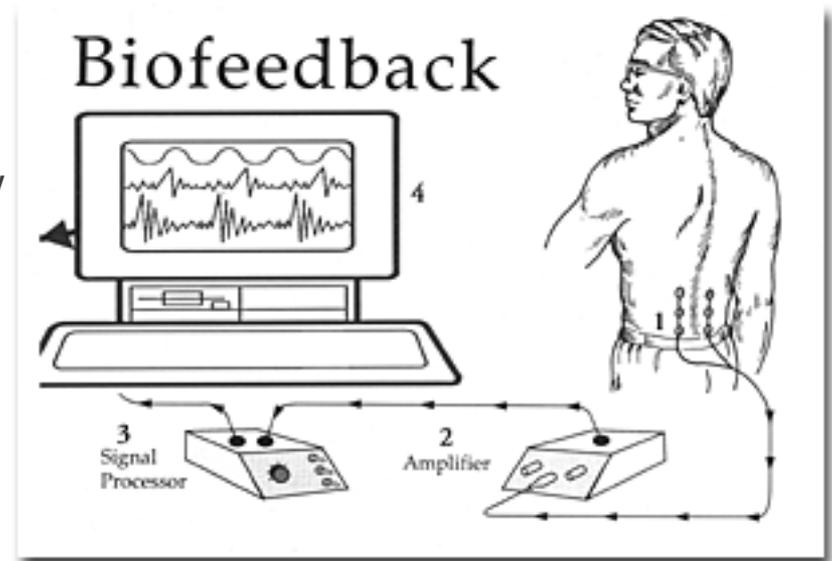
- ▶ Benzodiazepines
- ▶ Indications: Acute pain due to bruxism (short-term only, 1-2 weeks), musculoskeletal pain
- ▶ Contraindicated in patients with depression prior to therapy
  - ▶ Diazepam 2-10 mg tid to qid
  - ▶ Clonazepam Start 0.5 mg tid; increase slowly to maximum of 15 mg/day
  - ▶ Alprazolam 0.25 - 0.5 mg bid or tid; maximum is 4 mg/day

## 5. Pharmacologic Therapy: Systemic Medication

- ▶ Adjuvant analgesics: Serotonin modulators (TCA's, SNRI's)
- ▶ Indications: chronic myofascial or neuropathic pain; chronic TMJ capsulitis/synovitis or arthritis that has not responded to previous medications and conservative therapy
  - ▶ Amitriptyline, nortriptyline: 10-30 mg/day, taken hs; titrate up to 40 mg/day
  - ▶ Desipramine: 10-25 mg hs, up to 50 mg/day
  - ▶ Duloxetine: 30 mg/day; titrate up to 60 mg/day
  - ▶ Venlafaxine: 37.5 mg/day up to 225 mg/day

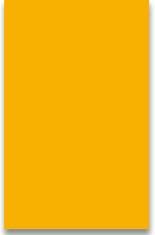
## 6. Psychological therapy/pain counseling

- ▶ A) Behavioral therapy
- ▶ B) Cognitive-behavioral therapy
- ▶ C) Relaxation therapy
  - ▶ EMG Biofeedback
- ▶ D) Stress management program



# Behavioral therapy

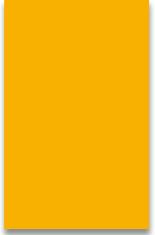
- ▶ Pain Diary/Exercises Program
- ▶ Increased Circulation Program
- ▶ Identify and Reduce Triggers
- ▶ Chronic Pain Self-Help Bk/CD
- ▶ Psychometric Assessment
- ▶ Pain Management/Rx Contracts
- ▶ Referral and Follow-up



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Pain Stress Diary	Pain Level	Medication Stretching Exercises Heat/Ice	Stress Level	Quite (read, TV) Eat Exercises, Work
TIME	0-10	Indicate:	0-10	Principal Activity
8:00~9:00				
9:00~10:00				
10:00~11:00				
11:00~12:00				
12:00~1:00				
1:00~2:00				
2:00~3:00				
3:00~4:00				
4:00~5:00				
5:00~6:00				
6:00~7:00				
7:00~8:00				
8:00~9:00				
9:00~10:00				
10:00~11:00				

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- 6 YOGA POSES -  
TO TREAT **TMJ** PAIN



**DIAPHRAGMATIC BREATHING:**

1. Sit in a relaxed position, hands on stomach.
2. Breathe in through your nose, feel hands move out.
3. Breathe out twice as long through pursed lips, feel hands move in.
4. Perform 10 breaths (repeat hourly)



## Create a list of goals

**My specific goals are: (check appropriate boxes)**

**To reduce pain intensity and frequency.**

**To regain control over my pain.**

**To eliminate my current medications.**

**To control my headaches.**

**To sleep better.**

**To improve my posture.**

**To decrease pain and improve function.**

**To increase my neck mobility.**

**To return to work.**

**To increase my ability to experience the pleasures of life.**

# Case: Summary

1) Myofascial protocol and Avoidance Protocol

2) Spray and Stretch

3) Physical Therapy

4) Trigger point injections

5) Occlusal stabilization splint

6) Pharmacotherapy:  
cyclobenzaprine 5 mg hs

# Internal Derangements

1. DISC DISPLACEMENT WITH REDUCTION
2. DISC DISPLACEMENT WITH REDUCTION, WITH INTERMITTENT LOCKING
3. DISC DISPLACEMENT WITHOUT REDUCTION, WITH LIMITED OPENING
4. DISC DISPLACEMENT WITHOUT REDUCTION, WITHOUT LIMITED OPENING

# 15 yo girl presents with a painful click in the right jaw

- ▶ Jaw pain
- ▶ Jaw clicking

Onset	2 months ago
Location	Right joint
Quality	Sharp initially, then lingers to a dull ache
Frequency	Daily
Attack duration	Intermittent
Severity	8/10
Ameliorating factors	Keeping the jaw at rest
Exacerbating factors	Any jaw function

# Exam

## Palpations

Upper trap R

1

Upper trap L

1

Lateral capsule R

3

Lateral capsule L

1

Dorsal capsule R

3

Dorsal capsule L

1

Superficial masseter R

2

Superficial masseter L

1

Temporalis Tendon R

0

Temporalis Tendon L

0

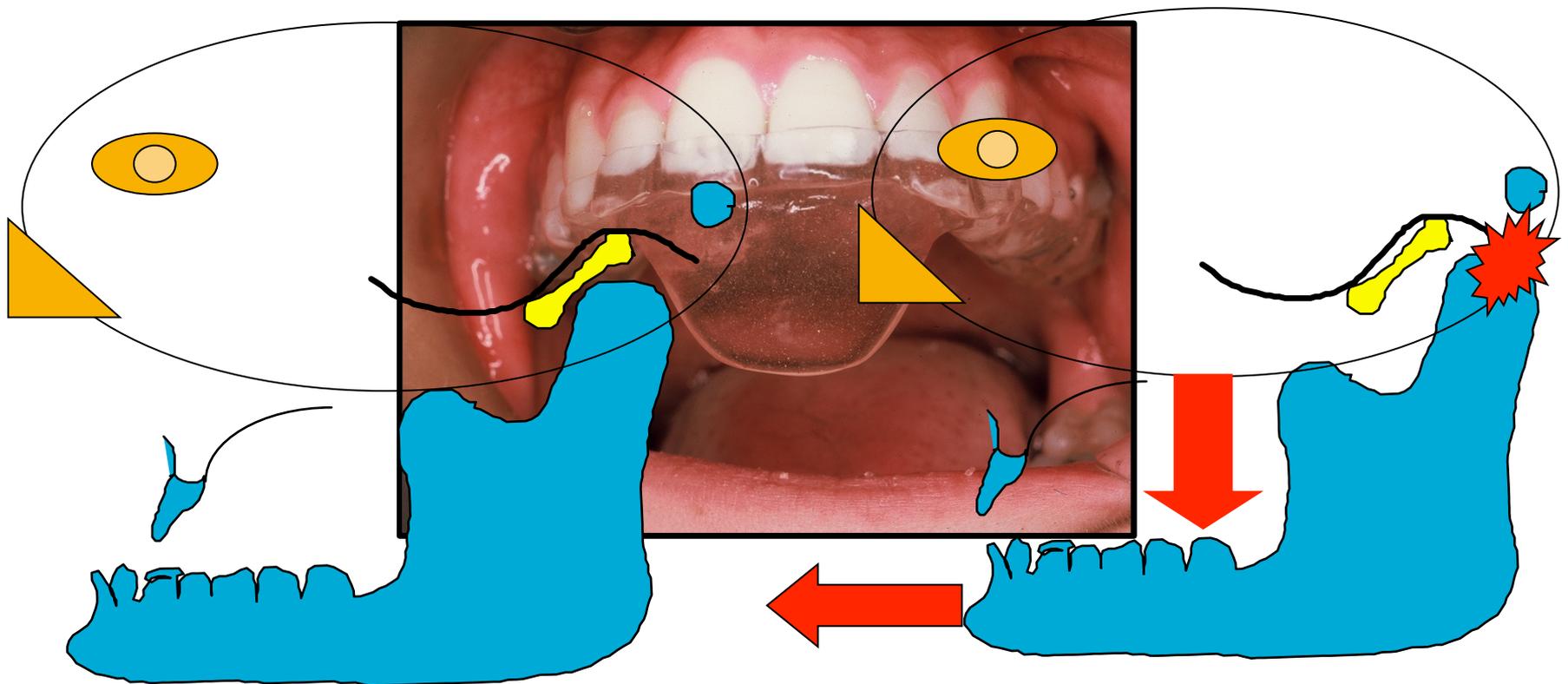
# Range of Motion

- ▶ Pain-free Opening: 25 mm
- ▶ Passive Opening: 40mm with pain on the right TMJ
- ▶ RT Laterotrusive: 12 mm
- ▶ LFT Laterotrusive: 13 mm
- ▶ Opening Path: deviates to the right upon opening
- ▶ TMJ noise: mid-opening click (able to reduce with anterior repositioning)

# Disc Displacement with Reduction

- ▶ 1) Is it painful?
- ▶ 2) Is it avoidable?
- ▶ Start with the avoidance and myofascial protocols.

# 1. Occlusal Appliance: Anterior Repositioning Splint



# 1. Occlusal appliances: Stabilization Splint

- ▶ Full arch, hard, acrylic stabilization splint
  - ▶ Maxillary arch
  - ▶ Mandibular arch
- ▶ Non-repositioning
- ▶ One arch



Serves as a behavioral changing device that makes the patient aware of any oral parafunction

# Occlusal appliances: WHY?

- ▶ 1) Protect teeth from further attrition
- ▶ 2) Reduce pressure on sore teeth
- ▶ 3) Maybe change the patient's parafunctional habits
- ▶ 4) Provide a stable occlusion for patients missing bilateral, posterior tooth contacts
- ▶ 5) Reduce clenching-induced ear ache
- ▶ 6) Reduce joint loading
- ▶ 7) Reduce painful clicking and/or episodic locking



## 2. Pharmacologic Therapy: Topical Medication

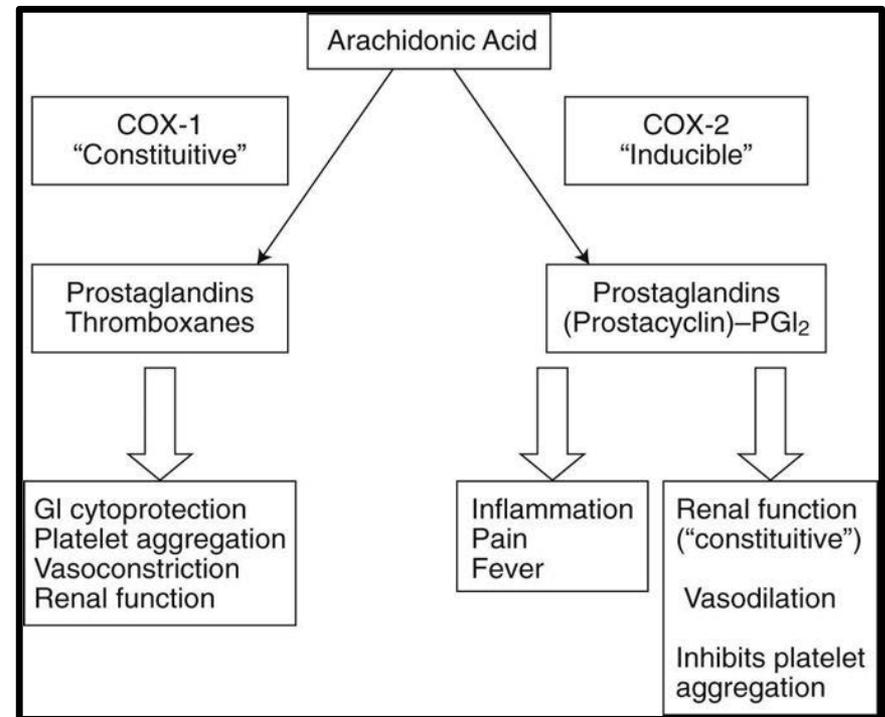
- 1) Voltaren gel 1%
  - 2) Ketoprofen 20% in PLO or Lipoderm (compounded)
  - 3) Lidocaine 5% patch
- Indications: acute TMJ capsulitis/synovitis, arthritis, myogenous pain

## 2. Pharmacologic Therapy: Systemic Medication

- ▶ NSAIDs: non-selective vs. selective
  - Indications: acute TMJ capsulitis/synovitis, arthritis, myogenous pain
- ▶ Non-selective
  - ▶ Ibuprofen: 600 mg QID (max: 3200 mg/day)
  - ▶ Nabumetone: 500 mg BID (max: 2000 mg/day)
  - ▶ Naproxen: 500 mg BID (max: 1500 mg/day)
  - ▶ Diclofenac: 25-50 mg q 6-8 hours (max of 150 mg/day)
  - ▶ Ketoprofen: 25-50 mg tid to qid (max is 300 mg/day)
  - ▶ Etodolac: 200-300 mg tid (max of 1200 mg/day)

# NSAIDs

- ▶ Analgesic
- ▶ Anti-pyretic
- ▶ CNS effects: reduce secondary hyperalgesia

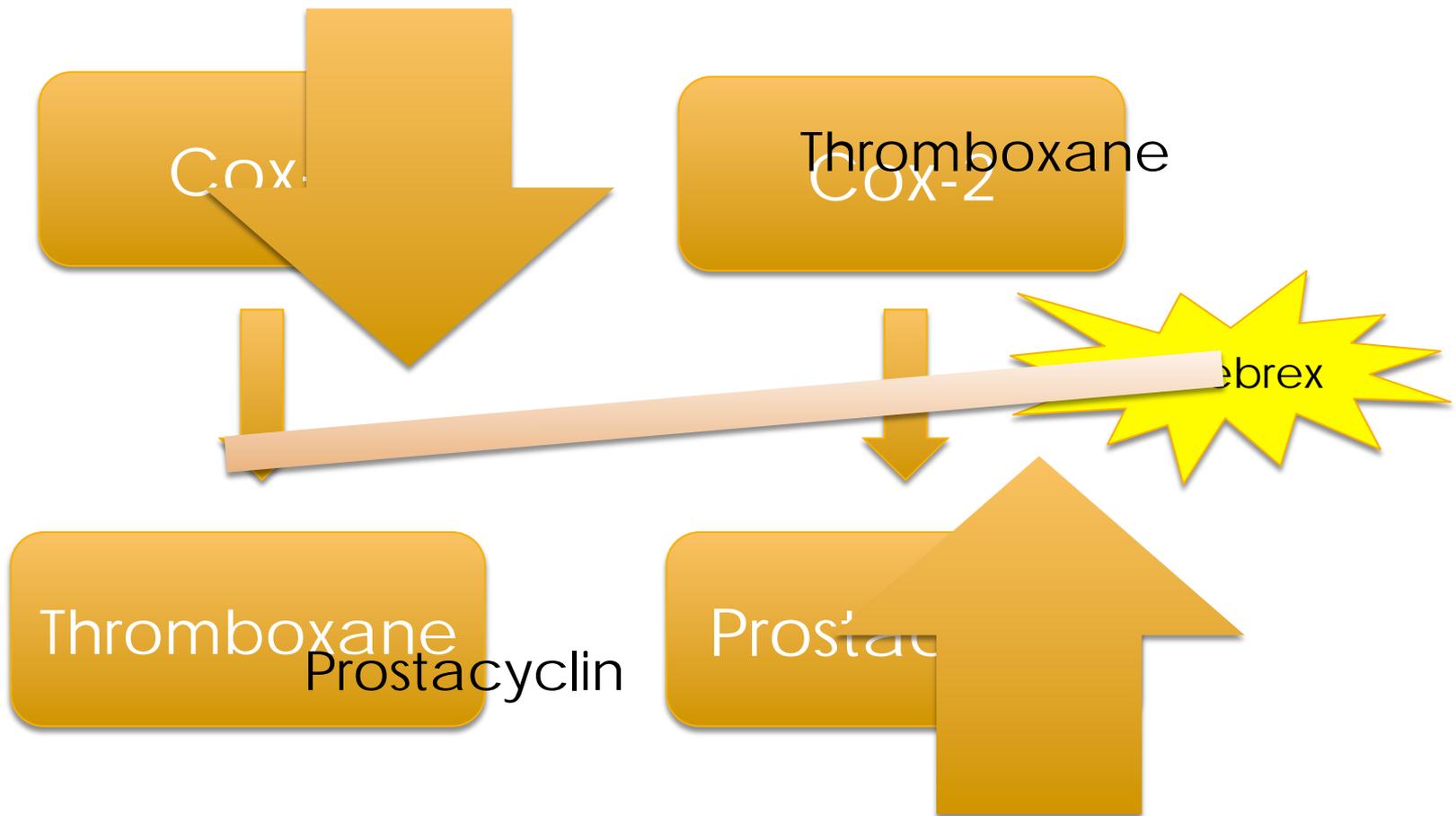


Hersh EV, Lally ET, Moore PA: Update on cyclooxygenase inhibitors: has a third COX isoform entered the fray? *Curr Med Res Opin* 21:1217-1226, 2005

## 2. Pharmacologic Therapy: Systemic Medication

- ▶ COX-2 inhibitors
  - ▶ Celebrex: 200 mg QD (max: 400 mg/day)
  - ▶ \*Meloxicam: 7.5 mg QD (max: 15 mg/day)
  - ▶ \*Etodolac: 300-500 mg BID (max: 1200 mg/day)
- ▶ Acetaminophen
  - ▶ Start 650 mg qid; increase to 4000 mg/day

# Cox-2 inhibitors and cardiovascular events: Why?



# Adverse effects

- ▶ NSAIDs
  - ▶ GI disturbances: dyspepsia, diarrhea, abdominal pain, ulceration, bleeding, perforation
  - ▶ May add sucralfate, cimetidine, ranitidine, misoprostol
  - ▶ Kidney dysfunction
  - ▶ May decrease effect of anti-hypertensives: diuretics, beta-blockers, adrenergic (take NSAID for 4 days or less)
- ▶ Acetaminophen:
  - ▶ Elevated bilirubin and alkaline phosphatase, liver toxicity, skin reaction, hypertension

# Intra-articular Injection



- ▶ Hyaluronic acid injections
  - ▶ Synvisc
  - ▶ Hyalgan
  - ▶ 3-4 series of injections, one month apart for each

## 2. Disc Displacement with reduction, with intermittent locking

- ▶ 1. Myofascial and avoidance protocols
- ▶ 2. Myofascial stretching: guided opening (rotation) exercises
- ▶ 3. Anterior repositioning splint
- ▶ 4. Pharmacotherapy: NSAIDs, acetaminophen
- ▶ 5. Intra-articular injection with hyaluronic acid

# 25 yo girl presents with a pain in the right jaw and limited opening

## ▶ Jaw pain

Onset	1 month ago
Location	Left joint
Quality	Sharp with movement, otherwise a constant ache
Frequency	Daily
Attack duration	Constant
Severity	8/10 when opening wide or chewing; 3/10 at rest
Ameliorating factors	Keeping the jaw at rest
Exacerbating factors	Any jaw function

# Exam

## Palpations

Upper trap R

1

Upper trap L

1

Lateral capsule R

1

Lateral capsule L

3

Dorsal capsule R

1

Dorsal capsule L

3

Superficial masseter R

3

Superficial masseter L

1

Temporalis Tendon R

2

Temporalis Tendon L

0

# Range of Motion

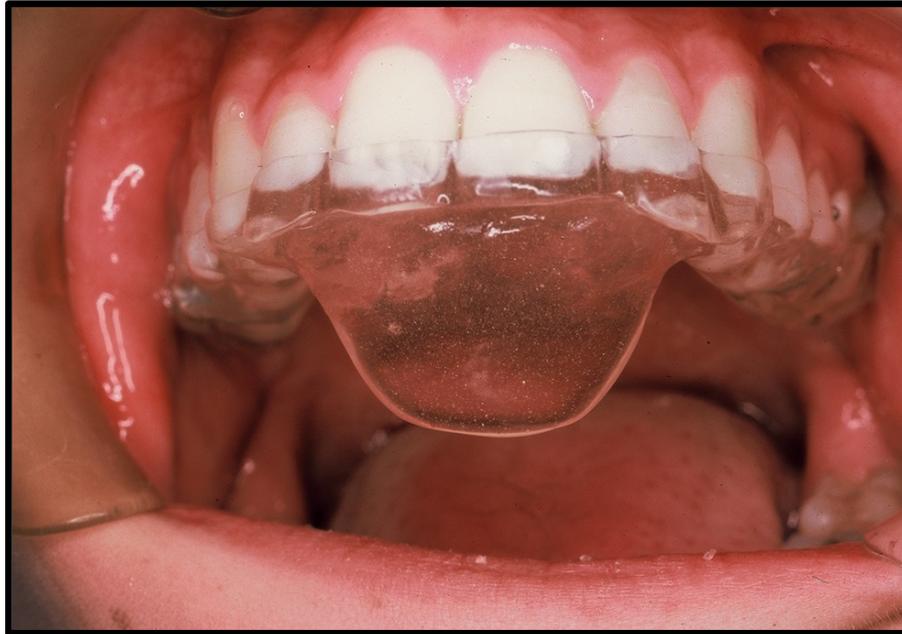
- ▶ Pain-free Opening: 20 mm
- ▶ Passive Opening: 42mm with pain on the left TMJ, hard-end feel
- ▶ RT Laterotrusive: 10 mm
- ▶ LFT Laterotrusive: 4 mm
- ▶ Opening Path: deflects to the left
- ▶ TMJ noise: none

### 3. Internal Derangement Without Reduction, With Limited Opening

- ▶ 1. Self-applied physical therapy with medication
- ▶ 2. Joint injection with anesthetic and steroid followed by manual mobilization
- ▶ 3. Sedation plus arthrocentesis of the joint followed by manual mobilization
- ▶ 4. Arthroscopic surgical intervention for mobilization



# Occlusal appliance?



# Intra-articular injection and mobilization



- ▶ Hyaluronic acid injections
  - ▶ Synvisc
  - ▶ Hyalgan

## 4. Internal Derangement without reduction, without limited opening

- ▶ 1) Myofascial and avoidance protocols
- ▶ 2) Pharmacologic therapy: NSAIDs, acetaminophen
- ▶ 3) Occlusal stabilization splint
- ▶ 4) Physical therapy
- ▶ 5) Corticosteroid joint injection or Hyalgan injection (if needed)

# Arthrogenous Disorders

LOCALIZE  
OSTEOARTHRITIS

# 60 yo female presents with jaw pain

- ▶ Jaw Pain
- ▶ Ear Pain
- ▶ Uncomfortable bite

Onset	1 month ago
Location	Left joint and ear
Quality	Throbbing, sharp and shooting
Frequency	Daily
Attack duration	Constant
Severity	7/10
Ameliorating factors	Ibuprofen
Exacerbating factors	Chewing

# Exam

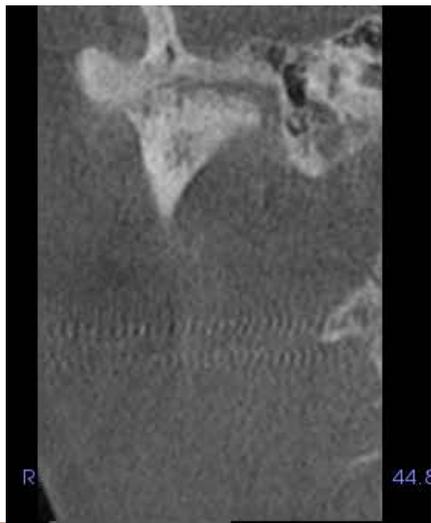
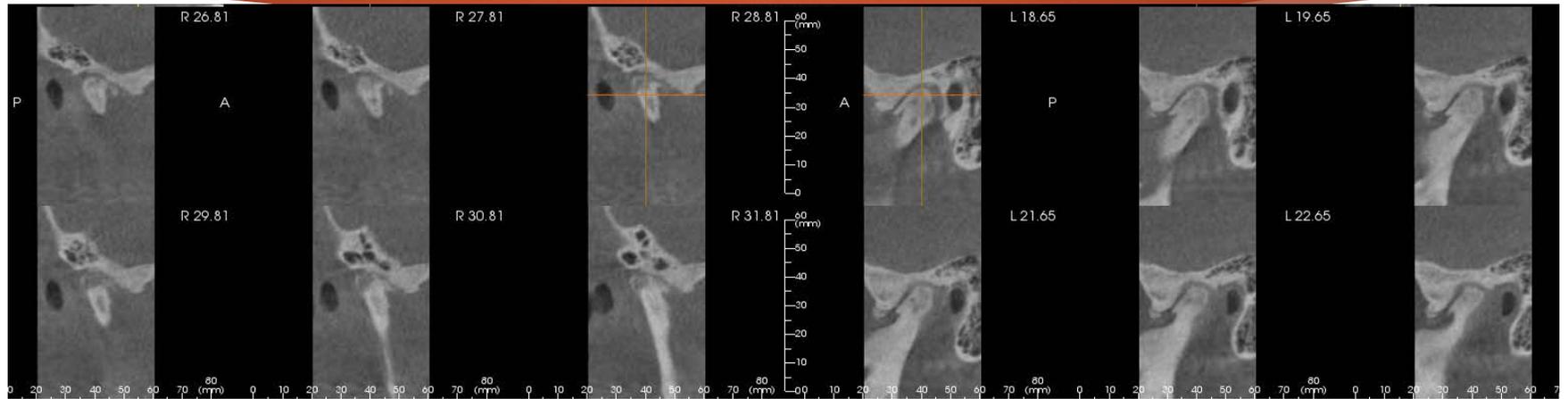
## Palpations

Upper trap R	0
Upper trap L	3
Lateral capsule R	0
Lateral capsule L	2
Dorsal capsule R	0
Dorsal capsule L	2
Superficial masseter R	0
Superficial masseter L	2
Temporalis Tendon R	0
Temporalis Tendon L	0
Superficial capsule L	0

# Range of Motion

- ▶ Pain-free Opening: 25 mm
- ▶ Passive Opening: 30 mm with pain on the left TMJ, soft-end feel
- ▶ RT Laterotrusive: 6 mm
- ▶ LFT Laterotrusive: 12 mm
- ▶ Opening Path: straight
- ▶ TMJ noise: crepitus on left joint

# Imaging



# Osteoarthritis

- ▶ 1) Myofascial and avoidance protocols, Physical Therapy
- ▶ 2) Occlusal stabilization splint
- ▶ 3) Pharmacologic therapy
- ▶ 4) Intra-articular injections

# 1. Occlusal appliances: Stabilization Splint

- ▶ Full arch, hard, acrylic stabilization splint
  - ▶ Maxillary arch
  - ▶ Mandibular arch
- ▶ Non-repositioning
- ▶ One arch



# Occlusal appliances: WHY?

- ▶ 1) Protect teeth from further attrition
- ▶ 2) Reduce pressure on sore teeth
- ▶ 3) Maybe change the patient's parafunctional habits
- ▶ 4) Provide a stable occlusion for patients missing bilateral, posterior tooth contacts
- ▶ 5) Reduce clenching-induced ear ache
- ▶ 6) Reduce joint loading 
- ▶ 7) Reduce painful clicking and/or episodic locking

# Pharmacologic therapy: Topical

- 1) Voltaren gel 1%
  - 2) Ketoprofen 20% in PLO or Lipoderm (compounded)
  - 3) Lidocaine 5% patch
- Indications: acute TMJ capsulitis/synovitis, arthritis, myogenous pain

# Pharmacologic Therapy: Systemic Medication

- ▶ NSAIDs: non-selective vs. selective
  - Indications: acute TMJ capsulitis/synovitis, arthritis, myogenous pain
- ▶ Non-selective
  - ▶ Ibuprofen: 600 mg QID (max: 3200 mg/day)
  - ▶ Nabumetone: 500 mg BID (max: 2000 mg/day)
  - ▶ Naproxen: 500 mg BID (max: 1500 mg/day)
  - ▶ Diclofenac: 25-50 mg q 6-8 hours (max of 150 mg/day)
  - ▶ Ketoprofen: 25-50 mg tid to qid (max is 300 mg/day)
  - ▶ Etodolac: 200-300 mg tid (max of 1200 mg/day)

# Pharmacologic Therapy: Systemic Medication

- ▶ COX-2 inhibitors
  - ▶ Celebrex: 200 mg QD (max: 400 mg/day)
  - ▶ \*Meloxicam: 7.5 mg QD (max: 15 mg/day)
  - ▶ \*Etodolac: 300-500 mg BID (max: 1200 mg/day)
- ▶ Acetaminophen
  - ▶ Start 650 mg qid; increase to 4000 mg/day

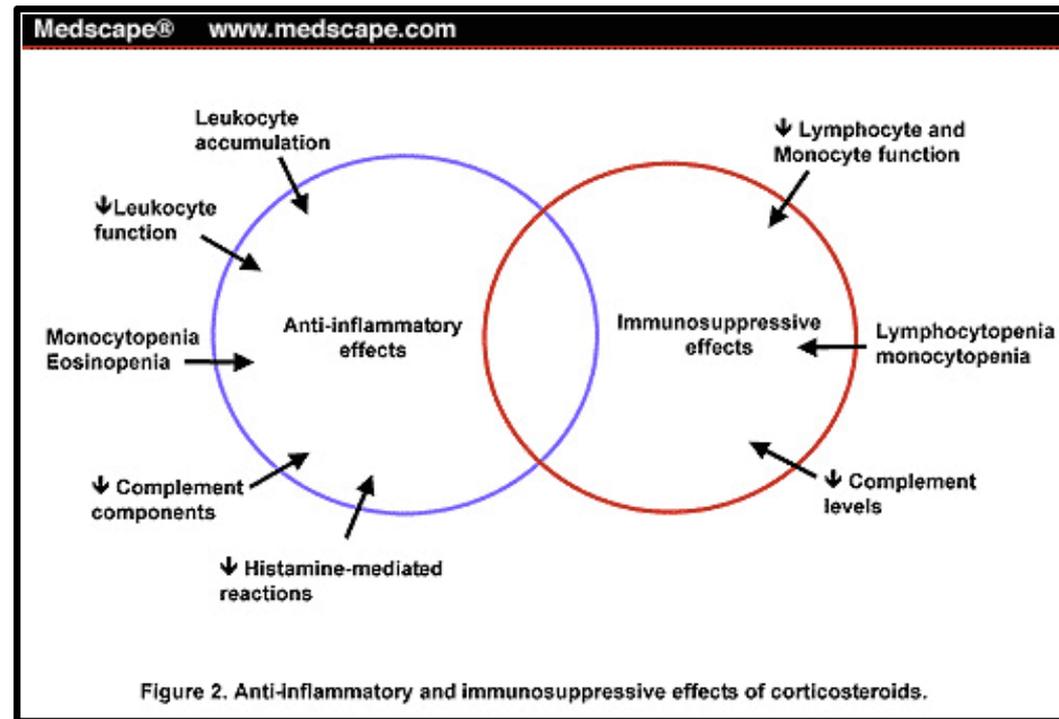
# Pharmacologic therapy

- Corticosteroids: systemic vs. intra-articular
- Indications: severe, unremitting TMJ capsulitis/synovitis, arthritis
  - Systemic: Prednisone taper, Medrol Dose Pack
  - Corticosteroid joint injections
    - 10-20 mg triamcinolone (0.5 cc)
    - 1.5 cc of 2% lidocaine without epi
    - Inject superior joint space
    - Do not repeat more than twice a year



# Mechanism of action: corticosteroids

- ▶ Carbohydrate and protein metabolism
- ▶ Lipid metabolism
- ▶ Electrolyte and water balance
- ▶ Anti-inflammatory properties\*



# Other intra-articular injections

- ▶ Pharmacologic therapy (continued)
  - ▶ E) Hyaluronic acid injections
    - ▶ Synvisc
    - ▶ Hyalgan
      - ▶ 3-4 series of injections, one month apart for each
  - ▶ F) Platelet-rich plasma injections
  - ▶ G) Joint lavage/arthrocentesis
  - ▶ H) DMARDs



Indications: TMJ capsulitis/synovitis, arthritis that has not responded to previous medications and conservative therapy

# What if conservative therapy doesn't work

- ▶ Need to reassess the diagnosis
- ▶ Reassess contributing factors that may be unrecognized
- ▶ Patients with chronic conditions and multiple contributing factors may benefit from a pain management program
  - ▶ → Need a team of providers

# Occlusal therapy

- ▶ Irreversible therapy
  - ▶ Orthodontics
  - ▶ Selective grinding
  - ▶ Fixed prosthodontic procedures
  - ▶ \*Necessary for dental malocclusion, but NOT for the treatment or prevention of TMJ pain or masticatory myogenous pain
- ▶ Occlusal therapy is beneficial when managing changes to the occlusion as a RESULT of a joint problem (i.e. osteoarthritis and anterior open bite)

# Questions?

