

Pankey TMD 2023

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Annapolis, Maryland

www.jrdroter.com

John R Droter, DDS

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Seminar Download

Pankey TMD 2023

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SEMINAR DOWNLOADS

Upcoming Seminars

July 20, 2016 D-PAS Hand on- In Office, Annapolis MD
July 21-23 2016 Droter Hands on- In office, Annapolis MD
Call Kim 301-805-9400

Pankey TMD Week, Key Biscayne FL
October 23-27, 2016
October 22-26, 2017
Call [LD Pankey Institute](http://LDPankeyInstitute.com) 305.428.5500

Spear TMD Course 1 with Dr Herb Blumenthal
Aug 11-13, 2016, Scottsdale Arizona
Call [Spear Education](http://SpearEducation.com) (866) 781-0072

Most Popular and Common Downloads

TMD Supersheet Download
[SuperTMDQx12.11](#)

Brux supersheet Download



Hello. I am:

John R Droter DDS
Annapolis, Maryland

Annapolis, Maryland
John R Droter DDS

Milestones



Visiting Faculty Spear Education 2013

Visiting Faculty LD Pankey Institute 2008

Visiting Faculty Orthodontic Program
Washington Hospital Center 2000

On staff AAMC: Orthopedic Rounds
In OR for TMJ Surgery

Devoted Facial Pain Practice 1996
(No Hygiene to Check!!)

CT and MRI Imaging Joints 1992
Guy Haddix, DDS: Mentor
(3,000+ images and rising)

Post Grad CE- GPR, LD Pankey Institute, Dawson, Mahan, Gremillion, Spear, Kois



Dr Guy Haddix
had been taking CT
scans since 1990



CT and MRI Scans in
my practice since 1992.

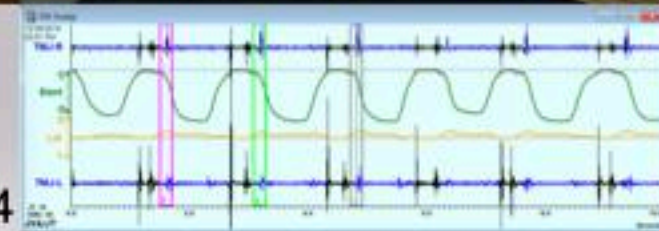


Closet full of printed
scans just as digital
appeared!!

Compare CT, Mounted models, MRI,
JVA before and after a case.
What can I see now?



JVA since 2004



Disclosures:

Atomic Skis- Sponsored.
I got stuff.

LD Pankey Institute- I am paid
a small honorarium for lectures

Spear Education- Paid
honorarium for lectures

Patent on sleep device: LatBrux
Co-Owner of ArrowPath Sleep



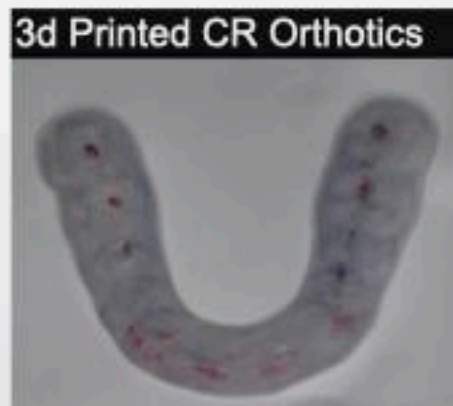
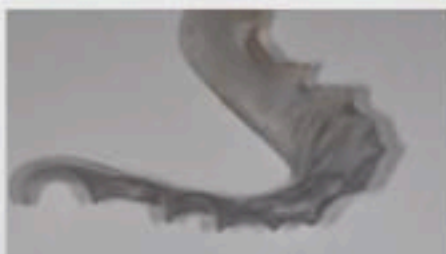
Ski Coach for National Ski Patrol
Level 3 Certified Professional Ski Instructors of America





Nate Brock, CDT

(865) 509-4509
connect@livingtreelab.com



APS In-Office Anterior Stop
2.5mm



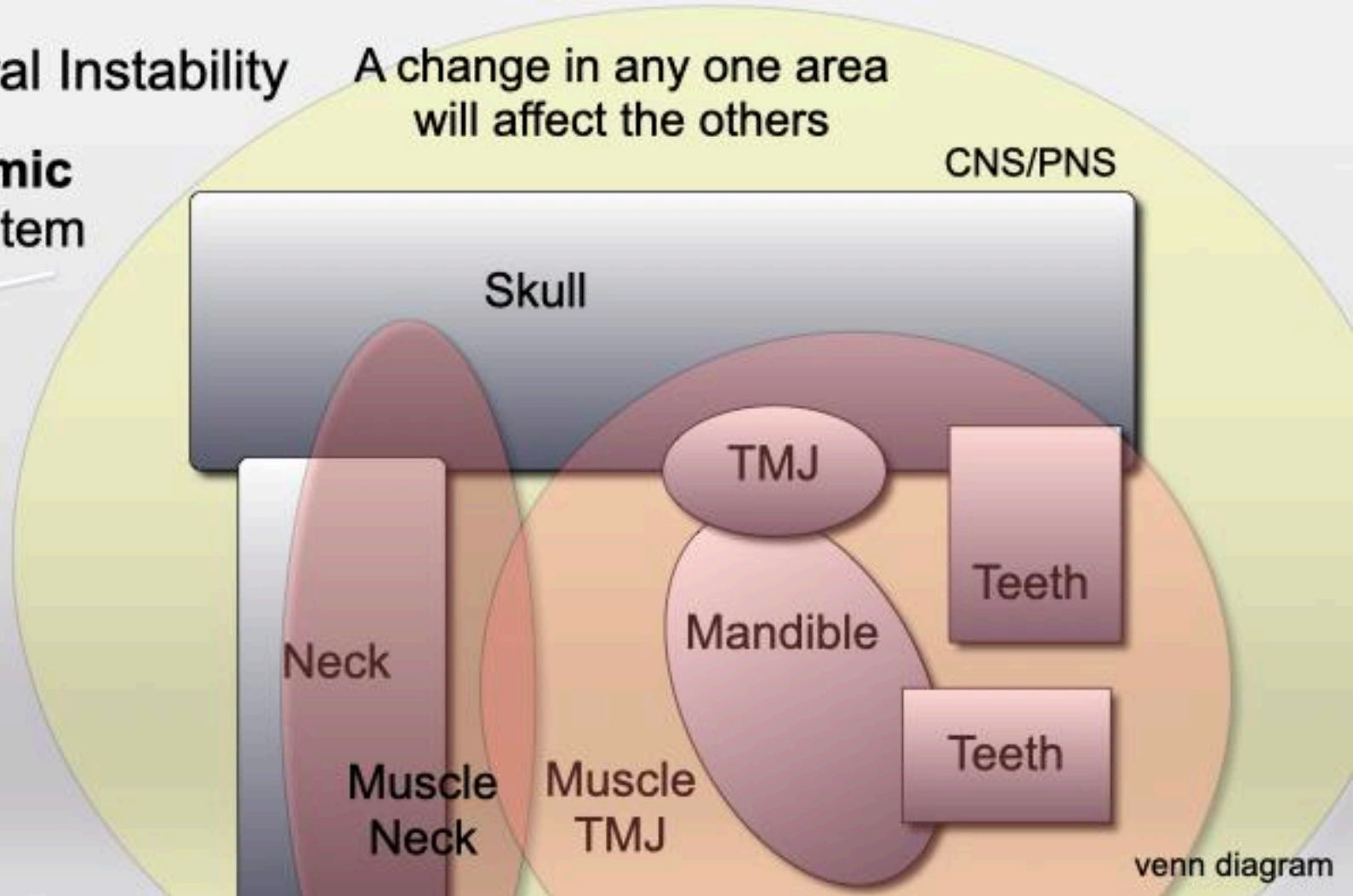
APS Airway Bite 4mm



Neck and Postural Instability

A change in any one area will affect the others

This is a **dynamic** orthopedic System



Different Diagnoses have Different Therapies

Specific Diagnosis

TMDs- What are the choices? (190 Diagnoses, 7 Categories)

1. TMJ Damage

Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint

2. Muscles of the TMJ

Myofascial pain-dysfunction
Myofascial pain-dysfunction
Myofascial pain-dysfunction
Myofascial pain-dysfunction
Myofascial pain-dysfunction
Myofascial pain-dysfunction
Myofascial pain-dysfunction
Myofascial pain-dysfunction
Myofascial pain-dysfunction
Myofascial pain-dysfunction

3. Cranial Alignment/Occlusion

Malocclusion
Malocclusion
Malocclusion
Malocclusion
Malocclusion
Malocclusion
Malocclusion
Malocclusion
Malocclusion
Malocclusion

Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
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Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint
Arthralgia/arthrosis of temporomandibular joint

4. Cervical Damage

Cervical spondylosis
Cervical spondylosis
Cervical spondylosis
Cervical spondylosis
Cervical spondylosis
Cervical spondylosis
Cervical spondylosis
Cervical spondylosis
Cervical spondylosis
Cervical spondylosis

5. Parafunction

Bruxism
Bruxism
Bruxism
Bruxism
Bruxism
Bruxism
Bruxism
Bruxism
Bruxism
Bruxism

6. Whole Body / Systemic

Systemic lupus erythematosus
Systemic lupus erythematosus
Systemic lupus erythematosus
Systemic lupus erythematosus
Systemic lupus erythematosus
Systemic lupus erythematosus
Systemic lupus erythematosus
Systemic lupus erythematosus
Systemic lupus erythematosus
Systemic lupus erythematosus

7. Other

Other
Other
Other
Other
Other
Other
Other
Other
Other
Other

TMD Therapies: (70 therapies)

Physical

Ice
Hot/Cold/Hot
Cold Laser
TENS in office
TENS home use
Range of motion exercises
Active Stretching: Manual, Tongue Blades, Dynasplint
Refer to Physical Therapy: Manual mobilization
Refer to Physical Therapy: Postural Restoration Therapy
Refer to Physical Therapy: Various Muscle Therapies
Refer to Chiropractic: Atlas Orthogonal
Refer to Osteopathic MD: Body alignment
Breathe, Walk, Exercise

Medicinal

Anti-inflammatory:
NSAIDs
Dicyclanide low dose
CBD Topical
Glucosamine/Chondroitin MSM
Vitamins: Vit C, Vit D, Vit B12
Minerals: Magnesium, Electrolytes
Minerals: Iron
Refer to MD for Lyme therapies
Refer to MD Rheumatoid Arthritis therapies
Refer to MD Masseter injections
Refer to MD Lateral Pterygoid injections
Food

Dental Orthotics

In Office Trial/Anterior Stop
Diagnostic Palatal Anterior Stop
Brux Checker
Lower full coverage CR
B/Arch Posterior Deprogrammer
Upper full coverage hard CR guard
Temporary home use anterior stop
Myofascial

Aqualizer
Lower Soft Sectional
Lower posterior deprogrammer
Lower TMJ Rehab flat plane
Lower postured indexed
Lower CR Indexed
Mandibular Advancement Device
Lateral Bracing Device

Sleep/ Fatigue

Mouth taping
Diet Modification
Postural Therapy
Vitamins: Vitamin D, Vitamin B12, Vit C
Minerals: Magnesium, Iron
Lateral Bracing Device guided plane
Lateral Bracing Device Elastic
Mandibular Advancement Device
CPAP

Surgical

Refer: Arthrocentesis w/ PRP
Refer: Discectomy w/ Fat Graft
Refer: Total Joint Replacement
Refer: Orthognathic Surgery

Occlusal Orthopedic

Lingual Light Wire
Lower soft sectional orthotic
Condylar distraction
Sectional orthodontics
Expansion orthopedics/ orthodontics
Restorative Dentistry
Occlusal Adjustment with OTR, TekScan

Tongue Parafunction

Refer for Cervical Alignment Stabilization
Myofascial
Upper Lingual light wire
Clear Brux Checker
Frenectomy
Myofunctional therapy

Specific Therapy

TMD Therapies: (70 therapies)

Physical

Ice
Hot Cold Hot
Cold Laser
TENS in office
TENS home use
Range of motion exercises
Active Stretching: Manual, Tongue Blades, Dynasplint
Refer to Physical Therapy: Rocabado mobilization
Refer to Physical Therapy: Postural Restoration Therapy
Refer to Physical Therapy: Various Muscle Therapies
Refer to Chiropractic: Atlas Orthogonist
Refer to Osteopathic MD: Body alignment
Breathe, Walk , Exercise

Brux Checker
Upper full coverage hard CR guard
BiArch Posterior Deprogrammer
Mandibular Advancement Device
Lateral Bruxing Device
Lingual Light Wire
Condylar Distraction

Medicinal

Anti Inflammatory:
NSAIDs,
Doxycycline low dose
CBD Topical
Glucosamine/Chondroitin MSM
Vitamins: Vit C, Vit D, Vit B12
Minerals: Magnesium, Electrolytes
Minerals: Iron
Refer to MD for Lyme therapies
Refer to MD Rheumatoid Arthritis therapies
Refer Botox Masseter injections
Refer Botox Lateral Pterygoid Injections
Food

Occlusal Orthopedic

Lingual Light Wire
Planas Tracks
Lower soft sectional orthotic
Sectional orthodontics
Expansion orthopedics/ orthodontics
Restorative Dentistry
Occlusal Adjustment with DTR, TekScan
Condylar distraction
Occlusal Adaptation

Tongue Parafunction

Refer for Cervical Alignment/ Stabilization
Myobrace
Upper Lingual light wire
Clear Brux Checker
Frenectomy
Myofunctional therapy

Dental Orthotics

In Office Trial Anterior Stop
Temporary home use anterior stop
Diagnostic Palatal Anterior Stop
Brux-PAS
Lower full coverage CR
Lower posterior deprogrammer
Lower TMJ Rehab flat plane
Lower Indexed
Brux Checker
Upper full coverage hard CR
Posterior Stop Night Guard
Mandibular Advancement Device
Anterior Stop Airway Bite
Facebow Verification
Lateral Bruxing Device
Condylar Distraction
Lingual Light Wire
Lower Soft Sectional
Athletic Mouthguard
Anterior Repositioning
Occlusal Adjust Assist
Aqualizer
Myobrace

Sleep/ Fatigue

Mouth taping
Diet Modification
Positional Therapy
Vitamins: Vitamin D, Vitamin B12, Vit C
Minerals: Magnesium, Iron
Lateral Bruxing Device guided plane
Lateral Bruxing Device Elastomeric
Mandibular Advancement Device
CPAP

Surgical

Refer: Arthrocentesis w/ PRP
Refer: Discectomy w/ Fat Graft
Refer: Total Joint Replacement
Refer: Orthognathic Surgery

TMD Therapies

Dental Orthotics

In Office Trial Anterior Stop
Temporary home use anterior stop
Diagnostic Palatal Anterior Stop
Brux-PAS
Lower full coverage CR
Lower posterior deprogrammer
Lower TMJ Rehab flat plane
Lower Indexed
Brux Checker

Upper full coverage hard CR
Posterior Stop Night Guard
Mandibular Advancement Device
Anterior Stop Airway Bite
Facebow Verification
Lateral Bruxing Device
Condylar Distraction
Lingual Light Wire
Lower Soft Sectional

Athletic Mouthguard
Anterior Repositioning
Occlusal Adjust Assist
Aqualizer
Myobrace

Dental Orthotics

Diagnostic



ArrowPath Sleep
Anterior Stop



D-PAS

Management



Posterior Stop Night Guard



D-PAS

Therapeutic



Indexed Orthotic



Centric Relation Orthotic

Protective



Upper Hard Centric
Relation Night Guard

Two additional categories: Useless Harmful



Quad R Appliance
Random
no Rhyme
no Reason
not Recommended

Appliance rocks
Tooth #31 only contact
Note gap 7-10 incisal

Only good is not hard/soft

PISD Effect

TMD Therapies

Dental Orthotics

In Office Trial Anterior Stop

Temporary home use anterior stop
Diagnostic Palatal Anterior Stop
Brux-PAS
Lower full coverage CR
Lower posterior deprogrammer
Lower TMJ Rehab flat plane
Lower Indexed
Brux Checker



ArrowPath Sleep
Anterior Stop

Diagnostic
Management
Therapeutic
Protective

Dental Orthotics

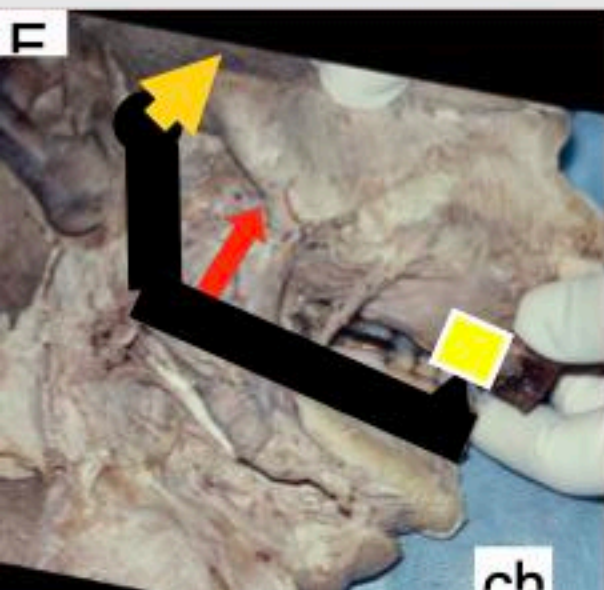


Pankey
Upper
Anterior
Stop

Test if the teeth have any role in pain and or dysfunction
Eliminates posterior and anterior tooth interferences
Condyles seat in fossa, optimal load bearing position

Test for decrease muscle contraction force

Allows Maxilla, Mandible, and Temporal bones to align



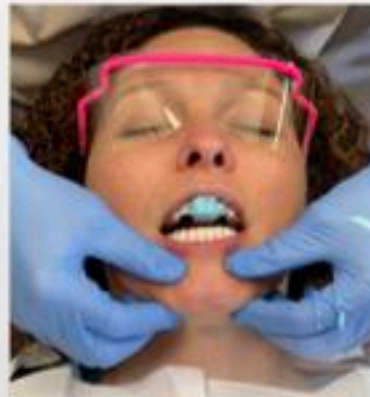
Pitch Perpendicular
to Arc of Closure

****Do not send home with patient**

Anterior Stop Orthotic In Office Diagnostic Test



ArrowPath Sleep
Anterior Stop



**Deprogram Muscle Engrams
Align Cranial Bones and Neck**

**If pain reduces, Occlusion/ Cranial
Alignment and/or Muscle Engrams
are part of the problem**

**Diagnostic
Management
Therapeutic
Protective**

With anterior stop in place:

5-10x wide open solid tap, open tap far left, open tap far right

2nd round same except Dr unexpectedly accelerates closing a few times

Occipital Lift with 3 deep breaths. Posterior neck opening muscle massage.

3rd round same as first except less taps each position

Office USE ONLY Do not send home with patient

Anterior Stop Orthotic In Office Diagnostic Test

Can do 2nd mix to
overlay 1st if needed



Anterior Stop Orthotic In Office Diagnostic Test



ArrowPath Sleep
Anterior stop 2.5 mm

Does the occlusion, cranial alignment, and/or muscle bracing have anything to do with the dysfunction or pain?

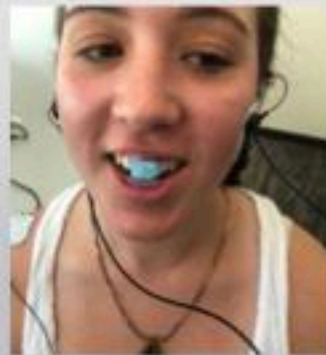
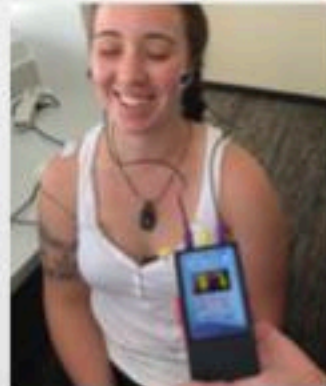
Are the TMJ muscles inhibited from full contraction with anterior only tooth contact?

>30% of headaches have an occlusal component

Occlusal adjustment in patients with craniomandibular disorders including headaches. A 3- and 6-month follow-up. Vallon D, Ekberg E, Nilner M. Acta Odontol Scand. 1995

Response to occlusal treatment in headache patients previously treated by mock occlusal adjustment. Forssell H, Kirveskari P, Kangasniemi P. Acta Odontol Scand. 1987

m-Scan
BioResearch



TMD Therapies

Dental Orthotics

In Office Trial Anterior Stop

Temporary home use anterior stop

Diagnostic Palatal Anterior Stop

Brux-PAS

Lower full coverage CR

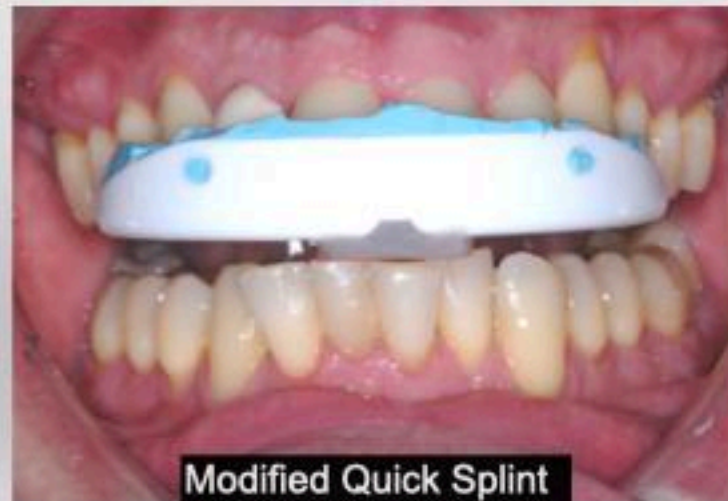
Lower posterior deprogrammer

Lower TMJ Rehab flat plane

Lower Indexed

Brux Checker

Reline with
Blue Mousse



Diagnostic
Management
Therapeutic
Protective

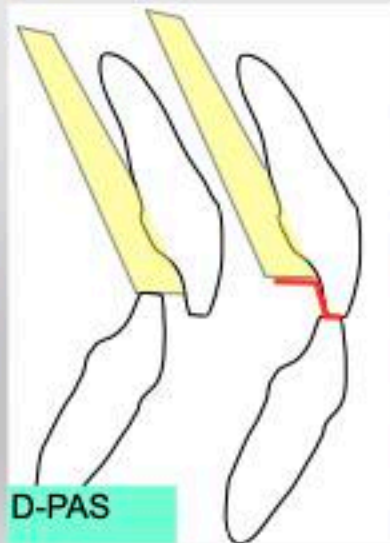
TMD Therapies

Dental Orthotics

In Office Trial Anterior Stop
Temporary home use anterior stop

Diagnostic Palatal Anterior Stop Brux-PAS

Lower full coverage CR
Lower posterior deprogrammer
Lower TMJ Rehab flat plane
Lower Indexed
Brux Checker



Diagnostic
Management
Therapeutic
Protective

Diagnostic Palatal Anterior Stop

D-PAS Test: Wear for 2 weeks, 24/7, take out to eat

Better- Decrease in Symptoms

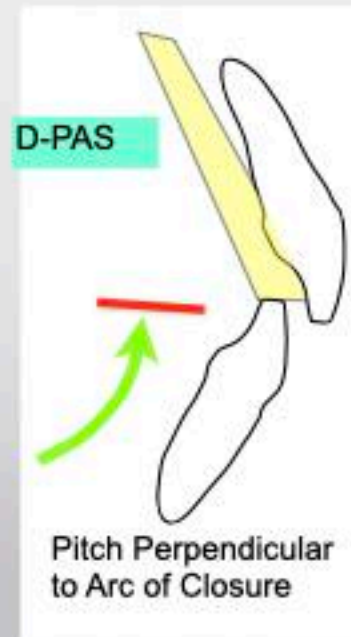
Sleep Clenching Inhibited: Wear D-PAS as night guard
Orthotic Improved Airway: D-PAS as night guard
Occlusal Muscle Disharmony: Occlusal Adjust

Worse- Increase in Symptoms

Mechanically Unstable TMJ, joint subluxation
Intracapsular Problem TMJ
Orthotic Made Sleep Airway Worse

Stays the Same- No Change in Symptoms

Damaged TMJ are mechanically stable
Pain not related to occlusion



Stapelmann H, Türp JC. The NTI-tss device for the therapy of bruxism, temporomandibular disorders, and headache.....BMC Oral Health. 2008 Jul PMID: 18662411

Dental Orthotics



Brux-PAS +
Lower Essex



Diagnostic
Management
Therapeutic
Protective

Manage and protect teeth Grinding
Slippery against slippery

Manage protect Grind Clench

Could use to manage clenching
however D-PAS is better

Must have some muscle inhibition!!!

TMD Therapies

Dental Orthotics

In Office Trial Anterior Stop
Temporary home use anterior stop
Diagnostic Palatal Anterior Stop
Brux-PAS

Lower full coverage CR

Lower posterior deprogrammer
Lower TMJ Rehab flat plane
Lower Indexed
Brux Checker

3-6 weeks trial of an ideal occlusion, 24/7.
If symptoms resolve, equilibrate the occlusion.

Holding Pattern: Awaiting neck therapy, patient acceptance.

Diagnostic
Management
Therapeutic
Protective

Dots in the back,
lines in the front



Triad- No longer manufactured



3D Printed Keysplint Hard with
durasplint added to anterior

Lower Centric Relation Orthotic by Dr. Glenn Kidder

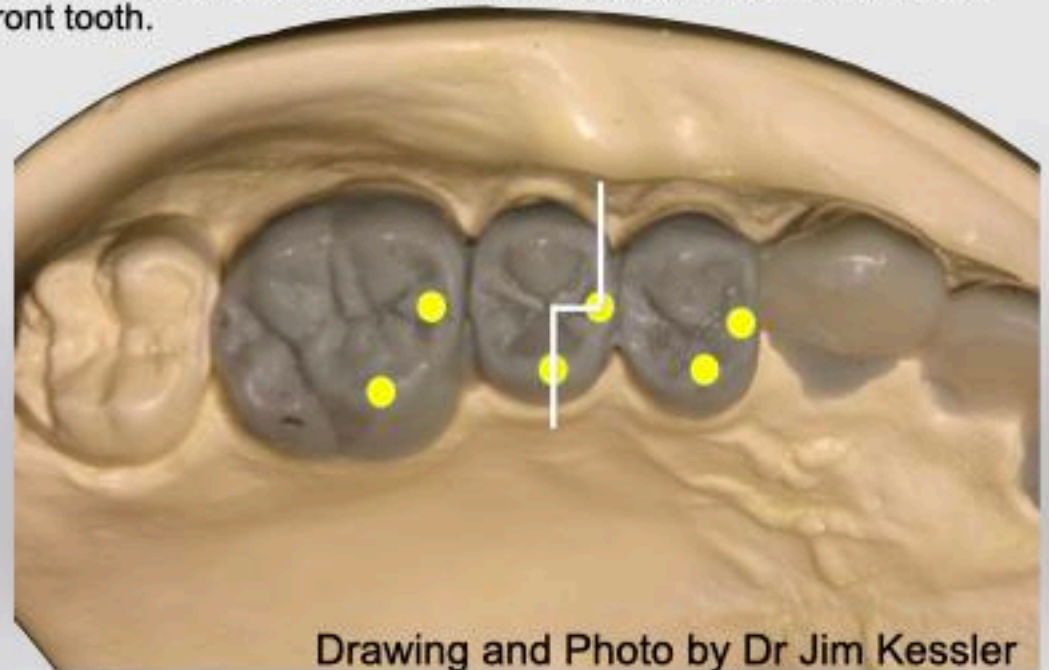
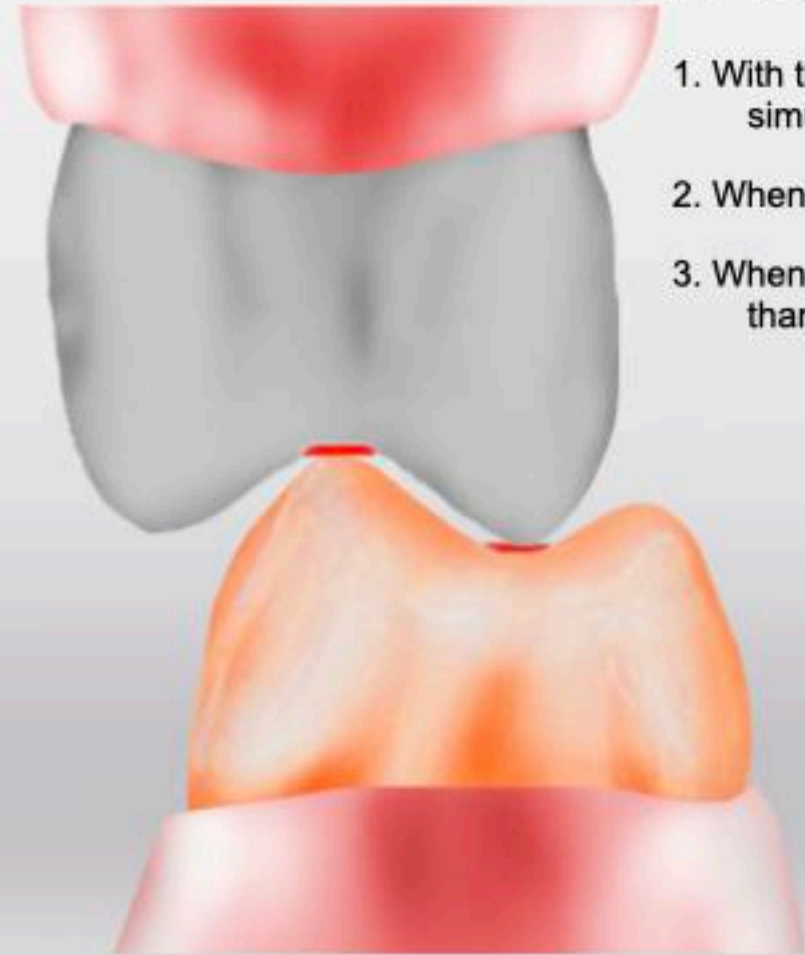
Orthotic Acrylic: Solid, Retentive, Hard



If Symptoms resolve, equilibrate the occlusion

LD Pankey's 3 Rules of Occlusion (Clyde Schuyler)

1. With the condyles fully seated in the fossa, all the posterior teeth touch simultaneously and even, with the anterior teeth lightly touching.
2. When you squeeze, neither a tooth nor the mandible moves (in a lateral direction).
3. When you move the mandible in any excursion, no back tooth hits before, harder than, or after a front tooth.



Drawing and Photo by Dr Jim Kessler

Diagnostic
Management
Therapeutic
Protective

TMD Therapies

Dental Orthotics

In Office Trial Anterior Stop
Temporary home use anterior stop
Diagnostic Palatal Anterior Stop
Brux-PAS
Lower full coverage CR

Lower posterior deprogrammer
Lower TMJ Rehab flat plane
Lower Indexed

Brux Checker

Advanced TMD Orthotics

Posterior Deprogrammer



Indexed Orthotic

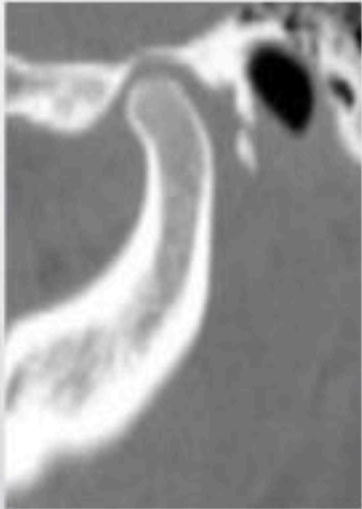


Centric Relation
Orthotic



All roads lead to lower CR
as final orthotic then occlusal
adjustment with DTR

I use both Centric Relation and Non-Centric Relation Orthotics



Treatment Position vs Final Position: Do Not Confuse the Two

Treatment Position Creates Change (Adaptation)

Treat: Painful CR Load Zone

Mechanically Unstable Centric Relation Loading
Cranial bones misaligned

Final Position Creates Stability (Centric Relation)

When the forces are balanced, Adaptation Stops



TMD Therapies

Dental Orthotics

Brux Checker
Great Lakes Orthodontics

Diagnostic
Management
Therapeutic
Protective

In Office Trial Anterior Stop
Temporary home use anterior stop
Diagnostic Palatal Anterior Stop
Brux-PAS
Lower full coverage CR
Lower posterior deprogrammer
Lower TMJ Rehab flat plane
Lower Indexed

Brux Checker

0.1mm Mylar: Same as mylar strip for composite

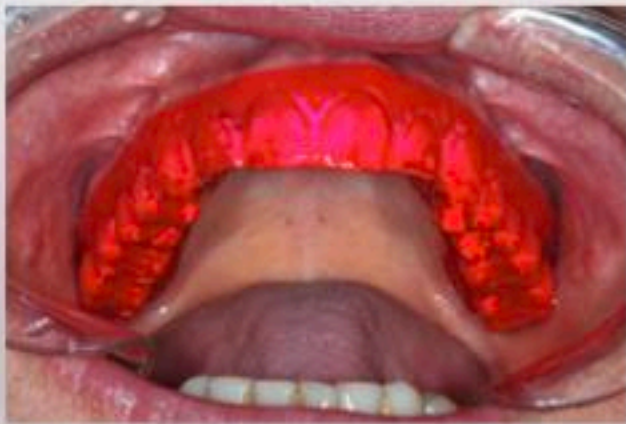


Made on Biostar Machine

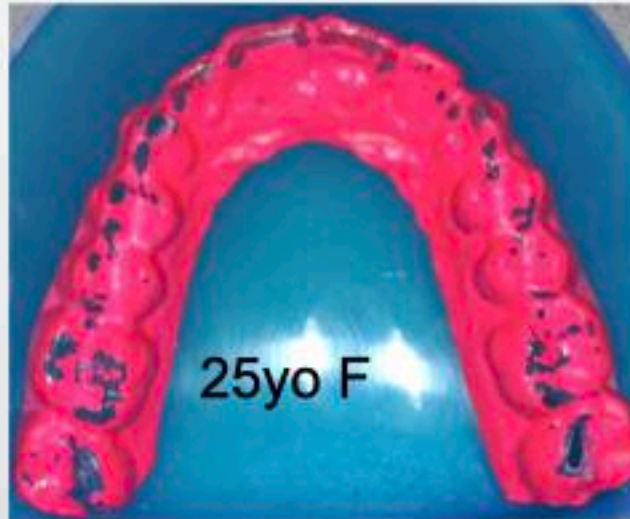
Does grinding occur awake or asleep?

Brux Checker
Great Lakes Orthodontics

0.1mm Mylar



Made on Biostar Machine



TMD Therapies

Dental Orthotics

In Office Trial Anterior Stop
Temporary home use anterior stop
Diagnostic Palatal Anterior Stop
Brux-PAS
Lower full coverage CR
Lower posterior deprogrammer
Lower TMJ Rehab flat plane
Lower Indexed

Brux Checker

Clear Brux Checker
Treats Daytime Clenching
Increases awareness to break habit
Takes 6 weeks

Very thin: Similar to mylar
used for composites



Diagnostic
Management
Therapeutic
Protective

Great Lakes Orthodontics
Platzhalterfolie by Scheu

1-800-758-1487
Scheu Ref # 3202.1



Protective: Lower clear brux checker

Full Denture implant supported- Locator Attachments
E-max custom posterior denture teeth



clear brux checker
covers lower denture

Posterior Denture teeth e-Max



Lasts about 3 weeks



TMD Therapies

Dental Orthotics

Upper full coverage hard CR guard

Posterior Stop Night Guard
Mandibular Advancement Device
Anterior Stop Airway Bite
Facebow Verification
Lateral Bruxing Device
Condylar Distraction
Lingual Light Wire
Lower Soft Sectional

Upper hard full coverage CR guard



Diagnostic
Management
Therapeutic
Protective

Patient can place severe
force on front teeth.

Upper teeth +2 mobility



TMD Therapies

Dental Orthotics

Upper full coverage hard CR guard

Posterior Stop Night Guard

Mandibular Advancement Device

Anterior Stop Airway Bite

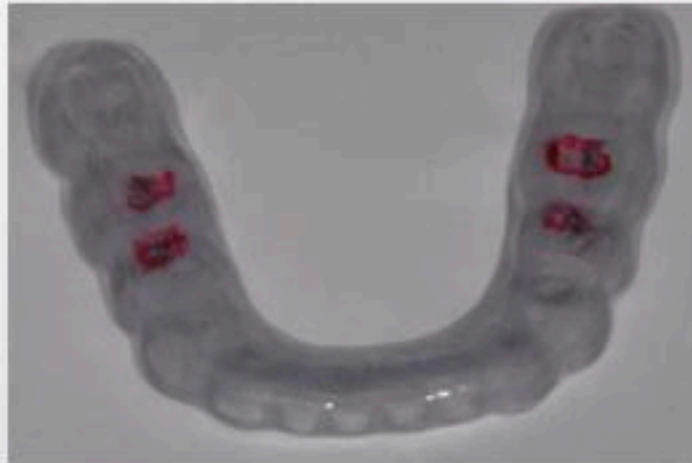
Facebow Verification

Lateral Bruxing Device

Condylar Distraction

Lingual Light Wire

Lower Soft Sectional



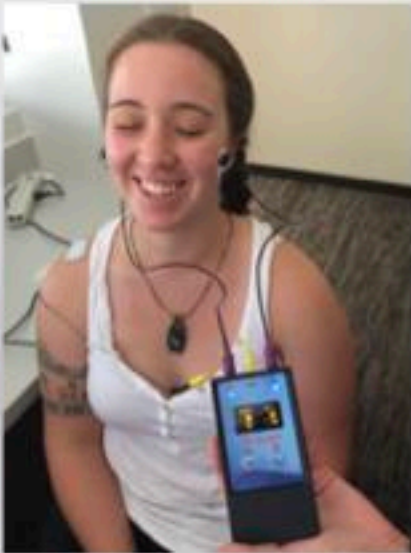
Diagnostic
Management
Therapeutic
Protective

TMD Therapies

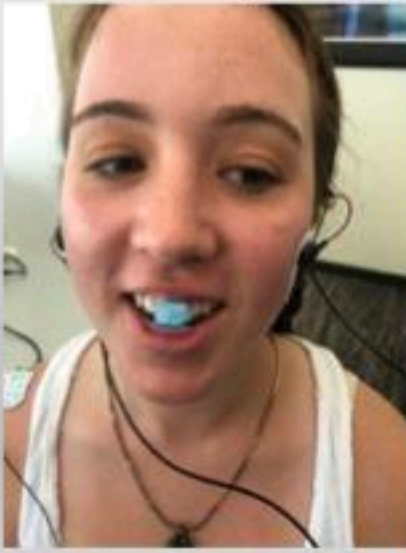
Dental Orthotics

Posterior Stop Night Guard

Clench
Back teeth



Clench
Anterior stop



m-Scan BioResearch
Clench

Back teeth +250 μ v
Front teeth +121 μ v

Some Inhibition but can
place moderate force on
front teeth.



Keeps forces
centered in Maxilla

Optional upper
essix. Most patients
like without essix

TMD Therapies

Dental Orthotics

Upper full coverage hard CR guard
Posterior Stop Night Guard

Mandibular Advancement Device

Anterior Stop Airway Bite
Facebow Verification
Lateral Bruxing Device
Condylar Distraction
Lingual Light Wire
Lower Soft Sectional

MyTAP



Diagnostic
Management

Therapeutic
Protective



Great Lakes Nylon Herbst

D-SAD Panthera Dental



ArrowPath Sleep Airway Bite

Try in anterior stop before reline.
Verify where patient occludes in full range of excursions

APS Airway Bite Anterior Stop 4mm



Reline with Parkell Blu-Mousse Super Fast
Can do 2nd reline over top of the first if needed



Device shifted back so
flush with buccal surface
of front teeth



Device shifted forward
so lingual surface of
front teeth touch device.

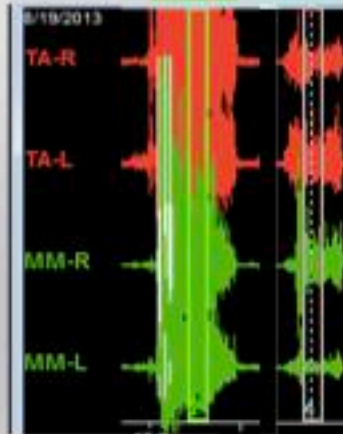


Use anterior stop and an EMG to
choose style of sleep device:

**Patient with muscles
inhibited by anterior only contact**



	Clench MaxIC	Anterior Stop D-PAS
	μV	μV
TA-R	100.6	15.7
TA-L	108.9	25.3
MM-R	115.4	25.5
MM-L	70.5	6.8



Will sleep airway device
have an anterior stop or
posterior contact?

ArrowPath Sleep Airway Bite



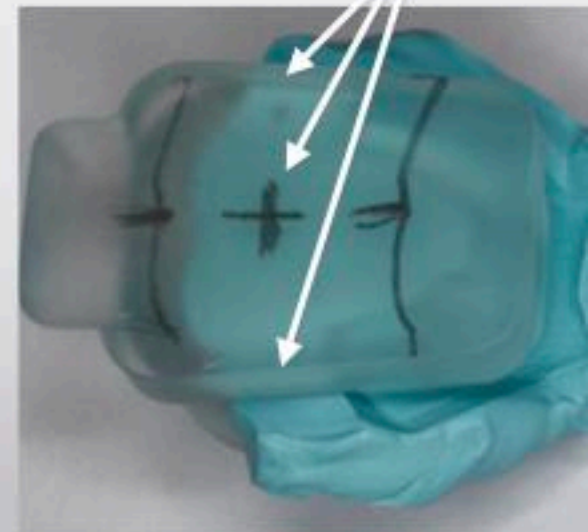
Mark furthest forward and back jaw position and midline with sterile disposable pencil



Measure and mark the amount of protrusive you want to build into the Mandibular Advancement Device

50% is typically a good place to start

Place bonding agent



ArrowPath Sleep Airway Bite



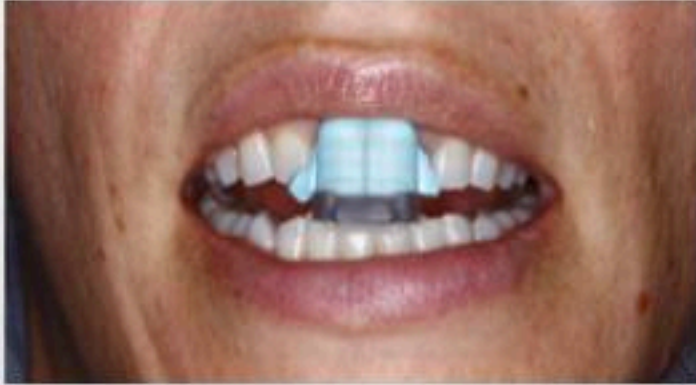
Move jaw into position, verify with tap tap, then flow flowable composite in front of lower incisors, cure.



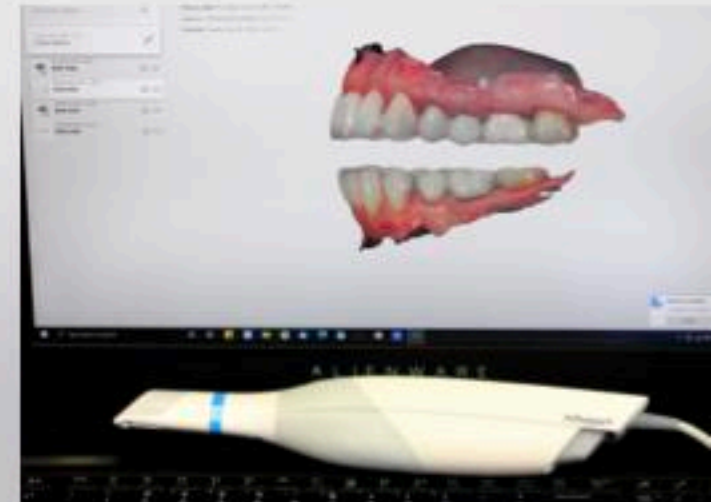
At edge of anterior stop
flow some composite
behind teeth and cure.

Jaw is now held stable in forward position.

ArrowPath Sleep Airway Bite

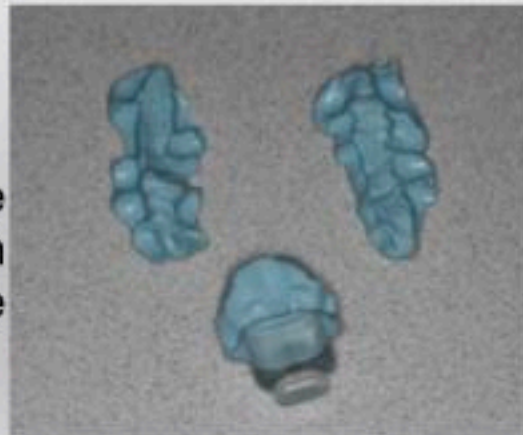


or take digital scan with
anterior stop in place and
jaw positioned forward

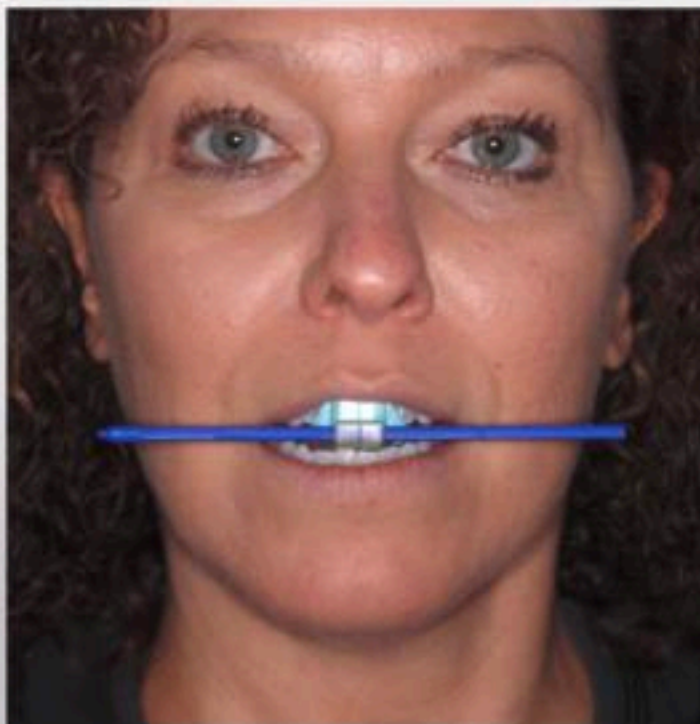


Jaw is held stable in forward position.

Silicone bite
registration
of airway bite



Facebow verification
Send photo and anterior stop to lab



Updated sleep airway anterior stop now has hole for brush, same device, two uses

TMD Therapies

Dental Orthotics

Upper full coverage hard CR guard
 Posterior Stop Night Guard
 Mandibular Advancement Device
 Anterior Stop Airway Bite
 Facebow Verification

Lateral Bruxing Device

Condylar Distraction
 Lingual Light Wire
 Lower Soft Sectional



APS Lat-Brux Anterior Stop Elastomers



APS Lat-Brux Guide Plane



Add upper essix if not expanding upper arch



Great Lakes Nylon Lat Brux
 Remove one arm

TMD Therapies

Dental Orthotics

Upper full coverage hard CR guard
Posterior Stop Night Guard
Mandibular Advancement Device
Anterior Stop Airway Bite
Facebow Verification
Lateral Bruxing Device

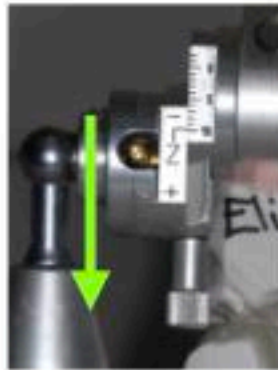
Condylar Distraction

Lingual Light Wire
Lower Soft Sectional



Anterior Openbite Treatment : Moving the Maxilla

Therapeutic



SAM MPV



Anterior Openbite with Active TMJ Bone Loss

Diagnostic
Management
Therapeutic
Protective

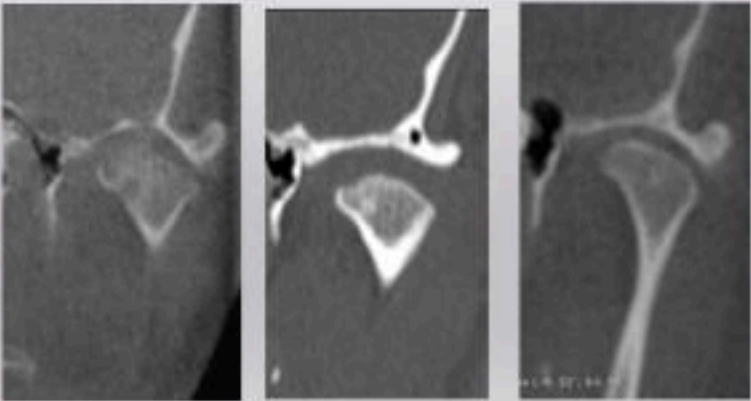
Non Surgical Therapies



Condylar Distraction



Anti Inflammatory Therapies



TMD Therapies

Dental Orthotics

Upper full coverage hard CR guard
Posterior Stop Night Guard
Mandibular Advancement Device
Anterior Stop Airway Bite
Facebow Verification
Lateral Bruxing Device
Condylar Distraction

Lingual Light Wire

Lower Soft Sectional

Lingual Light Wire- Crozat Arch Expansion

Diagnostic
Management
Therapeutic
Protective

Age 29
Start



Age 30
7 months LLW



TMD Therapies

Dental Orthotics

- Upper full coverage hard CR guard
- Posterior Stop Night Guard
- Mandibular Advancement Device
- Anterior Stop Airway Bite
- Facebow Verification
- Lateral Bruxing Device
- Condylar Distraction
- Lingual Light Wire

Lower Soft Sectional

3 mm rubber guard that only covers lower molars

Intrudes lower posterior teeth

One of three ways to close anterior open bite



Condylar Distraction



Lingual Light Wire



Lower Soft Sectional

Start



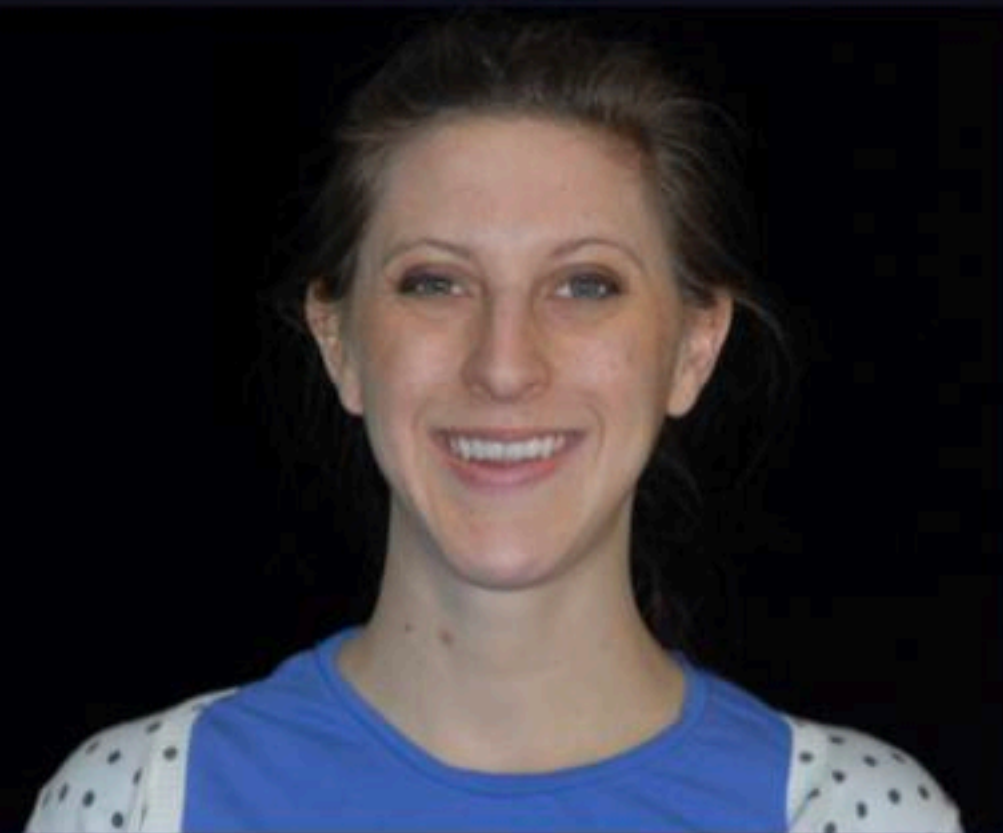
Age 27



Age 32



Age 27



Age 32



TMD Therapies

Dental Orthotics

Athletic Mouthguard

- Anterior Repositioning
- Occlusal Adjust Assist
- Aqualizer
- Myobrace

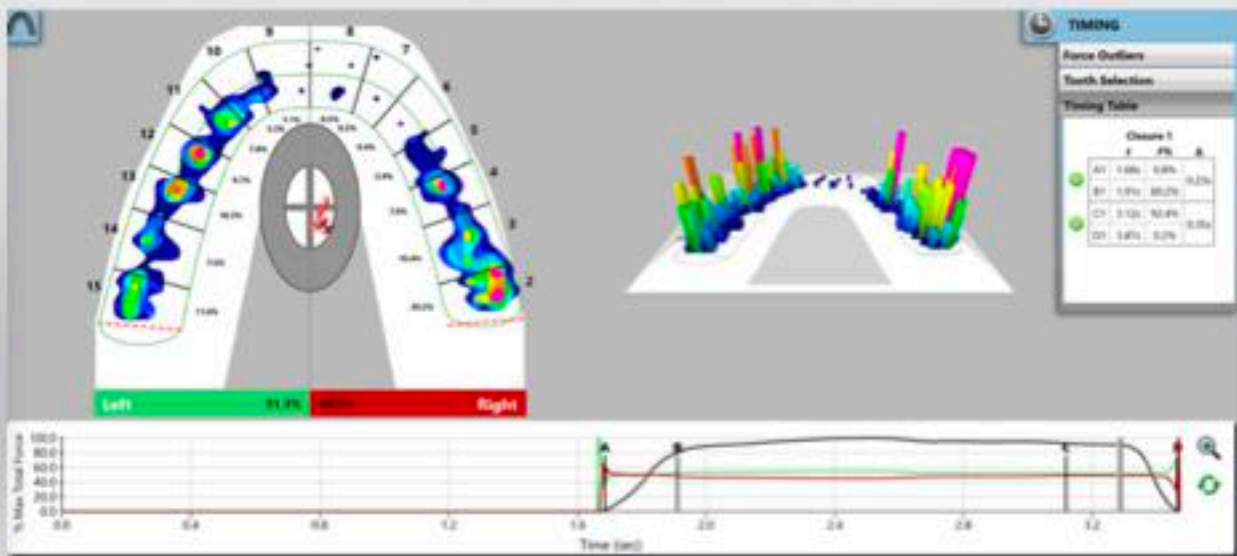
Sports Guard

Upper soft full coverage

Diagnostic Management Therapeutic Protective



***Adjusted with T-Scan



TMD Therapies

Dental Orthotics

Athletic Mouthguard

Anterior Repositioning

Occlusal Adjust Assist

Aqualizer

Myobrace

Upper Anterior Repositioning Orthotic



Diagnostic
Management
Therapeutic
Protective

Manages airway

Jaw positioned forward

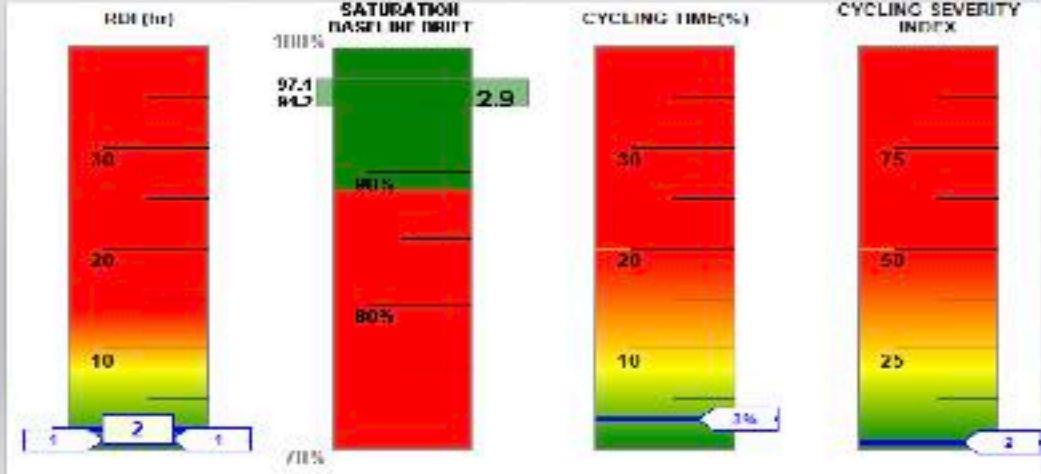
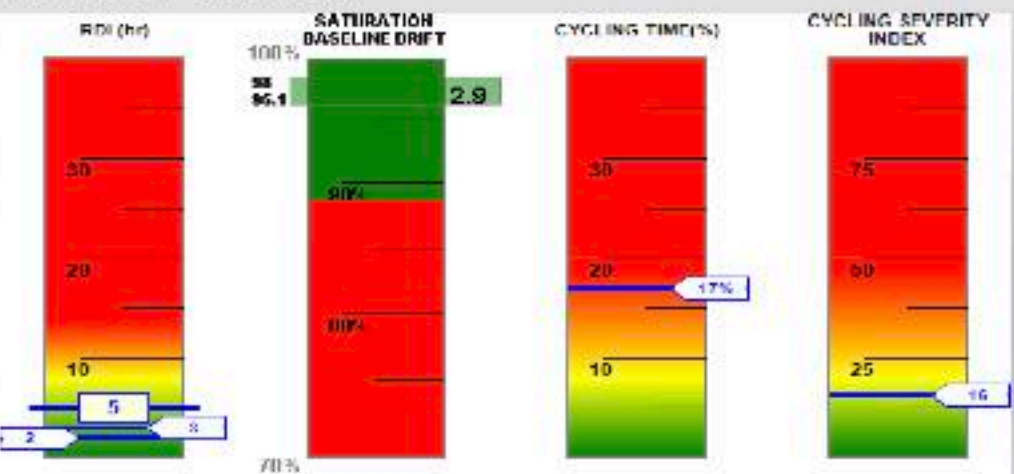
Therapeutic in acute sprains

Jaw positioned forward

Anterior Repositioning Orthotic



Minolta Pulse Ox



TMD Therapies

Dental Orthotics

Athletic Mouthguard
Anterior Repositioning

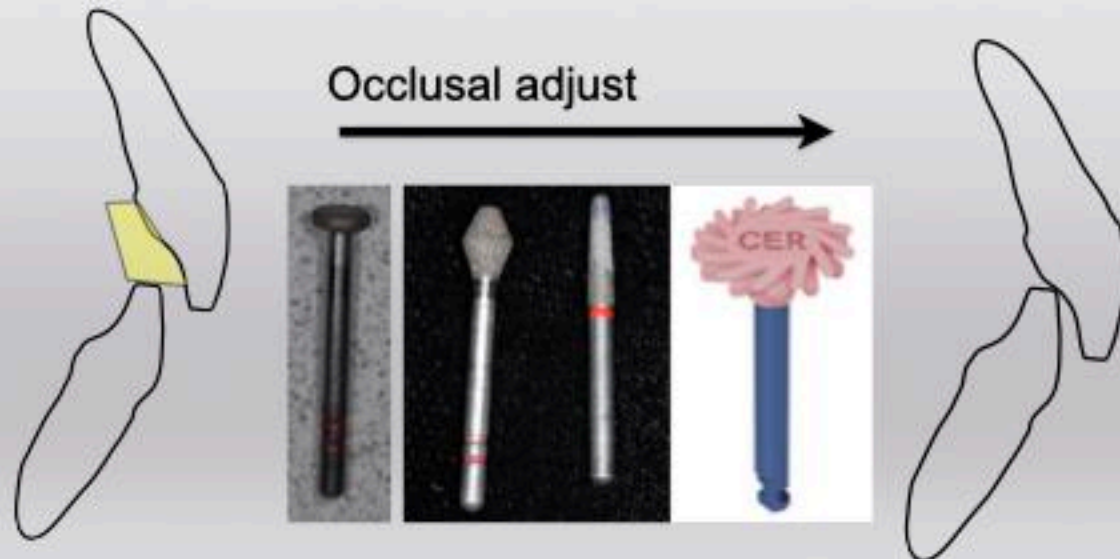
Occlusal Adjust Assist

Aqualizer
Myobrace

Assists with therapeutic occlusal adjust

Diagnostic
Management
Therapeutic
Protective

Triad- Now use Durasplint



TMD Therapies

Dental Orthotics

Athletic Mouthguard
Anterior Repositioning
Occlusal Adjust Assist

Aqualizer

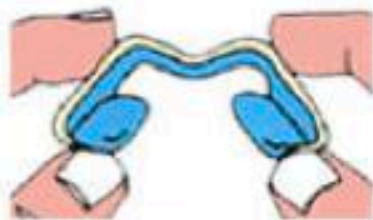
Myobrace

Water cushion for the teeth

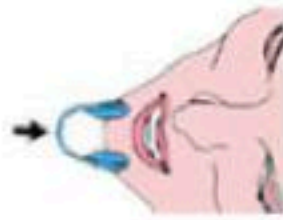
I use the low and medium thickness.

Diagnostic
Management
Therapeutic
Protective

Keep in Freezer



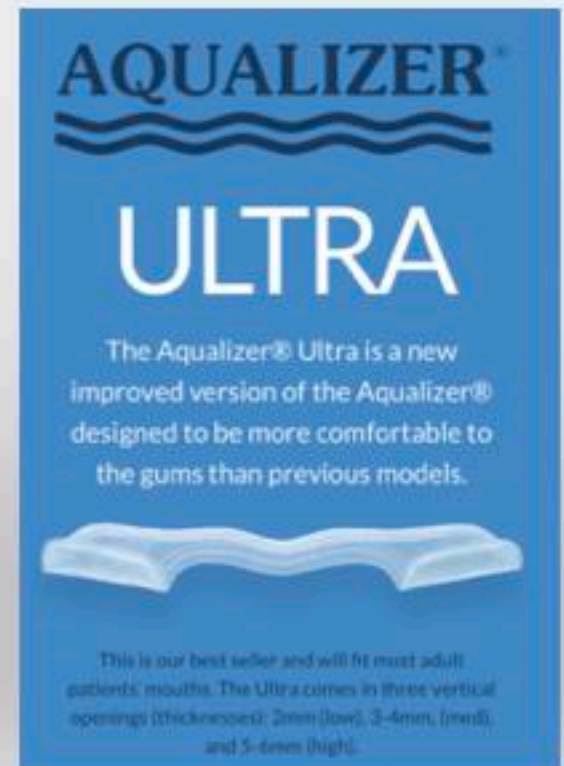
Step 1



Step 2



Step 3



TMD Therapies

Dental Orthotics

Athletic Mouthguard
Anterior Repositioning
Occlusal Adjust Assist
Aqualizer

Myobrace

Protect sleep grinding

Manage Airway: Lower jaw forward

Trains Breathe through nose, swallow
Expands Maxilla

Diagnostic
Management
Therapeutic
Protective

MyoBrace
A1



MyoBrace
TMJ





Know Yourself

Know Your Work + **Know Your Patient**

Apply Your Knowledge

LD Pankey Institute

Write your Dream

Common TMDs

John R Droter DDS
Annapolis, Maryland

6 Common TMDs

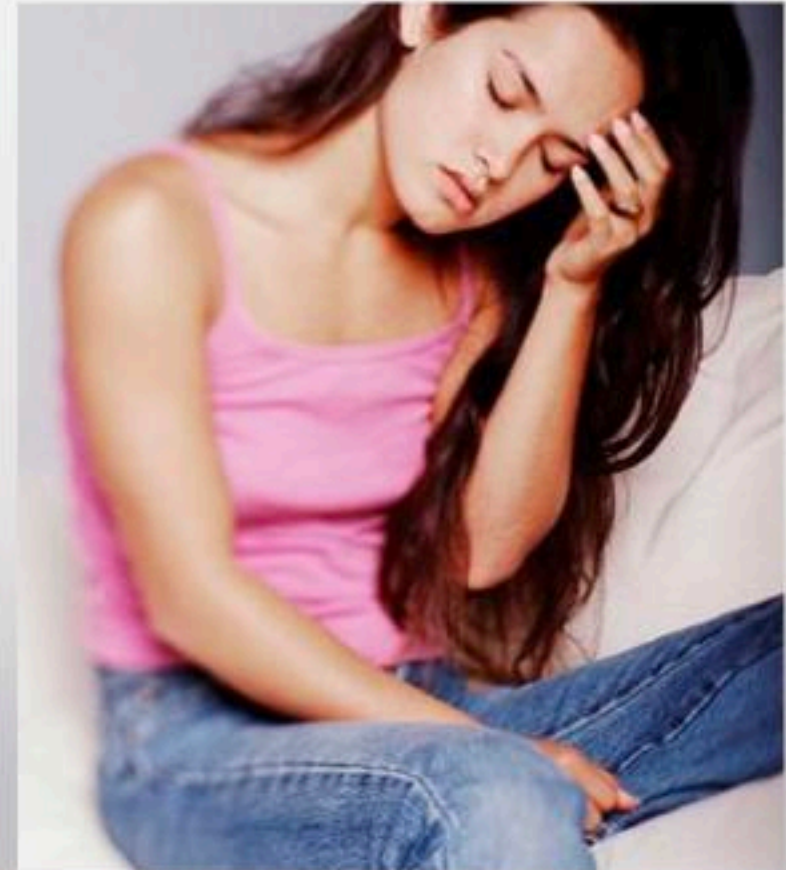
- Parafunctional Clenching
- Parafunctional Grinding
- Occlusal Muscle Dysfunction
- Osteoarthritis
- Acute Sprain
- Acute Closed lock of TMJ disc

5 Common Obstacles

- Neck and Postural Instability
- Wobbly TM Joint (Subluxation)
- Compromised Breathing/Airway
- Avascular Necrosis
- Referred Pain Muscle Triggerpoints

1 TMD that **usually** does not need therapy

- TMJ Clicking



6 Common TMDs

Diagnosis	Pattern	Treatment
Clenching	Patient is aware Masseters Ache Morning TMJ clicking that resolves	Occlusal Adjust D-PAS Night Guard (if inhibition) Magnesium and Vitamin C hs
Sleep Grinding	Worn Teeth	Protective night guard Airway night night guard
Occlusal Muscle Dysfunction	Sore muscles when chewing Sore Lateral Pterygoid, Headaches Day D-PAS Relieves Symptoms	Occlusal Adjustment
Osteoarthritis of TMJ	Arthralgia CBCT shows worn bone loss MRI T2, STIR ++	NSAID for 6-12 weeks Occlusal Adjustment Do not put in a night guard
Sprain Discal Ligament TMJ, Acute	Sudden onset pain TMJ, sore TMJ Limited opening Soft end point active stretch	Cold Laser, Ice 15 min 3x a day Rest, Soft diet, NSAID 7 days Anterior Reposition Orthotic 7 days
Acute Closed Lock TMJ	Sore TMJ Limited opening Hard end point active stretch	Arthrocentesis with PRP

6 Common TMDs

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Acute Closed Lock TMJ	Sore TMJ Limited opening Hard end point active stretch	Arthrocentesis with PRP

Parafunctional Clenching

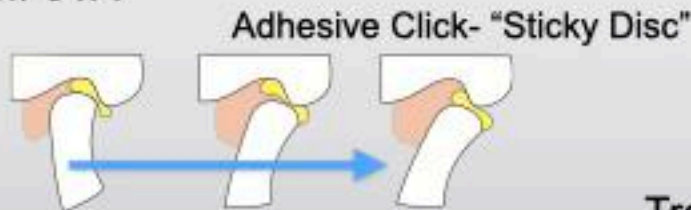
Signs

- Strong Masseters
- No major wear on teeth
- Slight wear around tooth contacts
- Fremitus
- Tori
- Slight scratch vibration doppler/ JVA



Symptoms

- Aware of clenching
- Sore muscles on waking
- Clicking on waking that goes away
- Headaches



Causes

- Uneven occlusion
- Neck stabilization
- SSRI

Diagnostic Tests

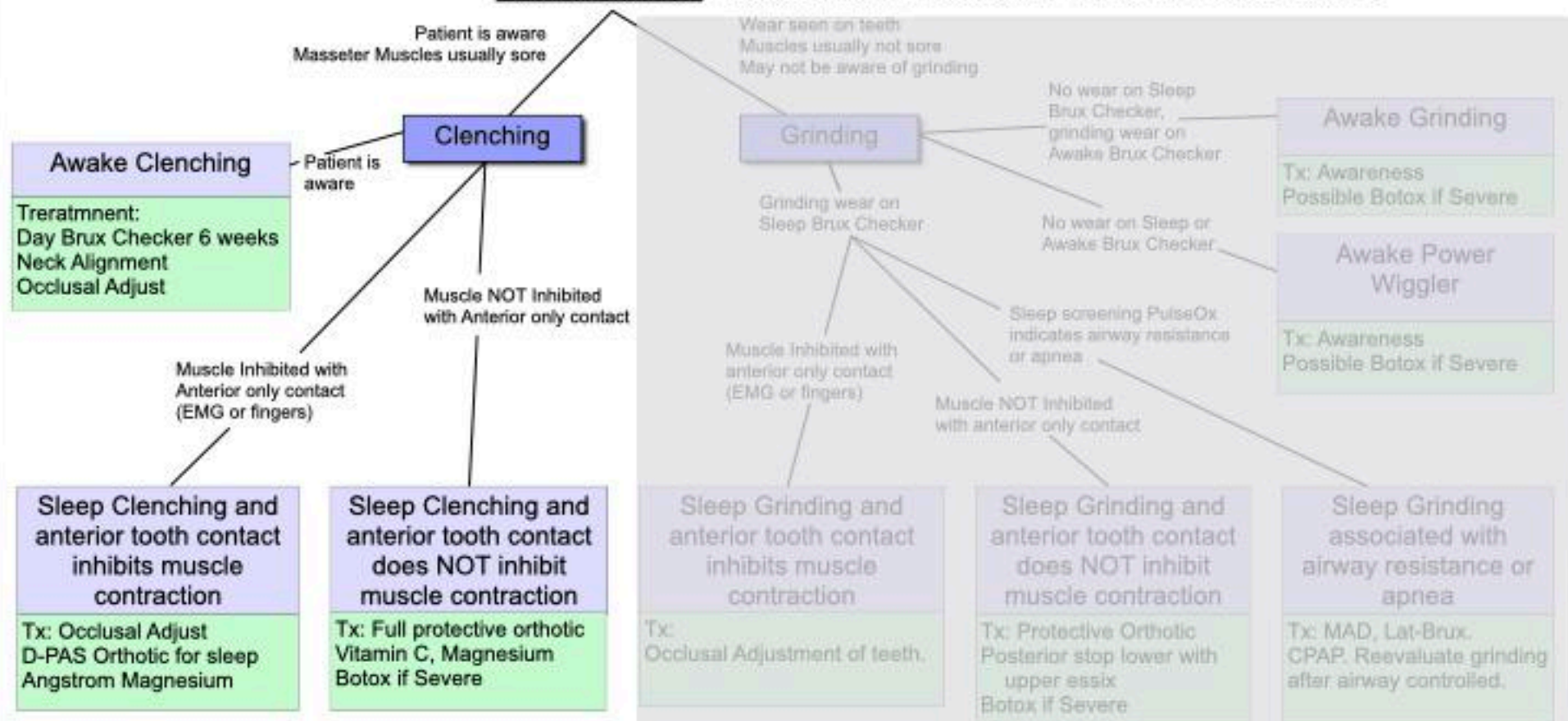
- EMG M-scan
- Determine if muscle inhibition
- D-PAS for sleep



Treatments

- Occlusal Adjustment
- Neck alignment/ stabilization
- D-PAS as night guard
- Time Release Vitamin C
- Angstrom Magnesium
- Clear Brux Checker daytime for 6 weeks

BRUXING: PARAFUNCTIONAL TOOTH CONTACT



Diagnostic Palatal Anterior Stop

D-PAS Test: Wear for 2 weeks, 24/7, take out to eat

Better- Decrease in Symptoms

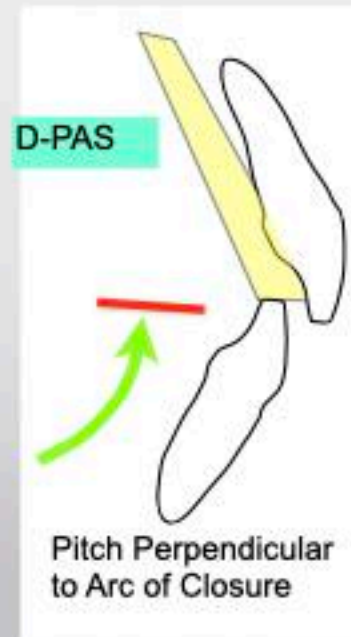
Sleep Clenching Inhibited: Wear D-PAS as night guard
Orthotic Improved Airway: D-PAS as night guard
Occlusal Muscle Disharmony: Occlusal Adjust

Worse- Increase in Symptoms

Mechanically Unstable TMJ, joint subluxation
Intracapsular Problem TMJ
Orthotic Made Sleep Airway Worse

Stays the Same- No Change in Symptoms

Damaged TMJ are mechanically stable
Pain not related to occlusion



Stapelmann H, Türp JC. The NTI-tss device for the therapy of bruxism, temporomandibular disorders, and headache.....BMC Oral Health. 2008 Jul PMID: 18662411

Temporary Anterior Stop Test

Wear for sleep for 1-2 weeks
Limited daytime wear if headache

Better- Decrease Symptoms on Waking

Sleep Clenching or Grinding
Orthotic Improved Airway

Worse- Increase Symptoms

Mechanically Unstable TMJ (Joint subluxation)
Intracapsular Problem TMJ
Orthotic Made Airway Worse

This is a diagnostic test, not treatment



Stapelmann H, Türp JC. The NTI-tss device for the therapy of bruxism, temporomandibular disorders, and headache.....BMC Oral Health. 2008 Jul PMID: 18662411

D-PAS Diagnostic Palatal Anterior Stop Test

This is a diagnostic test, not treatment.

D-PAS Instructions:

For next 2 weeks wear for sleeping and as much during the day as possible.
You will need to remove to eat.

Keep track of what changes you notice.

When out of the mouth always put it in its case.

Top: 3 ways appliance are lost or broken:

1. Placed in a paper towel while eating and thrown out.
2. Placed in pocket and set on.
3. Your dog finds it and uses it as a chew toy.

Clean by scrubbing off with toothbrush and toothpaste.

If facial tightness or muscle soreness increases for more than 2 days, you can stop wearing for 2 days and try again. If still sore stop wearing and contact us.

Symptoms will either get better, get worse, or stay the same.

If symptoms become worse you may have a more serious problem that will require further tests.

Diagnostic Palatal Anterior Stop

D-PAS Test: Wear 2 weeks, Day and Night

Better- Decrease Symptoms

Sleep Clenching: Wear D-PAS as night guard
Occlusal Muscle Disharmony: Occlusal Adjust

Worse- Increase Symptoms

Mechanically Unstable TMJ (Joint subluxation)
Intracapsular Problem TMJ

Stays the Same- No Change in Symptoms

Damaged TMJ are mechanically stable
Pain not related to occlusion

This is a diagnostic test, not treatment



Are the TMJ muscles inhibited from full contraction with anterior only tooth contact?

Detect with EMG or muscle palpation- Clench full power on posterior teeth and then with D-PAS orthotic.

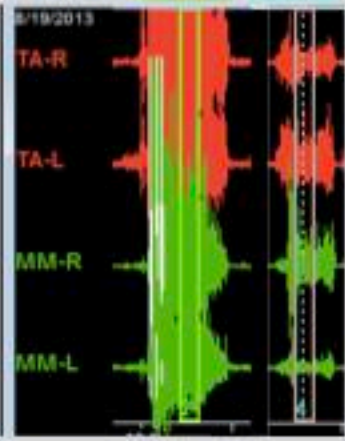
BioResearch EMG

BioResearch mScan



Patient with muscles inhibited by anterior only contact

	Clench MaxIC μV	Anterior Stop D-PAS μV
TA-R	100.6	15.7
TA-L	108.9	25.3
MM-R	115.4	25.5
MM-L	70.5	6.8

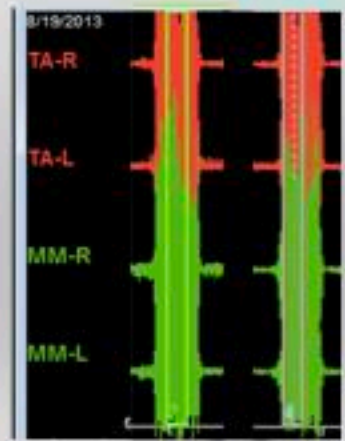


Major decrease in muscle power with D-PAS

BioResearch EMG

Another Patient with muscles NOT inhibited by anterior only contact

	Clench MaxIC μV	Anterior Stop D-PAS μV
TA-R	82.2	77.9
TA-L	124.6	103.6
MM-R	185.0	169.0
MM-L	79.9	86.6



Muscle power same with D-PAS



Diagnostic Palatal Anterior Stop

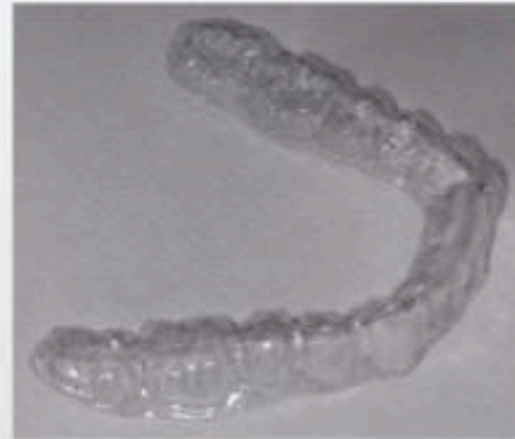


Daytime Clenching- Clear Brux Checker

Increase awareness to break habit

Very thin: Similar to mylar used for composites

50 μ m thick



Great Lakes Orthodontics
Platzhalterfolie by Scheu
Scheu Ref # 3202.1



6 Common TMDs

Diagnosis	Pattern	Treatment
Clenching	Patient is aware Masseters Ache Morning TMJ clicking that resolves	Occlusal Adjust D-PAS Night Guard (if inhibition) Magnesium and Vitamin C hs
Sleep Grinding	Worn Teeth	Protective night guard Airway night guard
Occlusal Muscle Dysfunction	Sore muscles when chewing Sore Lateral Pterygoid, Headaches Day D-PAS Relieves Symptoms	Occlusal Adjustment
Osteoarthritis of TMJ	Arthralgia CBCT shows worn bone loss MRI T2, STIR ++	NSAID for 6-12 weeks Occlusal Adjustment Do not put in a night guard
Sprain Discal Ligament TMJ, Acute	Sudden onset pain TMJ, sore TMJ Limited opening Soft end point active stretch	Cold Laser, Ice 15 min 3x a day Rest, Soft diet, NSAID 7 days Anterior Reposition Orthotic 7 days
Acute Closed Lock TMJ	Sore TMJ Limited opening Hard end point active stretch	Arthrocentesis with PRP



Clenchers destroy the joint,
Grinders destroy the teeth



Clenching

Painful Muscles

Patient is usually aware of clenching

Fremitus

Strong Masseters

See slight wear around tooth contacts

Damage TMJ cartilage

If patient is unaware of clenching-

Plant seed at hygiene visit

Do you clench?

Grinding

See tooth wear

Patient is usually not aware

Buttressing bone if teeth are tight

If tooth mobility, on excursions

Strong Masseters

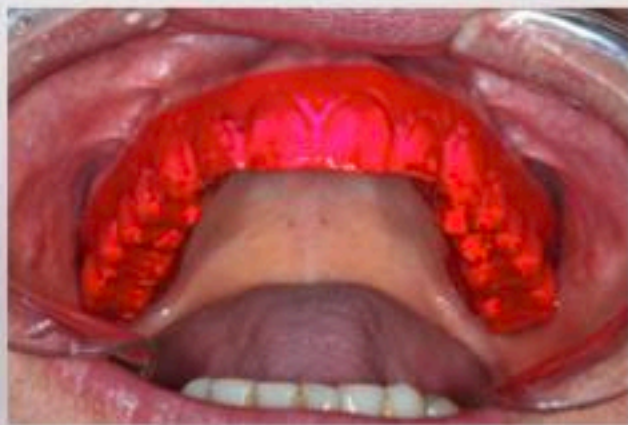
Slight if any soreness muscles

Usually no muscle pain

2. Does this occur awake or asleep?

Brux Checker
Great Lakes Orthodontics

0.1mm Mylar



Made on Biostar Machine

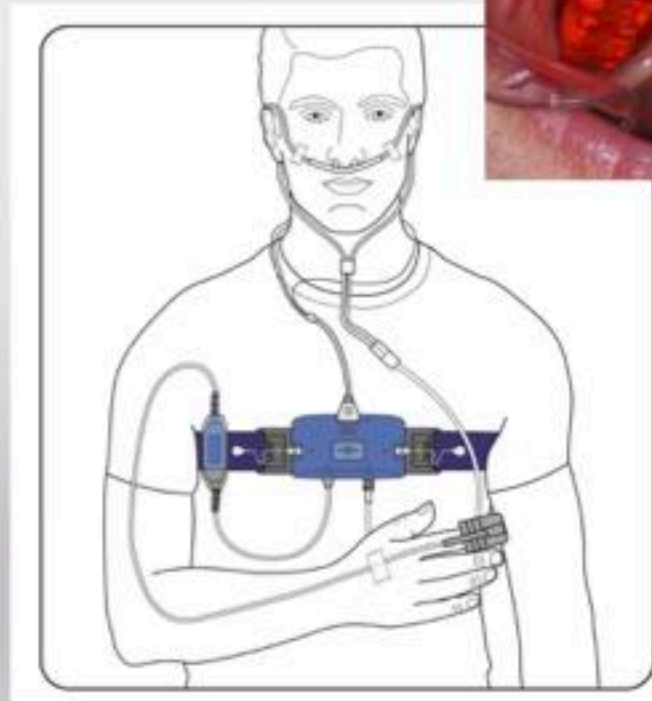


zMachine

GENERAL
sleep



zMachine + Brux Checker
+ Snore Lab



Call (888) 330-4424

Use Code: DROTER to receive special offer

Also ask for access to Droter Modified Report

Treating Common TMDs in a General Practice

Management

Diagnosis

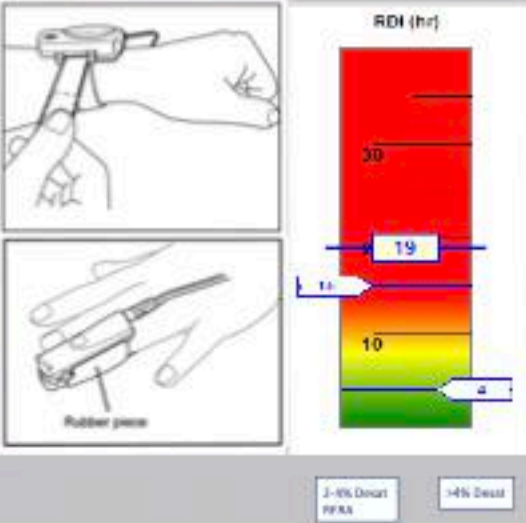
Sleep Grinding Airway Related

Pattern

Worn Teeth
Upper Airway Resistance

~~Treatment~~

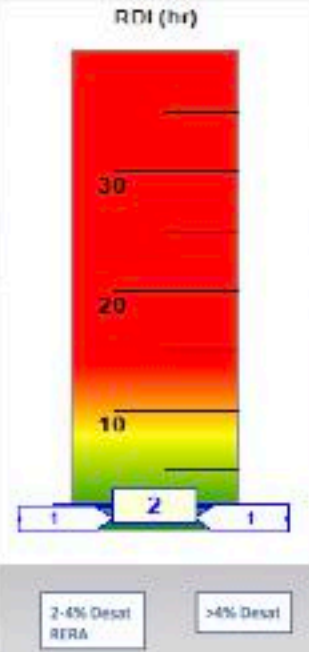
Mandibular Advancement
Appliance (after MD approves)



PULSOX 300i, Konica Minolta
with data analysis Patient Safety, Inc.

Pulse Ox Screening
Refer to Medical Sleep Doctor
Get approval for Mandibular Advancement Appliance
Verify Airway Improves
19 events/hr before
2 events/hr with Orthotic

Narval CC
Great Lakes Ortho



Which Occlusal Orthotic for Grinding?



Lower Hard CR Orthotic



Upper Hard CR Orthotic



Mandibular Advancement Device

Lower Posterior Stop Night guard with upper Essix



6 Common TMDs

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Occlusal Muscle Dysfunction	Sore muscles when chewing Sore Lateral Pterygoid, Headaches Day D-PAS Relieves Symptoms	Occlusal Adjustment
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Acute Closed Lock TMJ	Sore TMJ Limited opening Hard end point active stretch	Arthrocentesis with PRP

Occlusal Muscle Disharmony

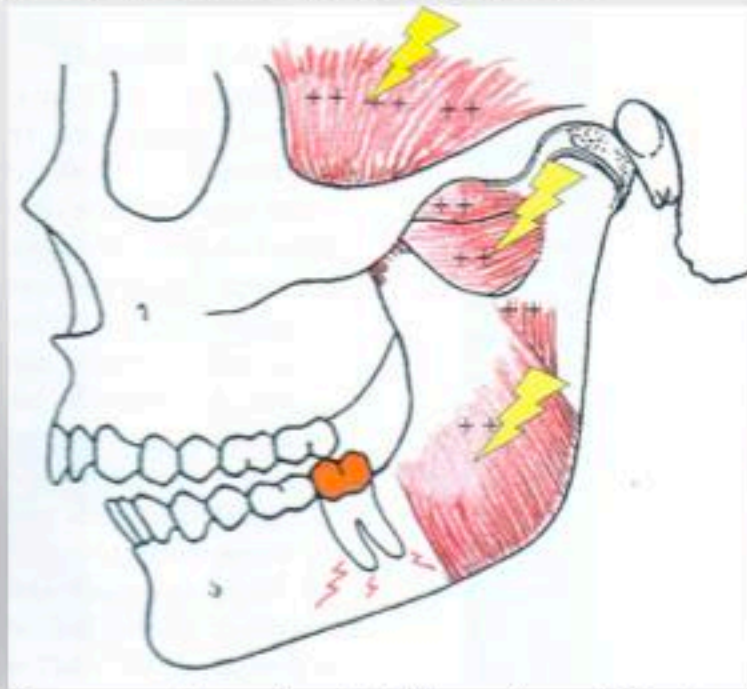
Uneven tooth contact with condyles fully seated triggers muscle activity

Lateral pterygoid fires out of sequence to create even tooth contact on closure

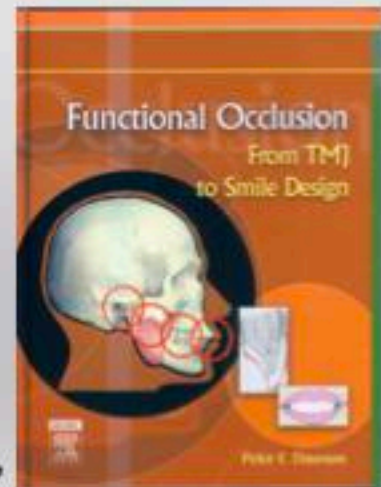
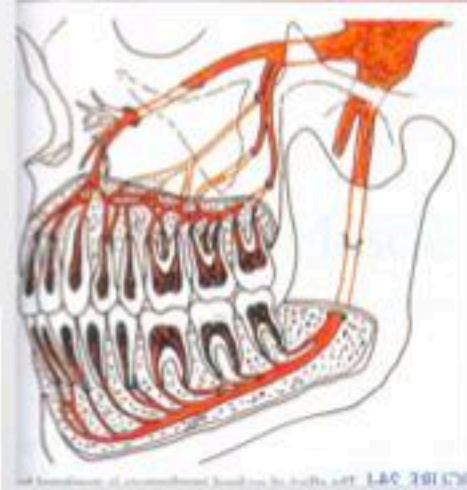
Disharmony in all muscles: Splinting/Bracing

Muscles sore from overuse

Muscles do not think- CNS input

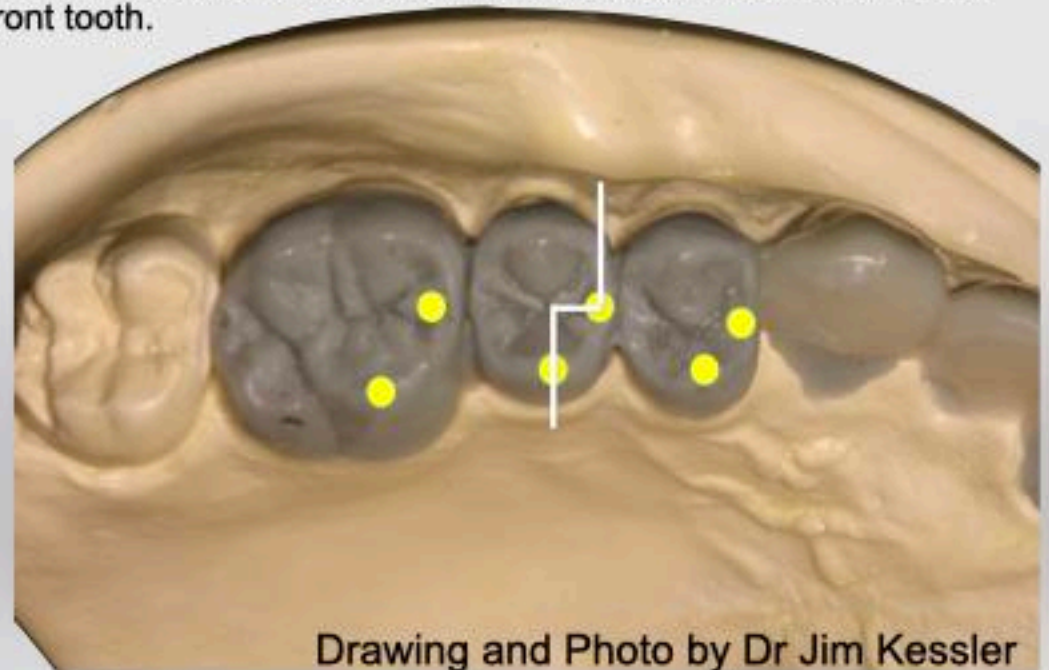
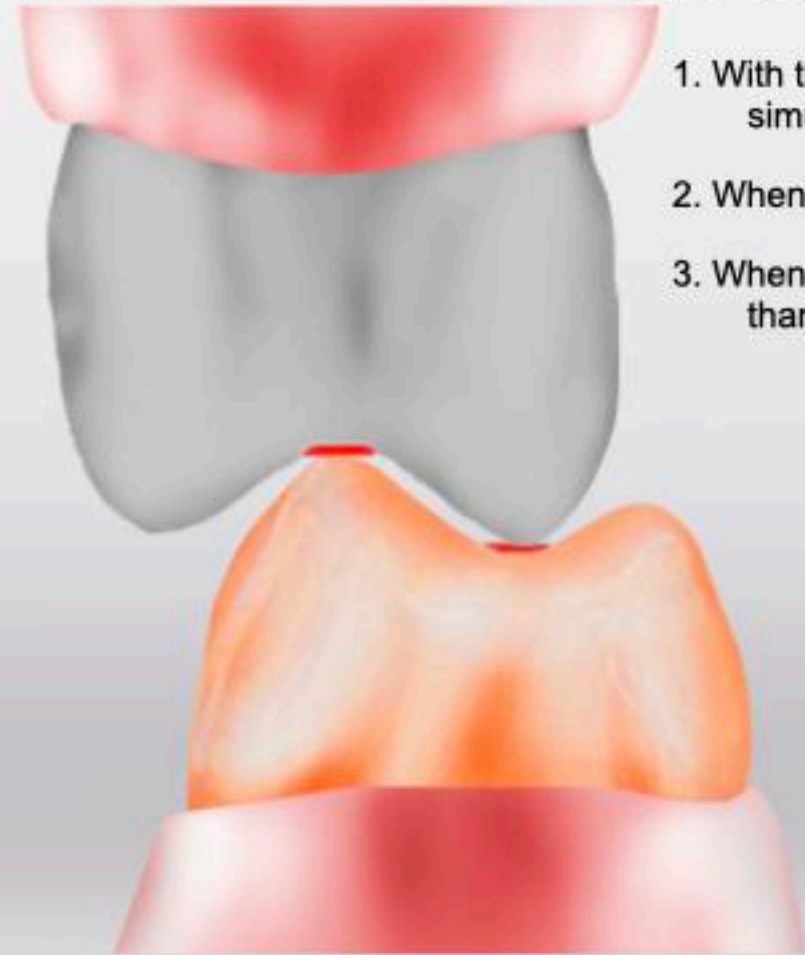


from Dawson's Textbook, "Functional Occlusion"



LD Pankey's 3 Rules of Occlusion (Clyde Schuyler)

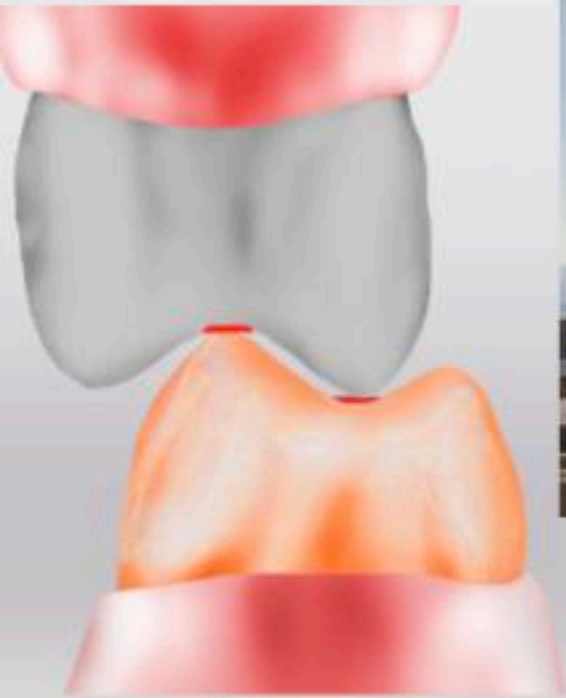
1. With the condyles fully seated in the fossa, all the posterior teeth touch simultaneously and even, with the anterior teeth lightly touching.
2. When you squeeze, neither a tooth nor the mandible moves (in a lateral direction).
3. When you move the mandible in any excursion, no back tooth hits before, harder than, or after a front tooth.



Drawing and Photo by Dr Jim Kessler

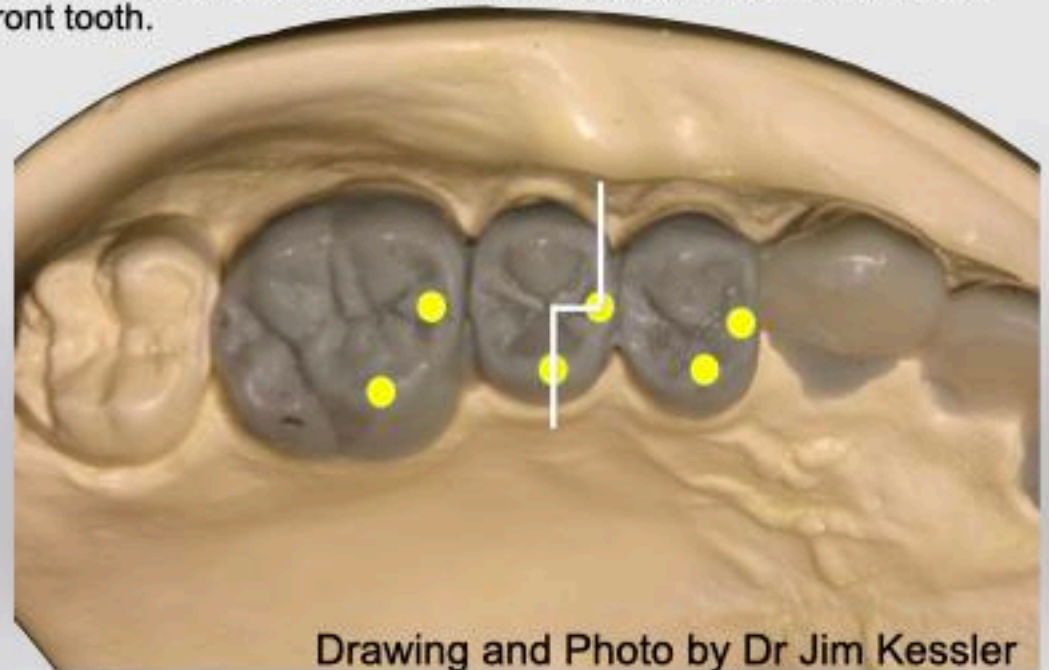
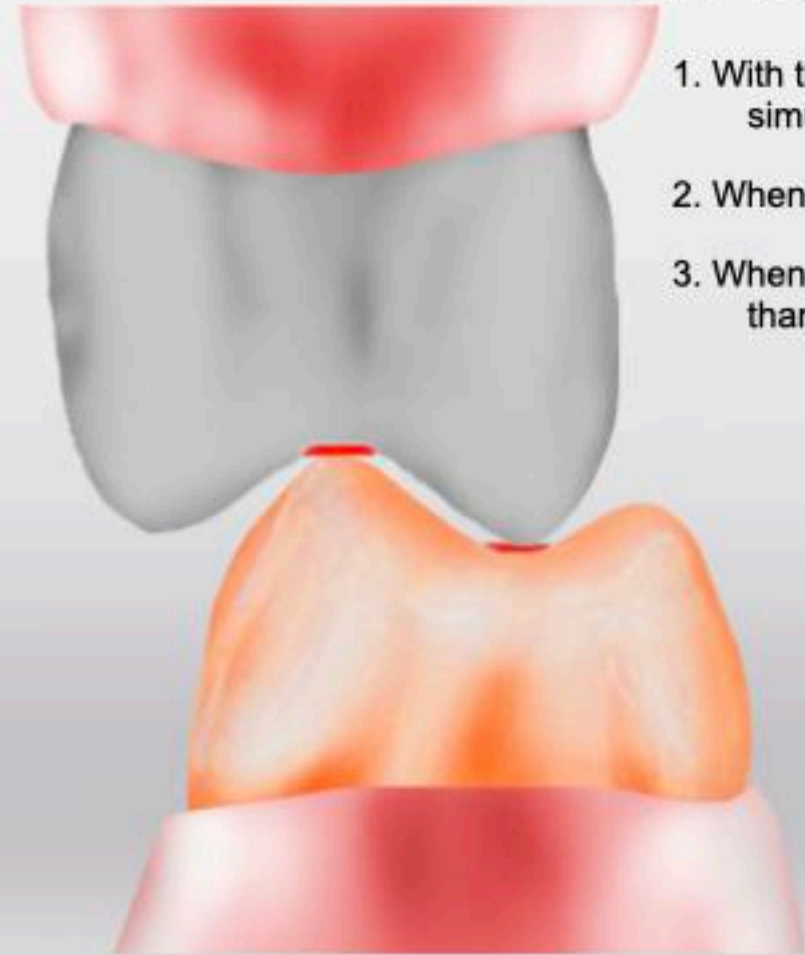
2. When you squeeze, neither a tooth nor the mandible moves (in a lateral direction).

Rule #2 = Flat Landing Area



LD Pankey's 3 Rules of Occlusion (Clyde Schuyler)

1. With the condyles fully seated in the fossa, all the posterior teeth touch simultaneously and even, with the anterior teeth lightly touching.
2. When you squeeze, neither a tooth nor the mandible moves (in a lateral direction).
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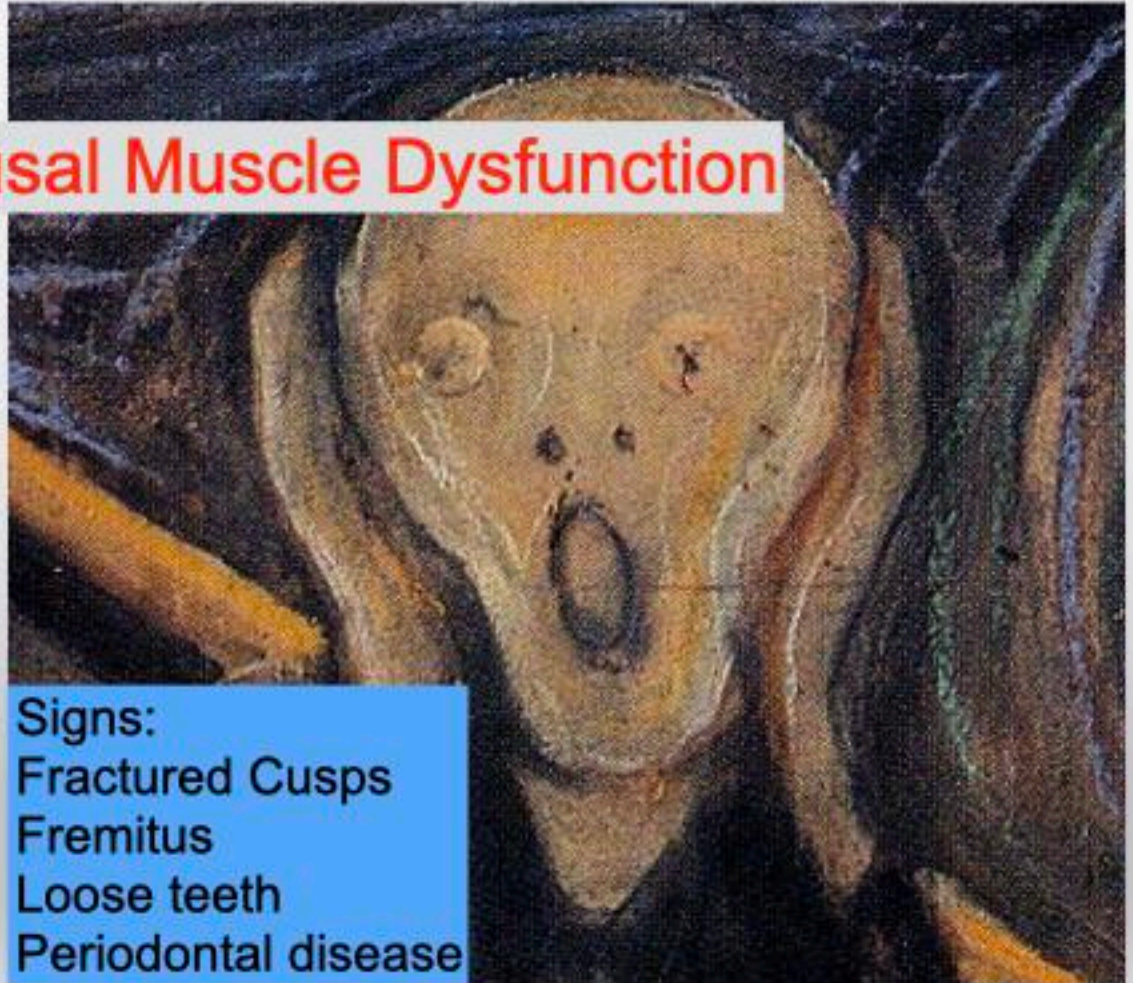
Drawing and Photo by Dr Jim Kessler

TMD Symptoms

Sore TM Joint
Sore TMJ muscles
Difficulty chewing
Headaches
Eye pain
Ear pain
TMJ clicking
Jaw locking
Limited opening
Difficulty open jaw
Difficulty closing jaw
Anterior Open Bite

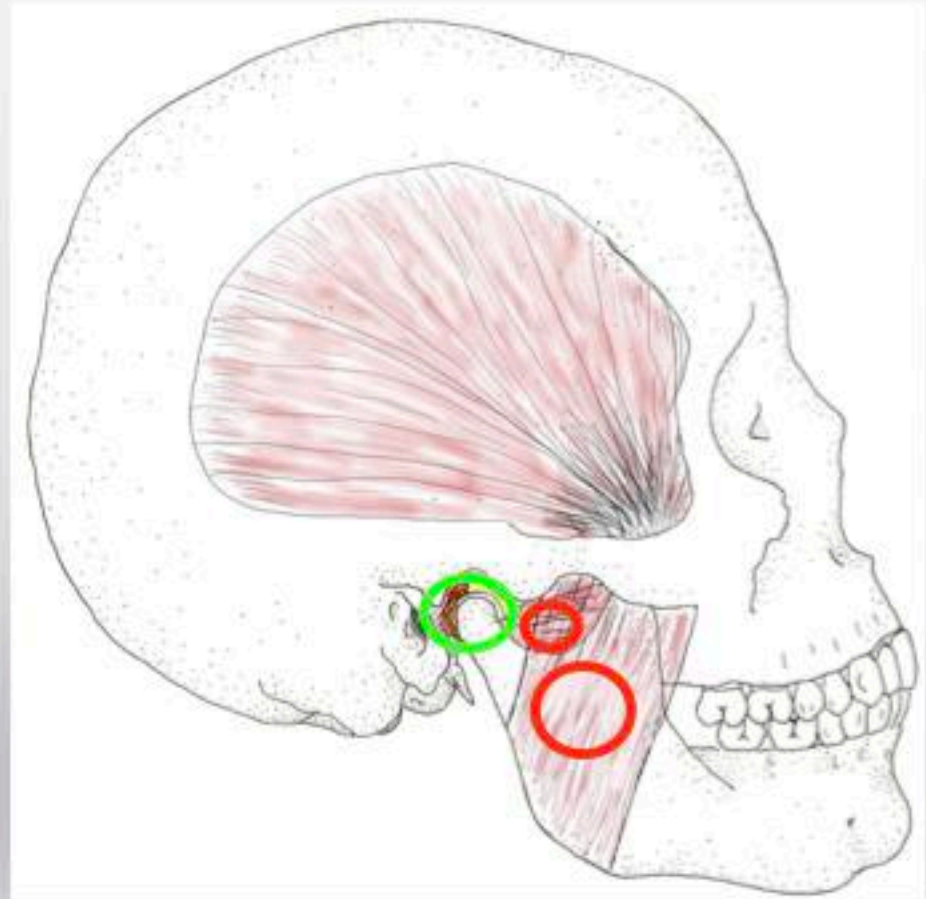
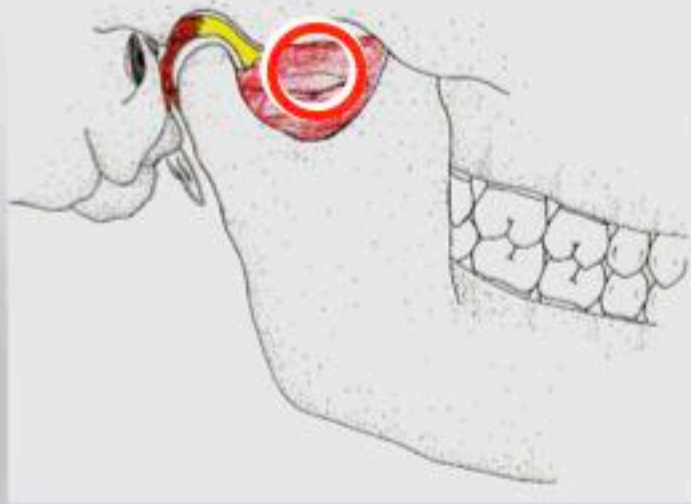
Occlusal Muscle Dysfunction

Signs:
Fractured Cusps
Fremitus
Loose teeth
Periodontal disease



Occlusal Muscle Dysfunction Pattern

Sore muscles when chewing
Sore Lateral Pterygoid
TMJ is not sore
Day orthotic relieves symptoms



Drawings by Gretta Tomb DDS and John Droter DDS

Occlusal Muscle Dysfunction Diagnostic Tests

Occlusal Muscle Dysfunction is a daytime problem

Clenching can be both a daytime and nighttime problem

>30% of headaches have an occlusal component

Occlusal adjustment in patients with craniomandibular disorders including headaches. A 3- and 6-month follow-up. Vallon D, Ekberg E, Nilner M. Acta Odontol Scand. 1995



D-PAS 2 week trial



3-6 week lower CR orthotic



Response to occlusal treatment in headache patients previously treated by mock occlusal adjustment. Forssell H, Kirveskari P, Kangasniemi P. Acta Odontol Scand. 1987

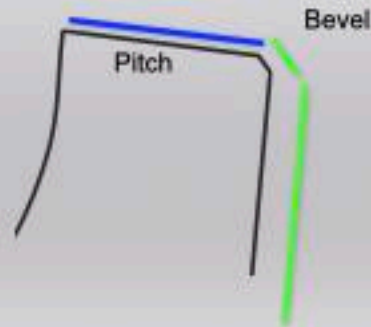
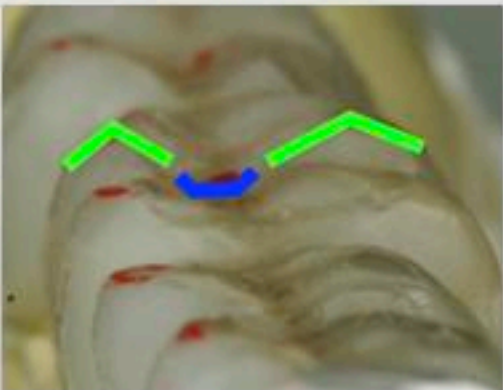
Occlusal Sculpting Tools, including Zirconia



Wheel
 Create Cusp Landing Zone
 Flatten Incisal edges
 Bulk reduction of inclines



Move and Shape Cusps,
 Inclines, Facial Surfaces



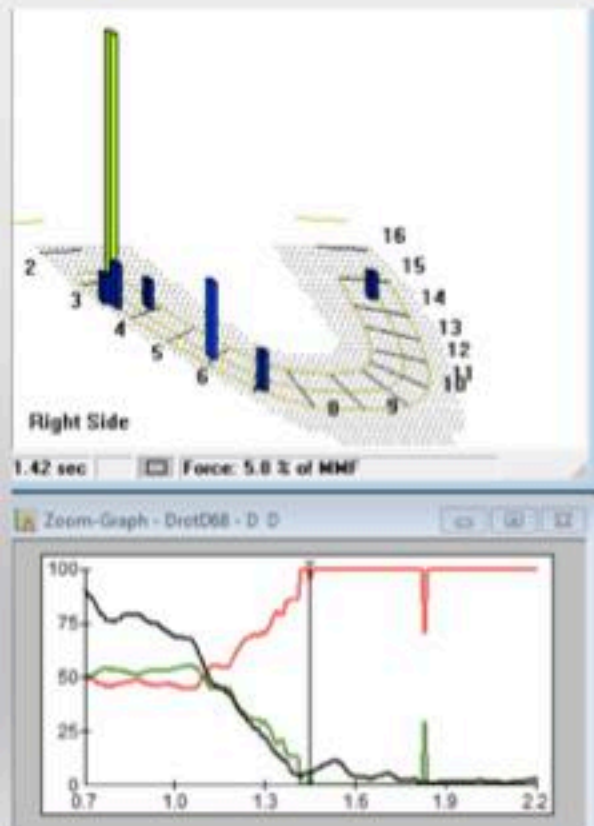
Brassler Brio Shine
 FLBCER-1
 FLBF-2



Premier 860.9 F Wheel Diamond
 Premier 230 F Barrel Diamond
 Neodiamond 1118.7F Roundend taper
 Dedco Green Stone
 White Arkansas stone
 Filtek Supreme- B1B, Albond

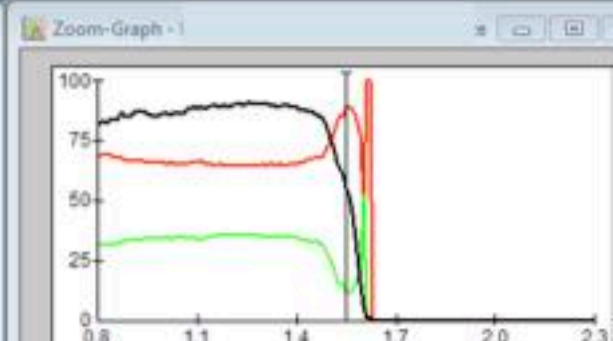
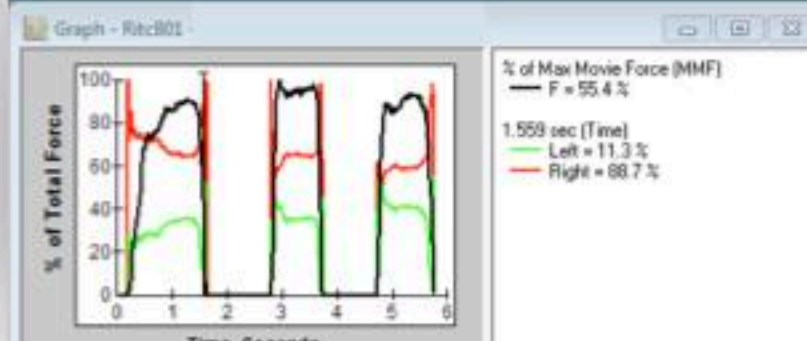
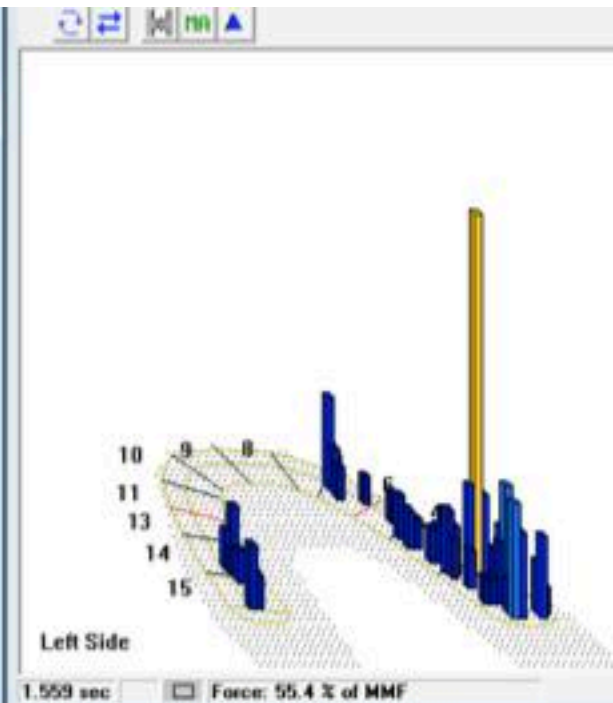
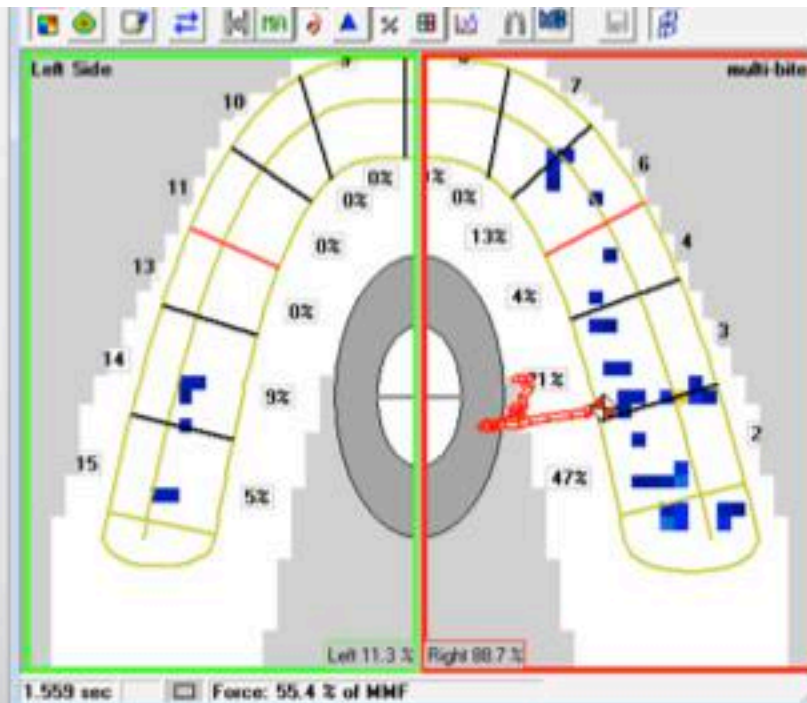
The indispensable value of T-Scan is not in finding heavy CR contacts, but working and nonworking contacts.

Is that a smudge or a muscle activating interference?



Remove too much and you decrease the ability to chew, especially lettuce. Chewing lettuce requires posterior inclines coming close enough to chew, but far enough apart to not touch and activate muscle.

T-Scan is excellent for Patient Education of Occlusal Pathology



TMDs- What are the choices? (190 Diagnoses, 7 Categories)

1. TMJ Damage

Adhesions and ankylosis of temporomandibular joint
Avascular Necrosis Mandibular Condyle
Cartilage Fibrillation, Mandibular Condyle, Fossa
Closed Lock, Jaw Cartilage, Acute
Closed Lock, Jaw Cartilage, Chronic
Closed Lock, Jaw Cartilage, Intermittent, Mechanically dysfunctional
Crush Injury Mandibular Condyle
Crystal arthropathy, unspecified, TMJ
Dislocation jaw cartilage due to injury, Sequela
Dislocation jaw cartilage with reduction, favorable adaptation, TMJ
Dislocation jaw cartilage without reduction, favorable adaptation, TMJ
Effusion, TMJ

Impingement Retrodiscal Tissue
Inflammatory Tissue Bone Resorption, TMJ Condyle
Loose Body (Joint Mice), TMJ
Malignant neoplasms of bones of skull and face
Open Lock TMJ, Recurring
Osteoarthritis TMJ, active degeneration
Osteoarthritis- Inactive
Osteochondritis Dissecans TMJ
Osteolysis Mandibular Condyle, Active
Perforation Meniscus, TMJ
Perforation Pseudocyst, TMJ
Psoriatic Arthritis TMJ
Rheumatoid Arthritis Seronegative TMJ
Synovitis

2. Muscles of the TMJ

Dystonia
Habitual posture forward mandible
Hemifacial Muscle spasm
Inhibitory Reflex Dysfunction, Periodontal Ligament Masseter Muscle
Muscle Atrophy, TMJ
Muscle Bracing Neck Stabilization
Muscle Bracing Pain Avoidance
Muscle Bracing TMJ stabilization
Muscle Bracing Airway **Patency** (with Tongue)
Muscle Contracture Fibrosis Lateral Pterygoid
Muscle Contracture Fibrosis Masseter, Medial Pterygoid, Temporalis
Muscle Fatigue Overuse
Muscle Hypertrophy TMJ Muscles

3. Cranial Alignment/Occlusion

Cranial Distortion / Misalignment
Hemifacial Hypoplasia
Hyper Occlusal Awareness
Idiopathic Orthotic Damage
Malocclusion Anterior Open Bite
Malocclusion Centric occlusion MesioC discrepancy
Malocclusion Deep Bite
Malocclusion due to mouth breathing
Malocclusion due to TMJ bone loss
Malocclusion due to tongue, lip or finger habits
Malocclusion Insufficient anterior occlusal guidance
Malocclusion lack of posterior occlusal support
Malocclusion Posterior Openbite Bilateral
Malocclusion Posterior Openbite Unilateral
Malocclusion unspecified

Malposition/Misalignment: Maxilla, Temporal Bone, Mandible
Mandibular asymmetry
Mandibular hyperplasia
Mandibular hypoplasia
Mandibular Retrognathia
Maxillary asymmetry
Maxillary hyperplasia
Maxillary hypoplasia
Maxillary Retrognathia
Occlusal Adaptation, Favorable
Occlusal Dependency for Joint Stabilization/ Proprioception
Tooth Intrusion
Tooth Supereruption

4. Cervical Damage

Cervical Vertebrae Alignment Dysfunction
Cervicocranial Syndrome
Muscle Guarding due Neck Instability
Trigger Point Neck Muscle with Referred Pain
Trigger Point Neck Muscle, Localized Pain

5. Parafunction

Excessive Tooth Wear, Damage
Hyperensitive Occlusion
Parafunctional dechewing wiggle
Parafunctional Clenching Teeth, Awake
Parafunctional Clenching Teeth, Sleep
Parafunctional Grinding Teeth, Awake
Parafunctional Grinding Teeth, Sleep
Parafunctional Tongue Bracing avoiding uncomfortable tooth contact
Parafunctional Tongue Bracing Neck stabilization
Parafunctional Tongue Bracing to maintain Airway
Parafunctional Tongue Bracing unknown cause

6. Whole Body / Systemic

Lyme Disease Arthritis
Magnesium Deficiency
Obstructive Sleep Apnea
Osteoporosis without current pathological fracture
Pathological Habitual Movement Patterns
Postural Disharmony Standing
Postural Disharmony Walking
Postural Forward Head Position
Upper Airway Resistance, UARS

7. Other

Other.....

..... chronic pain disorder
Pain disorder with related psychological factors
Sensitized Sensitization

Facial Pain: Not always OMD

CC: Sharp Shooting Nerve Pain Right Face

Dx: Class 2 Malocclusion

Tx: Orthognathic Surgery. Still Facial Pain.

Dx: OMD

Tx: Multiple Occlusal Adjustment over a year
Still Pain

Dx: CT scan reveals Parotid Cancer, Stage 4.



7 Rules for Dx Facial Pain:

1. Listen to the patient, oral and written
2. Patients can have more than one disease
3. Develop a Differential Diagnosis
4. Run tests that increase or decrease the pain
5. Develop a Working Diagnosis
6. Diagnosis Confirmed after Tx
7. Do not chase a diagnosis too long before you rule out cancer.



Rule cancer out early, rule it out often.

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Perforation Pseudocyst, TMJ
Psoriatic Arthritis TMJ
Rheumatoid Arthritis Sero Negative TMJ
Scurvy

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Muscle Guarding due Neck Instability
Trigger Point Neck Muscle with Referred Pain
Trigger Point Neck Muscle, Localized Pain

5. Parafunction

Without ruling out occlusal problems and parafunction
it is hard to figure out the rest.

Muscle Bracing Pain Avoidance
Muscle Bracing TMJ stabilization
Muscle Bracing Airway Patency (with Tongue)
Muscle Contracture Fibrosis Lateral Pterygoid
Muscle Contracture Fibrosis Masseter, Medial Pterygoid, Temporalis
Muscle Fatigue Overuse
Muscle Hypertrophy TMJ Muscles

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Osteoporosis without current pathological fracture
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Postural Forward Head Position
Upper Airway Resistance, UARS

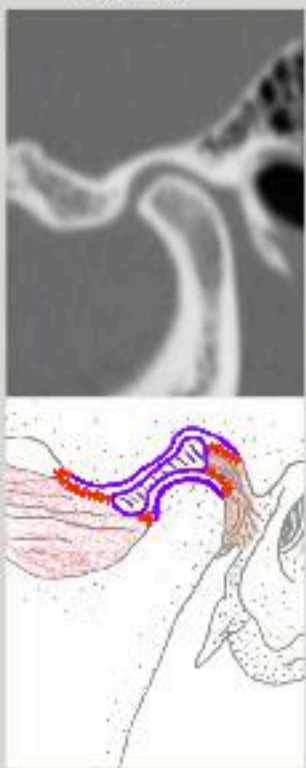
7. Other

Nerve Entrapment Masseteric Nerve due to Masseteric hypertonicity
Neuroma Trigeminal Nerve
Obsessive-Compulsive Personality Disorder
Other
Otitis Ear Infection
Pain disorder exclusively related to psychological factors, Somatoform pain disorder
Pain disorder with related psychological factors
Scurvy

6 Common TMDs

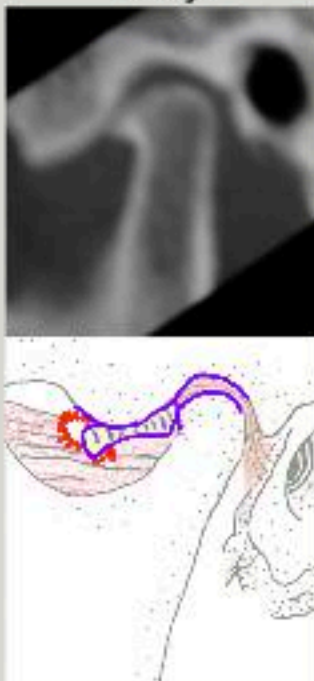
Diagnosis	Pattern	Treatment
Clenching	Patient is aware Masseters Ache Morning TMJ clicking that resolves	Occlusal Adjust D-PAS Night Guard (if inhibition) Magnesium and Vitamin C hs
Sleep Grinding	Worn Teeth	Protective night guard Airway night night guard
Occlusal Muscle Dysfunction	Sore muscles when chewing Sore Lateral Pterygoid, Headaches Day D-PAS Relieves Symptoms	Occlusal Adjustment
Osteoarthritis of TMJ	Arthralgia CBCT shows worn bone loss MRI T2, STIR ++	NSAID for 6-12 weeks Occlusal Adjustment Do not put in a night guard
Sprain Discal Ligament TMJ, Acute	Sudden onset pain TMJ, sore TMJ Limited opening Soft end point active stretch	Cold Laser, Ice 15 min 3x a day Rest, Soft diet, NSAID 7 days Anterior Reposition Orthotic 7 days
Acute Closed Lock TMJ	Sore TMJ Limited opening Hard end point active stretch	Arthrocentesis with PRP

Normal



Osteoarthrosis/Osteoarthritis

Early



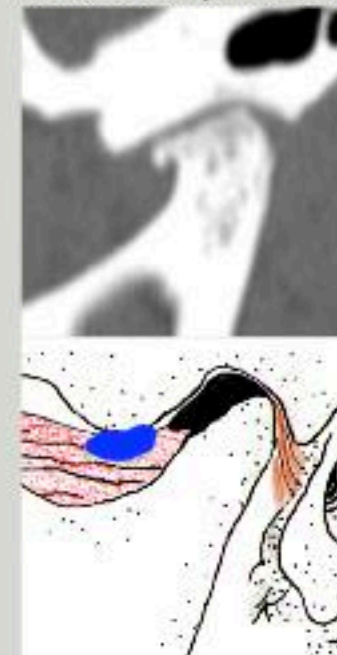
Early/ Moderate



Moderate



Severe OA, Eburnation



Healthy joints have no friction or wear.
Damaged joints have Friction. Friction causes wear.
OA is a wearing out of a joint which starts in cartilage.
Parafunction increases wear.

Representative examples of OA
in different patients

Drawings by Gretta Tomb DDS and John Droter DDS

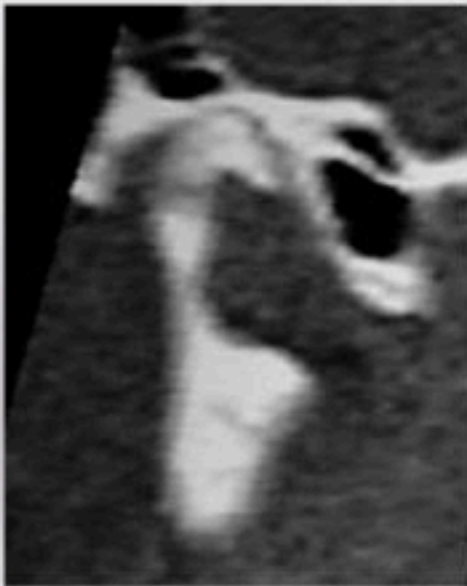
Adaptation Chronic Bilateral Osteoarthritis

Mandible recedes Slowly

Teeth Move/ Adapt

Anterior Guidance gets steeper as Condylar Guidance get shallower

OA Right and Left Bone Loss
#8 Ankylosed



Treatment OA

Osteoarthrosis

Glucosamine 1500mg /Chondroitin 600 mg per day

Minimize parafunction:

If sleep grinding due to airway
CPAP or Dental Airway Device

Osteoarthritis

All of the above plus eliminate inflammation.....

NSAIDs for 6+ weeks

Cold Laser

If still inflamed arthrocentesis with
Platelet Rich Plasma (PRP)



Shea Brand CBD



MLS Laser
3x week for 3 weeks

MLS Laser: BioResearch

Multiwave Locked System Laser

808 nm Continuous, 905 nm Pulsed

Diode Laser

Stimulates metabolic processes in cells
Increase release NO from cells
Decrease inflammation
Pain Reduction
Faster Healing
Eliminates Trigger Points
Much better than Dry Needling



Chung, H., Dai, T., Sharma, S. K., Huang, Y.-Y., Carroll, J. D., & Hamblin, M. R. (2012). The nuts and bolts of low-level laser (light) therapy. *Annals of Biomedical Engineering*, 40(2), 516–533.

Ilbuldu E, Cakmak A, Disci R, Aydin R. Comparison of laser, dry needling, and placebo laser treatments in myofascial pain syndrome. *Photomed Laser Surg*. 2004 Aug;22(4):306-11.

Treatment OA

Osteoarthrosis

Minimize parafunction:

If sleep grinding due to airway:

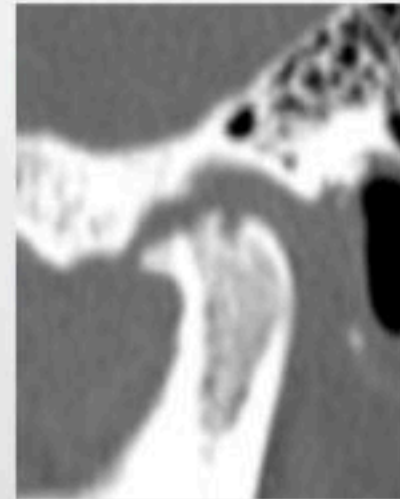
CPAP or Dental Airway Device

Glucosamine 1500mg /Chondroitin 600 mg per day

If still pain in 6 -12 weeks of NSAID:

Arthrocentesis

Platelet Rich Plasma



Osteoarthritis

All of the above plus eliminate inflammation.....

NSAIDs

Cold Laser

If still inflamed arthrocentesis with Platelet Rich Plasma (PRP)



6 Common TMDs

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Acute Closed Lock TMJ	Sore TMJ Limited opening Hard end point active stretch	Arthrocentesis with PRP

TMD Symptoms

Limited Opening

Diseases to consider and rule out:

- Pain Avoidance Sore Joint
- Pain Avoidance Sore Muscle
- Hematoma
- Muscle Spasm
- Masseteric Space Infection
- Nonreducing Disc (4b,3b Acute)
- Joint Fibrosis, Muscle Fibrosis
- Other



Differential Diagnosis: Limited Joint Motion

Muscle Spasm

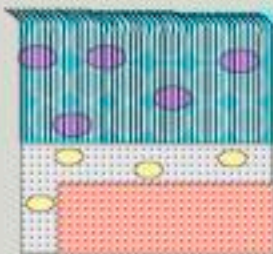
Painful to Move
Joint Pain
Muscle Pain

Mechanically Blocked
4b Acute
Adhesion

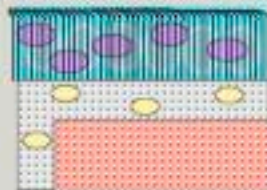
Masseteric Space
Infection
Hematoma



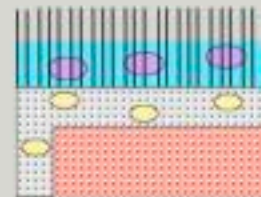
Healthy Cartilage



4 Weeks



8 Weeks



Lose 50% height of cartilage
Proteoglycans not being produced by Chondrocytes
Loss of 50% proteoglycans and water
Collagen still intact
Process is reversible
Move joint with light force/repetitive motion next 30 days

You have 6-8 weeks to get jaw moving
before cartilage is irreversibly damaged,
independent of the cause of the
immobilization

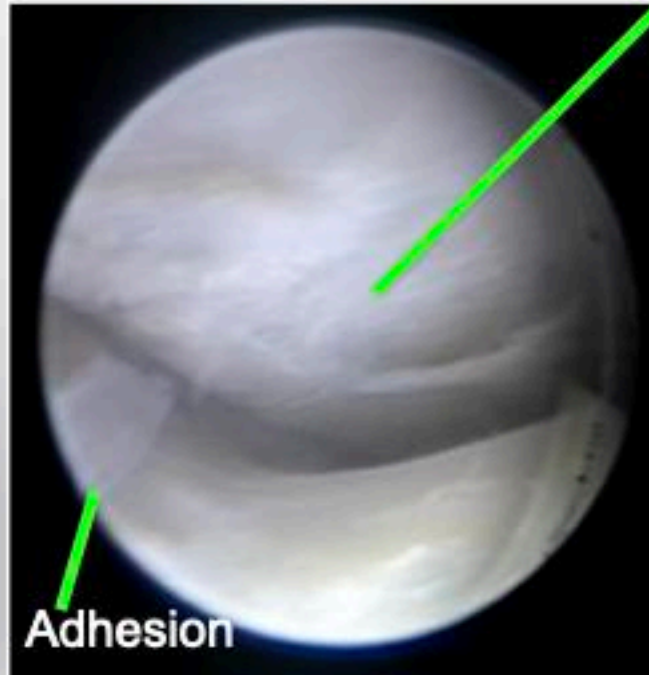
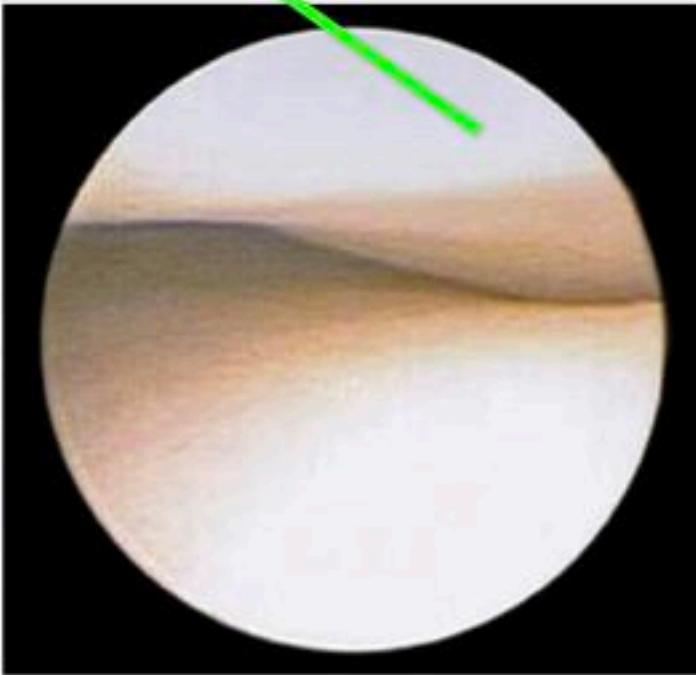


E.B. Evans, GWN Eggers, J.K. Butler, and J. Blumel, Experimental immobilization and remobilization of rat knee joints, J Bone Joint Surg Am, 1960 vol. 42 (5) pp. 737-758
Enneking WF, Horowitz M. The intra-articular effects of immobilization on the human knee. J Bone Joint Surg Am. 1972 Jul;54(5):973-85. PMID: 5068717

Arthroscopic View Left TMJ

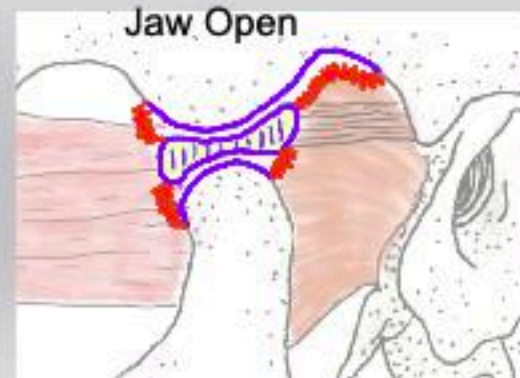
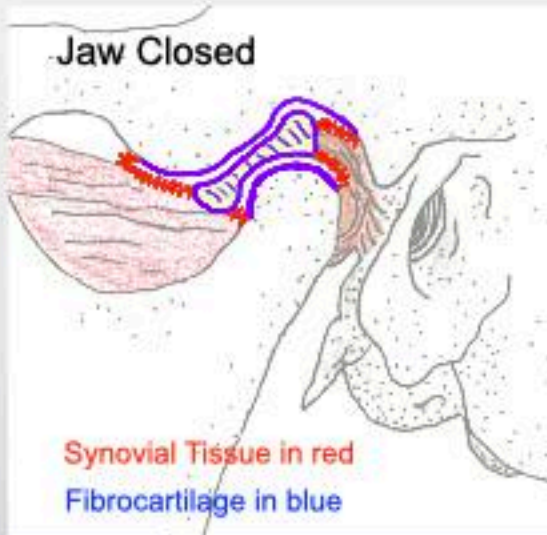
Eminence Healthy Cartilage

Eminence Necrotic Cartilage



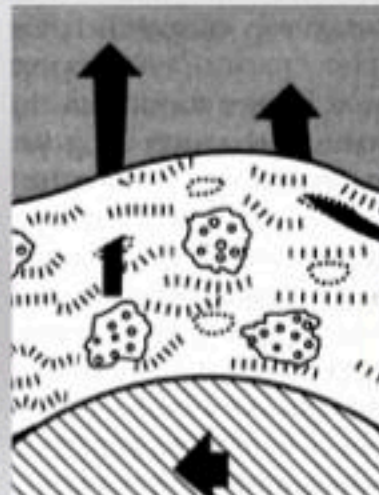
Not Same Patient

Normal TMJ- Synovium, Cartilage

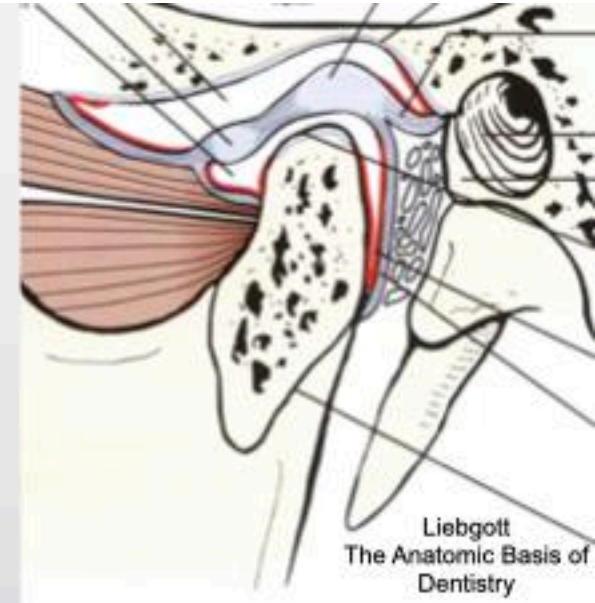


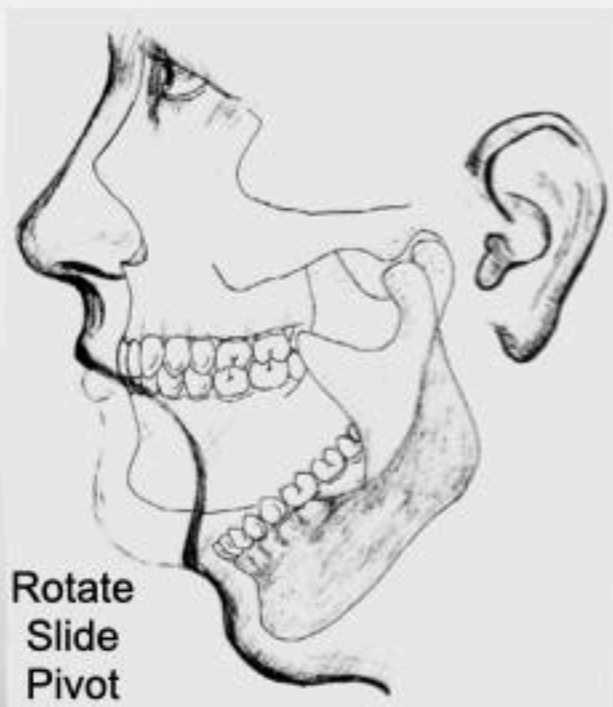
Fibrocartilage-
Slope of Eminence
Disc
Top of Condyle

Synovial Tissue makes Synovial Fluid
No blood vessels in a health joint
Nutrition to the cartilage cells
Lubrication- Hyaluronic Acid and Lubricin



Fibrocartilage surface covered in fluid
Cartilage is hydrophilic
Proteoglycan negative charge
Surface Active Phospholipids
Fluid slides against fluid
5x slipperier than ice





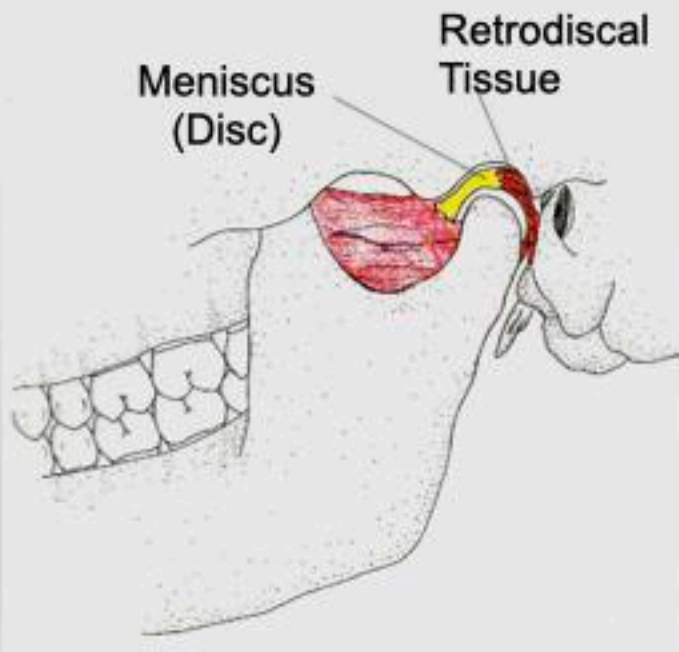
Rotation only 25mm

Max Open	40-55mm
Right Lateral	10-12mm
Left Lateral	10-12mm
Protrusive	10-12mm



TMJ has 2 Joint Compartments:

Upper- Translation
Lower- Rotation



Acute non-Reducing Disc
Limits Translation.

"Old Adapted" may have
full range of motion.



Note: Acute Sprain is much more common than non-reducing disc displacement as a cause of limited opening.

Subjective:

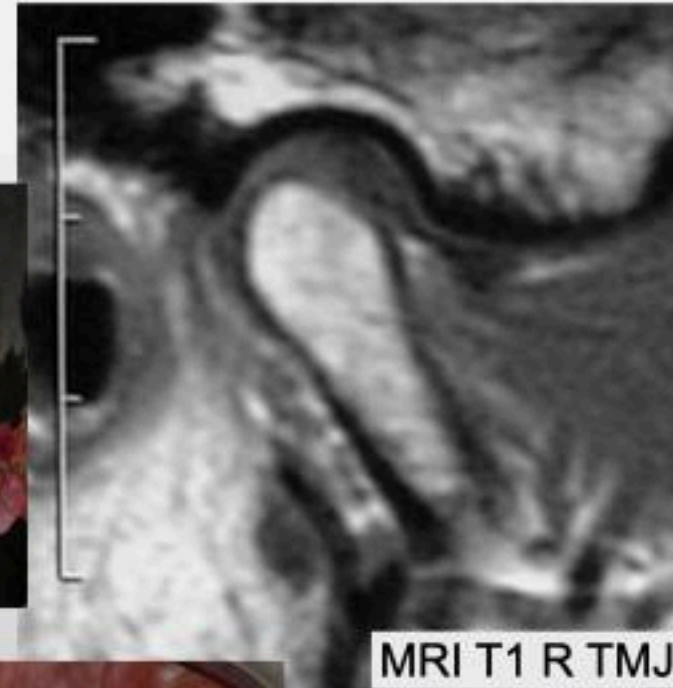
Dentist doing crown prep #30 1 week ago
Severe pain Right TMJ after moving jaw at end of appt
Constant deep pain Right TMJ
Limited opening

Objective:

Limited opening 32mm, Mandible shifts Left
Normal side to side motion
98 temp, normal perio probe 2nd molars, no caries
No pain palpation RL Medial Pterygoid
Soft end point on active stretch, 45mm, R TMJ pain
Right TMJ pain to palpation, Left TMJ normal
Posterior openbite Right, does not hold Accufilm

Assessment:

Limited opening due to Right TMJ pain avoidance
Acute Sprain Right TMJ Ligaments



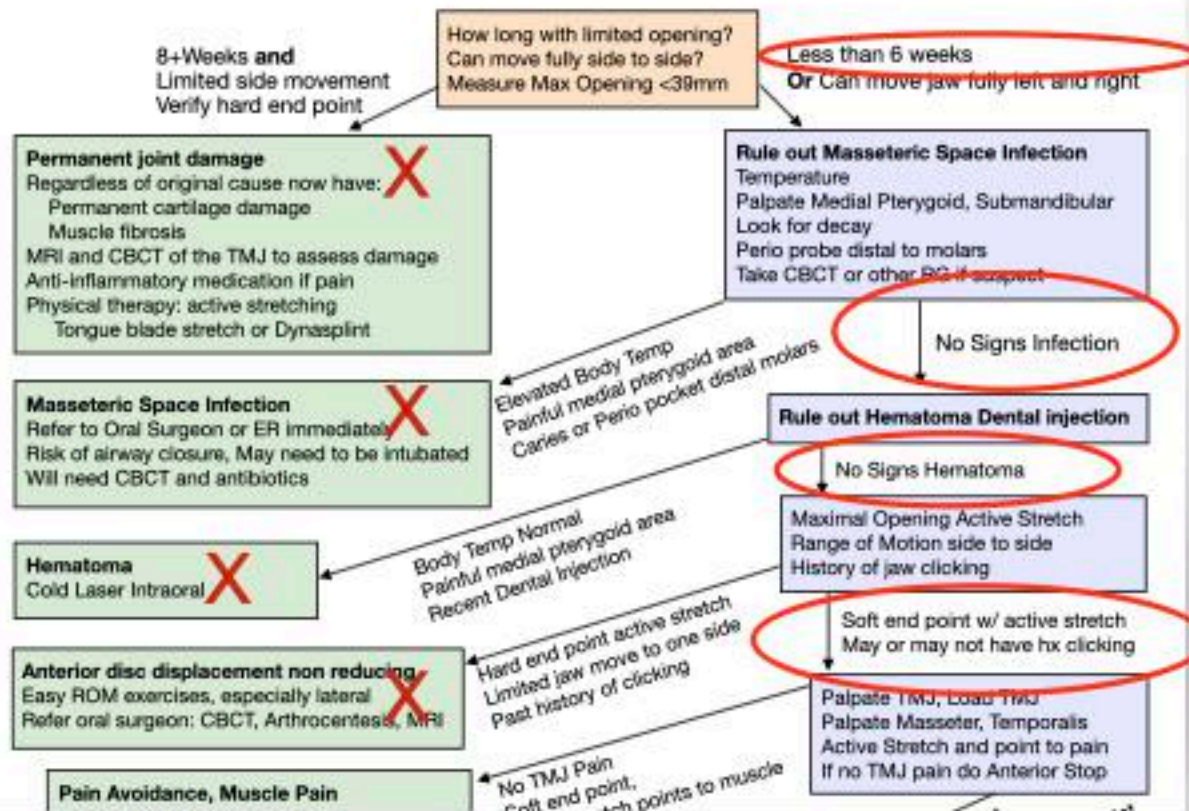
MRI T1 R TMJ



Dr Droter's Limited Opening Algorithm

12.5

Differential Diagnosis Limited Opening (Less than 39mm): Pain Avoidance Sore Joint, Pain Avoidance Sore Muscle, Muscle Spasm, Masseteric Space Infection, Nonreducing Disc (4b,3b Acute), Joint Fibrosis, Muscle Fibrosis, other.



Objective:

Limited opening 32mm, Mandible shifts Left

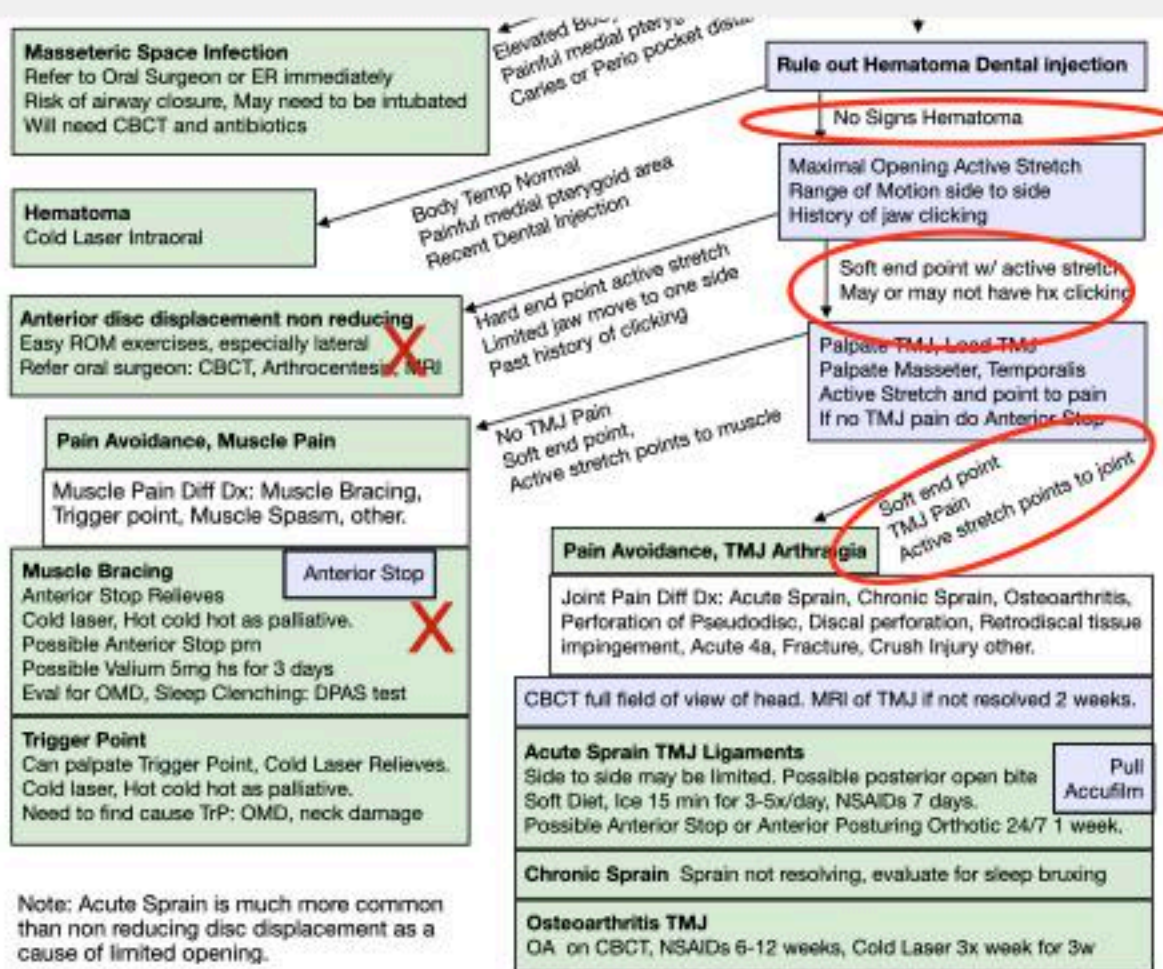
Normal side to side motion
98 temp, normal perio probe 2nd molars, no caries

No pain palpation RL Medial Pterygoid

Soft end point on active stretch, 45mm, R TMJ pain

Right TMJ pain to palpation, Left TMJ normal

Posterior openbite Right, does not hold Accufilm



Objective:

Limited opening 32mm, Mandible shifts Left

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No pain palpation RL Medial Pterygoid

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Right TMJ pain to palpation, Left TMJ normal

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Pain Avoidance, TMJ Arthralgia

TMJ +
Active stretch

Joint Pain Diff Dx: Acute Sprain, Chronic Sprain, Osteoarthritis, Perforation of Pseudodisc, Discal perforation, Retrodiscal tissue impingement, Acute 4a, Fracture, Crush Injury other.

CBCT full field of view of head. MRI of TMJ if not resolved 2 weeks.

Acute Sprain TMJ Ligaments

Side to side may be limited. Possible posterior open bite
Soft Diet, Ice 15 min for 3-5x/day, NSAIDs 7 days.
Possible Anterior Stop or Anterior Posturing Orthotic 24/7 1 week.

Pull
Accufilm

Chronic Sprain Sprain not resolving, evaluate for sleep bruxing

Osteoarthritis TMJ

OA on CBCT, NSAIDs 6-12 weeks, Cold Laser 3x week for 3w

Objective:

Limited opening 32mm, Mandible shifts Left

Normal side to side motion

98 temp, normal perio probe 2nd molars, no caries

No pain palpation RL Medial

Pterygoid

Soft end point on active stretch, 45mm, R TMJ pain

Right TMJ pain to palpation, Left TMJ normal

Posterior openbite Right, does not hold Accufilm

Treatment:

Ice 15-20 minutes for 3-5x 2 days only

Anterior repositioning orthotic 24/7 one week

NSAID for 5 days- 800mg Advil Liquid gel caps, q8h

Sleep with head elevated first week

Soft chew diet

At 1 week Anterior repositioning orthotic sleep only for second week

Week 3, no orthotic, reintroduce harder foods



Verify Orthotic does not rub
lingual tissue of mandible



At 4 weeks patient had full ROM
No clicking

New addition to protocol
Cold Laser (MLS Laser- 1500 hz 15
seconds, 10 hz 30 seconds)

MLS Laser: BioResearch

Multiwave Locked System Laser

808 nm Continuous, 905 nm Pulsed

Diode Laser

Stimulates metabolic processes in cells
Increase release NO from cells
Decrease inflammation
Pain Reduction
Faster Healing
Eliminates Trigger Points
Much better than Dry Needling



Chung, H., Dai, T., Sharma, S. K., Huang, Y.-Y., Carroll, J. D., & Hamblin, M. R. (2012). The nuts and bolts of low-level laser (light) therapy. *Annals of Biomedical Engineering*, 40(2), 516–533.

Ilbuldu E, Cakmak A, Disci R, Aydin R. Comparison of laser, dry needling, and placebo laser treatments in myofascial pain syndrome. *Photomed Laser Surg*. 2004 Aug;22(4):306-11.

Ms MY

6 Common TMDs

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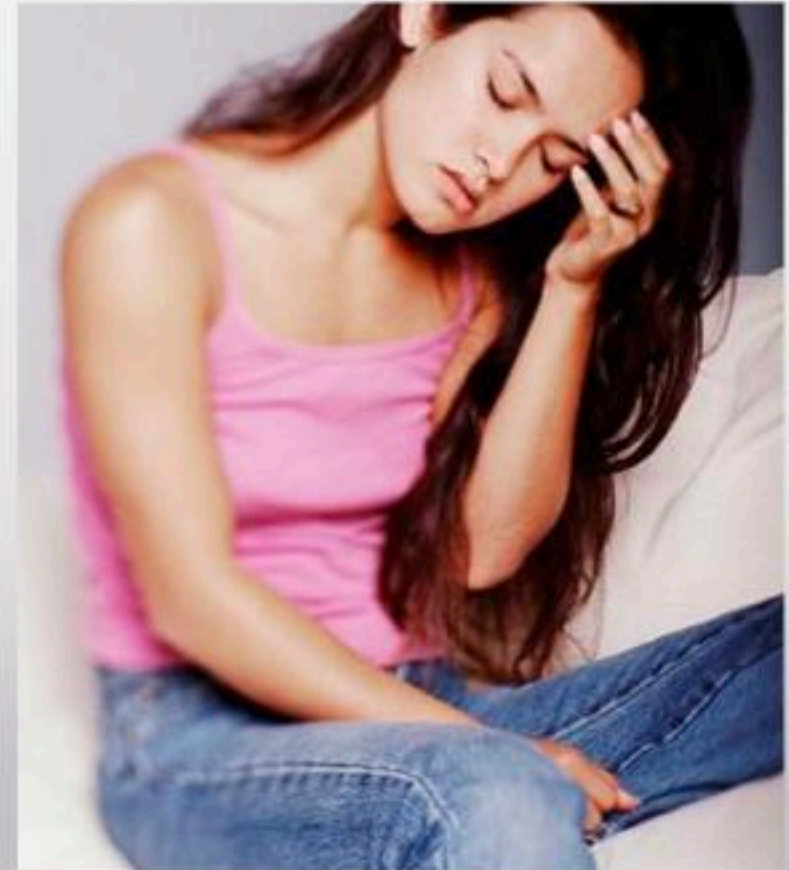
- Parafunctional Clenching
- Parafunctional Grinding
- Occlusal Muscle Dysfunction
- Osteoarthritis
- Acute Sprain
- Acute Closed lock of TMJ disc

5 Common Obstacles

- Neck and Postural Instability
- Wobbly TM Joint (Subluxation)
- Compromised Breathing/Airway
- Avascular Necrosis
- Referred Pain Muscle Triggerpoints

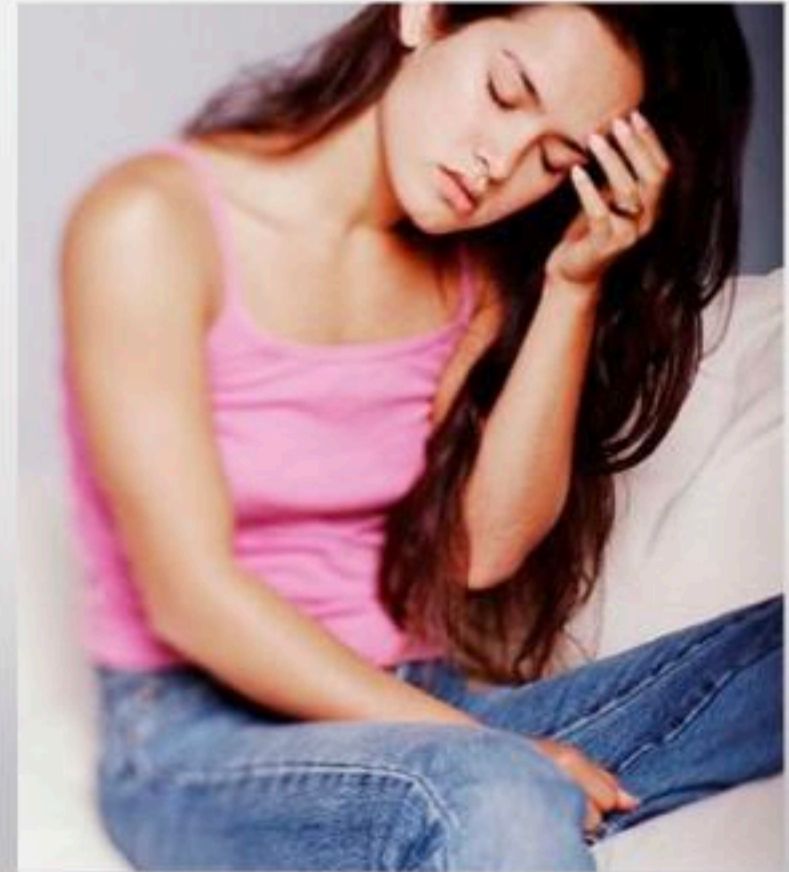
1 TMD that **usually** does not need therapy

- TMJ Clicking



5 Common Obstacles

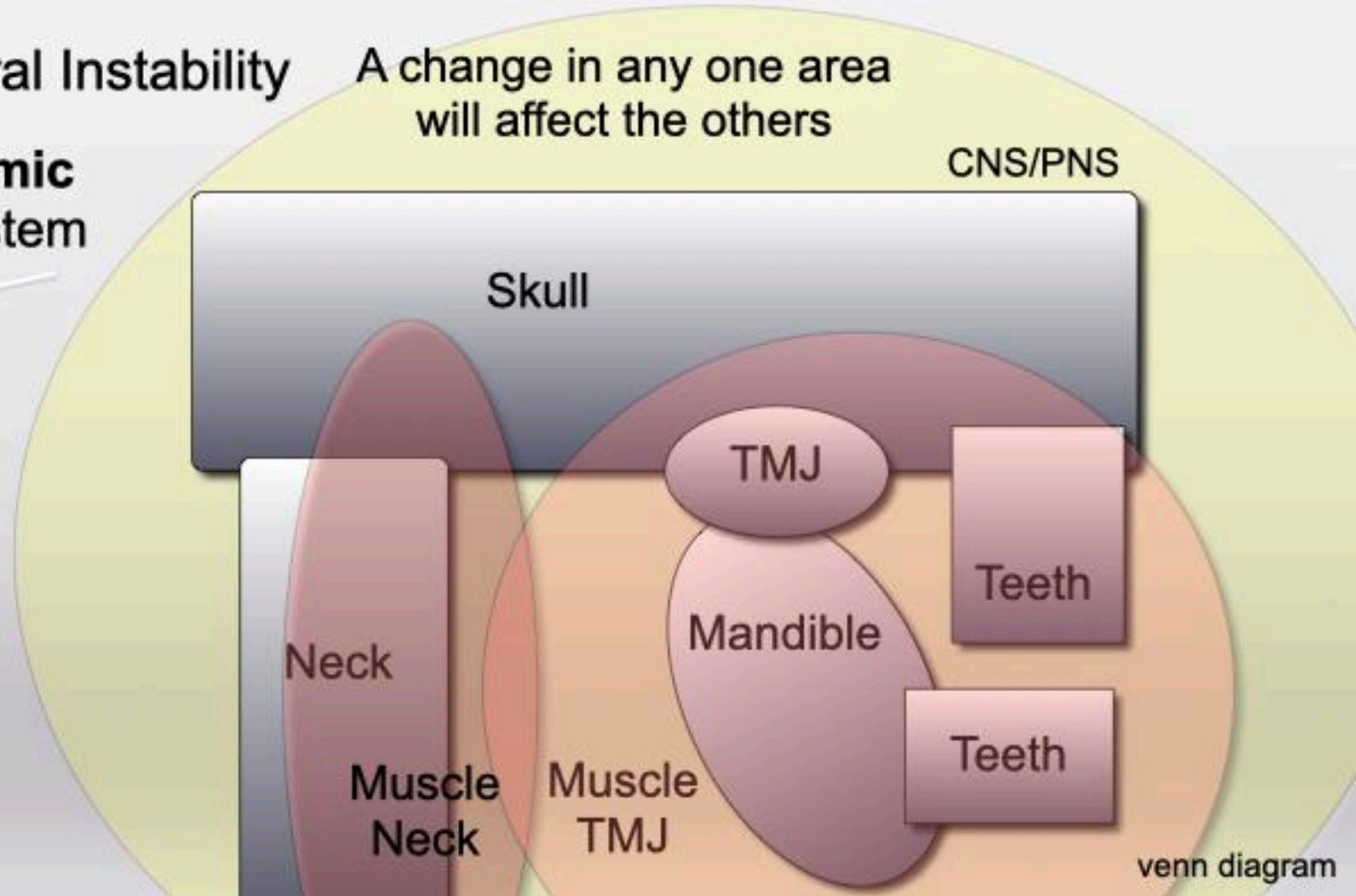
Neck and Postural Instability
Wobbly TM Joint (Subluxation)
Compromised Breathing/Airway
Avascular Necrosis
Referred Pain Muscle Triggerpoints



Neck and Postural Instability

A change in any one area will affect the others

This is a **dynamic** orthopedic System



Non-Linear Joint Deformity- Mechanically Unstable TMJs- “Wobbly Joint”

TM Joint subluxates under load
Adapted CR “wobbles”

TMJ Muscle hyperactivity
Looks similar to OMD
Muscles must stabilize the joint
Deep temporalis especially sore

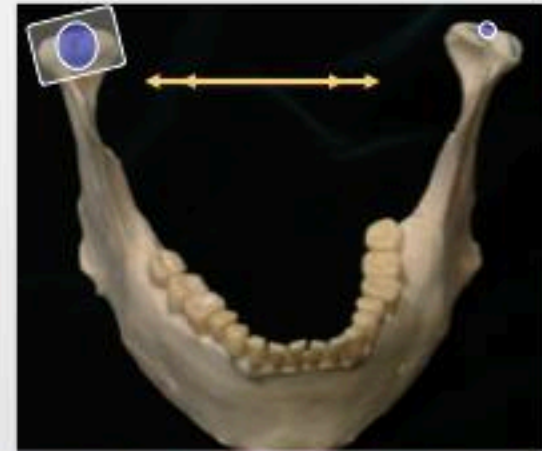
Clinically:

- Hypersensitive bite
- Increase muscle pain with anterior deprogrammer
- Continued muscle disharmony with flat plane orthotics
- CT Scan- CR load zone not medial
- JVA- after tooth tap see “wobble- 50hz vibration

How to Avoid Missing Dx- Offer complete exam to crown patients

- Include anterior stop dx test
- Let patients decide which risk to take.

Treatment: Lock-in Orthotic 6 months, the CR orthotic, then D-PAS.



Diagnostic Palatal Anterior Stop

D-PAS Test: Wear for 2 weeks, 24/7, take out to eat

Better- Decrease in Symptoms

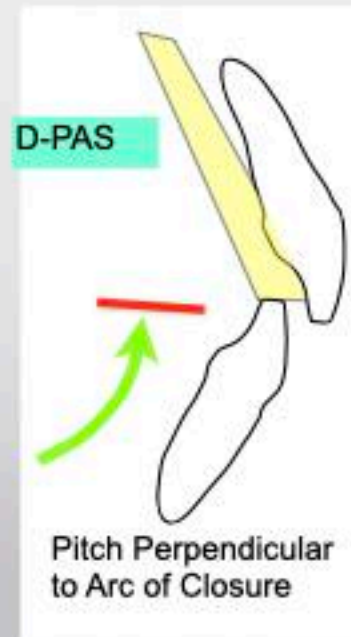
Sleep Clenching Inhibited: Wear D-PAS as night guard
Orthotic Improved Airway: D-PAS as night guard
Occlusal Muscle Disharmony: Occlusal Adjust

Worse- Increase in Symptoms

Mechanically Unstable TMJ, joint subluxation
Intracapsular Problem TMJ
Orthotic Made Sleep Airway Worse

Stays the Same- No Change in Symptoms

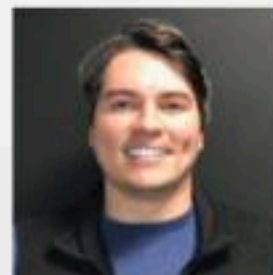
Damaged TMJ are mechanically stable
Pain not related to occlusion



Stapelmann H, Türp JC. The NTI-tss device for the therapy of bruxism, temporomandibular disorders, and headache.....BMC Oral Health. 2008 Jul PMID: 18662411



Nate Brock, CDT
(865) 509-4509
connect@livingtreelab.com



D-PAS option:
You can make your
own out of acrylic.

Instructions at
drdroter.com

3D Printed
D-PAS



3D Printed
Posterior deprogrammer
with upper essix



3D Printed
CR Orthotic



Age 16F
cc: Facial Pain, Excessive Daytime Fatigue

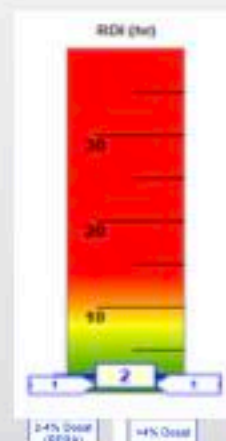
[illegible]

Medical Sleep Study in Lab RDI = 1
Dx: Snoring without evidence of gas exchange abnormalities or sleep disruptions

Sleep Latency Test
Dx: Narcolepsy
Recommend daytime medication

Patient Safety Inc Pulse Ox Sleep Screening

RDI = 2, Autonomic Arousals (31 /h)



PULSE RATE DATA

Autonomic Arousal
Index (#/hr): 31

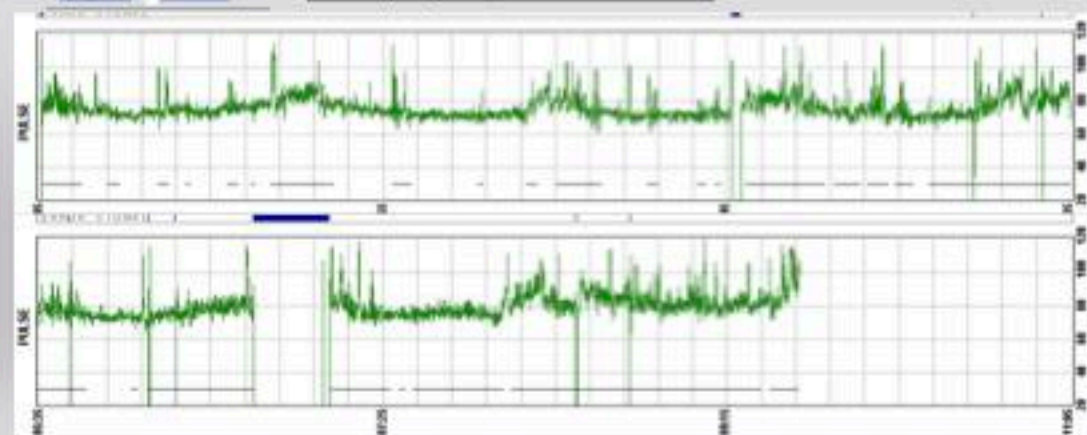
Pulse Rate Range
Mean: 78
Min: 34
Max: 122

Tachycardia - Sleep (>90 bpm)
Duration: 00:34:56
% (VRT): 6%

Bradycardia - Sleep (<50 bpm)
Duration: 00:00:35
% (VRT): 0%



Heart Rate
>90 bpm
for 35 min



Disordered Breathing Disease Progression

Disease Stage 1

Predisposing Factors

Small Airway

Tongue Tie, Lip Tie
Bottle Fed as Infant
Dysfunctional Swallow
Allergies
Nasal Obstruction
Large Tonsil
Large Adenoids
Large Tongue
Mid-face Deficient
Mandibular Deficient
4 Bicuspid Extraction

Disease Stage 2

Compensation: Airway Maintained

Signs

Mouth Breathing
Head Postured Forward
Jaw Postured Forward
Tongue Bracing
Indents in Tongue
Sore Masseters
Sore Neck Muscles

Symptoms

Facial Ache
Not Waking Rested
Daily Fatigue
Neck Soreness

Disease Stage 3

Sleep Airway Partial Collapse

Signs

All of stage 1 and 2 plus.....
Upper Airway Resistance
2-4% Drop O₂ Saturation
RERA- Respiratory Arousals
Sleep Teeth Grinding
↓ Growth Hormone

Symptoms

Heart Rate Fluctuation
Snoring or "Purring"
Weight Gain
Cognitive Impairment, ADD
Hyperactivity

Disease Stage 4

Sleep Airway Full collapse

Signs

All of stage 1, 2, 3 plus....
4%+ drop O₂ Saturation
Apnea
Cardiovascular Damage
Elevated BP
GERD

Symptoms

All of stage 2, 3 plus....
Worn Teeth

Disordered Breathing Disease Stage 4

OSA- Obstructive Sleep Apnea

AHI- Apnea Hypopnea Index

Apnea and Hypopnea events per hour

Apnea- Stop airflow for 10 seconds

Hypopnea- <50% airflow or 4+% O₂ Desaturation

Disease Stage 1	Disease Stage 2	Disease Stage 3	Disease Stage 4
Predisposing Factors Small Airway Tongue Tie, Lip Tie Bottle Fed as Infant Dysfunctional Swallow Allergies Nasal Obstruction Large Tonsil Large Adenoids Large Tongue Mid-face Deficient Mandibular Deficient 4 Bicapsid Extension	Compensation: Airway Maintained Signs Mouth Breathing Head Postured Forward Jaw Postured Forward Tongue Bracing Indents in Tongue Sore Masseters Sore Neck Muscles Symptoms Facial Ache Not Waking Rested Daily Fatigue Neck Soreness	Sleep Airway Partial Collapse Signs All of stage 1 and 2 plus.... Upper Airway Resistance 2-4% Drop O ₂ Saturation RERA- Respiratory Arousal Sleep Teeth Grinding ↓ Growth Hormone Symptoms Heart Rate Fluctuation Snoring or "Purring" Weight Gain Cognitive Impairment, ADD Hyperactivity	Sleep Airway Full collapse Signs All of stage 1, 2, 3 plus.... 4%+ drop O ₂ Saturation Apnea Cardiovascular Damage Elevated BP GERD Symptoms All of stage 2, 3 plus.... Worn Teeth

John R. Droter DDS

AHI 1-4
"Normal" ??

AHI 5-15
Mild OSA

AHI 15-30
Moderate OSA

AHI 30+
Severe

Signs

Apnea
4% drop O₂ Saturation
Cardiovascular Damage
Elevated BP
GERD

Symptoms

Not Waking Rested, Daily Fatigue
Cognitive Impairment

Irreversible Damage

John R. Droter DDS

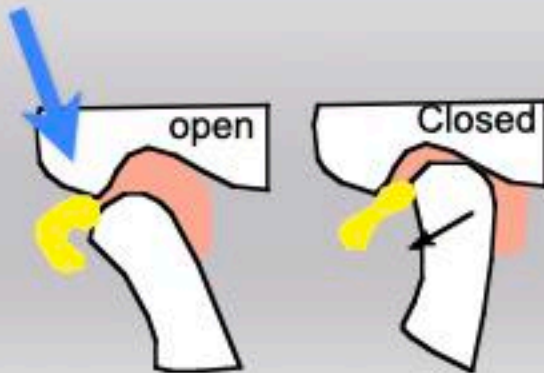
When the clicking stops (4a to 4b):

Compromised Condylar Perfusion
Blood flow through condyle is decreased

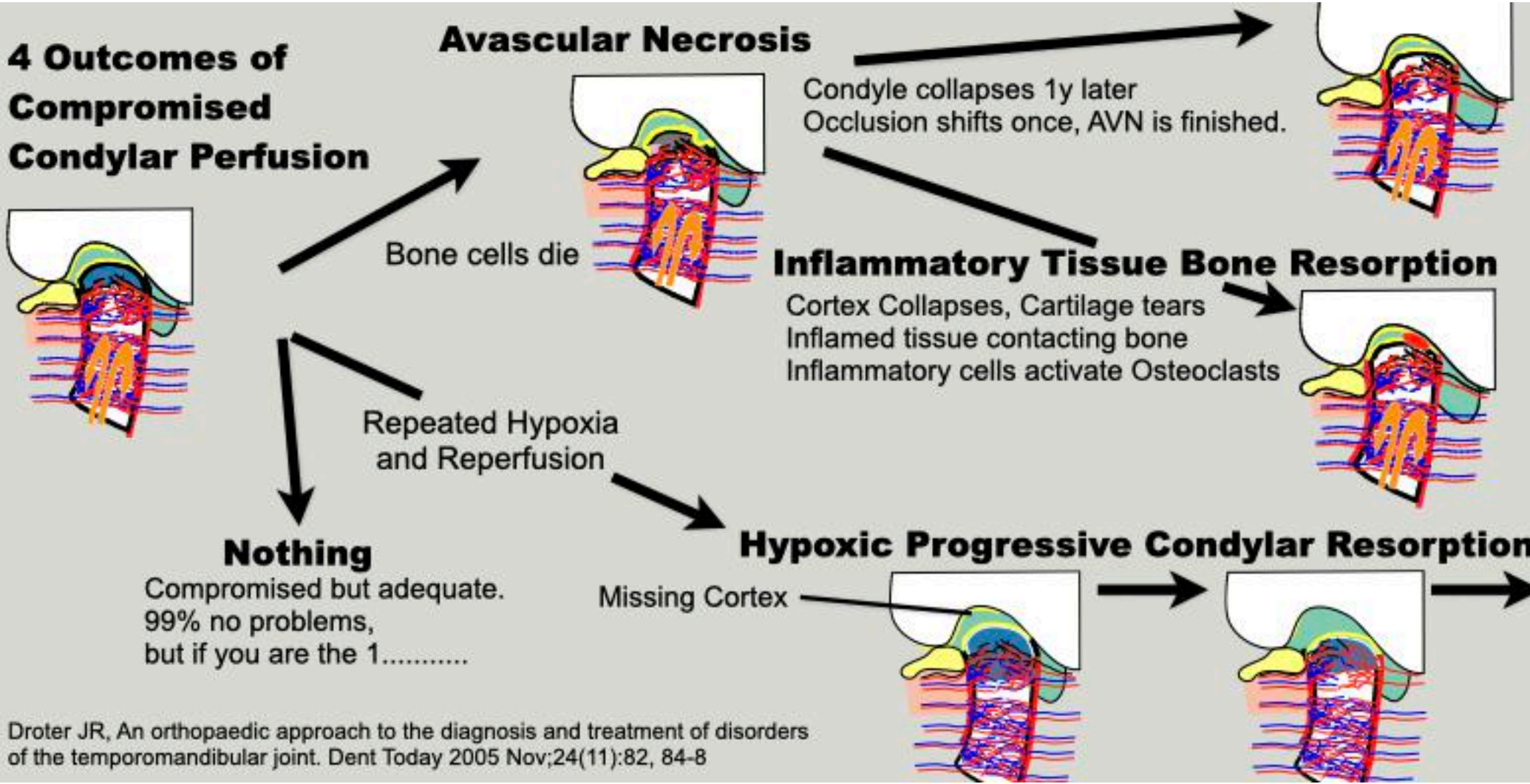
Disc Anterior

Venous return compromised

Condyle Distalized



4 Outcomes of Compromised Condylar Perfusion



Droter JR, An orthopaedic approach to the diagnosis and treatment of disorders of the temporomandibular joint. Dent Today 2005 Nov;24(11):82, 84-8

Anterior Open Bite Differential Diagnosis

TMJ Bone loss



Iatrogenic



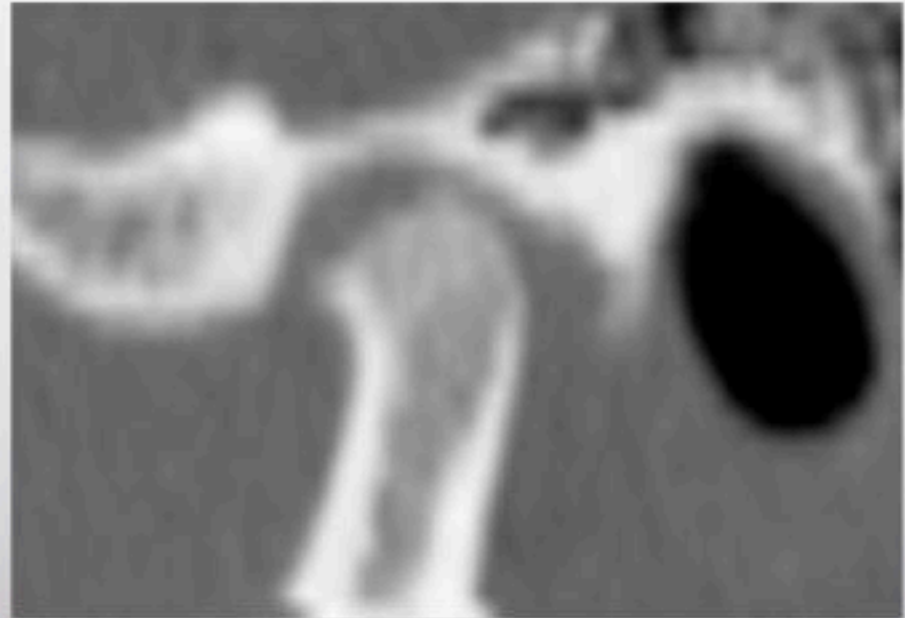
Tongue moved teeth



Hypoxia Induced Progressive Condylar Resorption HI-PCR

On CT see Flat condylar surface
Missing Subchondral Cortex During Active Phase
Slow, Progressive Condylar Resorption

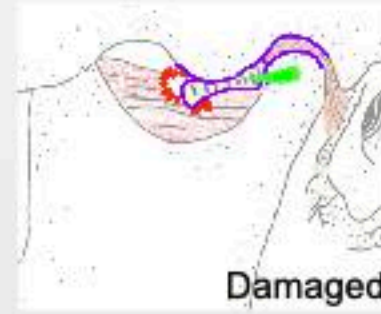
Occlusion will constantly be changing



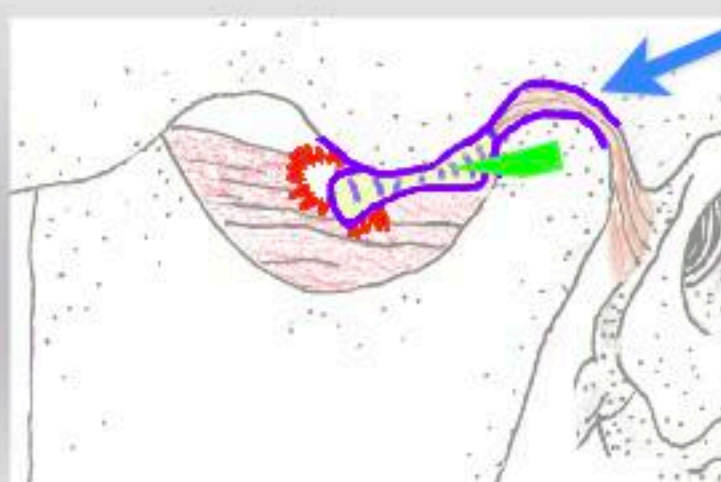
Basic Orthopedics

Joints are either
Healthy or
Damaged

If damaged, joints will be either:
Actively Breaking Down
Adapting
Adapted
Structurally, Mechanically
Favorably, Unfavorably



Majority of damaged
TMJs adapt favorably



Posterior ligament, synovium,
and retrodiscal tissue adapt to
form a
Pseudo-disc

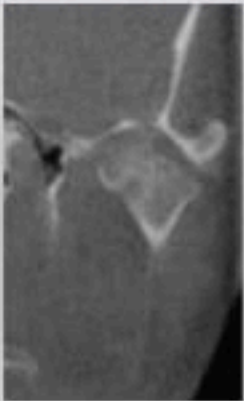
Tissue Fibrosis

Anterior Openbite with Active TMJ Bone Loss

Non Surgical Therapies



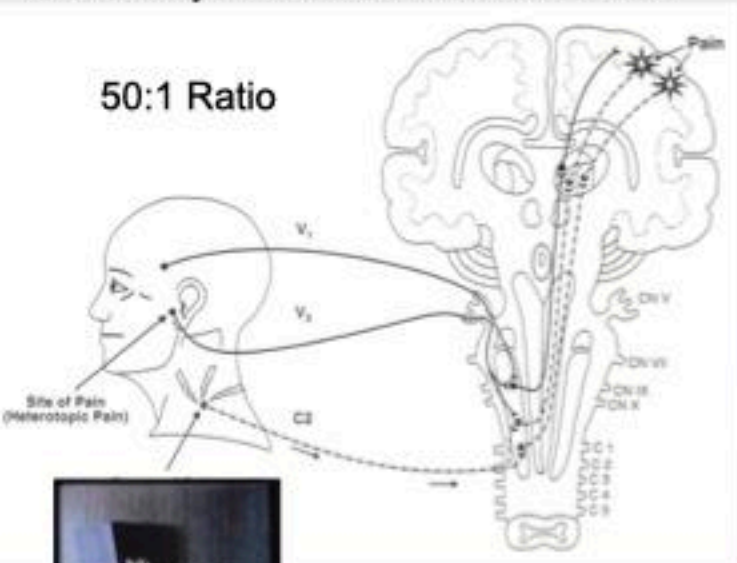
Condylar Distraction
Anti Inflammatory Medications



Referred Pain Convergence

More primary sensory neurons than
secondary neurons that travel to brain

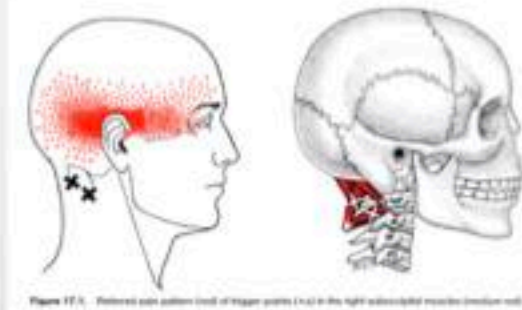
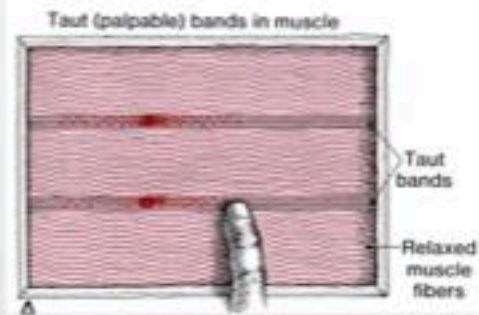
50:1 Ratio



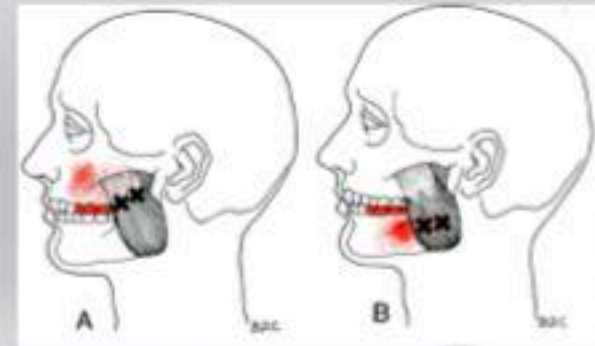
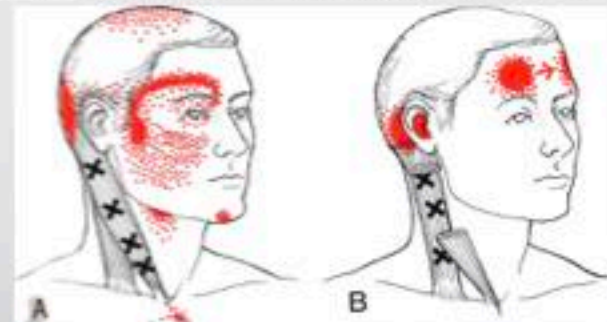
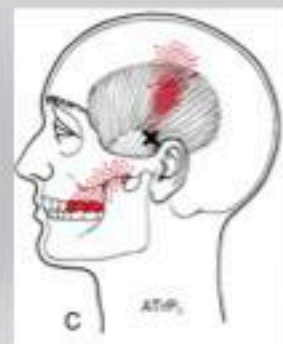
"Bell's Orofacial Pain"
Jeffrey Okeson

Trigger Points

Contracted mass
of actin, myosin
and histamine

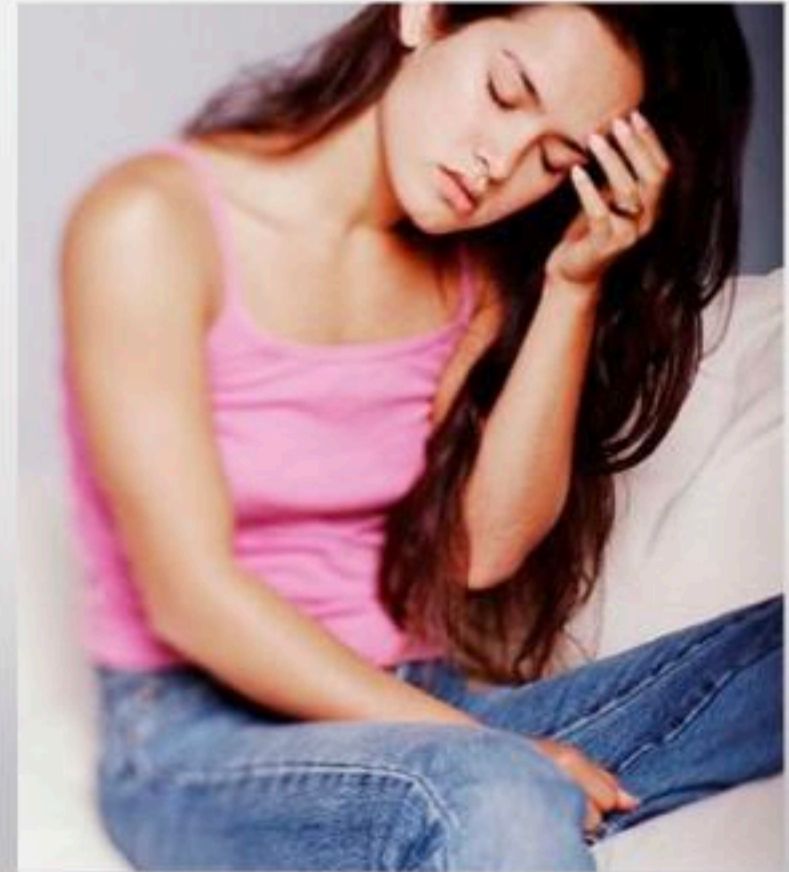


"The Trigger Point Manual"
Janet Travell, MD



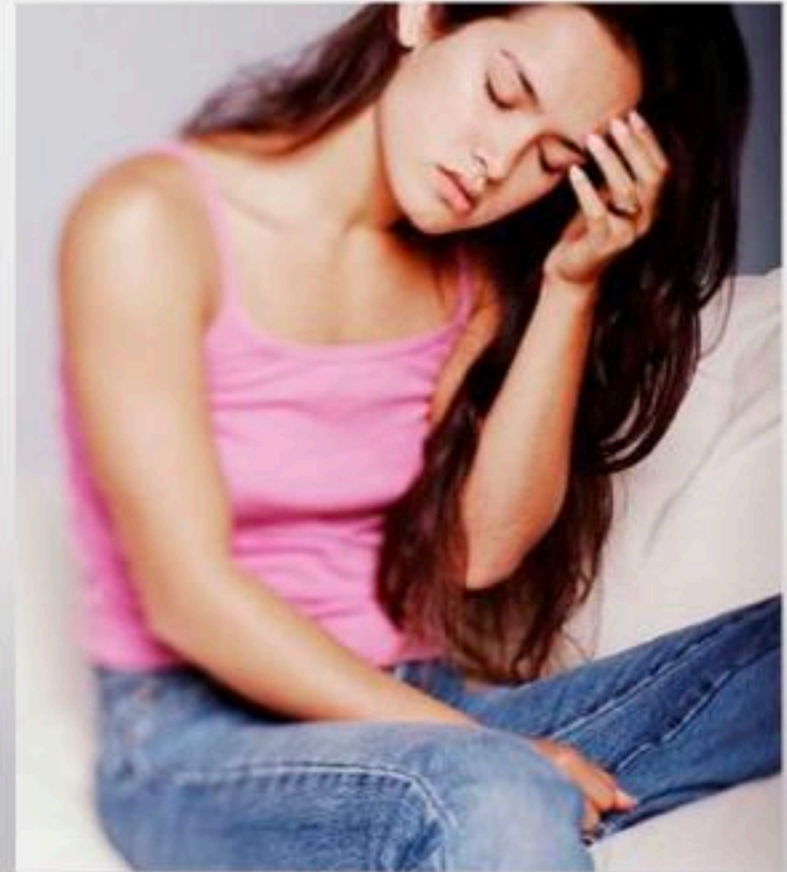
5 Common Obstacles

Neck and Postural Instability
Wobbly TM Joint (Subluxation)
Compromised Breathing/Airway
Avascular Necrosis
Referred Pain Muscle Triggerpoints



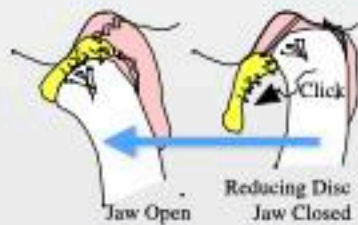
1 TMD that **usually** does not need therapy

TMJ Clicking

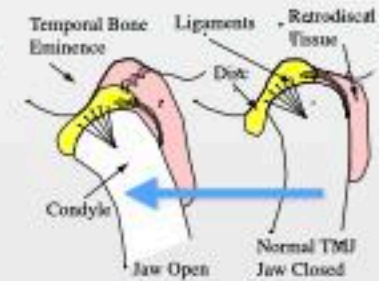


Differential Diagnosis of TMJ Clicking

Disc Reduction



Normal

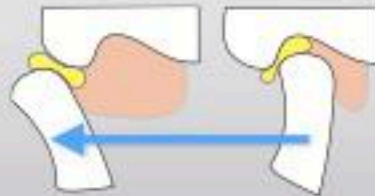


Adhesive Click



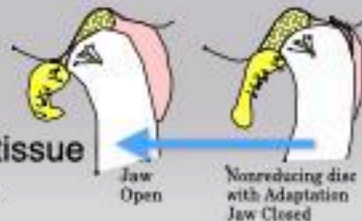
"Sticky Disc" - Disc sticks after prolonged clenching, then releases

Eminence Thud



A hypermobile condyle moves past the crest of the eminence and makes a thud sound

Adhesion Crackle

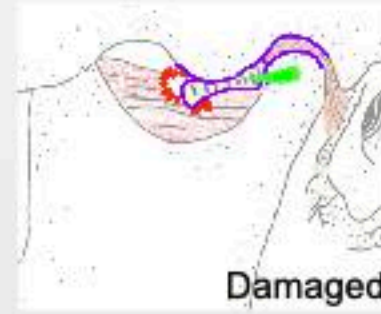


A small piece of fibrous tissue 4b joint is moved across

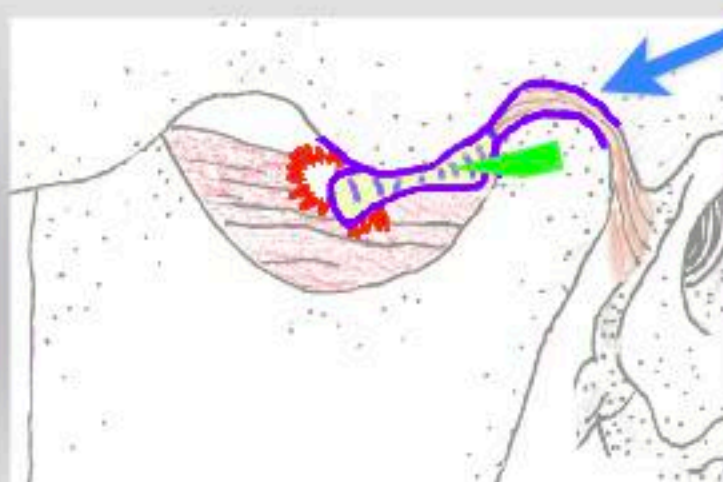
Basic Orthopedics

Joints are either
Healthy or
Damaged

If damaged, joints will be either:
Actively Breaking Down
Adapting
Adapted
Structurally, Mechanically
Favorably, Unfavorably



Majority of damaged
TMJs adapt favorably



Posterior ligament, synovium,
and retrodiscal tissue adapt to
form a
Pseudo-disc

Tissue Fibrosis

Symptoms of Temporomandibular Joint Osteoarthritis and Internal Derangement 30 years after Non-Surgical Treatment.

Leeuw, Boering, Stegenga, Bont,

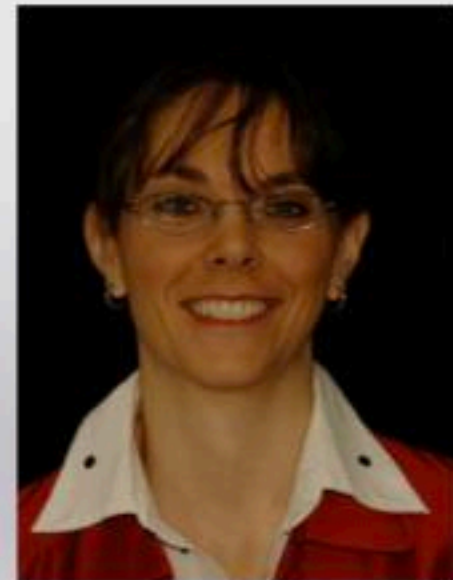
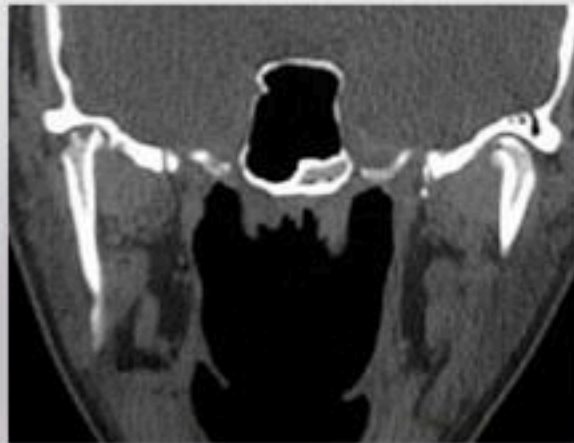
Journal of Craniomandibular Practice, April 1995, vol. 13, No. 2

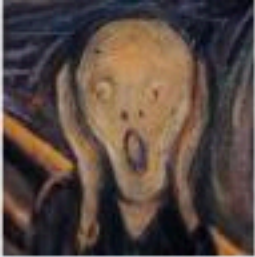
- University Hospital, Netherlands: 134 TMD patients, 30 year follow up
- Patients received good clinical work up and diagnosis 30 years ago, but basically no treatment
 - (Reassurance, PT, exercise, limited occlusal adjust)
- 70% satisfied with results
- 25% still had pain on movement
- 15% not able to eat hard foods
- 35 control patients had no apparent symptoms

**If you have a disease that is
one in a thousand, it is 100% for you**

There is no love sincerer than the love of food.

G. B. Shaw





Damaged TMJs



Adapt Favorably 85%
Adapt Fairly 14%
Adapt Poorly <1%



Occlusal Muscle Dysfunction
Osteoarthritis



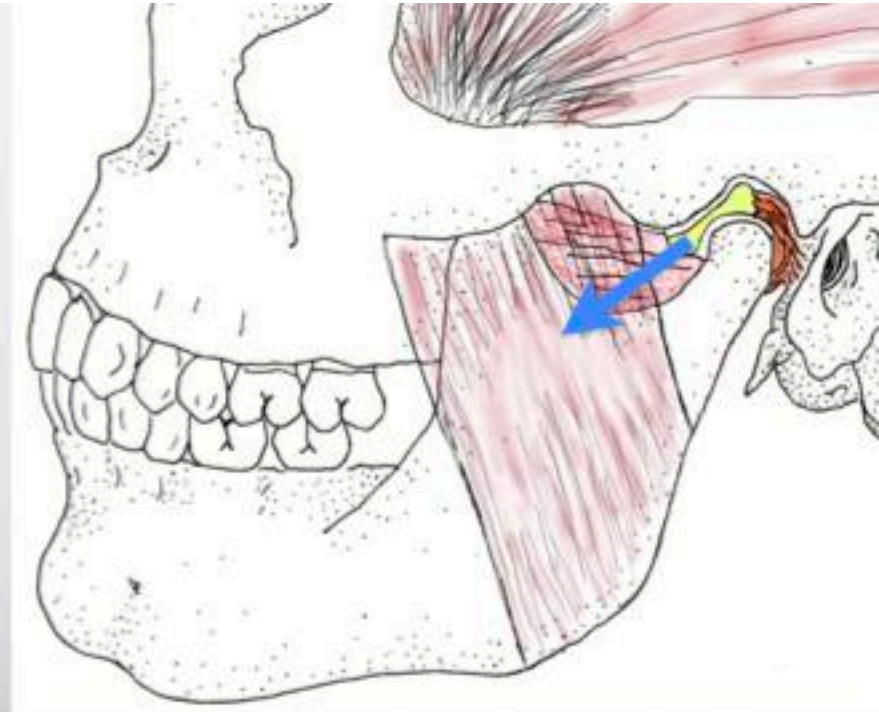
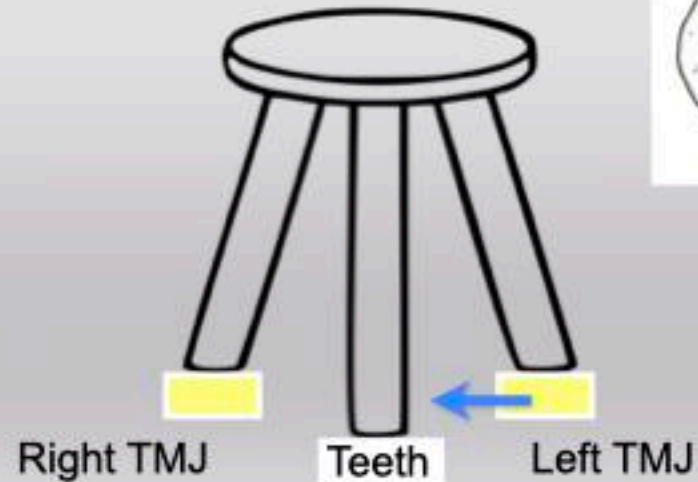
Avascular Necrosis
Progressive Condylar Resorption

*These are my guesses on %, no research to back up to backup

Normal Joint with Normal Occlusion

All teeth touch evenly with condyles seated in fossa

What happens to the occlusion if the disc is dislocated?



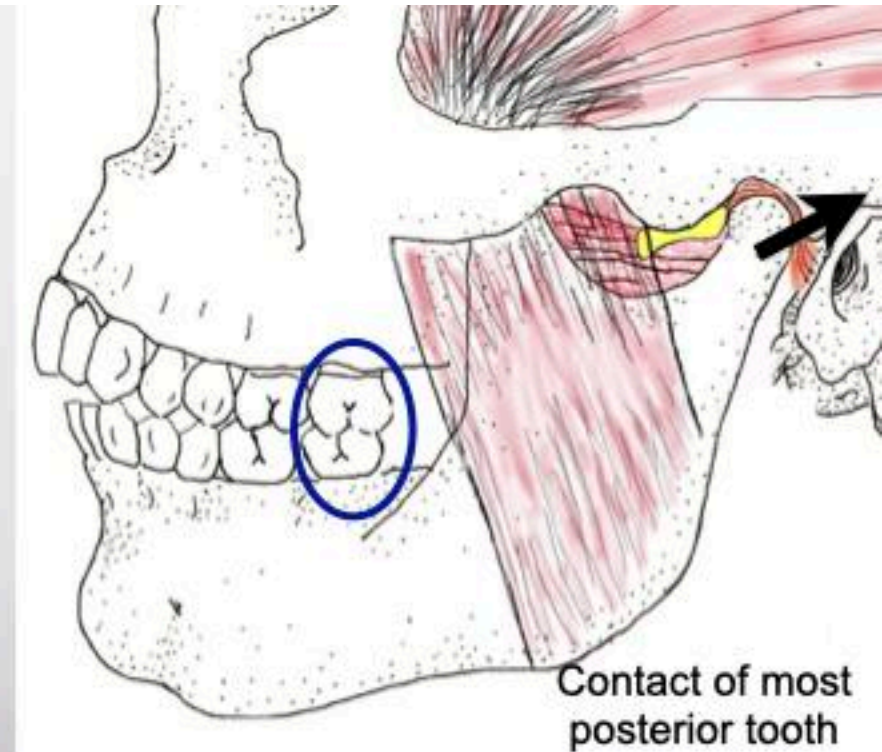
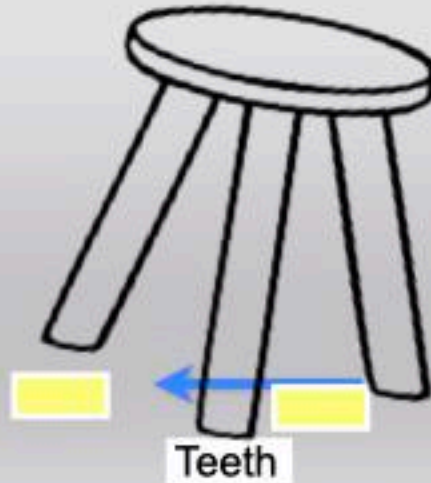
Damaged Joint with Malocclusion

85% damaged joints adapt favorably with respect to the TMJ.

Anteriorly Dislocated Disc, Mandible shifts:
Inadequate Anterior Guidance, Posterior Disclusion
Uneven Occlusion,
 $CR \neq MaxIC$
Occlusal Muscle Disharmony develops.

Treat Adapted joints with OMD
the same as healthy joints with OMD:
Occlusal Adjustment

$CR \neq MaxIC$ should be 2mm or less.
(Anterior Posterior 2mm)
If >2mm something else is going on.



6 Common TMDs

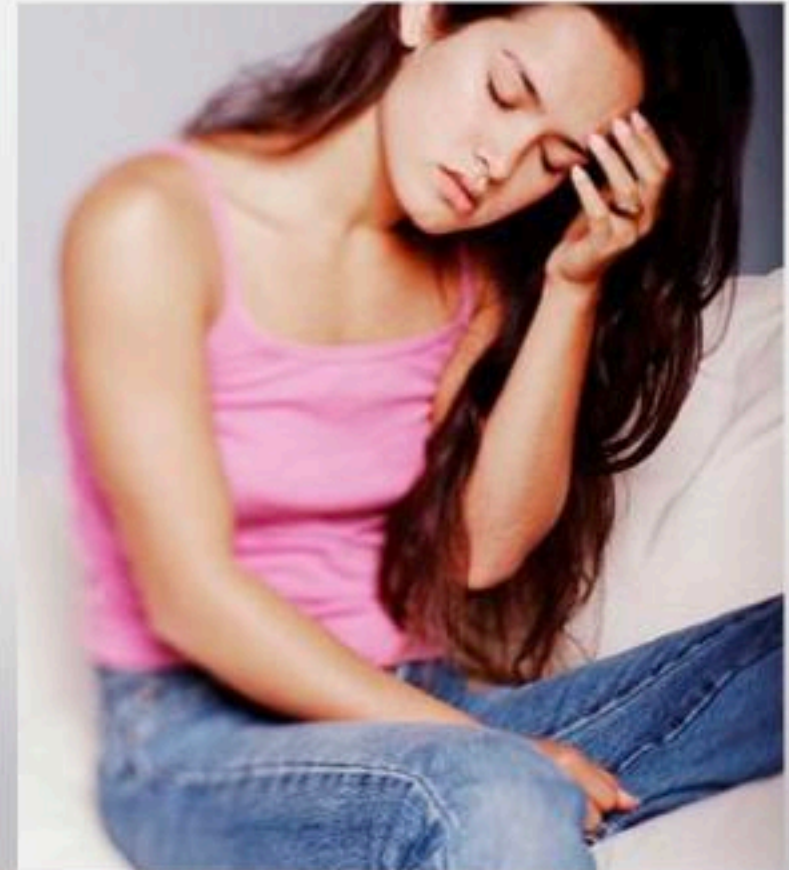
- Parafunctional Clenching
- Parafunctional Grinding
- Occlusal Muscle Dysfunction
- Osteoarthritis
- Acute Sprain
- Acute Closed lock of TMJ disc

5 Common Obstacles

- Neck and Postural Instability
- Wobbly TM Joint (Subluxation)
- Compromised Breathing/Airway
- Avascular Necrosis
- Referred Pain Muscle Triggerpoints

1 TMD that **usually** does not need therapy

- TMJ Clicking





Know Yourself

Know Your Work + **Know Your Patient**

Apply Your Knowledge

LD Pankey Institute

Write your Dream

Exam and Diagnostic Tests

John R Droter DDS
Annapolis, Maryland

Specific Diagnosis

1. TMJ Damage

[illegible][illegible][illegible]

7. Other

Physical

Ios
 Hot Cold Hot
 Cold Laser
 TENS in office
 TENS home use
 Range of motion exercises
 Active Stretching; Manual, Tongue Blades, Dynaprint
 Refer to Physical Therapy: Roadside mobilization
 Refer to Physical Therapy: Postural Restoration Therapy
 Refer to Physical Therapy: Viscous Muscle Therapies
 Refer to Chiropractic: Atlas Orthogonal
 Refer to Chiropractic: MD: Body alignment
 Breaths, Walk, Exercise

Medicinal

- Anti-inflammatory:
 - NSAIDs
 - Doxycycline low dose
- CSD Topical
 - Glucosamine/Chondroitin MSM
- Vitamins: Vit C, Vit D, Vit B12
- Minerals: Magnesium, Electrolytes
- Minerals: Iron
- Refer to MD for Lyme therapies
- Refer to MD Rheumatoid Arthritis therapies
- Refer Botex Masseter injections
- Refer Botex Lateral Pterygoid injections
- Feed

Dental Orthotics

- In Office Trial Anterior Stop
- Diagnostic Palatal Anterior Stop
- Brux Checker
- Lower full coverage CR
- BiArch Posterior Deprogrammer
- Upper full coverage hard CR guard
- Temporary home use anterior stop
- Myobrace

Sleep/ Fatigue

- Mouth taping
- Diet Modification
- Positional Therapy
- Vitamins: Vitamin D, Vitamin B12, Vit C
- Minerals: Magnesium, Iron
- Lateral Bracing Device: guided plane
- Lateral Bracing Device: Elastic
- Mandibular Advancement Device
- CPAP

Surgical

- Refer: Arthrocentesis w/ PRP
- Refer: Discectomy w/ Fat Graft
- Refer: Total Joint Replacement
- Refer: Orthognathic Surgery

Occlusal Orthopedic

Lingual Light Wire
Lower soft sectional ortho
Concylar distraction
Sectional orthodontics
Expansion orthopedics/ orthodontics
Restorative Dentistry
Occlusal Adjustment with OTR, TekScan

Tongue Parafunction

- Refer for Cervical Alignment Stabilization
- Myofascial
- Upper Lingual light wire
- Clear Brux Checker
- Frenectomy
- Myofunctional therapy

Specific Therapy

TMDs- What are the choices? (190 Diagnoses, 7 Categories)

1. TMJ Damage

Adhesions and ankylosis of temporomandibular joint
Avascular Necrosis Mandibular Condyle
Cartilage Fibrillation, Mandibular Condyle, Fossa
Closed Lock, Jaw Cartilage, Acute
Closed Lock, Jaw Cartilage, Chronic
Closed Lock, Jaw Cartilage, Intermittent, Mechanically dysfunctional
Crush Injury Mandibular Condyle
Crystal arthropathy, unspecified, TMJ
Dislocation jaw cartilage due to injury, Sequela
Dislocation jaw cartilage with reduction, favorable adaptation, TMJ
Dislocation jaw cartilage without reduction, favorable adaptation, TMJ
Effusion, TMJ

Impingement Retrodiscal Tissue
Inflammatory Tissue Bone Resorption, TMJ Condyle
Loose Body (Joint Mice), TMJ
Malignant neoplasms of bones of skull and face
Open Lock TMJ, Recurring
Osteoarthritis TMJ, active degeneration
Osteoarthritis- Inactive
Osteoarthralgia Dissecting TMJ
Osteolysis Mandibular Condyle, Active
Perforation Meniscus, TMJ
Perforation Pseudocyst, TMJ
Psoriatic Arthritis TMJ
Rheumatoid Arthritis Sero Negative TMJ
Synovitis

2. Muscles of the TMJ

Dystonia
Habitual posture forward mandible
Hemifacial Muscle spasm
Inhibitory Reflex Dysfunction, Periodontal Ligament Masseter Muscle
Muscle Atrophy, TMJ
Muscle Bracing Neck Stabilization
Muscle Bracing Pain Avoidance
Muscle Bracing TMJ stabilization
Muscle Bracing Airway **Potentiality** (with Tongue)
Muscle Contracture Fibrosis Lateral Pterygoid
Muscle Contracture Fibrosis Masseter, Medial Pterygoid, Temporalis
Muscle Fatigue Overuse
Muscle Hypertrophy TMJ Muscles

3. Cranial Alignment/Occlusion

Cranial Distortion / Misalignment
Hemifacial Hypoplasia
Hyper Occlusal Awareness
Idiopathic Orthodontic Damage
Malocclusion Anterior Open Bite
Malocclusion Centric occlusion MesioC discrepancy
Malocclusion Deep Bite
Malocclusion due to mouth breathing
Malocclusion due to TMJ bone loss
Malocclusion due to tongue, lip or finger habits
Malocclusion Insufficient anterior occlusal guidance
Malocclusion lack of posterior occlusal support
Malocclusion Posterior Openbite Bilateral
Malocclusion Posterior Openbite Unilateral
Malocclusion unspecified

Malposition/Misalignment: Maxilla, Temporal Bone, Mandible
Mandibular asymmetry
Mandibular hyperplasia
Mandibular hypoplasia
Mandibular Retrognathia
Maxillary asymmetry
Maxillary hyperplasia
Maxillary hypoplasia
Maxillary Retrognathia
Occlusal Adaptation, Favorable
Occlusal Dependency for Joint Stabilization/ Proprioception
Tooth Intrusion
Tooth Supereruption

4. Cervical Damage

Cervical Vertebrae Alignment Dysfunction
Cervicocranial Syndrome
Muscle Guarding due Neck Instability
Trigger Point Neck Muscle with Referred Pain
Trigger Point Neck Muscle, Localized Pain

5. Parafunction

Excessive Tooth Wear, Damage
Hypersensitive Occlusion
Parafunctional Clenching Teeth, Awake
Parafunctional Clenching Teeth, Sleep
Parafunctional Grinding Teeth, Awake
Parafunctional Grinding Teeth, Sleep
Parafunctional ClenchGrind Wiggle
Parafunctional Tongue Bracing avoiding uncomfortable tooth contact
Parafunctional Tongue Bracing Neck stabilization
Parafunctional Tongue Bracing to maintain Airway
Parafunctional Tongue Bracing unknown cause

6. Whole Body / Systemic

Lyme Disease Arthritis
Magnesium Deficiency
Obstructive Sleep Apnea
Osteoporosis without current pathological fracture
Pathological Habitual Movement Pattern
Postural Disharmony Standing
Postural Disharmony Walking
Postural Forward Head Position
Upper Airway Resistance, UARS

7. Other

Nerve Entrapment Masseteric Nerve due to Masseteric hypertonicity
Neurotoma Trigeminal Nerve
Obsessive-Compulsive Personality Disorder
Other
Otitis Ear Infection
Pain disorder exclusively related to psychological factors, Somatoform pain disorder
Pain disorder with related psychological factors
Peripheral Sensitization

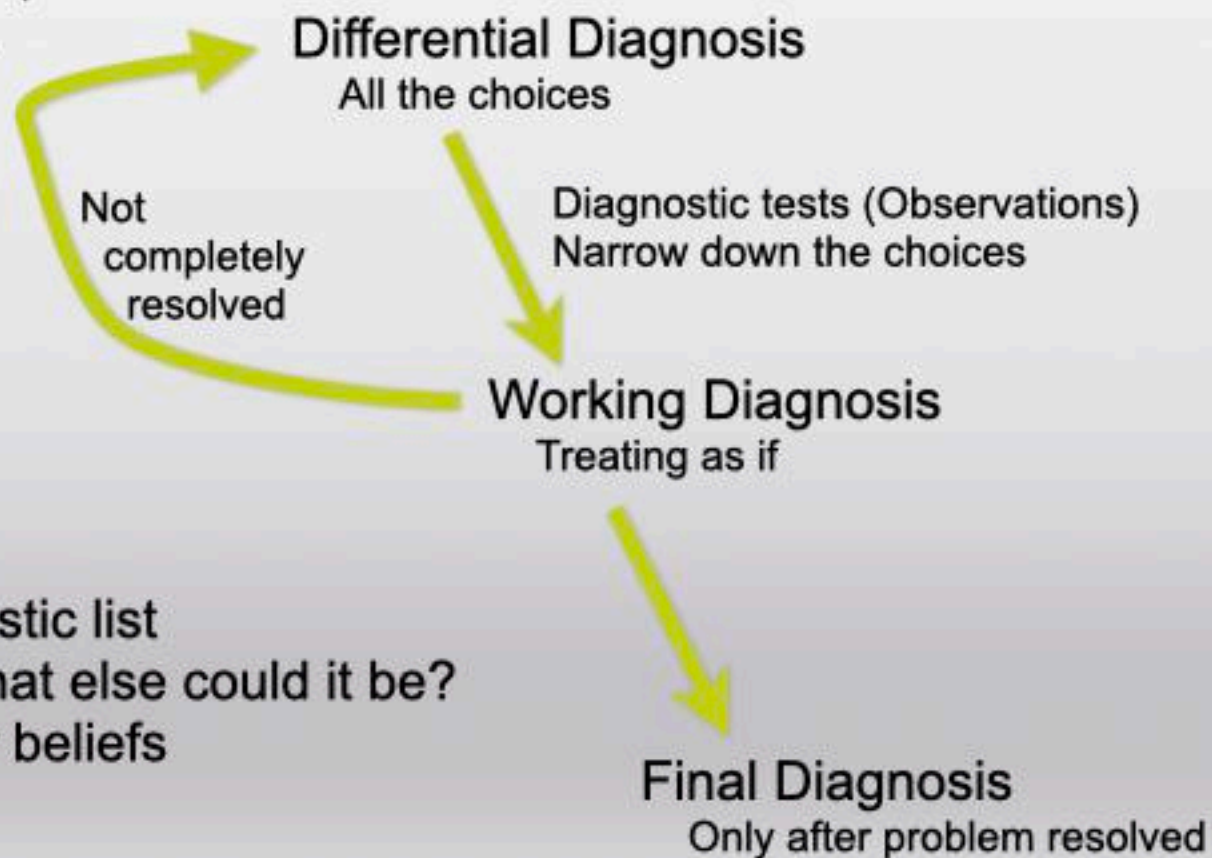
The Diagnostic Process

When diagnosing and treating facial pain, we have entered the world of medicine.



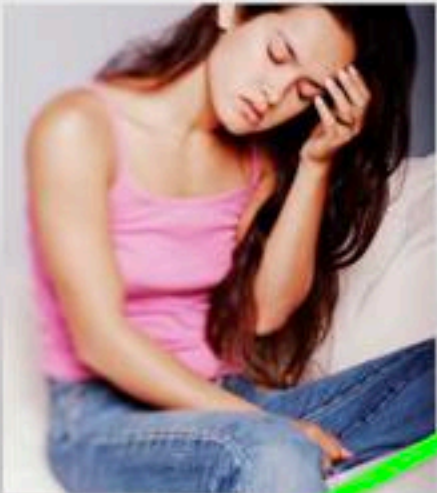
Think!!

Always make a differential diagnostic list
Ask, "It appears to be this, but what else could it be?"
Be aware you are blinded by your beliefs



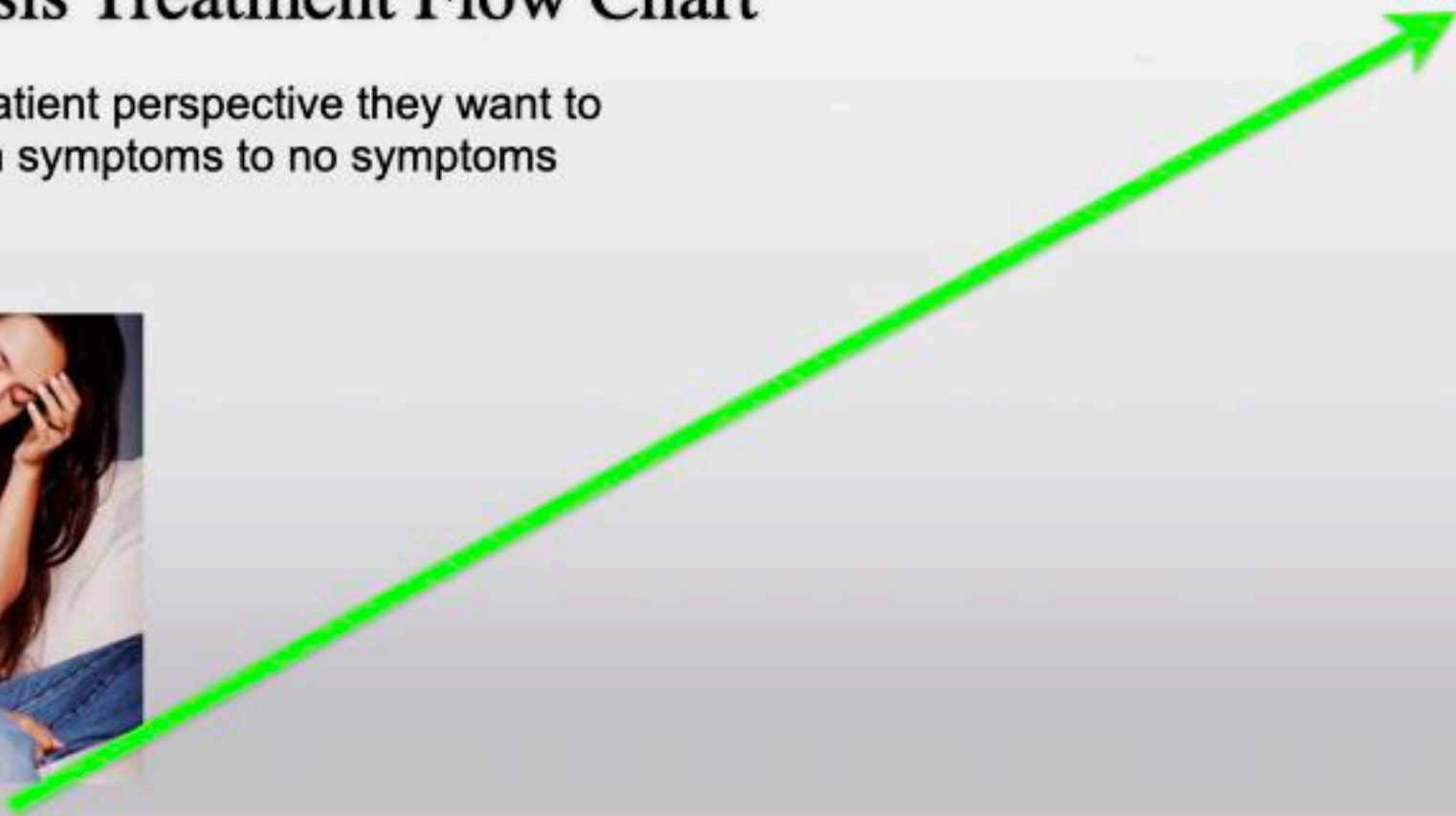
Diagnosis Treatment Flow Chart

From a patient perspective they want to go from symptoms to no symptoms



Symptoms

No Symptoms



Diagnosis Treatment Flow Chart

From a patient perspective they want to go from symptoms to no symptoms



Symptoms

History

Signs

Doctor Exam

Differential Diagnosis

Diagnostic Tests

Specific Working Diagnosis

Treatment

No Signs

No Symptoms
Final Dx

Doctor Re-Exam

If not resolved

Symptom Dx

Tooth Pain
Arthralgia

vs
vs

Specific Dx

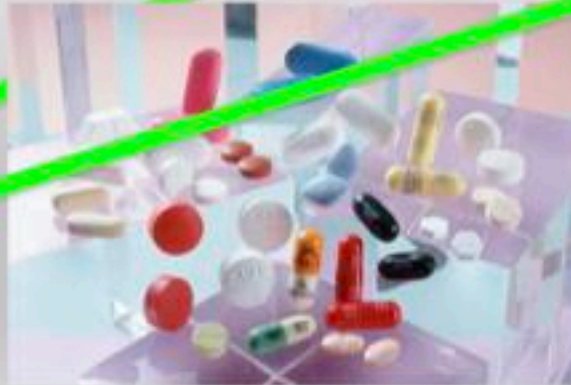
Irreversible Pulpitis
Osteoarthritis

Diagnosis Treatment Flow Chart

From a patient perspective they want to go from symptoms to no symptoms



Symptoms



Specific Dx
Irreversible Pulpitis
Osteoarthritis

Generalized Dx
Tooth Pain
Arthralgia

Less Symptoms

If you skip the exam, diagnostic tests, and diagnosis, you can give a therapy directed at symptoms. If you dull the symptoms the patient will perceive a benefit.

No Symptoms

Facial Pain Diagnosis

Diagnostic Tools

- 1 Written and Oral History
- 2 Observation
- 3 Physical Exam

Muscle Palpation
Joint Palpation
Joint Auscultation
Joint Motion

- 4 Anterior Stop Test
- 5 Sleep Airway Screening
- 6 CT Scan

MRI
Blood Tests

Biometrics

Joint Vibration

Jaw Tracker

Electromyography

T-Scan

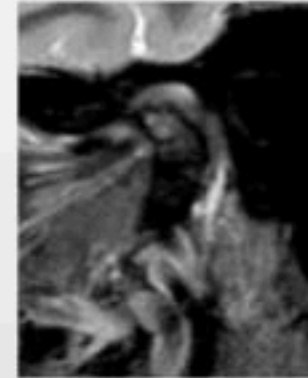
Occlusion: CR Mounted Study Models

Complete Dental Exam

Clinical Photographs

Dx Blocks

Dx Orthotics- Brux Checker, CR Orthotic



Facial Pain Diagnosis

Diagnostic Tools

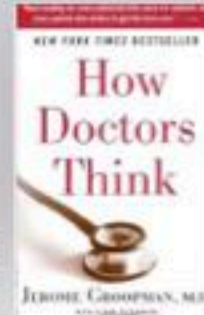
- 1 **Written and Oral History**
- 2 **Observation**
- 3 **Physical Exam**
 - Muscle Palpation
 - Joint Palpation
 - Joint Auscultation
 - Joint Motion
- 4 Anterior Stop Test
- 5 Sleep Airway Screening
- 6 CT Scan
- MRI
- Blood Tests

Most Important is the history. You have a good idea of what is going from this alone.

You can also observe speech, jaw movements, neck movements, demeanor, body posture during the oral history.

Need to resist the temptation to zero in on one diagnosis.

Still need make a Differential Diagnosis.
It appears to be, but what else could it be?






Julia R. Broder, D.D.S.
16501 Woodchuck Hill, #200
Bellevue, Maryland 20711
410-454-9400
drbroder@comcast.net
Fax: 301-454-0102

Facial Problem Questionnaire

I. Name _____ Age _____
Date _____ Referred by _____

II. Which of the following do you have (circle all that apply):
Headaches Neck Pain Jaw pain Ear Pain
Facial Pain Bite Problems Damaged teeth
Other _____

III. Please shade in where your pain is located:






IV. How long have you had this pain? _____
Is the pain constant? _____
Is the pain worse at (circle all that apply): Morning Evening
Awakening Sleeping In bed Other _____
Is the pain worse in the (circle all that apply): Morning Afternoon Evening Night
What makes the pain better? _____
What makes the pain worse? _____

How severe is your pain? Please make a mark along the line below:
No Pain |-----| Worst Pain Ever



Facial Problem Questionnaire

Facial Problem Questionnaire

 **John R. Droter, D.D.S.**
4000 Massachusetts Rd., 1200B
Bowie, Maryland, 21716
301-505-0400

1. Name _____ Age _____
Date _____ Referral by _____
Referring Doctor: Please Print Name:

2. Which of the following do you have (circle all that apply):
Headaches Neck Pain Jaw pain Ear Pain
Facial Pain Bite Problems Damaged teeth
Other _____

3. If Pain, Please shade in where your pain is located:
4. If pain, How long have you had this pain? _____
Is the pain constant? _____
Is the pain (circle all that apply): Aching Burning
Stabbing Sharp Dull Other _____
Is the pain worse in the (circle all that apply):
Morning Afternoon Evening Night
What makes the pain better? _____
What makes the pain worse? _____
How severe is your pain? Please make a mark along the line below:
No Pain | _____ | Worst Pain Ever

016

Pt fills out FPQ and mails in prior to appointment being made
It is reviewed and type of appointment is determined.

FPQ is a combination of:
Parker Mahan, DDS
Henry Gremillion, DDS
Mark Piper, MD
John R Droter, DDS

Feel free to download and use
www.jrdroter.com
Patient Download

All patients fill out whether they have pain or not

Question 20 is the most important of all

Start Reading here when you first look at form

What we want to know first, is best answered by the patient last. Patient's memory has been focused on the details of the problem for the previous 5 pages. Now when they answer, it is a much more focused answer.

FAB

Feature
Advantage
Benefit

All treatment discussions are made in reference to the benefit to the patient

Nobody ever wants to own a feature: an occlusal adjustment, a crown, or a root canal.
The first step to achieving(Benefit for patient).... is
The cost to(Benefit for patient).... is \$\$

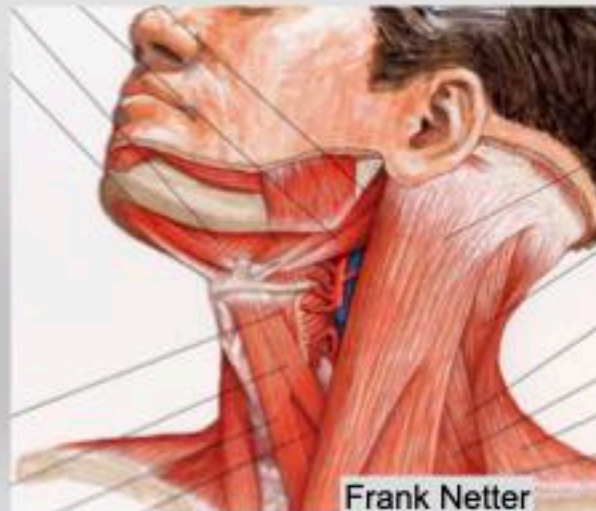
Facial Pain Diagnosis

While I palpate many muscles, the ones I find key are:

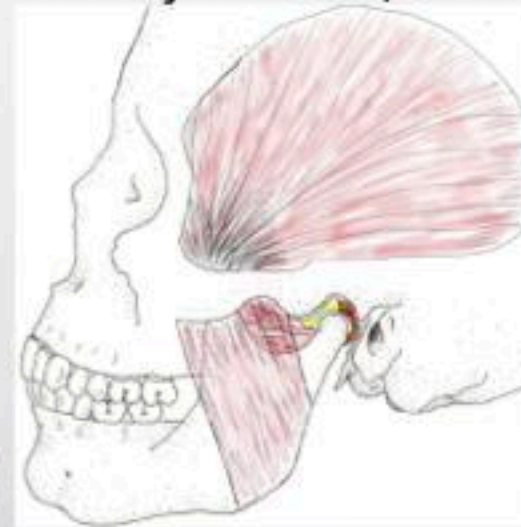
Diagnostic Tools

- 1 Written and Oral History
- 2 Observation
- 3 **Physical Exam**
 - Muscle Palpation**
 - Joint Palpation
 - Joint Auscultation
 - Joint Motion
- 4 Anterior Stop Test
- 5 Sleep Airway Screening
- 6 CT Scan
- MRI
- Blood Tests

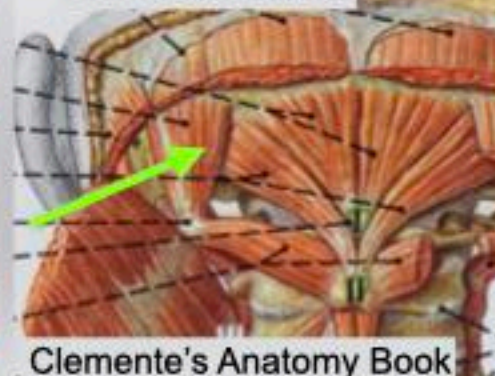
Anterior Temporalis
Masseter
Posterior Digastric
Superior Oblique Capitus
Deep Temporalis
Lateral Pterygoid



Frank Netter



Posterior view

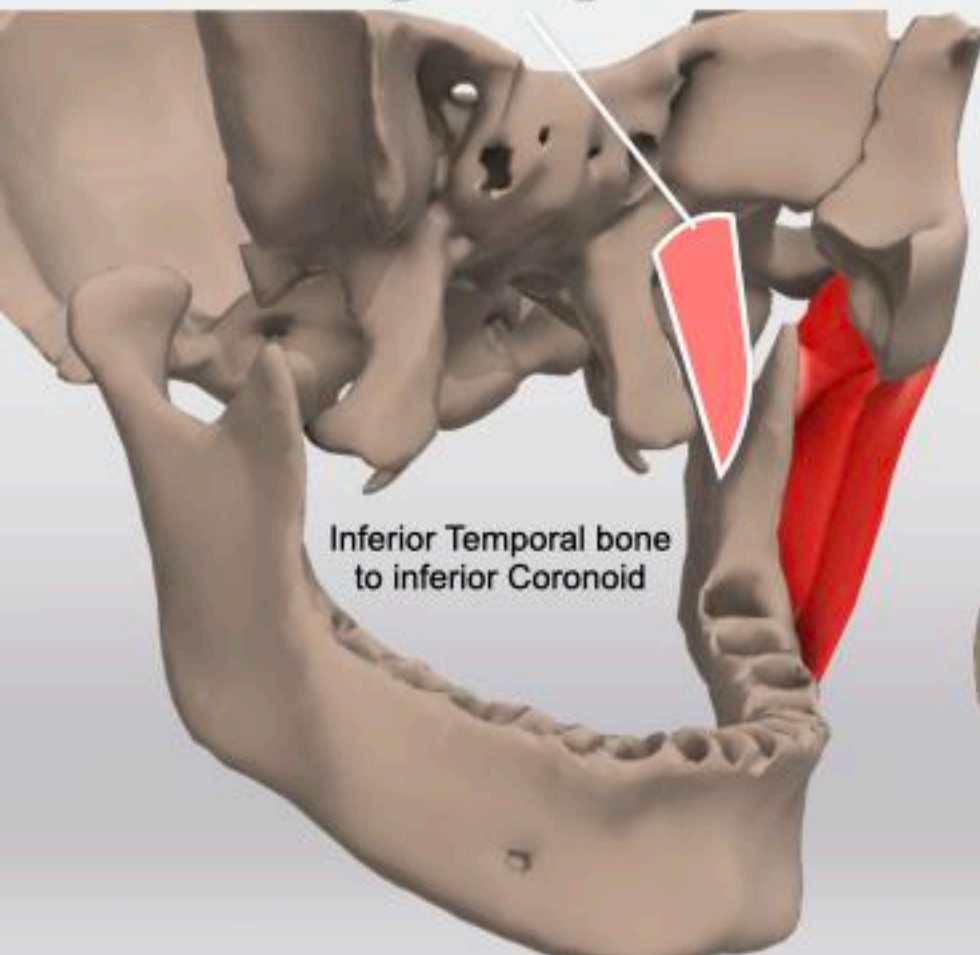


Clemente's Anatomy Book



Anatomy TV

Deep Temporalis

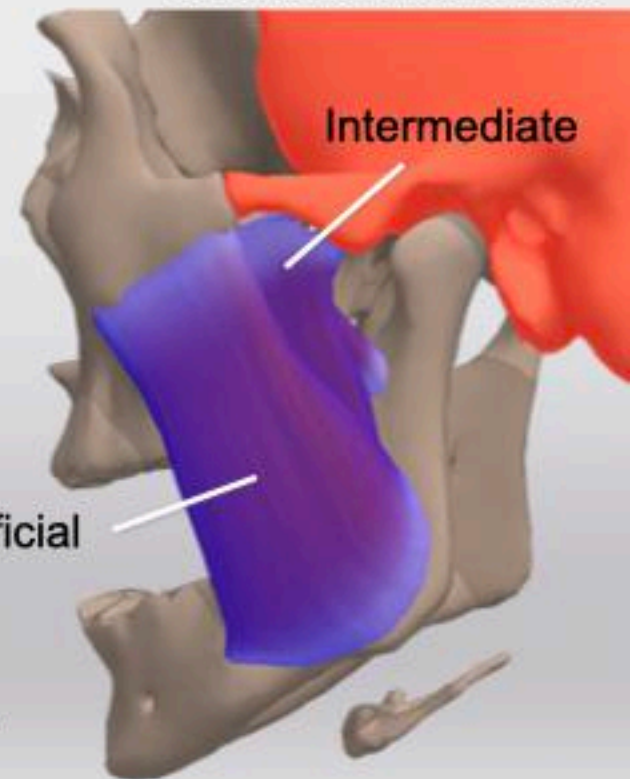


Masseter Muscle is Complex

Complex Muscle
3 Different Portions
3 Different Functions



Superficial



Renderings by Anatomy.TV
and Dr Herb Blumenthal

Facial Pain Diagnosis

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Key Question: What is sore?
Is it the joint, or is it muscle,
or both, or neither?

Anterior Lateral Pole



Posterior Lateral Pole



Indirect through Ear



Palpation and Load

Load in CR- gradual increase pressure
Load In Excursions if negative in CR
No pain does not mean stable



Load Testing

No pain does not mean stable

Reviewed 600 cases (MRI and CT Scans) at my practice of facial pain:

6.5% cases had structurally unstable TM joints. 39/600

(A general practice will have less % structurally unstable TM joints)

CR Load test on these 39 joints:

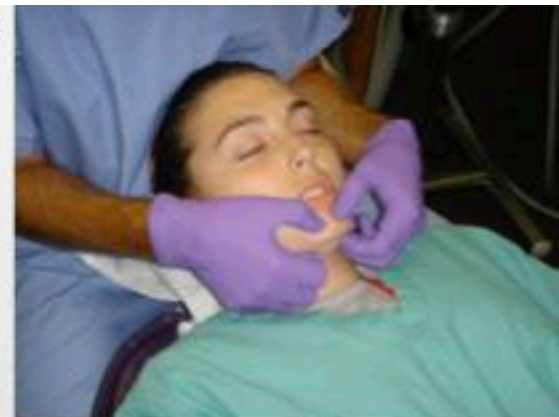
CR Load Positive Soreness 22/39 (56%)

Missed 17/39 structurally unstable joints (44%)

CR and Lateral Load test on these 39 joints:

Positive Soreness of one or both test 33/39 (85%)

Missed 6/39 structurally unstable joints (15%)



Load Test Bimanual Manipulation

46yo F
CR Load Normal
Excursion Load Normal



40yo F
CR Load Normal
Excursion Load Slight



12yo F- CR Load Normal
Excursion Load Slight



Facial Pain Diagnosis

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A healthy joint is quiet,

A damage joint is not.

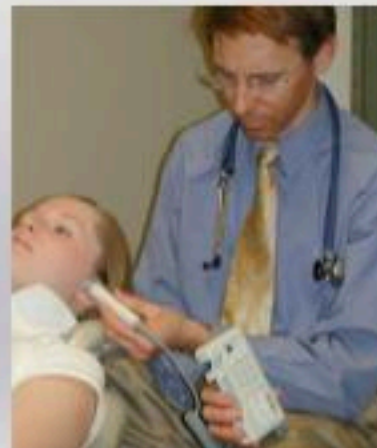
A joint that does not move is also quiet.

Stethoscope

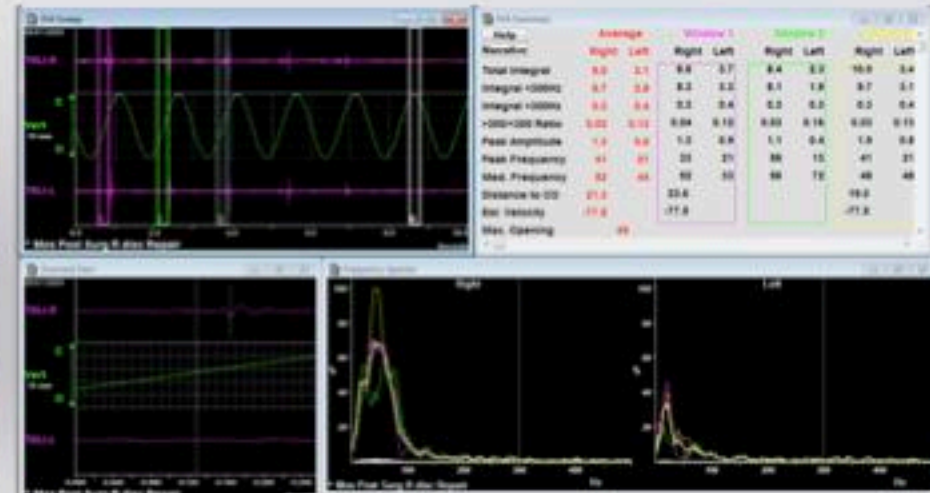
Doppler - Landmark Healthcare 800-334-5618
 Huntleigh Mini Dopplex 5hz
 Great Lakes Orthodontics 800-828-7626

Joint Vibration Analysis/Jaw Tracker

BioResearch 800-251-2315



Sounds/ Vibrations



Sounds/ Vibrations Stethoscope



Use Bell side, not Diaphragm side,
over the TMJ

3M Littmann Classic II S.E. Stethoscope

My Subjective Description of Joint Sounds

smooth
paper
sand
pebbles
rocks
glass

fine
med
coarse

crackle
crunchy
squeaky
scratch

Click
soft
crisp
squishy
early
late
100%
75%
50%
25%
sporadic
??

negative joint movement
minimal joint movement

Joint Vibration Analysis

Objectively measures and quantifies joint vibrations during motion which is an indication of cartilage health



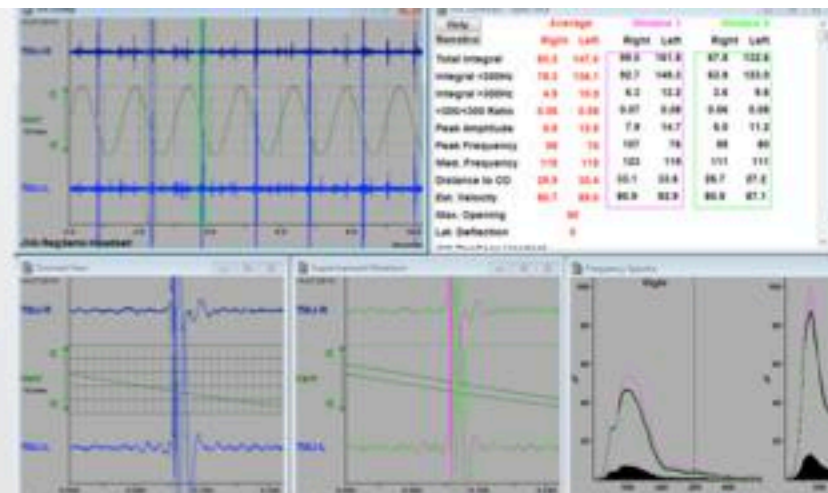
Three main types of sounds



Disc Reduction
Disc Dislocation
Adhesion crackle
tooth tap

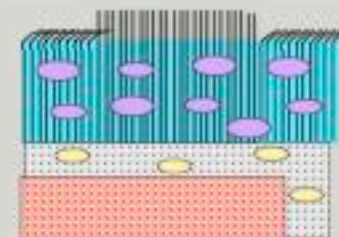
Osteoarthritis
Pseudo Disc
Damaged Cartilage

Disc Subluxation
Joint Subluxation
Disc Reduction
Disc Dislocation

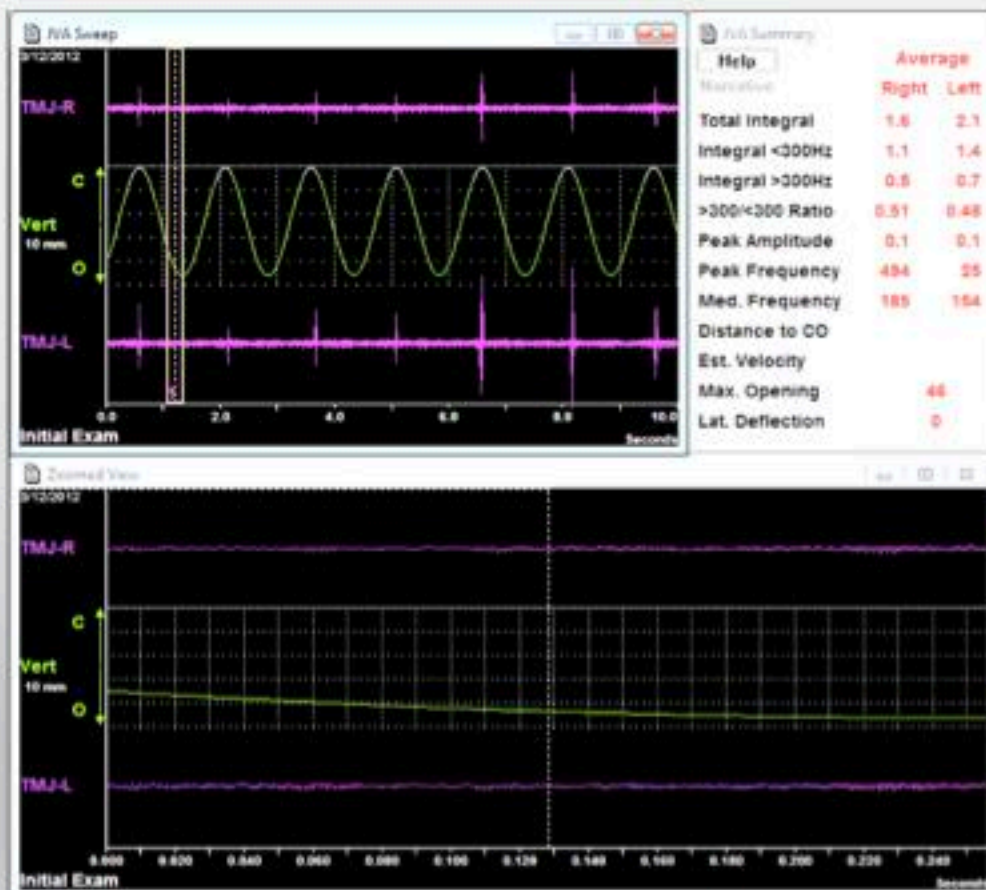


Based on Sonar.
It is not a microphone

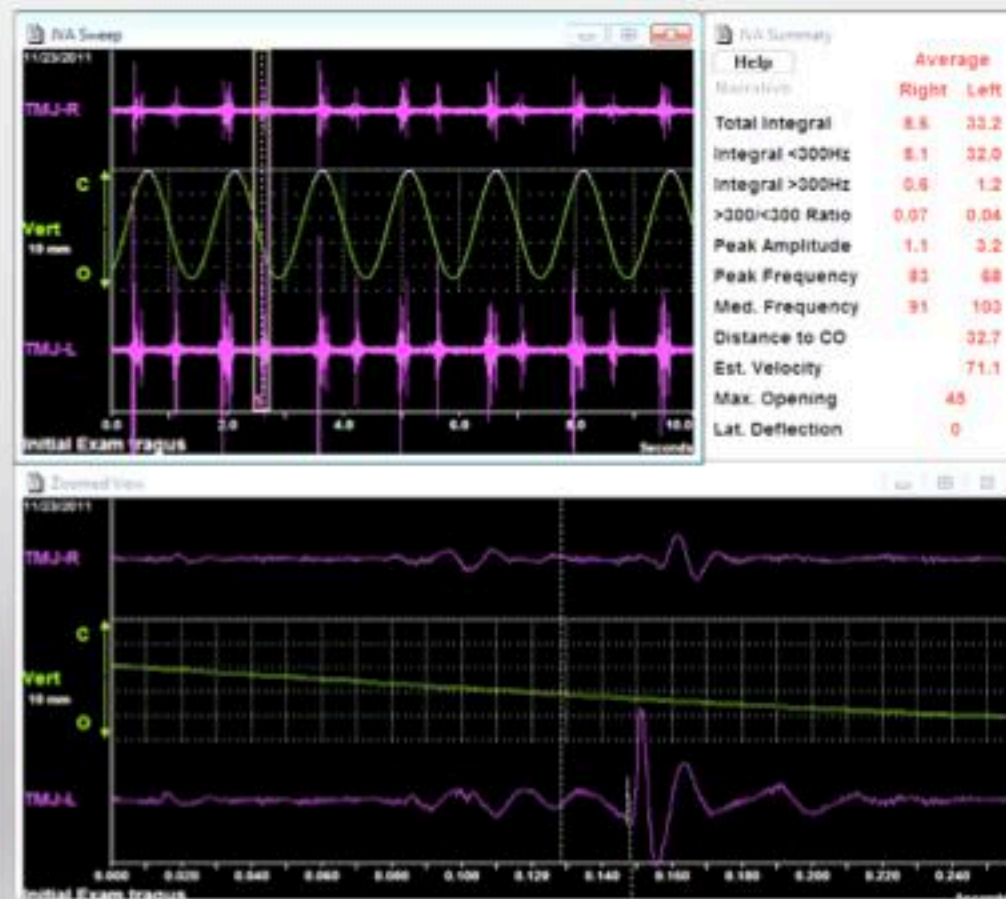
JVA measures the health of the cartilage



Healthy or Damaged?



Healthy or Damaged?



Why is Joint making this vibration?

Smooth

Good Vibrations
Healthy Cartilage
No Movement

Wobble

Wobble
Disc Dislocation
Disc Reduction
Disc subluxation
Joint subluxation
Condyle bumps Disc
Sensor roll on face

Click

Click
Disc Reduction
Disc Dislocation
Adhesion Crackle
Tooth Tap
Contralateral Transference

Scratch

Scratch
Cartilage Fibrillation
Cartilage against tissue
Bone against bone
Velcro Noise

Differential Diagnosis
All the choices

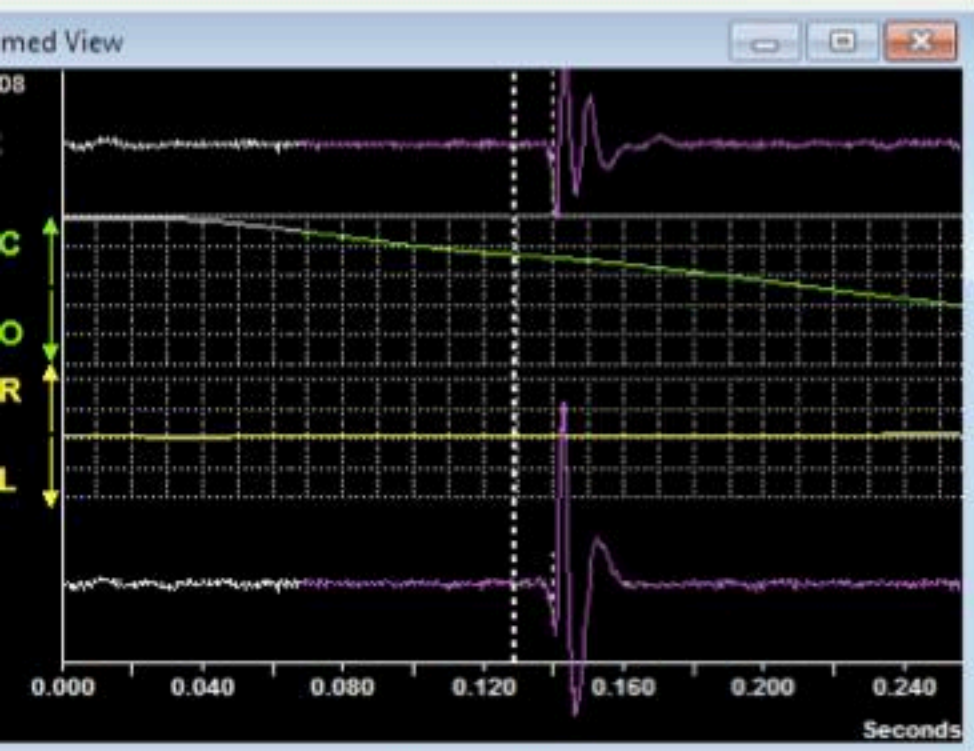
Not
completely
resolved

Diagnostic tests
Narrow down the choices

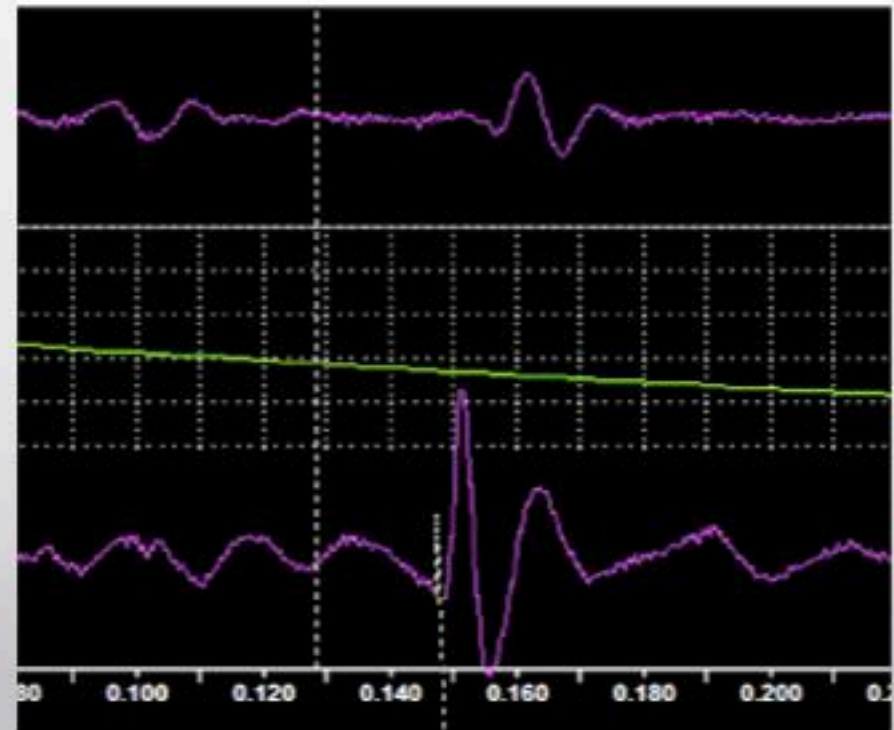
Working Diagnosis
Treating as if

Final Diagnosis
Only after problem resolved

Simple or Complex



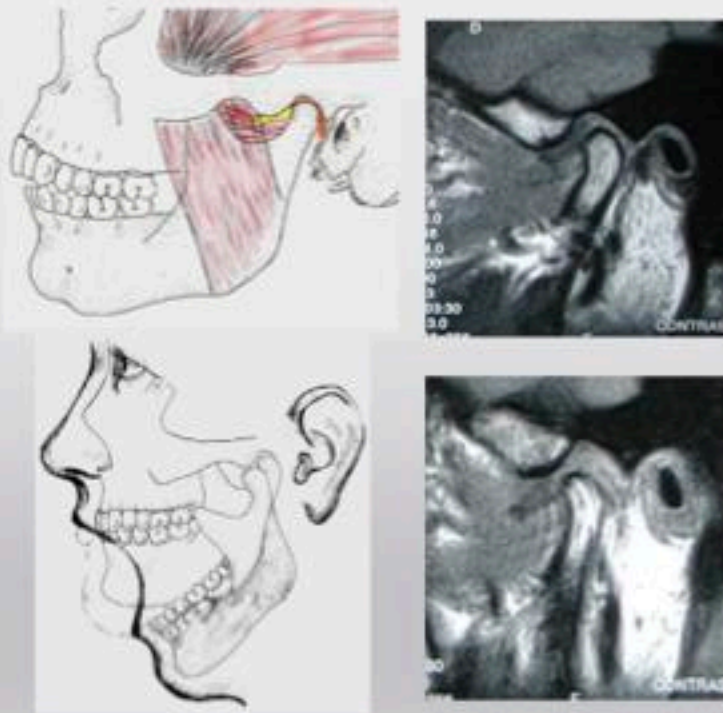
Simple left click with transference vibration to right
L4a



Complex Click
L3a, R4b

Magnetic Resonance Imaging

MRI gives you the start and finish
You have to infer what happened in between



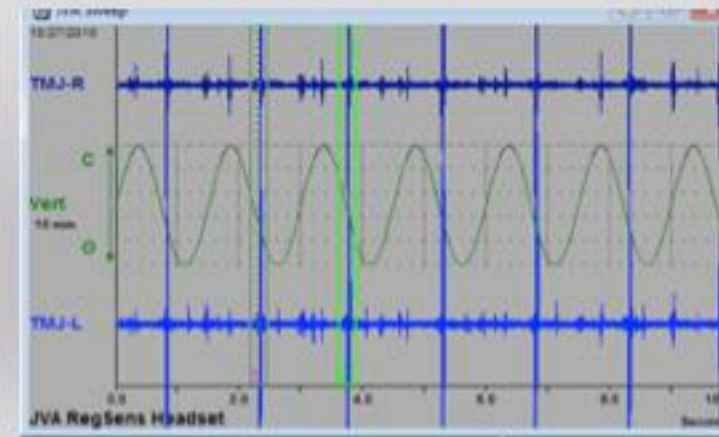
Joint Vibration Analysis

JVA gives you what happens in between
open and closed. It records "motion".
You then infer the start and finish



JVA records Objectively the vibrations of
the TMJ as you open and close.
Ability to compare from year to year.

JVA allows you to view
the joint in function



Facial Pain Diagnosis

Evaluate for Full, Smooth Range of Motion

40-55 mm, 300mm/sec velocity, straight path, consistent arc

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Joint Motion

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Take 4 Measurements:

Maximum Opening	40-55mm
Right Lateral	10-12mm
Left Lateral	10-12mm
Protrusive	10-12mm

38+4 indicates 38mm edge to edge
plus 4mm overbite for a total of 42mm

Normal excursion are 25% of the max open

Evaluate Smoothness:
Light hold on chin as patient
moves jaw

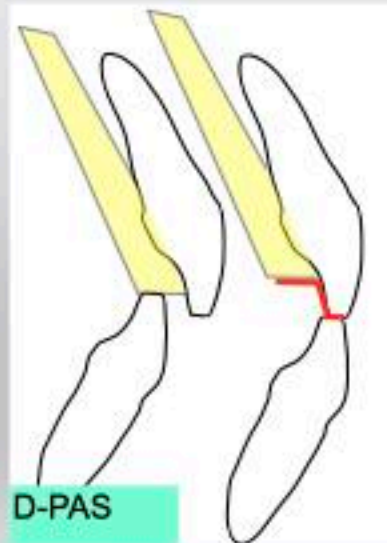


Therabite, 1-800-217-0025
www.therabite.com

Facial Pain Diagnosis

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D-PAS

Anterior Stop Orthotics



NTI



Lucia Jig



Modified Quick Splint



Pankey Anterior Stop



Kois Deprogrammer



APS In Office Anterior Stop



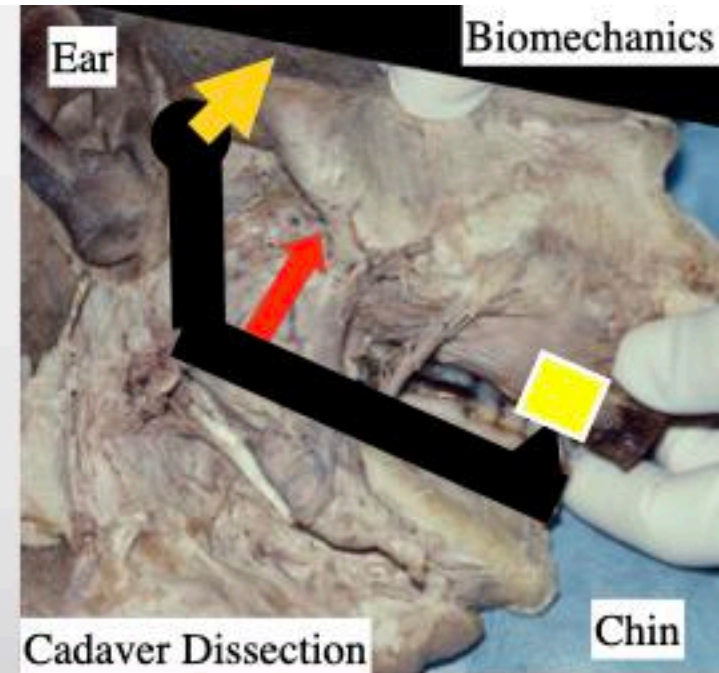
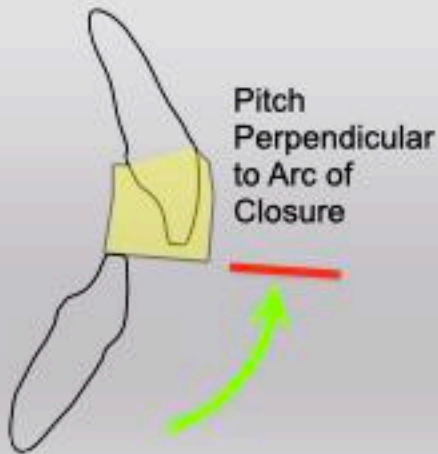
APS D-Pas



APS Temp Anterior Stop

Anterior Stop Orthotic 3 Effects

1. Allows Maxilla, Mandible, and Temporal bones to align.
2. Major decrease in muscle contraction force, most patients.
3. Breaks muscle engram avoidance and bracing patterns.



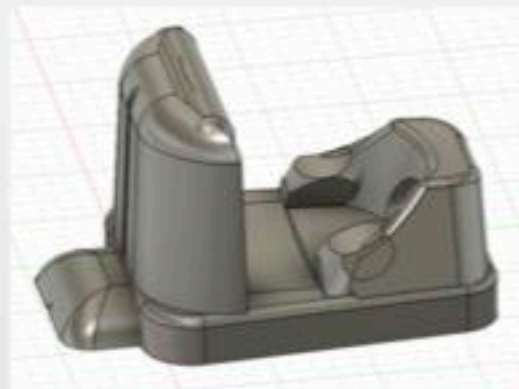
Anterior Stop Orthotic In Office Diagnostic Test



Reline with Parkell Blu-Mousse Super Fast

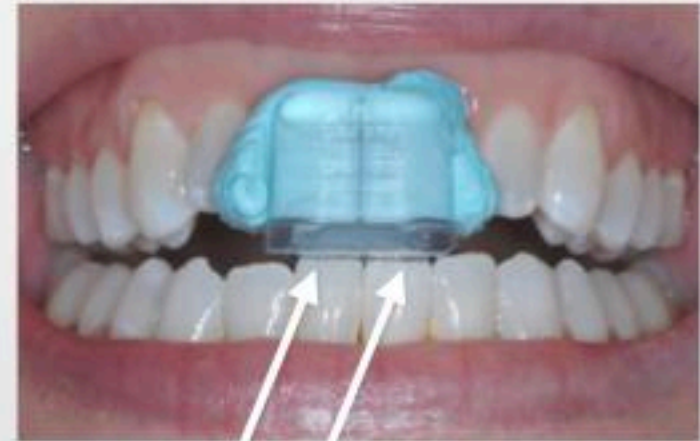


Can do 2nd reline over
top of the first if needed

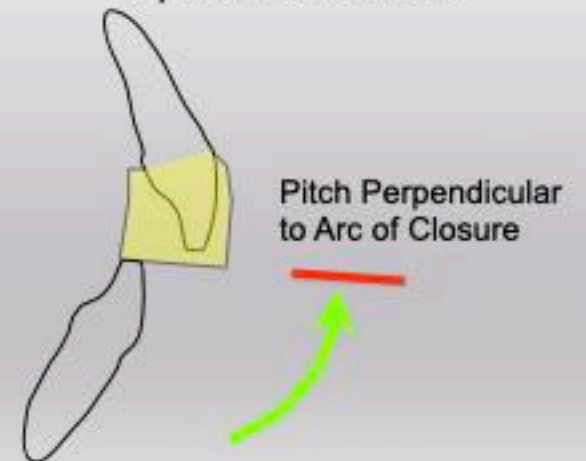


APS Anterior Stop 2.5mm

Easy to hold and align
Built in undercuts
Long enough for class 2 and class 3
Is bondable to composite



2 points of contact



Anterior Stop Orthotic In Office Diagnostic Test



ArrowPath Sleep
Anterior Stop



Deprogram Muscle Engrams

If pain reduces, Occlusion/ Cranial Alignment and/or Muscle Engrams are part of the problem

With anterior stop in place:

5-10x wide open solid tap, open tap far left, open tap far right

2nd round same except Dr unexpectedly accelerates closing a few times

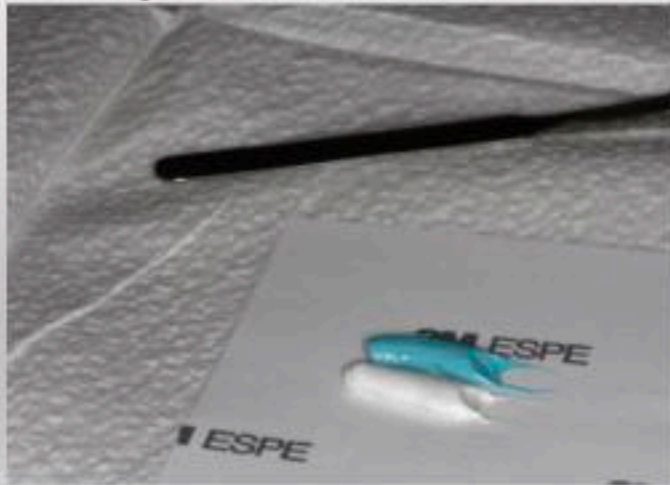
Occipital Lift with 3 deep breaths. Posterior neck opening muscle massage.

3rd round same as first except less taps each position

Office USE ONLY Do not send home with patient

Anterior Stop Orthotic In Office Diagnostic Test

Can do 2nd mix to
overlay 1st if needed



Anterior Stop Orthotic In Office Diagnostic Test

Does the occlusion, cranial alignment, and/or muscle bracing have anything to do with the dysfunction or pain?

Are the TMJ muscles inhibited from full contraction with anterior only tooth contact?



ArrowPath Sleep
Anterior stop 2.5 mm

>30% of headaches have an occlusal component

Occlusal adjustment in patients with craniomandibular disorders including headaches. A 3- and 6-month follow-up. Vallon D, Ekberg E, Nilner M. Acta Odontol Scand. 1995

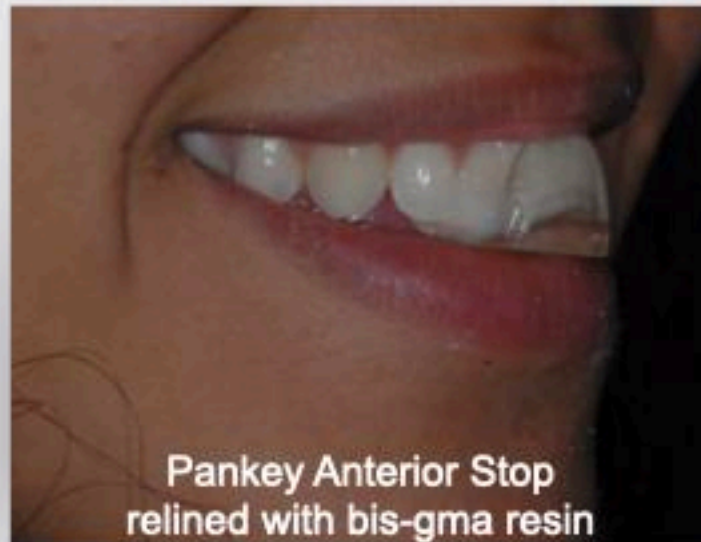
Response to occlusal treatment in headache patients previously treated by mock occlusal adjustment. Forssell H, Kirveskari P, Kangasniemi P. Acta Odontol Scand. 1987

19 yo F Limited opening for past year 30-2 mm

Not able to eat solid foods for past 6 months
and scheduled for TMJ surgery next month



Anterior stop placed:
5 minutes of jaw manipulation
Pain level went from 8/10 to 0
Opening went from 30-2 to 48-3



Pankey Anterior Stop
relined with bis-gma resin

Working Diagnosis:

Protective Muscle Bracing
Occlusal Muscle Dysfunction
Anterior Openbite

Anterior Stop Orthotics

Diagnostic Test

Patient Awareness

Disease Management

Bite Recording Tool



The D-PAS
Diagnostic Palatal Anterior Stop



Basically a relined upper Hawley retainer with anterior stop, no wire, no buccal restrictions.

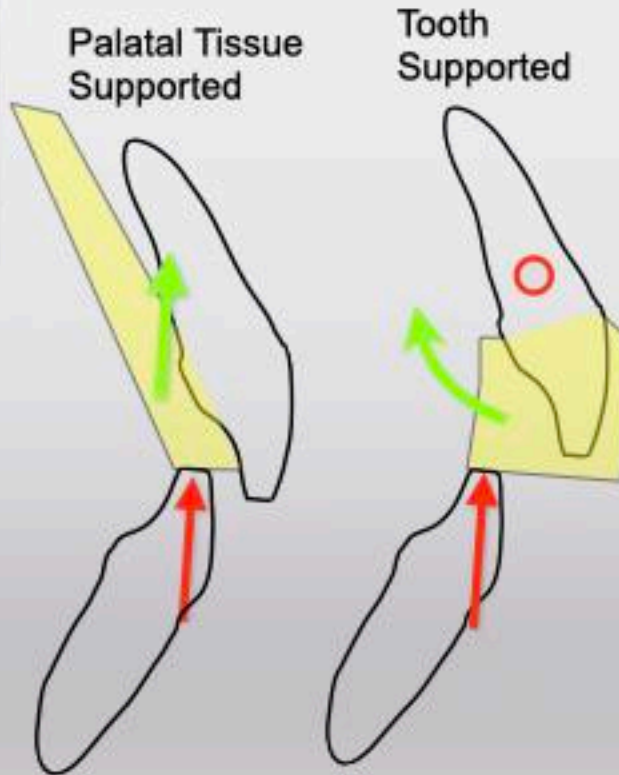


Anterior Stop Force Distribution: D-PAS vs NTI



D-PAS
Diagnostic Palatal
Anterior Stop

Must be relined



NTI-tss Splint
Nociceptive Trigeminal Inhibition
Tension Suppression System



NTI is tooth supported, hard reline.
Contact causes tooth flexure and rotation
Cranial/Skull unfriendly
Can end up being inhaled or swallowed

Stapelmann H, Türp JC. The NTI-tss device for the therapy of bruxism, temporomandibular disorders, and headache.....BMC Oral Health. 2008 Jul PMID: 18662411

Diagnostic Palatal Anterior Stop

D-PAS Test: Wear for 2 weeks, 24/7, take out to eat

Better- Decrease in Symptoms

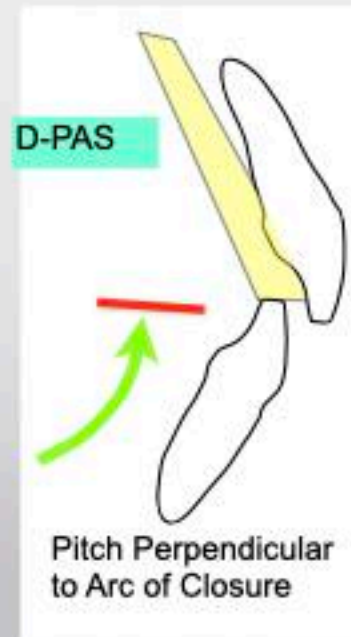
Sleep Clenching Inhibited: Wear D-PAS as night guard
Orthotic Improved Airway: D-PAS as night guard
Occlusal Muscle Disharmony: Occlusal Adjust

Worse- Increase in Symptoms

Mechanically Unstable TMJ, joint subluxation
Intracapsular Problem TMJ
Orthotic Made Sleep Airway Worse

Stays the Same- No Change in Symptoms

Damaged TMJ are mechanically stable
Pain not related to occlusion



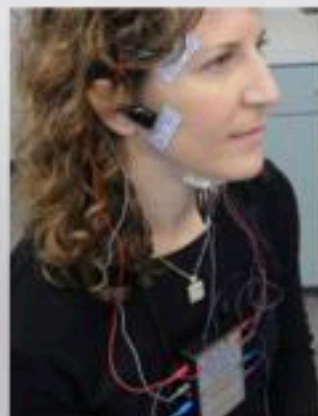
Stapelmann H, Türp JC. The NTI-tss device for the therapy of bruxism, temporomandibular disorders, and headache.....BMC Oral Health. 2008 Jul PMID: 18662411

Anterior Stop Orthotic 3 Effects

Allows Maxilla, Mandible, and Temporal bones to align.

Major decrease in muscle contraction force, most patients.

Breaks muscle engram avoidance and bracing patterns.



BioResearch EMG

Patient with muscles inhibited by anterior only contact

	Clench MaxIC μV	Anterior Stop D-PAS μV
TA-R	100.6	15.7
TA-L	108.9	25.3
MM-R	115.4	25.5
MM-L	70.5	6.8



Major decrease in muscle power with D-PAS

Another Patient with muscles NOT inhibited by anterior only contact

	Clench MaxIC μV	Anterior Stop D-PAS μV
TA-R	82.2	77.9
TA-L	124.6	103.6
MM-R	185.0	169.0
MM-L	79.9	86.6

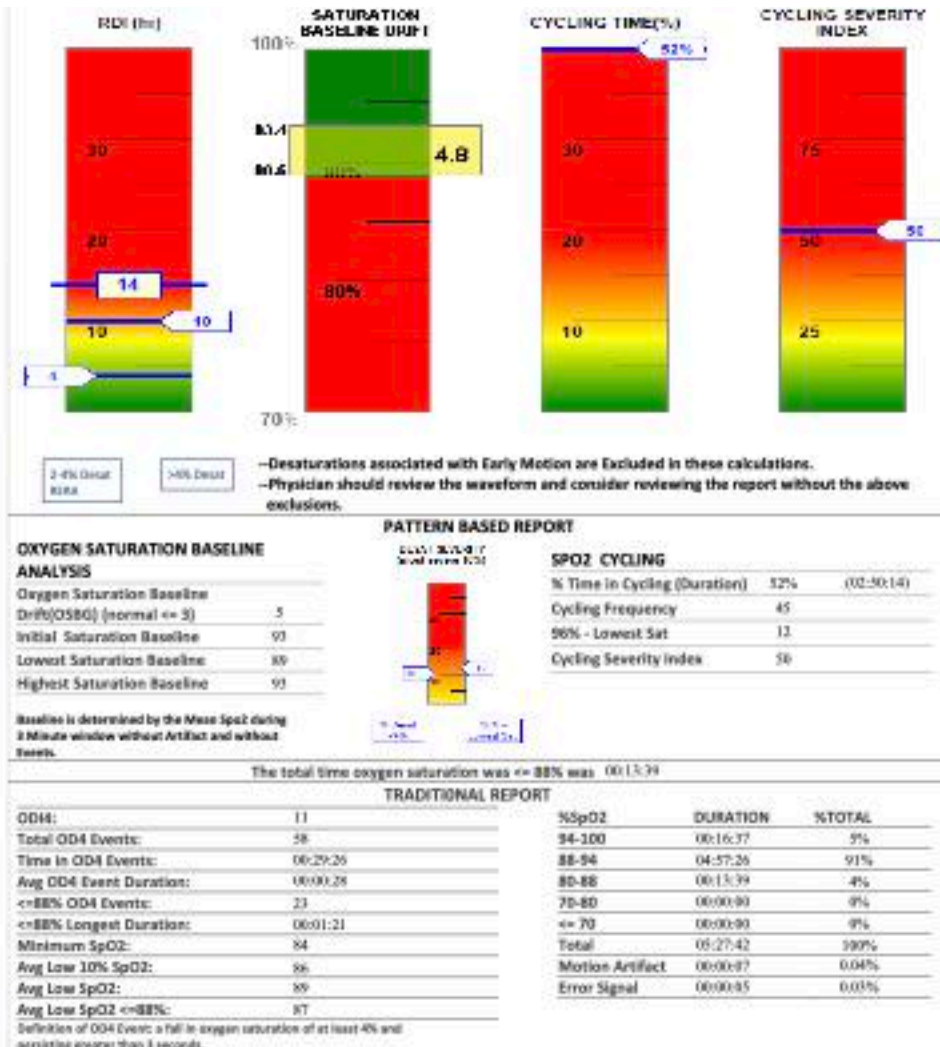
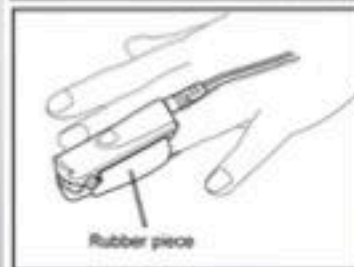
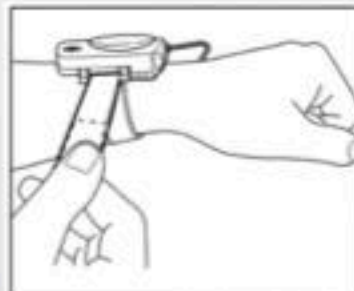


Muscle power same with D-PAS

Facial Pain Diagnosis

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Is there an airway issue? (Upper Airway Resistance or Obstructive Sleep Apnea)

"Sleep Airway Screening"



High Resolution
Pulse Oximetry

Data every 1
second average
over 3 seconds



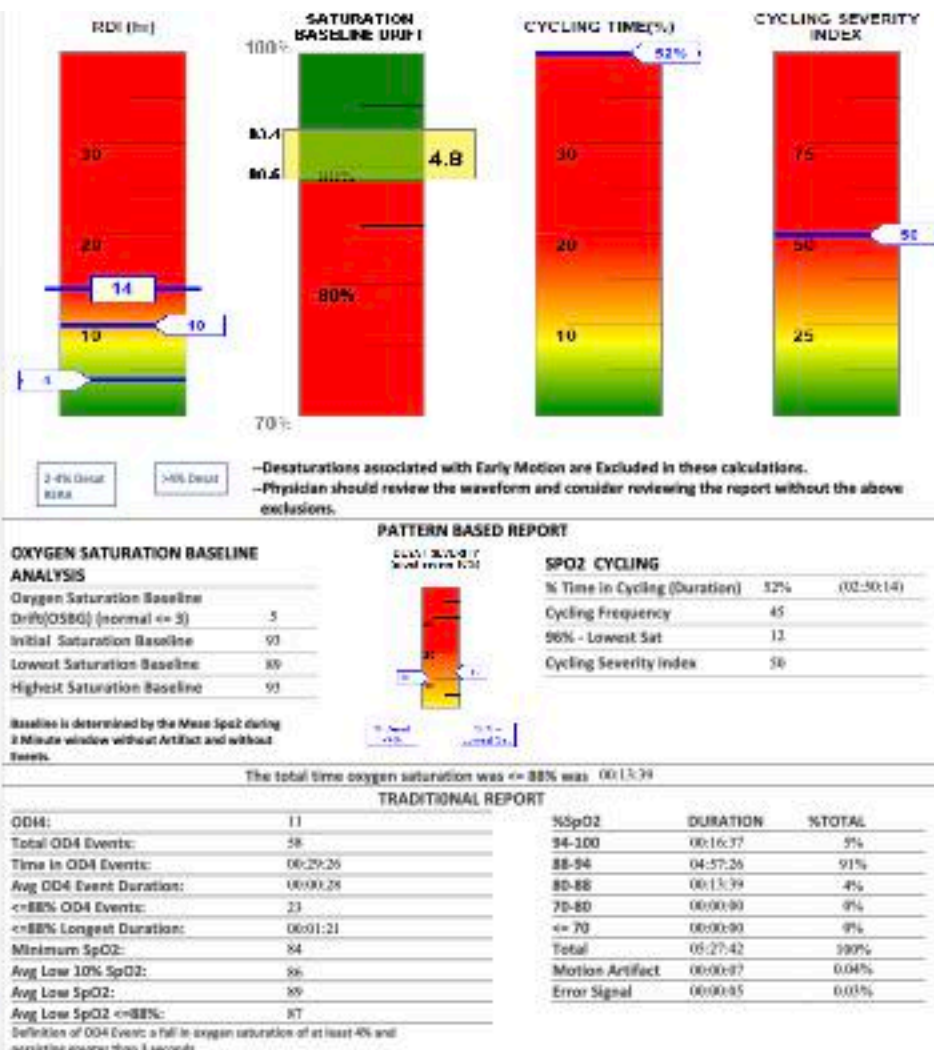
Patient Safety Inc.

SLEEPSAT

SATSCREEN

Order Pulse Ox and Software: Go to my website or
www.patientsafetyinc.com

Sleep SAT is the replacement for
PULSOX 300i, Konica Minolta no longer made

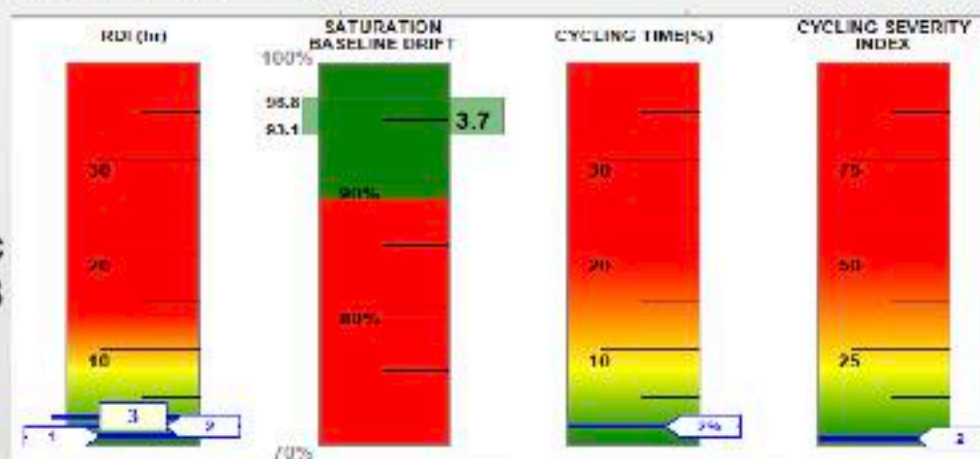


Does the dental orthotic make the airway better or worse?

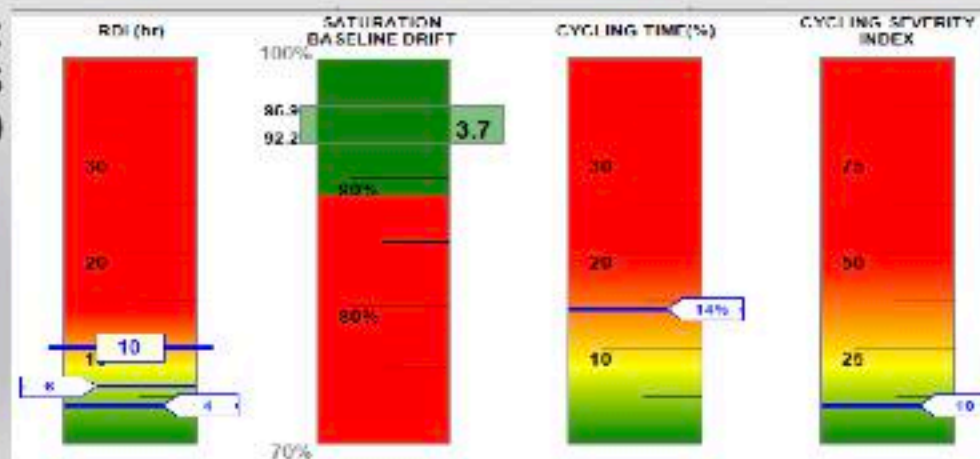
RDI= Respiratory Distress Index

Sometimes D-PAS
makes airway better,
sometimes worse

No dental orthotic
RDI = 3



Dental Orthotic:
Anterior Stop: D-PAS
RDI = 10



High Resolution
Pulse Oximetry

PULSOX 300i,
Konica Minolta
with data analysis
Patient Safety, Inc.

Age 16F
cc: Facial Pain, Excessive Daytime Fatigue



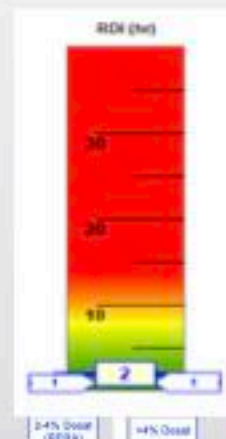
Age 16F
cc: Facial Pain, Excessive Daytime Fatigue



Medical Sleep Study in Lab RDI = 1
Dx: Snoring without evidence of gas exchange abnormalities or sleep disruptions

Sleep Latency Test
Dx: Narcolepsy
Recommend daytime medication

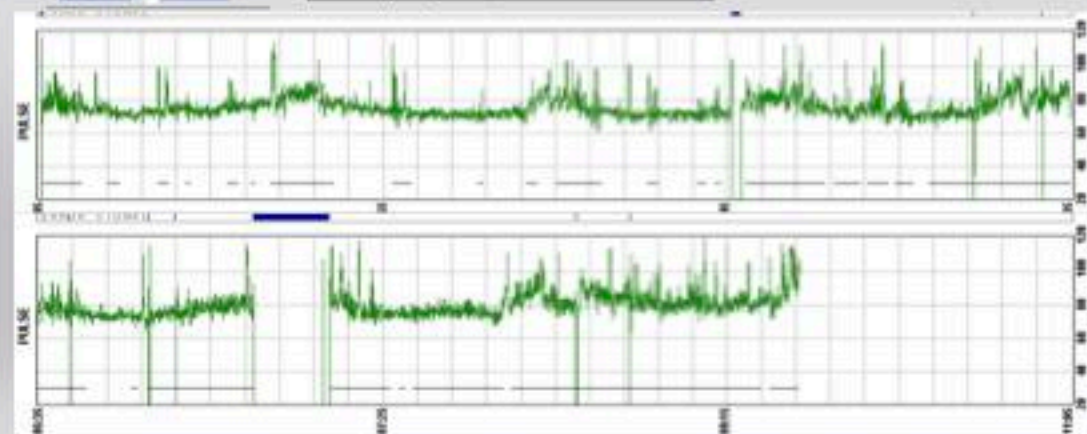
Patient Safety Inc Pulse Ox Sleep Screening
RDI = 2, Autonomic Arousal **31 /h**



PULSE RATE DATA	
Autonomic Arousal	
Index (#/hr):	31
Pulse Rate Range	
Mean:	78
Min:	34
Max:	122
Tachycardia - Sleep (>90 bpm)	
Duration:	00:34:56
% (VRT):	6%
Bradycardia - Sleep (<50 bpm)	
Duration:	00:00:35
% (VRT):	0%



Heart Rate
>90 bpm
for 35 min

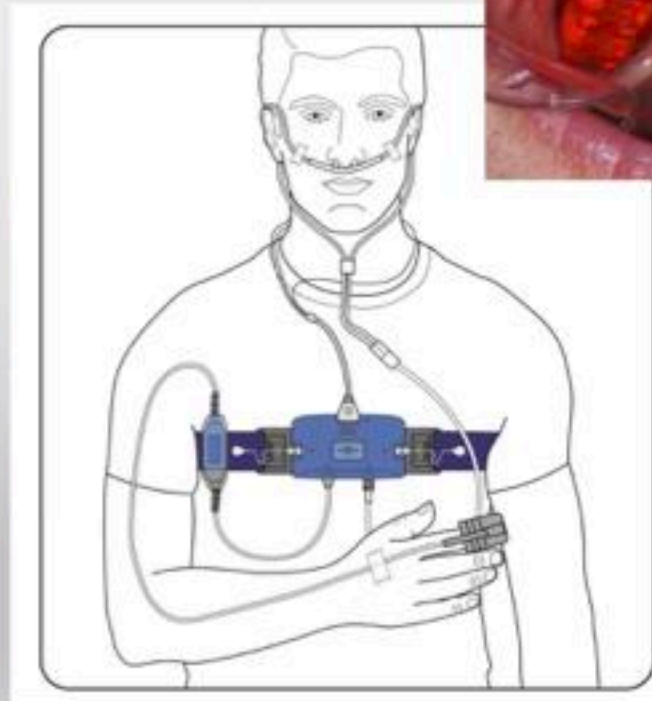


zMachine

GENERAL
sleep



zMachine + Brux Checker
+ Snore Lab



Call (888) 330-4424

Use Code: DROTER to receive special offer

Patient: M Y
Study Date: 2018-09-27 Study ID: 1124990576
3% Threshold

AHI: 8.9
AHI is how many times an hour your blood oxygen goes down.

RDI: 8.9
RDI is how many times an hour your sleep is disturbed due to respiration.

Date of Birth: 1988
Age: 20
Sex: F

Height: 63 inches
Weight: 105 Pounds
BMI: 18.60

Note:

GENERAL
sleep
Zmachine® Synergy
Home Sleep Test Report
Study Ordered by:
John R. Droter, DOS
Scored by: Computer

Study Details: Computer Generated Scoring

The following parameters were recorded using a Zmachine Synergy (General Sleep Corporation): EEG for sleep staging & arousals; respiratory inductance plethysmography for thoracic respiratory effort; pressure transducer for respiratory airflow & scans; pulse oximeter for SpO₂; pulse, & optical plethysmography; and tri-axial accelerometer for body position. Hypopneas were scored per AASM recommended definition of 3% desaturation.

Times and Durations	
Lights off	2018-09-27 01:47:32
Lights on	2018-09-27 08:42:54
Total Recording Time (TRT)	936.8 min.
Time in Bed (TIB)	414.0 min. (81.7% of TRT) L 6 hours 54 minutes
Total Sleep Time (TST)	396.8 min. (95.9% of TIB)
Sleep Efficiency (SE)	95.9 % of TIB
Latency to Persistent Sleep (LPS)	8 min
Latency to Deep Sleep (LDEEP)	29 min
Latency to REM Sleep (LREM)	8.5 min
Total Light Sleep Time N1+N2	207.9 min. (52.4% of TST)
Total Deep Sleep Time N3+SWS	85.7 min. (24.3% of TST)
Total REM Time	83.2 min. (23.5% of TST)
SpO ₂ < 88% cumulative time	0 min.
SpO ₂ < 88% longest span	0 min.

Awakenings During Sleep	
Wake After Sleep Onset (WASO)	13 min
≥ 1-epoch Awakenings	18 (2.7 per sleep hour)
≥ 3-epoch Awakenings	0 (0 per sleep hour)

WASO is the cumulative wake time following LPS. ≥ 1-epoch Awakenings is the number of times the patient woke for one epoch (i.e., 30 seconds) or more after LPS, and ≥ 3-epoch awakenings is the number of times the patient woke for three epochs or more after LPS. This is a value of a 3-epoch.

Sleep Study Ranges of Normal

Sleep latency: 10-20 min
Latency to REM Sleep: 10-20 min
Sleep Efficiency: 85%

N1 2% - 5%
N2 45% - 55%
N3 Deep Sleep: 10% - 20%
REM sleep: 40 min to 90 min
REM Sleep: 20% - 25%
REM sleep: 40 min to 130 min

REM to REM is about 90 min
4-5 cycles per night
REM time longer as night goes on

Deep N3 SWS sleep is in first third of night. Less as we age.

TST is the total duration of the recording. TIB is the elapsed time from lights off to lights on. TST is the cumulative time scored as any stage of sleep. SE is 100(TST/TIB) expressed as a percentage. AHI is apneas + hypopneas per hour of sleep time; RDI is apneas + hypopneas + RERAs per hour of sleep time; and RDI is apneas + hypopneas + RERAs per hour of recording time.

LPS is the elapsed time to the beginning of the first period in which 10 of 30 minutes are scored as any stage of sleep (i.e., the start of persistent sleep). LDEEP is the elapsed time to the beginning of first epoch of Deep Sleep, and LREM is the elapsed time to the beginning of first epoch of REM.

Respiratory Events

Body Position

72.1% Supine/hr

9.0

0% Prone/hr

0

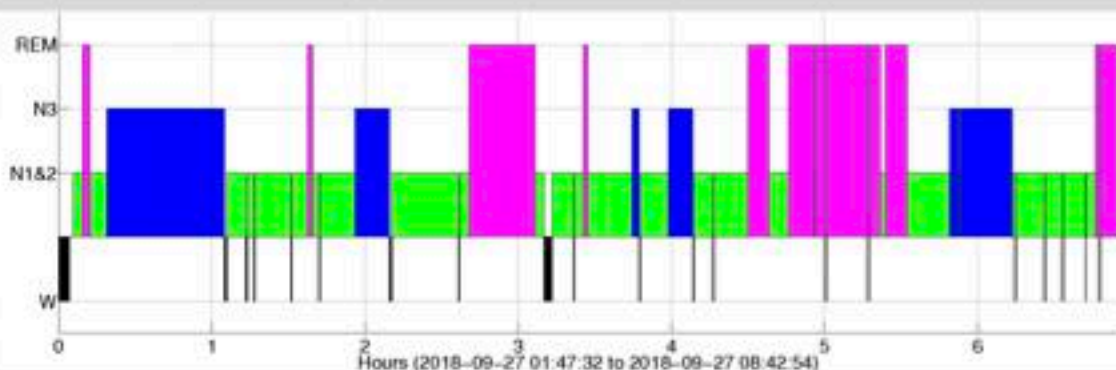
12.9% Left/hr

4.5

14.8% Right/hr

9.8

Sleep Stages



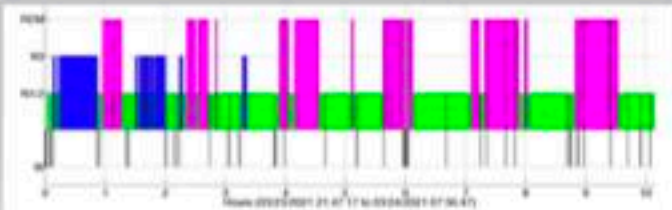
Sleep Simplified

1. Need adequate Deep and REM Sleep every night.
2. Need to get oxygen through the nose to lungs, unimpeded, all the time.
3. Parasympathetic Dominance in non REM Sleep

Sleep Complexity:

Problems are Numerous.....
 Tests are Numerous.....
 Therapies are Numerous.....

Always go to the back to basics:
 60+min Deep and 90+min REM
 Air from Nose to Lungs
 Large periods of calm, steady heart rate

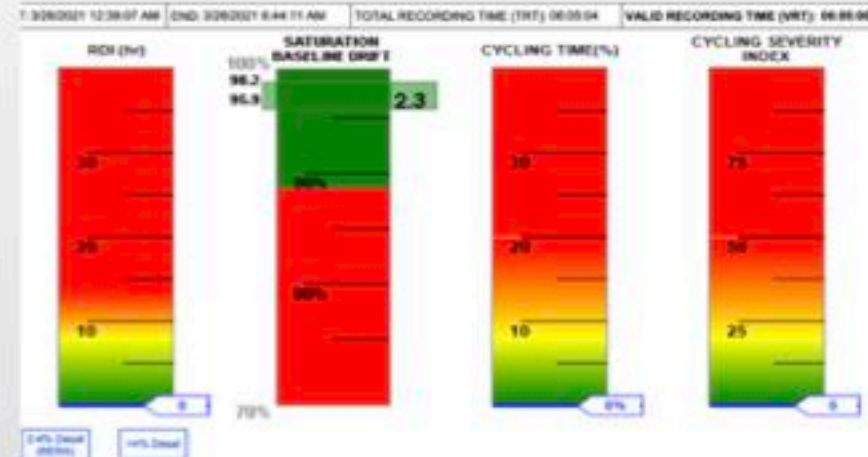


AHI: **0.5**

AHI is how many times an hour your blood oxygen goes down.

zMachine: Interrupted Deep and REM

Sat Screen by Patient Safety Inc



PULSE RATE DATA

Autonomic Arousal

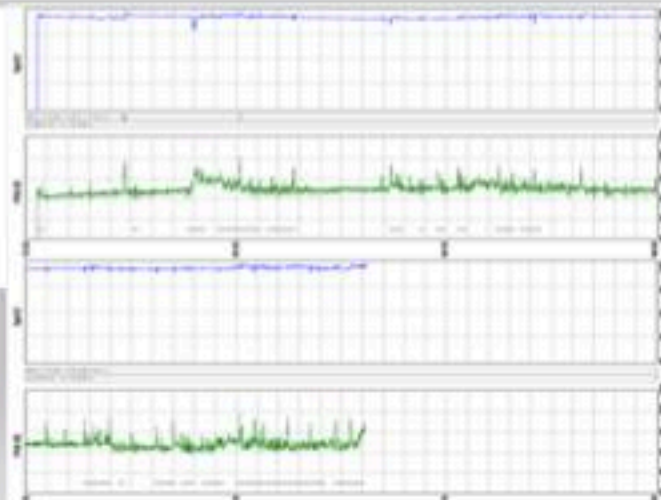
Index (#/hr): 23

Pulse Rate Range

Mean: 69

Min: 58

Max: 102



Facial Pain Diagnosis

Diagnostic Tools

- 1 Written and Oral History
- 2 Observation
- 3 Physical Exam
 - Muscle Palpation
 - Joint Palpation
 - Joint Auscultation
 - Joint Motion
- 4 Anterior Stop Test
- 5 Sleep Airway Screening
- 6 **CT Scan**
 - MRI
 - Blood Tests



Normal TMJ- Bone

Bone Density

Intact Cortex

Even pattern Trabecular bone

Normal Size/Shape Condyle/Fossa

Ovoid Condylar Shape

Non-Congruent Condyle/Fossa

Condyle 70% Size Fossa

Condyle Centered in Fossa

Coronal and Sagittal

Room for Disc

Stable CR load Zone

Condyle closest to fossa

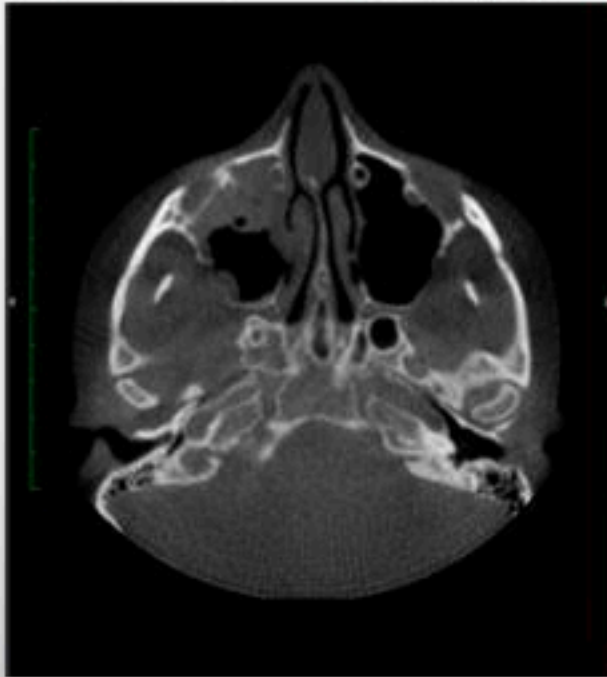
CT Scan
Coronal View



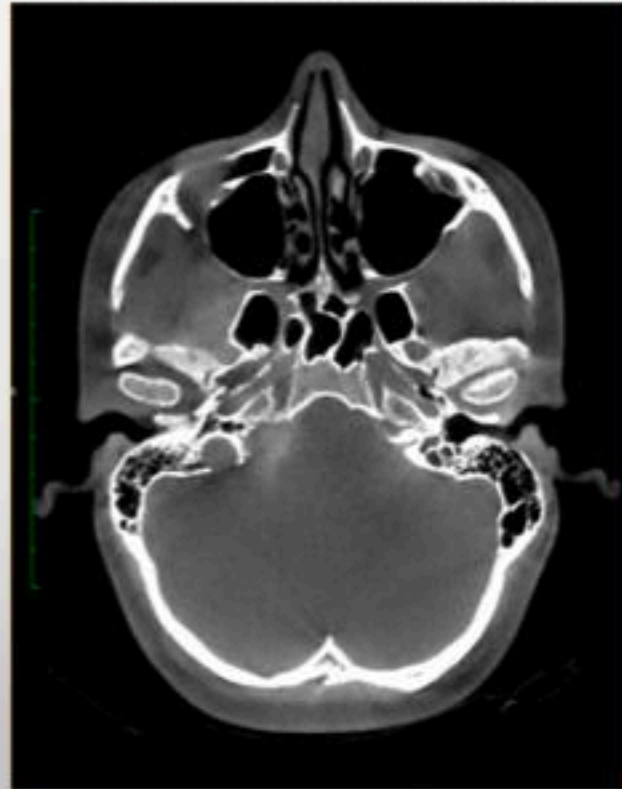
CT Scan
Sagittal View

Compare CT scans

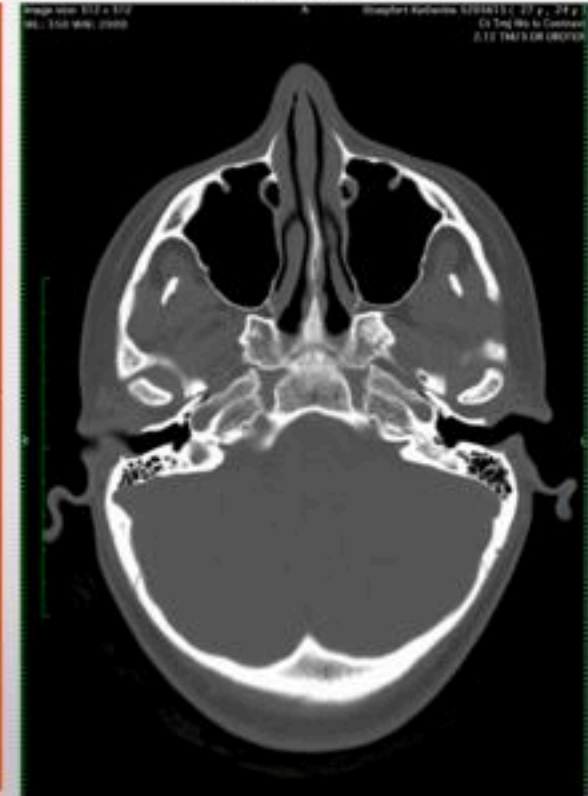
CBCT- iCAT



CBCT- Vatech i3D Premium



Spiral CT



Best Contrast
Much more radiation

Interpreting CBCT

Review of Scan: CBCT
John R Droter, DDS
 Review Date: _____
 Scan Quality: ☐ Good ☐ Fair ☐ Marginal

Name: _____ Scan Date: _____

Read the quick scroll through axial, coronal and sagittal for global impressions.

Right TMJ *Good: Centered Sagittal and Coronal Coronal*

Condyle: ☐ Normal Size ☐ Small condylar disc ☐
☐ Normal Shape ☐ Altered condylar shape ☐
☐ Cortex Intact ☐ Cortex not intact ☐
☐ Cortex Even ☐ Hypertrophia ☐

Fossa: ☐ Normal Size ☐ Small fossa size ☐
☐ Normal Shape ☐ Flattened fossa shape ☐
☐ Cortex Intact ☐ Cortex not intact ☐

Condyle Position: ☐ Centered in fossa ☐ Condyle distalized ☐
 Joint spacing: ☐ Room for disc ☐ No room for disc ☐

CR Load Zone: ☐ Superior medial ☐ Superior Lateral ☐

Estimate Pincer: R1 R2 R3a R3b R4a R4b R5a R5b

Right TMJ Health: ☐ Healthy ☐ Damaged ☐ Active Degeneration ☐ Adapting ☐ Adapted

Left TMJ *Good: Centered Sagittal and Coronal Coronal*

Condyle: ☐ Normal Size ☐ Small condylar disc ☐
☐ Normal Shape ☐ Altered condylar shape ☐
☐ Cortex Intact ☐ Cortex not intact ☐
☐ Cortex Even ☐ Hypertrophia ☐

Fossa: ☐ Normal Size ☐ Small fossa size ☐
☐ Normal Shape ☐ Flattened fossa shape ☐
☐ Cortex Intact ☐ Cortex not intact ☐

Condyle Position: ☐ Centered in fossa ☐ Condyle distalized ☐
 Joint spacing: ☐ Room for disc ☐ No room for disc ☐

CR Load Zone: ☐ Superior medial ☐ Superior Lateral ☐

Estimate Pincer: L1 L2 L3a L3b L4a L4b L5a L5b

Left TMJ Health: ☐ Healthy ☐ Damaged ☐ Active Degeneration ☐ Adapting ☐ Adapted

Swelling *Coronal View, Sagittal View, Axial View*

All Tissues: ☐ Right = Left ☐ = Except _____
 Look for tumors Brain, Muscle, Parotid Submand Gland, Hypertrophy

All Bones: ☐ Right = Left ☐ = Except _____
 Look for hypercalcified or radiolucent areas, cysts

Mand: *(Sagittal, Cor)* ☐ Open ☐ Restricted ☐ Deviated Septum ☐
 Sinuses: ☐ Clear ☐ Thickened Lining ☐ Tissue Polyps ☐
 Airway: ☐ Adequate ☐ Restricted ☐
 Teeth: *(Sagittal, Cor)* ☐ No PNP ☐ PNP is _____
(Pencil) ☐ No Gross Caries

Perio: *(Thick Sagittal)* ☐ No Gross Perio Bone Loss

Artes: ☐ ☐ Appears Centered ☐ Not Level with Skull Base ☐

C2, C3, C4: ☐ Aligned ☐ Misaligned

Max Mand Relation: ☐ Normal Sagittal ☐ Retrognathia ☐ Maxilla ☐ Mandible

Max Mand Casting: ☐ Normal Coronal ☐ Asymmetric Cast ☐ Maxilla ☐ Mandible

Impression: _____

www.jrdroter.com

Review of Scan: CT/CBCT Guide

TMJ

Condyle

Fossa

Condyle is 30% size of the fossa, with an oval shape. The condyle and fossa are noncongruent concave surfaces. The outer cortex of bone is a solid continuous line with no breaks. Look for areas of hypertrophia which are indicative of excess load in that area or damage and repair. The right and left TMJs should be the same size.

Condylar Position

☐ Centered in fossa

The condyle should be centered in the fossa. A distalized condyle is indicative of either joint damage and disc dislocation anteriorly or heavy anterior tooth contact. An anteriorly positioned condyle is indicative of a large CR/CO discrepancy usually associated with an adapted mandibular retrognathia.

Joint Spacing

☐ Centered in fossa

There should be room to "draw" a disc between the condyle and fossa.

CR Load Zone (Centric Relation Load Zone)

☐ Superior medial

Ideally the condyle in its optimal load bearing position (Centric Relation) should load on the superior medial surface. In the coronal view the area where the condyle is closest to the fossa is the Centric Relation Load Zone. A variant of normal is to have both condyles load on the superior lateral surface. If the load zones of the right and left do not match (i.e. one is medial the other lateral) this is indicative of joint damage and disc dislocation. Pincer or ankylosis for joint mechanical stability (joint wobble) with a DPM. Clinically these patients may have a hypertrophia "bite".

Estimate Pincer

This estimation combines clinical data from the clinical history, exam, joint palpation, ortho-scopes, auscultation, Doppler (JVA) (Joint Vibration Analysis) and the CT scan. If the joint is a left distalized condyle and no clicking is either a Pincer 4b or a health joint distalized due to heavy anterior contact (usually isometric). In the case of the 4b, JVA would show some slight "scratch vibrations", whereas a health TMJ distalized due to occlusion would show "smooth vibrations", and clinically have freeness on the anterior teeth.

1. Normal joint: MRI and CT are normal (See all above). No joint sounds, full range of motion, JVA no vibrations, quiet Doppler.

2. The TMJ is damaged but disc is still in place so MRI and CT are normal. Usually the cartilage is damaged, roughened from parafunctional bruxing. Doppler and JVA will both indicate slight vibrations. A well adapted 4b will also have the same vibratory signals as a Pincer 2, but the 4b will show changes in condylar position on the CBCT, and the MRI will show the disc dislocation.

3. This is a partial dislocation of the disc, usually in an anterior medial direction with the lateral ligament being taut or stretched. The joint reduces on opening and will make a vibration, either a click or wobble on JVA. If a 3a is opposite a health joint there is not a change in occlusion so CT is normal. A Pincer 3a is often consequential to a 4b. With loss of the opposing disc, the mandible shifts coronally, the CR load zone changes in both joints leading to 3a.

3b. Same as above except non-reducing and therefore no clicking vibration. CT is normal.

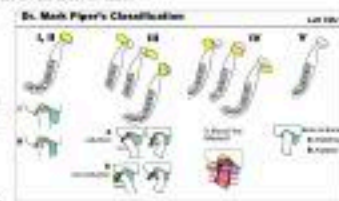
4. The disc is fully displaced off the head of the condyle and reduces on opening. There will be a shifting of the mandible which can be seen on the CBCT. Condyle not centered in fossa. Clinically there will "click or wobble" vibration as the disc returns and subluxates. While most vibrations are in the audible range some may not be. These will be detected with JVA.

4b. The disc is fully displaced off the head of the condyle and does not reduce on opening. This will look the same on CBCT as a 4a. Condyle not centered in fossa. While limited opening may occur, many can have a full range of motion. Range of motion should not be a sole determining factor on whether a joint is 4b.

5a. Osteoarthritis. There will be changes to the condylar shape and cortex seen on the CBCT. Osteoarthritis is the inflammatory phase of Osteoarthritis. Look for making cortex indicative of active degeneration. The joint will be tender to palpation. An MRI is helpful in detecting extent of inflammation.

5b. Osteoarthritis. There will be changes to the condylar shape and cortex seen on the CBCT. The Cortex however will be intact and the joint will not be tender to palpation. Hypertrophia will be seen having reinforced the damaged areas. There is a loss of congruency in the condyle and fossa wear down and becomes flattened. Parafunctional tooth grinding increases OA bone wear.

John R Droter DDS



Signature: _____

First do quick scroll through axial, coronal, and sagittal for global impression.

Right TMJ

Scroll Corrected Sagittal and Corrected Coronal

Condyle:	<input type="checkbox"/> Normal Size	<input type="checkbox"/> Small condylar size	<input type="checkbox"/>
	<input type="checkbox"/> Normal Shape	<input type="checkbox"/> Altered condylar shape	<input type="checkbox"/>
	<input type="checkbox"/> Cortex Intact	<input type="checkbox"/> Cortex not intact	<input type="checkbox"/>
	<input type="checkbox"/> Cortex Even	<input type="checkbox"/> Hypercalcification	<input type="checkbox"/>
Fossa:	<input type="checkbox"/> Normal Size	<input type="checkbox"/> Small fossa size	<input type="checkbox"/>
	<input type="checkbox"/> Normal Shape	<input type="checkbox"/> Flattened fossa shape	<input type="checkbox"/>
	<input type="checkbox"/> Cortex Intact	<input type="checkbox"/> Cortex not intact	<input type="checkbox"/>
Condyle Position	<input type="checkbox"/> Centered in fossa	<input type="checkbox"/> Condyle distalized	<input type="checkbox"/>
Joint spacing	<input type="checkbox"/> Room for disc	<input type="checkbox"/> No room for disc	<input type="checkbox"/>
CR Load Zone	<input type="checkbox"/> Superior medial	<input type="checkbox"/> Superior Lateral	<input type="checkbox"/>
Estimate Piper:	R1 R2 R3a R3b	R4a R4b R5a R5b	
Right TMJ Health:	<input type="checkbox"/> Healthy	<input type="checkbox"/> Damaged <input type="checkbox"/> Active Degeneration	
		<input type="checkbox"/> Adapting <input type="checkbox"/> Adapted	

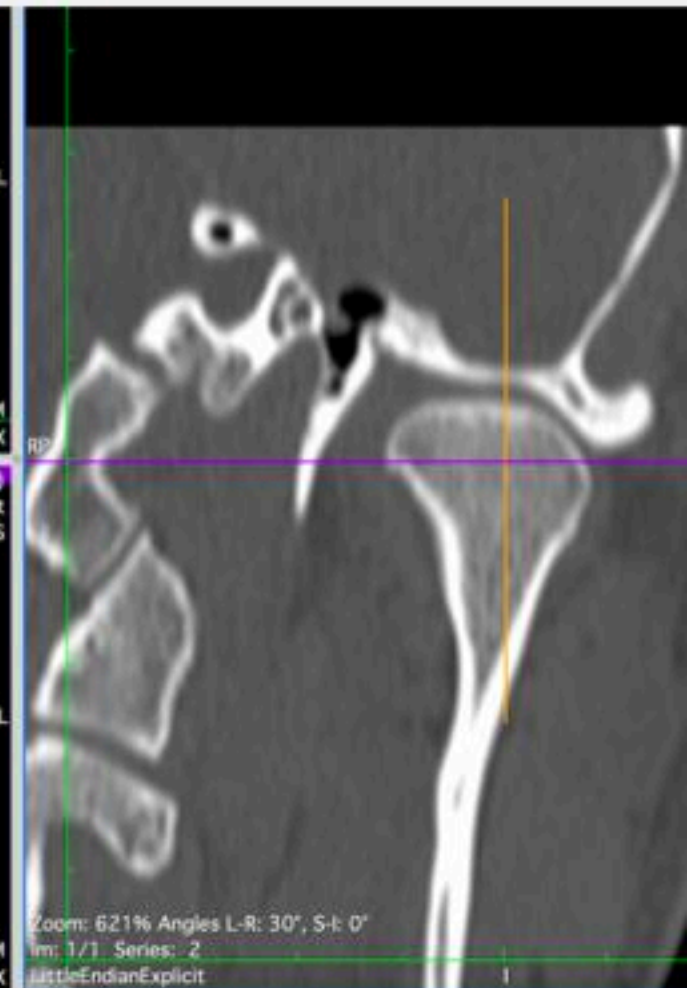
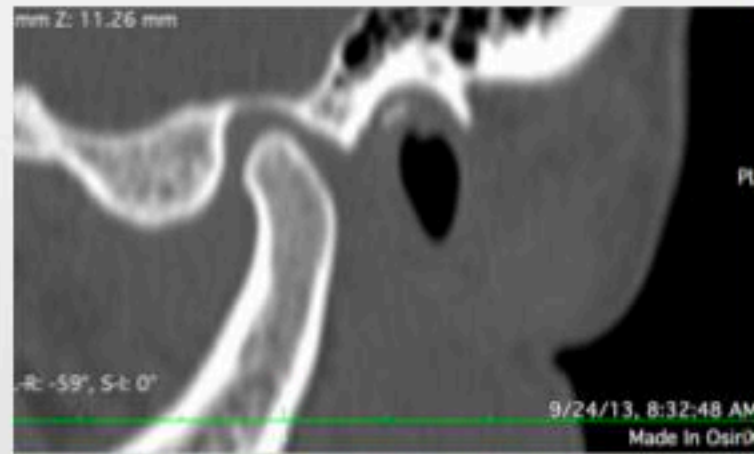
CT Left Piper 2 from MRI

Condyle:	<input checked="" type="checkbox"/> Normal Size
	<input checked="" type="checkbox"/> Normal Shape
	<input checked="" type="checkbox"/> Cortex Intact
	<input type="checkbox"/> Cortex Even
Fossa:	<input checked="" type="checkbox"/> Normal Size
	<input checked="" type="checkbox"/> Normal Shape
	<input checked="" type="checkbox"/> Cortex Intact
Condyle Position	<input type="checkbox"/> Centered in fossa
Joint spacing	<input checked="" type="checkbox"/> Room for disc
CR Load Zone	<input type="checkbox"/> Superior medial

☒ Hypercalcification

☒ Condyle distalized

☒ Superior Lateral



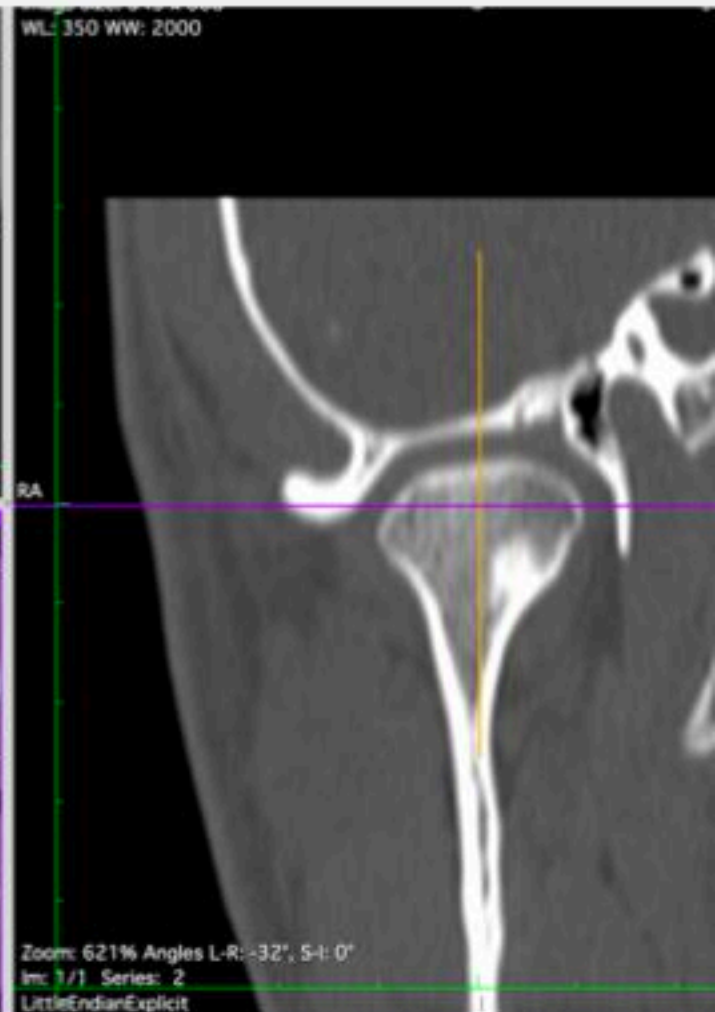
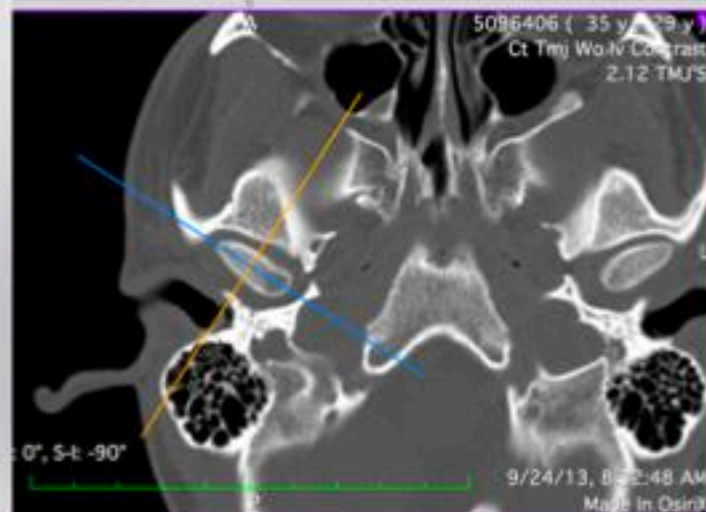
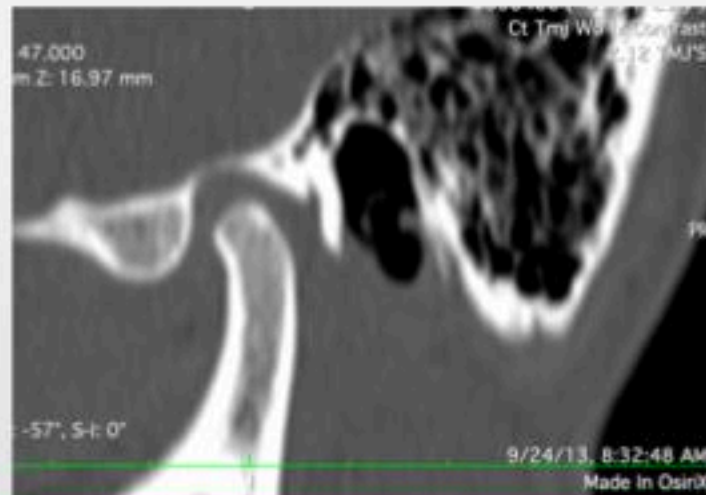
CT Right Piper 4a-e from MRI

- Condyle:
- ☒ Normal Size
 - ☒ Normal Shape
 - ☒ Cortex Intact
 - ☐ Cortex Even
- Fossa:
- ☒ Normal Size
 - ☒ Normal Shape
 - ☒ Cortex Intact
- Condyle Position
- ☒ Centered in fossa
- Joint spacing
- ☒ Room for disc
- CR Load Zone
- ☐ Superior medial

☒ Hypercalcification

☒ Superior Lateral

☒ Note: Large joint space

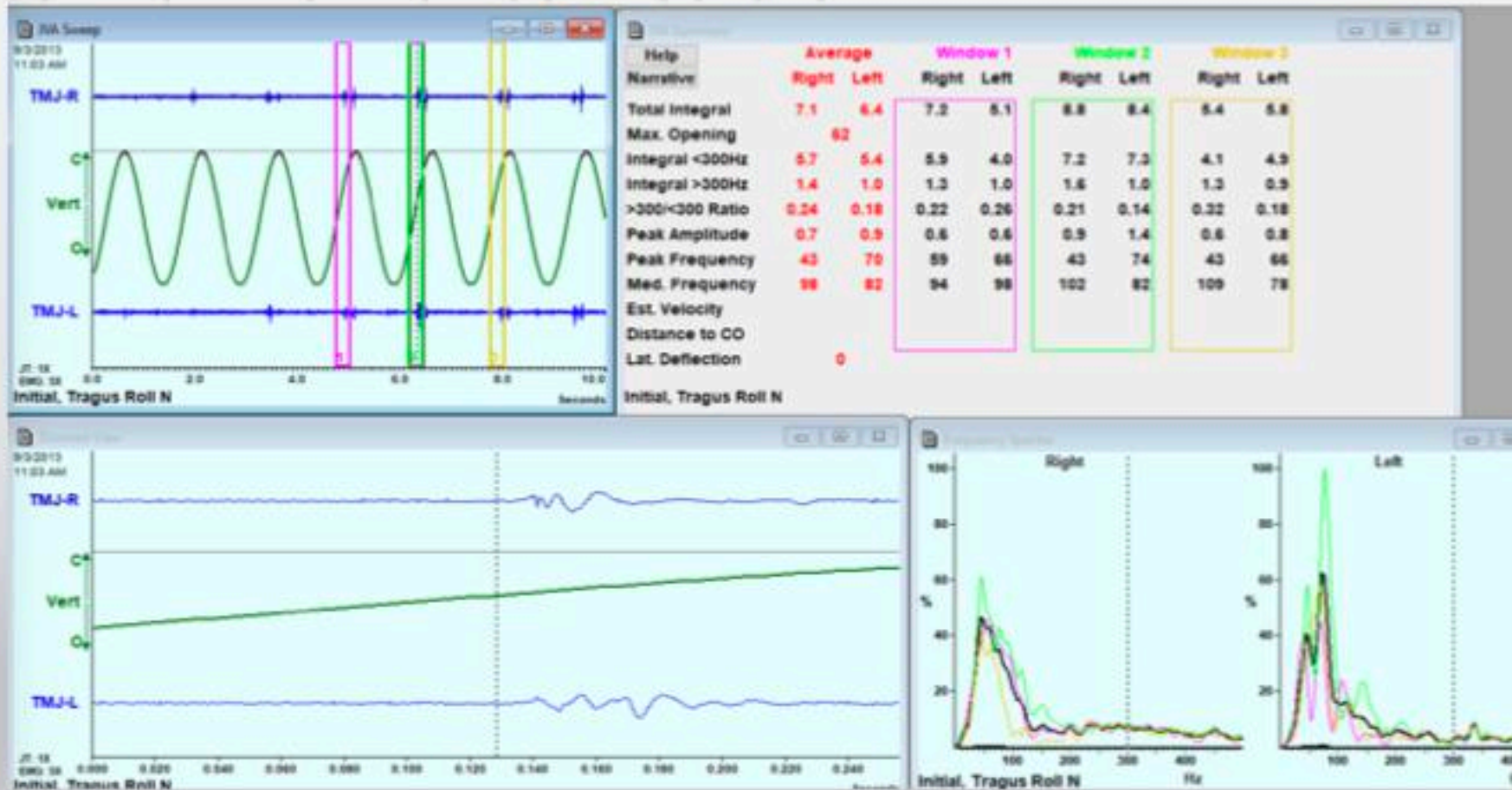


Slight Wobble
before tooth
contact

Joint
subluxation
on movement

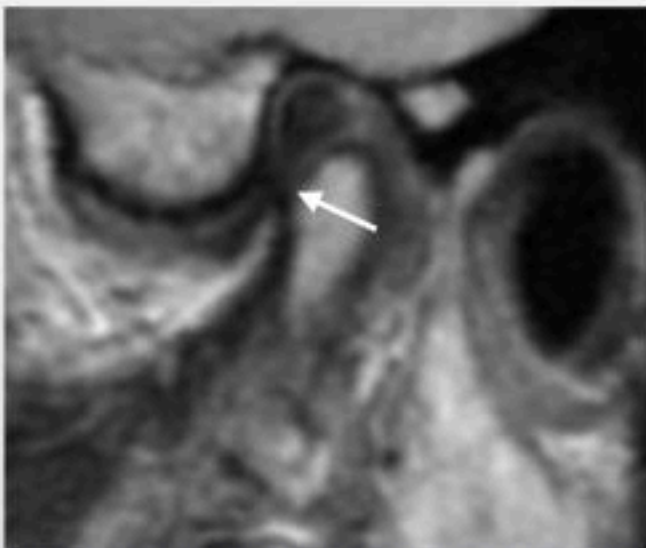
Clinical
Relevance?

Early damage
from
parafunction

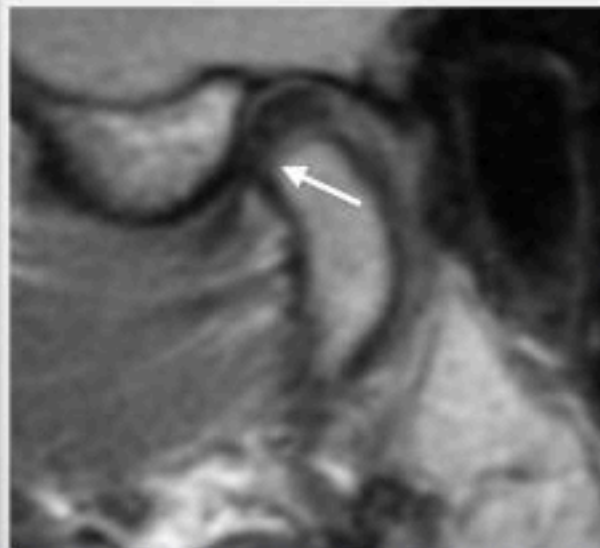


MRI
R4a-e, L2

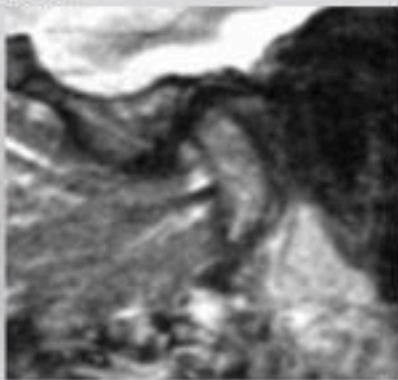
Right
PD Closed



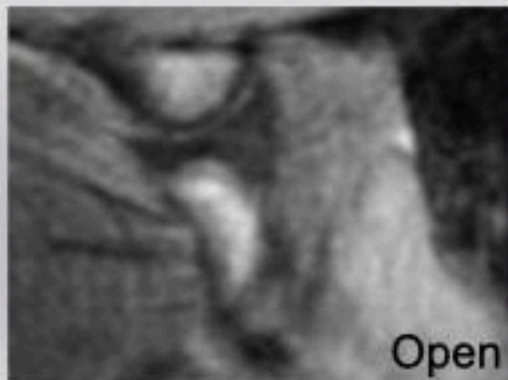
Left
PD Closed



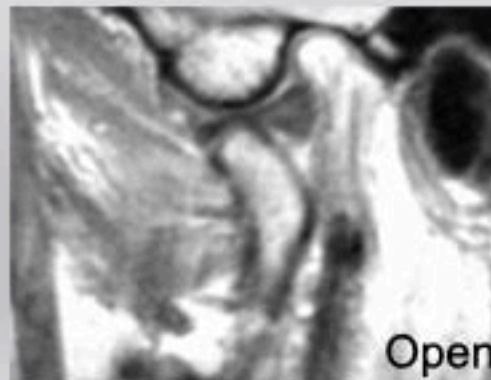
Stir



Open



Open



Stir



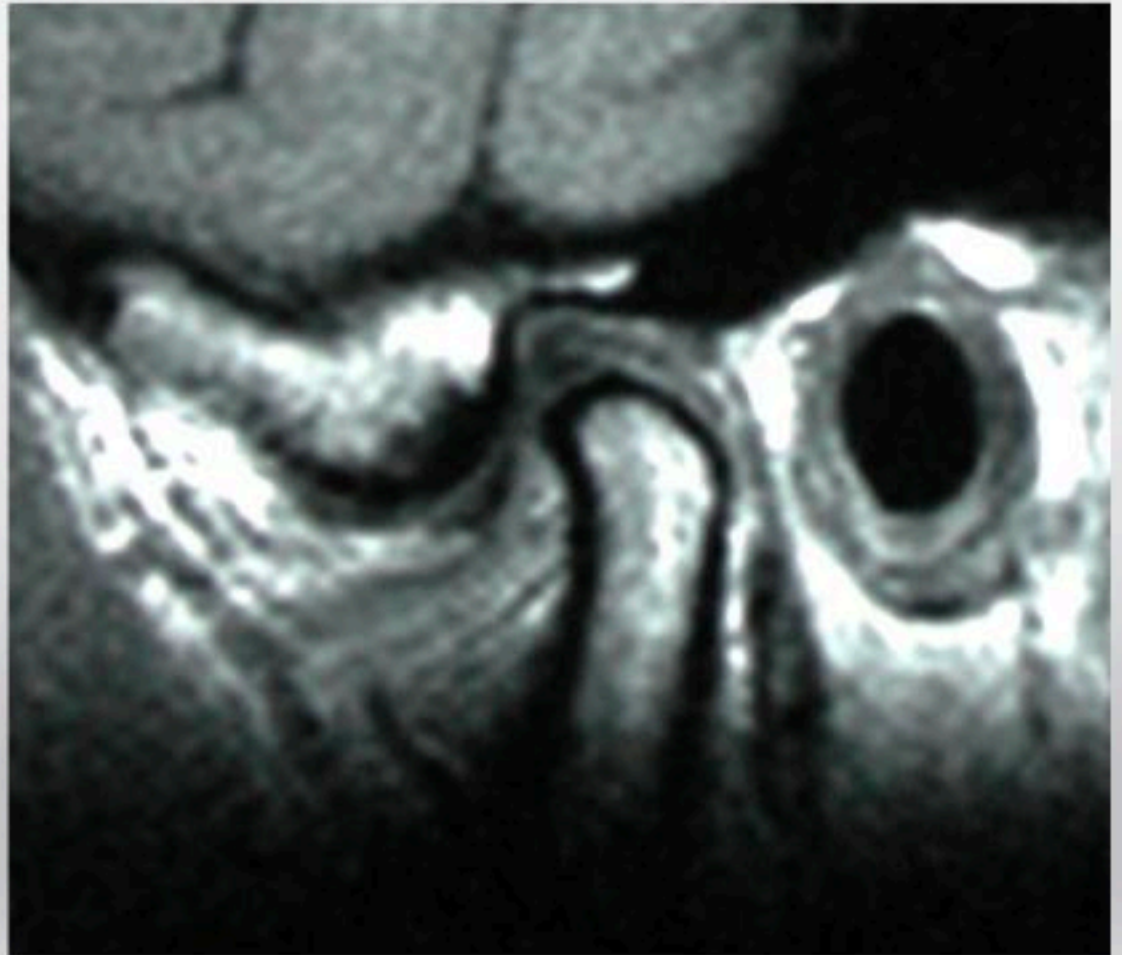
Facial Pain Diagnosis

Diagnostic Tools

- 1 Written and Oral History
- 2 Observation
- 3 Physical Exam
 - Muscle Palpation
 - Joint Palpation
 - Joint Auscultation
 - Joint Motion
- 4 Anterior Stop Test
- 5 Sleep Airway Screening
- 6 CT Scan

MRI

Blood Tests

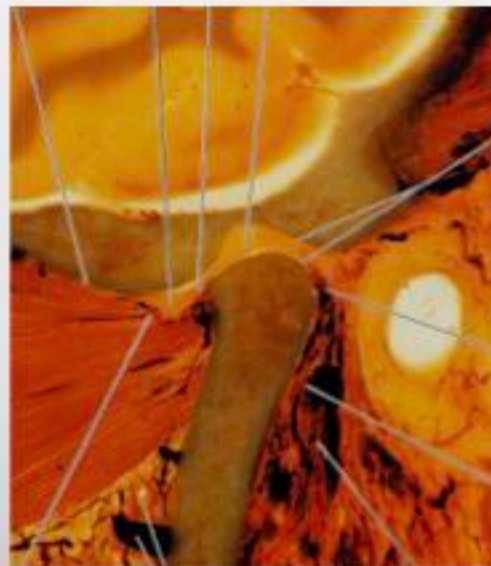


Short

T1 Inverted

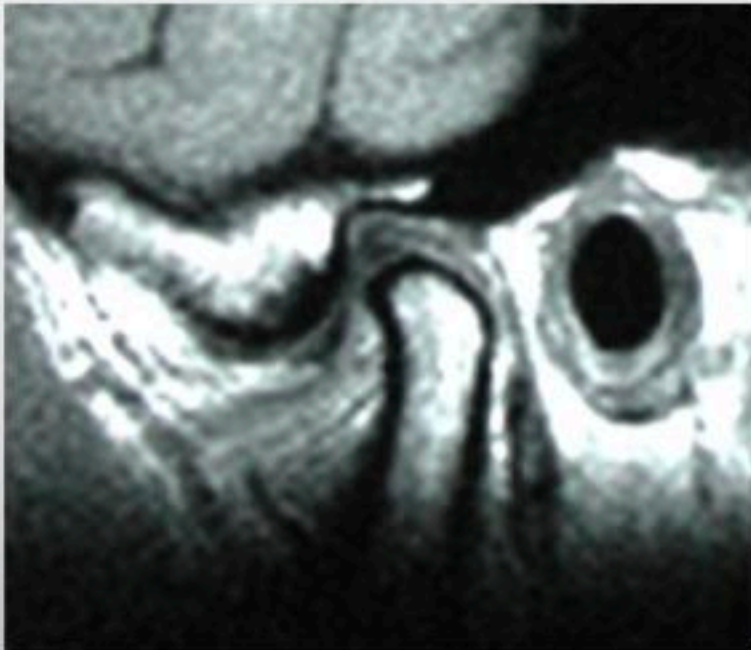


T1 Sagittal Closed



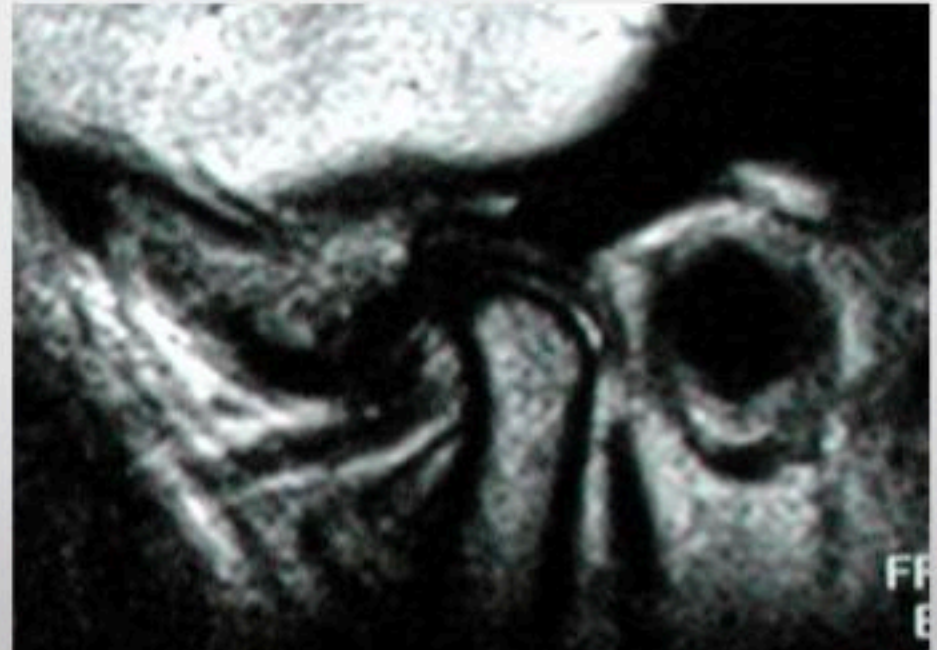
Normal MRI T1 and T2

T1 Sagittal Closed



T1 shows more fat

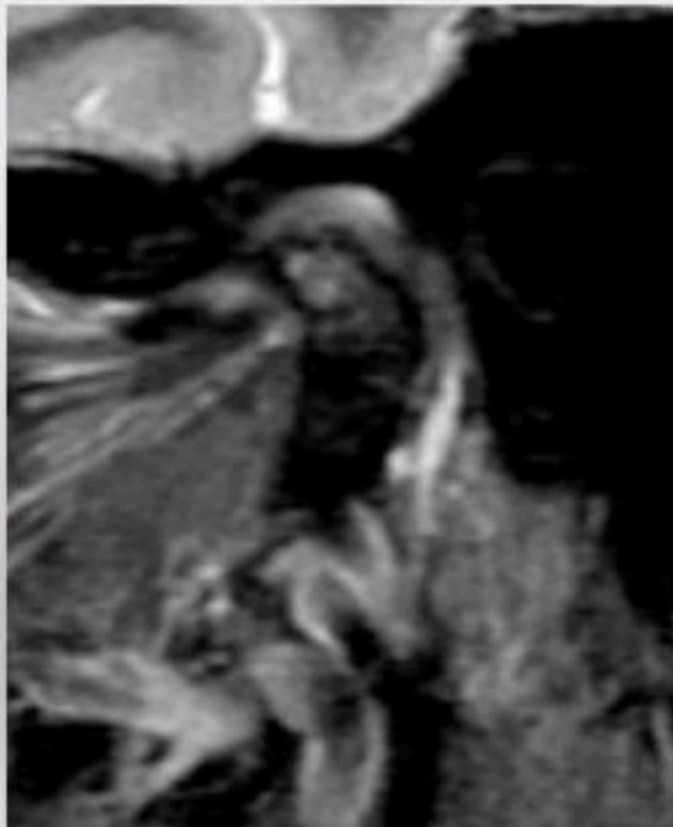
T2 Sagittal Closed



T2 shows more water:
Inflammation
Pathology

MRI STIR Image

STIR- Short T1 Inversion Recovery



STIR- "Supercharged" T2

Retrodiscal Inflammation

Marrow Edema

Diff Dx is active AVN, Osteoarthritis, Lyme Ds, RhA, Hypoxic Progressive Condylar Resorption, Other.

STIR and T2 shows water as white

Facial Pain Diagnosis

Diagnostic Tools

- 1 Written and Oral History
- 2 Observation
- 3 Physical Exam

Muscle Palpation
Joint Palpation
Joint Auscultation
Joint Motion

- 4 Anterior Stop Test
- 5 Sleep Airway Screening
- 6 CT Scan

MRI
Blood Tests

Occlusion: CR Mounted Study Models
Complete Dental Exam
Clinical Photographs
Dx Blocks
Dx Orthotics- Brux Checker, CR Orthotic

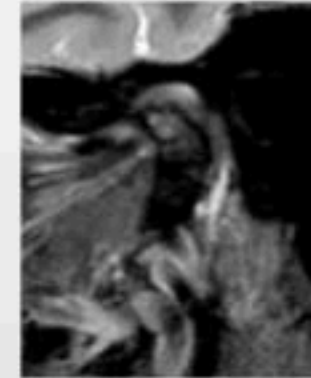
Biometrics

Joint Vibration

Jaw Tracker

Electromyography

T-Scan



Blood Work

CMP- Complete Metabolic Panel non-fasting
Iron Panel
Vitamin D
hs-CRP- High Sensitivity Reactive Protein

~~___ CMP Fasting Complete Metabolic Panel, Chem 14, Fasting Glucose~~

- ___ Total Iron, Serum
- ___ TIBC Total Iron-Binding Capacity
- ___ Ferritin, Serum
- ___ % Transferrin Saturation

- ___ Vitamin D, 25(OH) and 1,25 Dihydroxy (LC/MS technique)
- ___ Vitamin B12
- ___ Homocysteine

____ hs-CRP High Sensitivity C-Reactive Protein
____ ESR, Westergren Erythrocyte Sedimentation Rate, Westergren

____ HbA1C Hemoglobin A1c, Glycated hemoglobin
____ Fasting Insulin

Name:	Blank, Ulrike Tests	John R. Davies, DCL 4000 MacArthur Blvd Bldg. Silver MD, 20718 Tel: 443-488-8888 fax: 443-443-1132 jrd11@edwards-lab.com
Patient:		
Dr. Order:	4760.80 Pathology 4288.9 Upper Urinary Resistance	
UPO or REF	Complete Blood Count with white-cell differential Reticulocyte Count	
EMP Testing	Complete Metabolic Panel, then 14, Fasting Bilirubin Phosphorus, Serum Creatinine, Serum Urea Nitrogen or BUN to Creatinine	
HaptC	Hemoglobin & H, Glycated Hemoglobin	
Feeding Study:		
Total Iron, Serum	Total Iron-Binding Capacity	
Protein, Serum		
U. Excretion Studies:		
Uranic D, 24HR	U & 24 Dihydropyridine (C-888) technique	
Uranic 102		
Uranic 100		
Methylenetetrahydrofolate		
Uric Acid, Serum		
Uranic 100		
Selenium (RBC)		
Iron (RBC)		
Magnesium (RBC)		
Iron (RBC)	High-Sensitivity C-Reactive Protein	
CSA, Westergren	Erythrocyte Sedimentation Rate, Westergren	
Test		
Test	Thyroid Stimulating hormone	
Test	Test 14	
Test	Test 15	
Test	Test 16	
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Test	Test 108	
Test	Test 109	
Test </		

Diagnosis Treatment Flow Chart

From a patient perspective they want to go from symptoms to no symptoms



Symptoms

History

Signs

Doctor Exam

Differential Diagnosis

Diagnostic Tests

Specific Working Diagnosis

Treatment

No Signs

No Symptoms
Final Dx

Doctor Re-Exam

If not resolved

Symptom Dx

Tooth Pain
Arthralgia

vs
vs

Specific Dx

Irreversible Pulpitis
Osteoarthritis



Know Yourself

Know Your Work + **Know Your Patient**

Apply Your Knowledge

LD Pankey Institute

Write your Dream

TMD 1 Hands on: John, Herb, and Matt

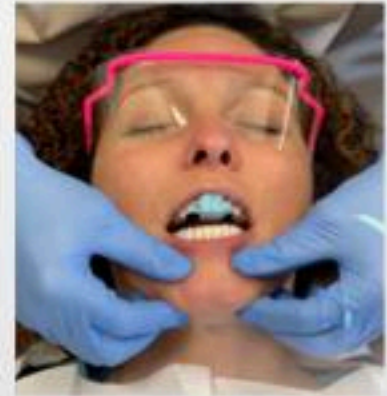
March 30, 31, April 1, 2023

Bozeman, Montana

John Droter DDS

Herb Blumenthal DDS

Matt Stensrud PT



Class size limited to 12
Send email or call Amber
jrdroter@mac.com
301-805-9400

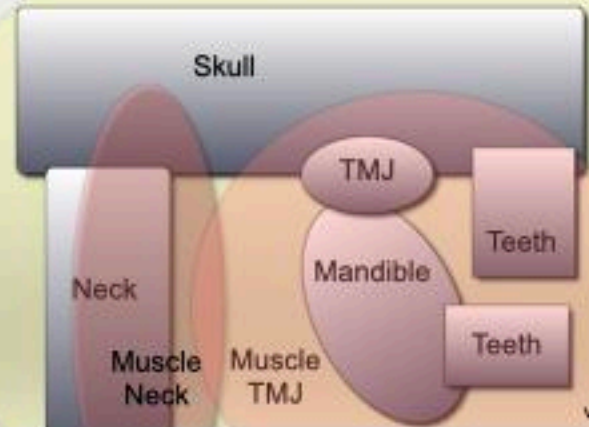
Adaptation

This is a **dynamic**
orthopedic System



A change in any one area
will affect the others

CNS/PNS



venn diagram

The Five Most Important Slides

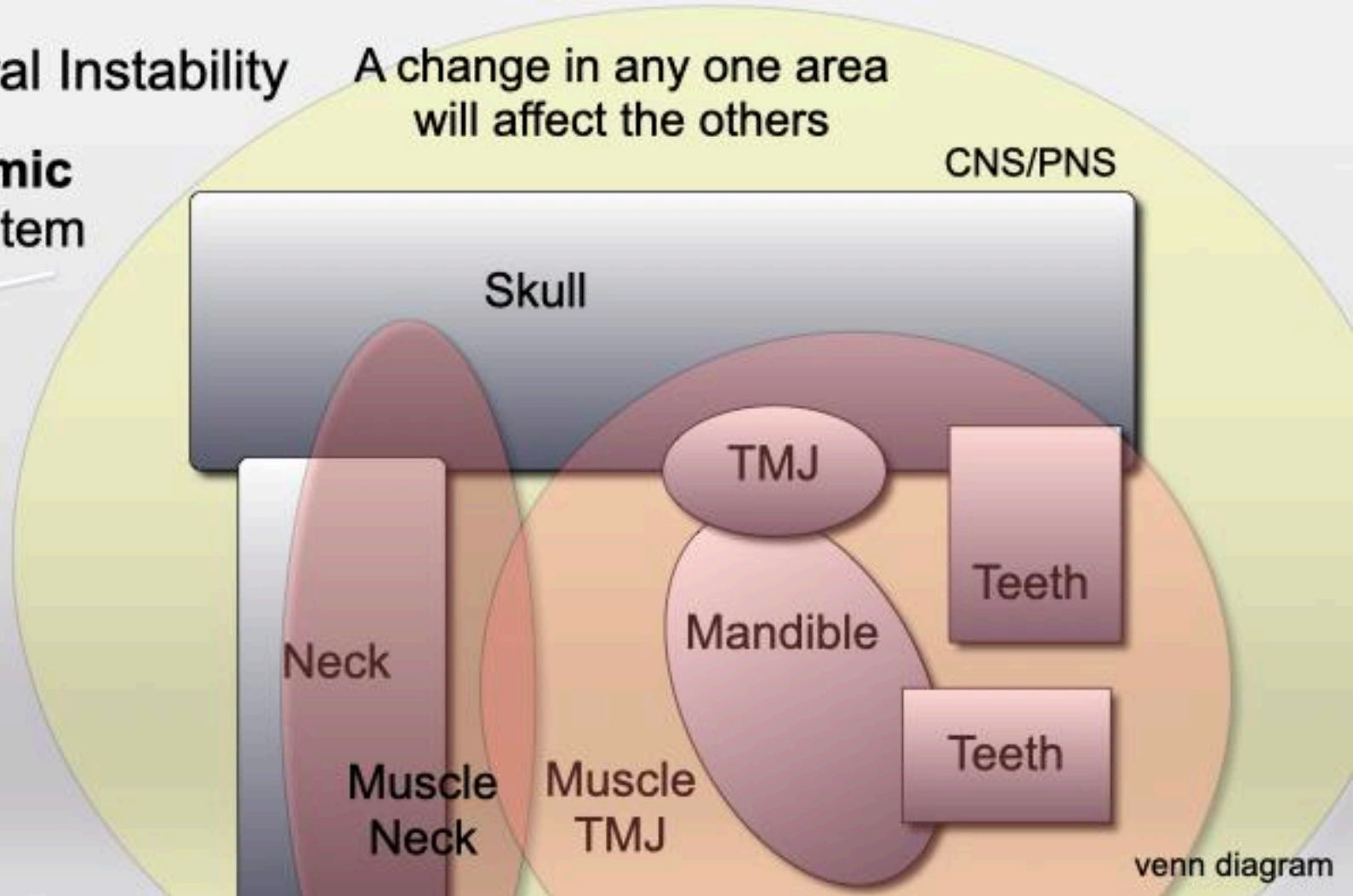
John R Droter DDS
Annapolis, Maryland

www.jrdroter.com

Neck and Postural Instability

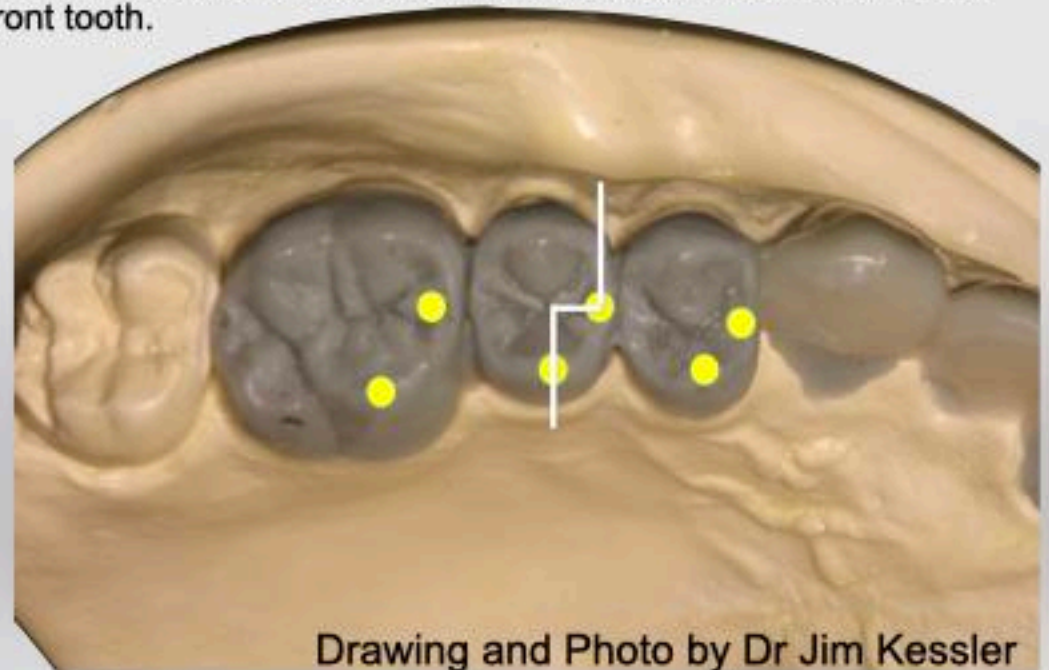
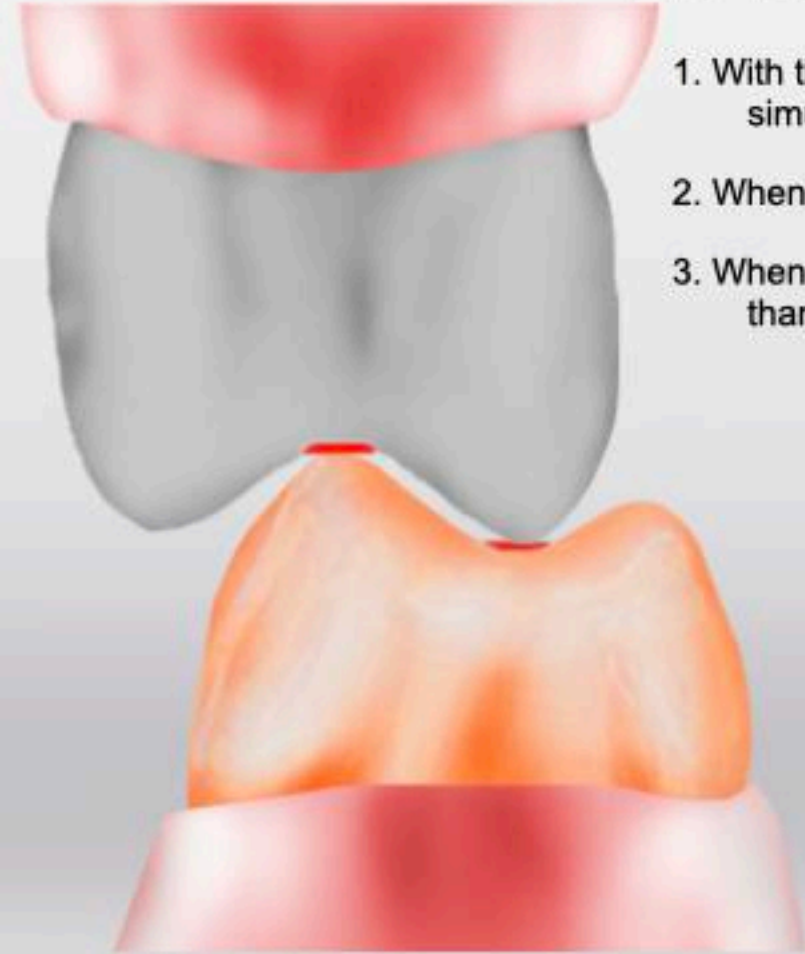
A change in any one area
will affect the others

This is a **dynamic**
orthopedic System



LD Pankey's 3 Rules of Occlusion (Clyde Schuyler)

1. With the condyles fully seated in the fossa, all the posterior teeth touch simultaneously and even, with the anterior teeth lightly touching.
2. When you squeeze, neither a tooth nor the mandible moves (in a lateral direction).
3. When you move the mandible in any excursion, no back tooth hits before, harder than, or after a front tooth.



Drawing and Photo by Dr Jim Kessler

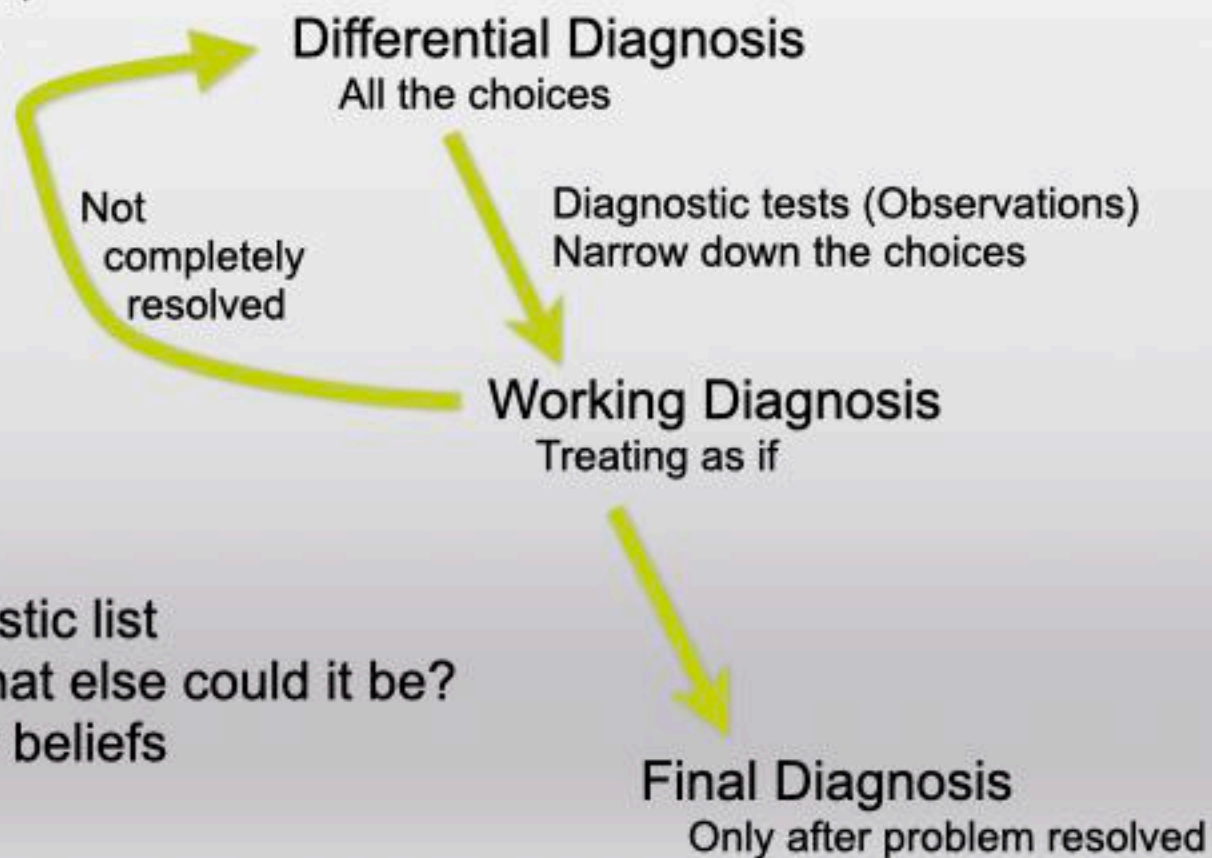
The Diagnostic Process

When diagnosing and treating facial pain, we have entered the world of medicine.



Think!!

Always make a differential diagnostic list
Ask, "It appears to be this, but what else could it be?"
Be aware you are blinded by your beliefs



Facial Pain Diagnosis

Diagnostic Tools

- 1 Written and Oral History
- 2 Observation
- 3 Physical Exam

Muscle Palpation
Joint Palpation
Joint Auscultation
Joint Motion

- 4 Anterior Stop Test
- 5 Sleep Airway Screening
- 6 CT Scan

MRI
Blood Tests

Occlusion: CR Mounted Study Models
Complete Dental Exam
Clinical Photographs
Dx Blocks
Dx Orthotics- Brux Checker, CR Orthotic

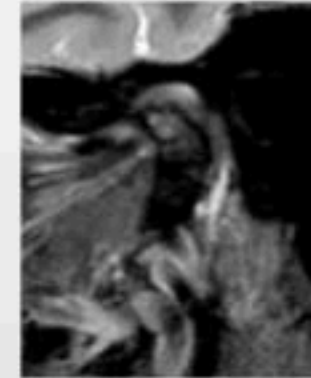
Biometrics

Joint Vibration

Jaw Tracker

Electromyography

T-Scan



Treating Common TMDs

Diagnosis	Pattern	Treatment
Sleep Clenching with anterior tooth contact inhibition	Sore masseters on waking Morning TMJ clicking that resolves Sleep D-PAS Relieves Symptoms	D-PAS Night Guard Time Release Vitamin C hs
Sleep Grinding , Airway Related	Worn Teeth Upper Airway Resistance	Mandibular Advancement Appliance
Occlusal Muscle Disharmony	Sore muscles when chewing Sore Lateral Pterygoid, Headaches Day D-PAS Relieves Symptoms	Occlusal Adjustment
Osteoarthritis of TMJ	Arthralgia CBCT shows worn bone loss MRI T2, STIR ++	NSAID for 6-12 weeks Occlusal Adjustment Do not put in a night guard
Sprain Discal Ligament TMJ, Acute	Sudden onset pain TMJ Pain palpation TMJ Limited opening	Cold Laser, Ice 15 min 3x a day Rest, Soft diet, NSAID 7 days Anterior Reposition Orthotic 7 days
Hypoxia Induced Progressive Condylar Resorption	Progressive anterior open bite Missing condylar cortex on CT	Condylar distraction for 6 months Meloxicam, Doxycycline

Possible Side Adventure

The Diagnostic Process- #1 is History

John R Droter DDS
Annapolis, Maryland

Facial Pain Diagnosis

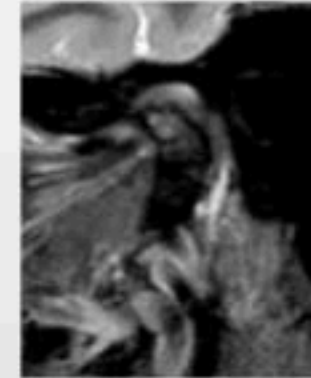
Diagnostic Tools

- 1 Written and Oral History
- 2 Observation
- 3 Physical Exam
 - Muscle Palpation
 - Joint Palpation
 - Joint Auscultation
 - Joint Motion
- 4 CT Scan
- 5 Dx Orthotic- D-PAS
- 6 Sleep Airway Screening
- 7 MRI

Biometrics

- Joint Vibration
- Jaw Tracker
- Electromyography
- T-Scan

Occlusion: CR Mounted Study Models
 Complete Dental Exam
 Clinical Photographs
 Dx Blocks
 Blood test
 Dx Orthotics- Brux Checker, CR Orthotic



Diagnosis Treatment Flow Chart

Goal of history is to put as many things on Differential Diagnosis as possible



Symptoms

History

Signs

Doctor Exam

Diagnostic Tests

Differential Diagnosis

Specific Working Diagnosis

Treatment

No Signs

No Symptoms
Final Dx

Doctor Re-Exam

If not resolved

Symptom Dx

Tooth Pain
Arthralgia

vs
vs

Specific Dx

Irreversible Pulpitis
Osteoarthritis

Occlusion Problem Screening



John R. Dreter, D.D.S.
4500 Mitchellville Rd., #110
Bowie, Maryland, 20716

101-825-4400
drdrete@mac.com

Name _____ Age _____ Date _____

In the past have you had:

Broken teeth	No	Yes
Worn Teeth	No	Yes
Crown (s)	No	Yes
Root Canal (s)	No	Yes

Over the last 6 weeks have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
Jaw fatigue on chewing	0	1	2	3
Sore teeth	0	1	2	3
Teeth do not have a comfortable place to rest	0	1	2	3
Limiting diet to softer foods	0	1	2	3
Cold sensitive teeth	0	1	2	3
Clenching of teeth	0	1	2	3
Grinding of teeth	0	1	2	3
Clicking or popping jaw joint	0	1	2	3
Jaw joint pain	0	1	2	3
Ear pain	0	1	2	3
Ringing in ears	0	1	2	3
Dizziness	0	1	2	3
Temple Headache	0	1	2	3
Migraine Headaches	0	1	2	3
Any other type of headache	0	1	2	3
Facial ache	0	1	2	3
Neck tightness	0	1	2	3
Neck pain	0	1	2	3
Limited jaw opening	0	1	2	3
Need to wiggle jaw to open	0	1	2	3
Not waking up rested	0	1	2	3
Fatigue during the day	0	1	2	3

Sleep/Fatigue Screening

Name _____

Date _____

Age _____

Recent Sleepers (Include Risk Factors): Please check all that apply.

1. I have been told I sleep breathe while asleep ☐
2. I have fallen asleep or nodded off while driving ☐
3. I've woken up with stiffness or trouble getting on my back being ☐
4. I feel excessively sleepy or fatigued during the day ☐
5. I snore or have been told that I snore ☐
6. I have had weight gain and found it difficult to lose ☐
7. I have been diagnosed with high blood pressure ☐
8. It takes me less than 10 minutes to fall asleep ☐
9. I wake up more than 1 time per night ☐
10. I wake up with headaches ☐

Related Health History (Signs & Symptoms): Please check all that apply.

- | | |
|--|--|
| <input type="checkbox"/> Snoring | <input type="checkbox"/> Diabetes |
| <input type="checkbox"/> Depression/Anxiety | <input type="checkbox"/> History of Stroke/Heart Disease |
| <input type="checkbox"/> Uncontrolled blood pressure | <input type="checkbox"/> Acid Reflux/GERD |
| <input type="checkbox"/> Medication (including sleeping pills) | <input type="checkbox"/> Hypertension |
| <input type="checkbox"/> Asthma/Obstructive | <input type="checkbox"/> Menstrual Cycle |
| <input type="checkbox"/> History of weight loss/gain | <input type="checkbox"/> Family History of Sleep Apnea |
| <input type="checkbox"/> Chronic Obstructive Pulmonary Disease | <input type="checkbox"/> Heart Failure |
| <input type="checkbox"/> Sleep Apnea | <input type="checkbox"/> Currently Not Using Prescribed CPAP |

Tiredness: How likely are you to doze off in the following situations? Use the following scale to choose the most appropriate number for each situation:
 0 = no chance of dozing 2 = moderate chance of dozing
 1 = slight chance of dozing 3 = high chance of dozing

- Situation _____
- Sitting and reading _____
- Watching TV _____
- Sitting inactive in a public place (e.g., a theater or meeting) _____
- As a passenger in a car for an hour without a break _____
- Lying down to rest in the afternoon when circumstances permit _____
- Sitting and talking to someone _____
- Sitting quietly after lunch without alcohol _____
- In a car, while stopped for a few minutes in traffic _____

Over the last 2 weeks have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
Feeling tired	0	1	2	3
Trouble falling asleep	0	1	2	3
Feeling nervous, anxious or on edge	0	1	2	3
Not being able to stop or control worrying	0	1	2	3
Feeling down, depressed, or hopeless	0	1	2	3
Little interest or pleasure in doing things	0	1	2	3
Abdominal discomfort and/or bloating/fullness	0	1	2	3
Heartburn	0	1	2	3
Constipation	0	1	2	3
Bloating or gas rumbling	0	1	2	3

Epworth Sleepiness Scale
 10 or greater think OSA. Need to find out
 why they are not sleeping well.

Over the last 2 weeks have you been bothered by any of the following problems?	Not at all	Several days	More than half the days	Nearly every day
Feeling fatigued	0	1	2	3
Trouble falling asleep	0	1	2	3
Feeling nervous, anxious or on edge	0	1	2	3
Not being able to stop or control worrying	0	1	2	3
Feeling down, depressed, or hopeless	0	1	2	3
Little interest or pleasure in doing things	0	1	2	3
Abdominal discomfort and/ or bloating/fullness	0	1	2	3
Diarrhea	0	1	2	3
Constipation	0	1	2	3
Stomach or gut rumbling	0	1	2	3

Johns, M. W. M. (2000). Sensitivity and specificity of the multiple sleep latency test (MSLT), the maintenance of wakefulness test and the epworth sleepiness scale: failure of the MSLT as a gold standard. *Journal of Sleep Research*, 9(1), 5-11.

Date _____ Referred by _____

Referring Dr.'s Phone # and Email: _____

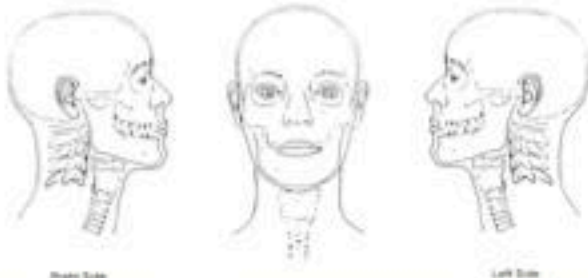
1. Which of the following do you have (circle all that apply)

Headaches Neck Pain Jaw pain Ear Pain
Facial Pain Bite Problems Damaged teeth Sleep Problem
Other _____

2. How many days a month are you pain free? _____

If pain free, go to next page.

If Pain, Please shade in where your pain is located:

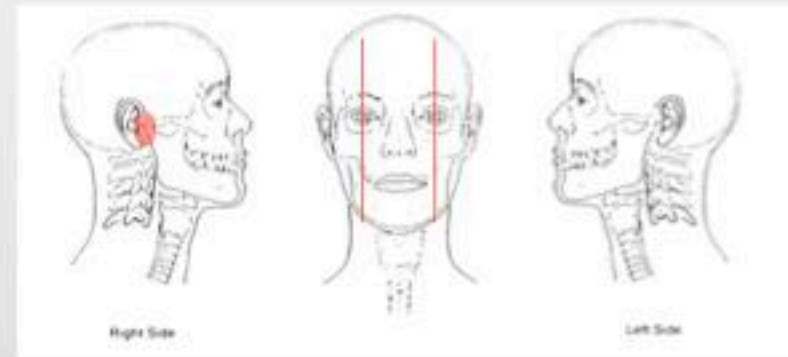


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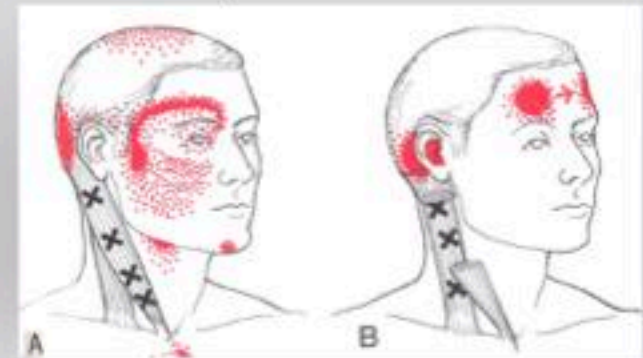
Date _____



**Legal- You need to know who wrote what.
Dr. only writes in here.**



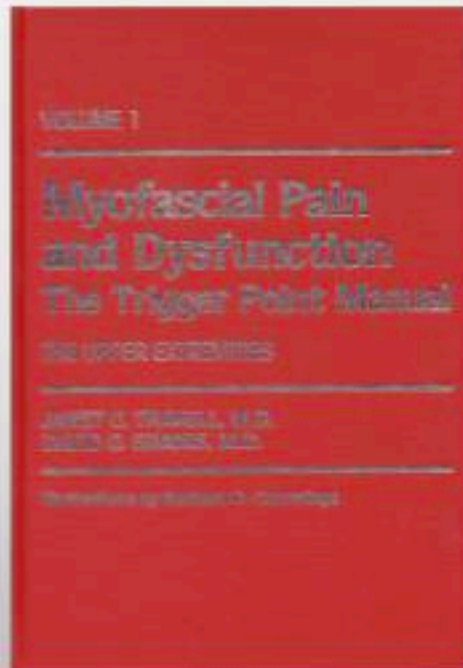
**Intracapsular pain is outside the pupils.
Muscle pain can be all over.**



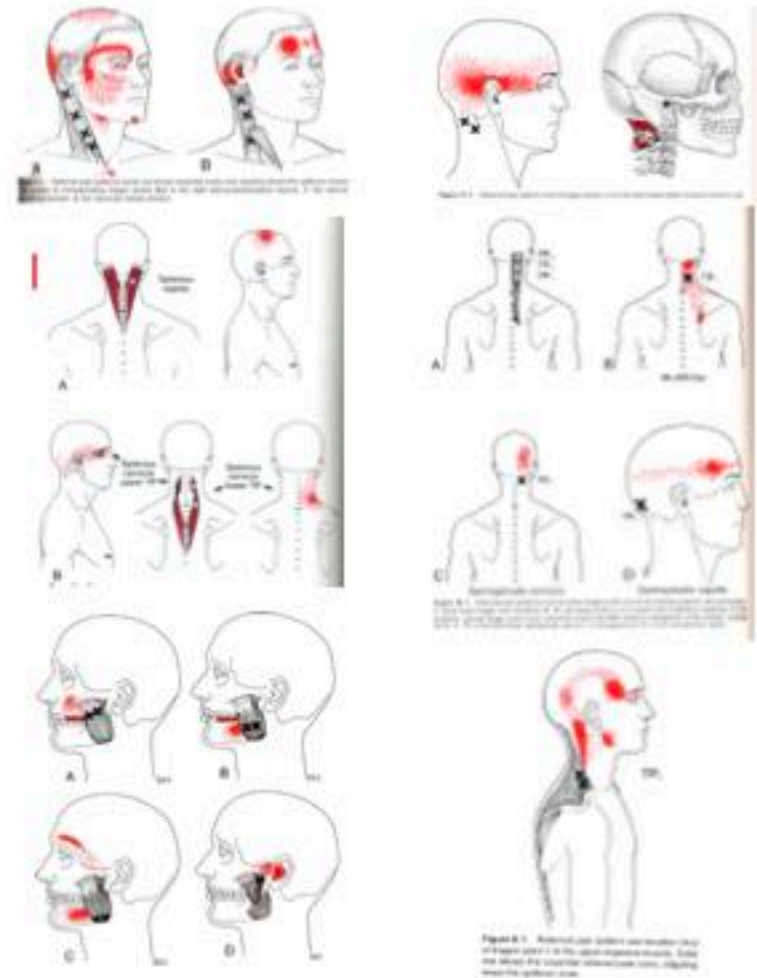
**Show me where the pain is:
One finger
Whole hand
Five intense fingers
With or with out movement
Quickness and certainty of answer**

"The Trigger Point Manual"
Janet Travell, MD

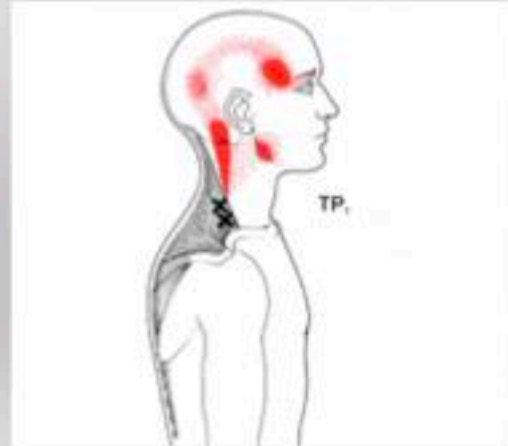
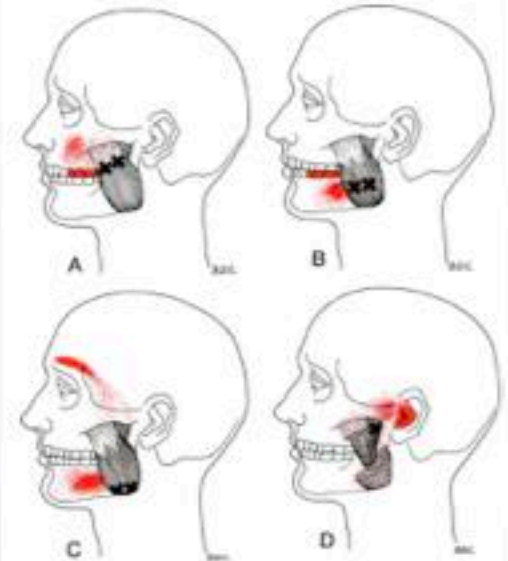
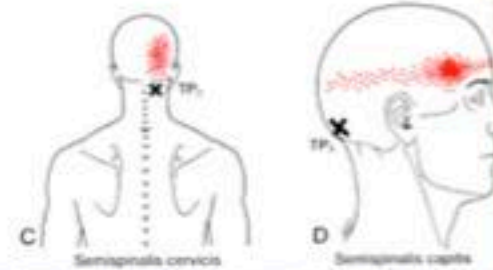
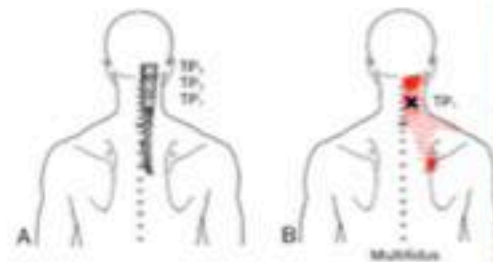
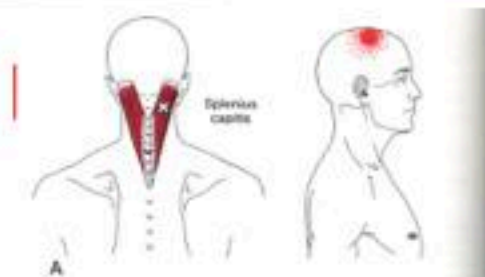
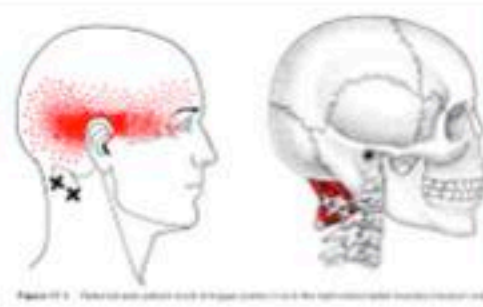
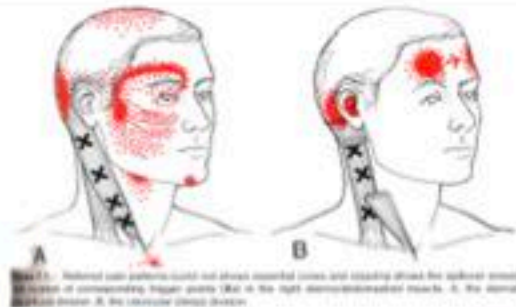
I have made my own summary
sheet I can hand to patient



Janet Travell: Myofascial Pain and Dysfunction



"The Trigger Point Manual" Janet Travell, MD



Show me where the pain is:

One finger

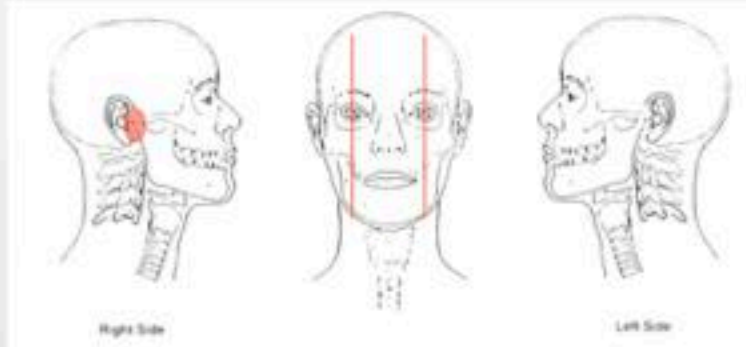
Three fingers

Whole hand

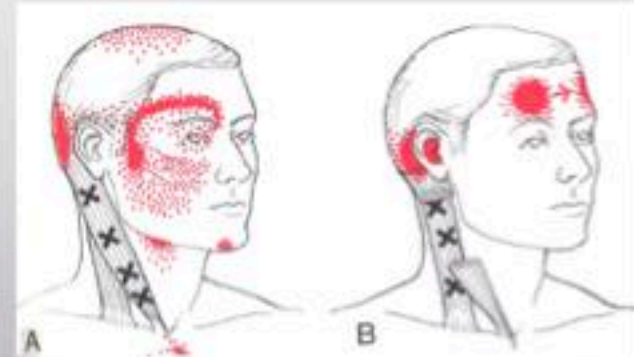
Five intense fingers

With or with out movement

Quickness and certainty of answer



Intracapsular pain is outside the pupils.
Muscle pain can be all over.



Clinical Observations and things to add to Differential Dx:

One finger over the TMJ- TMJ Arthralgia or ear infection

One or three fingers to masseter- myalgia of masseter

Whole hand cupping lower jaw over masseter- think OMD, Clench, Brux

Forehead- think sinus, neck

Whole hand circular- look at neck.

Pain that moves from one area to another- look at neck

Pain top of head- look at neck, cranial bone alignment

Five intense fingers- think RSD

Masseter pain increasing with chewing- OMD, neck damage

Temple Pain increasing with chewing- OMD, Temporal arteritis

If on scale of one to ten they
choose 12
Diff Dx: RSD

What medication do you take or have you previously taken for your pain?

MEDICATION	DOSE	FREQUENCY
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____
_____	_____	_____

	Yes	No
3. Any discomfort when you chew?	Y	N
Which side do you favor chewing on ?	R L	Use Both
Is it difficult or painful to swallow?	Y	N
Any discomfort when you move your jaw?	Y	N
Any discomfort upon chewing hard foods like carrots?	Y	N
Do your jaw muscles get tired from chewing?	Y	N
Does it hurt to open wide?	Y	N
Which side of your jaw makes a clicking/popping noise?	R L	neither
Which side of your jaw makes other noises?	R L	neither
What Noises? _____		
When did you first notice the noises or clicking? _____		
Have you noticed any changes in noises or clicking?	Y	N
Explain: _____		

Pain relieved by NSAID is easier to treat than narcotics or nothing helps.

How much medication taken and consistency give you idea on the type of person and coping skills.

Consistent NSAID for more than 20 days think stomach, kidney, BP issues.
Evaluate for Tylenol toxicity of liver, 4G/day

Question 3 assesses how well their jaw functions.
If all answers are "NO", it is not OMD.

4. Have you ever not been able to open your jaw all the way? Y N
 Have you ever had to wiggle your jaw to get it open? Y N
 Has your jaw ever been stuck open and you could not close it? Y N
 When did this first happen? _____ Last happen? _____
5. Has your speech changed? Y N
 Have you noticed a change in the way your teeth come together? Y N
 Have you noticed your teeth shifting? Y N
 Has the shape of your face changed? Y N
 Has your chin shifted to one side of your face? Y N
 When did you notice any of the above changes? _____
6. Do you have a hyper-sensitive bite? Y N
 Is your bite uncomfortable? Y N
 When you close your jaw, do you have to search for
 a comfortable position for your teeth to fit? Y N

Looking for disc locking, about to go from 4a to 4b.
 AVN risk. Closed lock is different than open lock.

Diff Dx: 4a locking, 3a locking opposite old 4b.

Looking for change of joint space
 Diff Dx: New 4a, condylar bone loss,
 condylar bone growth, synovial
 hyperplasia.

Diff Dx: Wobbly Joint

Diff Dx: Wobbly Joint, Occlusal Muscle Dysfunction

7. Are your teeth sore or sensitive? Y N
 Do you clench your teeth? Y N
 Do you grind your teeth? Y N
 Do you grind or clench during the day or night? Day Night Both Neither
 When did you start clenching or grinding? _____

8. Do you have a dentist who you see for routine care and cleanings? Y N
 Please list : _____ Last Visit: _____

Which of the following dental procedures have you had (please circle):

Fillings Orthodontics Root Canal Dentures
 Crowns Bridges Bite Adjustment

If you had braces, how many times were you in braces? _____

How old were you when you got braces? _____

How old were you when you were done? _____

Have you ever had a tooth extracted? Y N

Have you ever split or broken a tooth? Y N

Do you feel there is any connection between the dental work you have had done
 and the problems you are having? Y N

Recent dental work may have changed
 occlusion and triggered the event.
 Do not lead patient into making the association

Orthodontics more than once may
 indicate progressive adaptation.
 Ask why they went into braces.

It is important to know if they are blaming the dentist.

11.	Have you had any changes in your vision?				Y	N
	Do you get visual disturbances along with headaches?				Y	N
	Do you have problems with your ears?				Y	N
	Dizziness?	Y	N	Ringing?	Y	N
	Hearing?	Y	N	Other?	_____	
	Have you noticed any lumps in your face, throat or neck?				Y	N
	Do you typically breath through your mouth instead of your nose?				Y	N
	Do you have any sinus problems?				Y	N
	Explain: _____					

Diff Dx; Migraine

Pintos Ligament- TMJ damage can alter middle ear contents. Not common, but it can happen.

Put Cancer in Diff Dx

Diff Dx: Compromised Airway

Migraines:

70% are alignment C1, C2

20% histamine release from trigger,

10% other.

Occlusal appliances and subsequent occlusal adjustment can alter C1/C2 alignment and can affect migraines

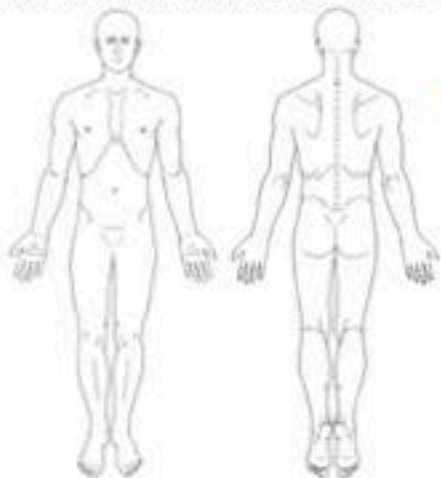


There is very little tissue between the ear and the TMJ. An inflamed ear will inflame the joint, and an inflamed joint will inflame the ear. Use Otoscope

- | | | | |
|-----|--|---|---|
| 12. | Do you have trouble sleeping? | Y | N |
| | Do you feel rested when you wake up? | Y | N |
| 13. | Do you have or have you had arthritis? | Y | N |
| | Does anyone related to you have arthritis? | Y | N |
| | Are your fingers sore or stiff? | Y | N |
| | Any dry skin patches past or present? | Y | N |
| | Any skin rashes past or present? | Y | N |
| | Have you been treated for any other painful condition in the last three years other than your present problem? | Y | N |

Explain _____

On the diagram below please indicate any other areas that are painful:



Look for neck and back involvement

Majority patients are not sleeping well.
Diff Dx: Compromised Airway

Diff Dx: Rheumatoid Arthritis,
Osteoarthritis, Psoriatic Arthritis

RhA is disease of Synovium
OA is disease of cartilage

Rheumatoid arthritis:

Family History

Multiple joints

Fingers and knees first usually

TMJ can be first

Need blood work

There is a correlation between
Fibromyalgia and not sleeping well

Good overview of what
has gone on, when.

Look for clues as to what has helped or hurt

Are you the first doctor in or the 20th?

How committed are they into healing?

14. Have you had any prior treatment for TMJ problems? Y N

Appliance/Splint? Y N When? _____ Did it help? Y N

Night guard? Y N When? _____ Did it help? Y N

Bite adjustment? Y N When? _____ Did it help? Y N

Orthodontics? Y N When? _____ Did it help? Y N

Other _____

15. Please list, in chronological order, health care providers
you have seen for the problem you are presenting with today:

Date	Doctor or provider	Treatment	Did it help?
_____	_____	_____	Y N
_____	_____	_____	Y N
_____	_____	_____	Y N
_____	_____	_____	Y N
_____	_____	_____	Y N
_____	_____	_____	Y N
_____	_____	_____	Y N

Question 17 is the most important of all

17. Describe the problem (s) in your own words:

How have these problems affected your life? Does it keep you from doing anything that you want to do? (work, play, chores, eating, talking)

What would you like to accomplish with treatment here?

Start Reading here when you first look at form

What we want to know first, is best answered by the patient last. Patient's memory has been focused on the details of the problem for the previous 4 pages. Now when they answer, it is a much more focused answer.

FAB

Feature
Advantage
Benefit

All treatment discussions are made in reference to the benefit to the patient

Nobody ever wants to own a feature: an occlusal adjustment, a crown, or a root canal.
The first step to achieving(Benefit for patient).... is
The cost to(Benefit for patient).... is \$\$

18. What has Changed and When:

So that I may have a better understanding of your problem, please list in chronological order with date estimates all the changes and/or defining moments of your problem.

(Examples are: fell down stairs, left TMJ clicking started, clicking stopped, teeth shifted, headaches increased, headaches stopped, left ear pain.)

Date Estimate

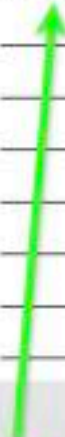
Change that Occurred

_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

5

Looking for defining moments
in the disease process

19. Is there anything else that I should know about?



It is amazing what you would miss without this question

Emotional Words



McGill Pain Questionnaire

20. So that I can better understand your pain, please complete the following:

What does your pain feel like? Some of the words below describe your present pain.

Circle all the words that describe it.

Flickering
Quivering
Pulsing
Throbbing
Beating
Pounding

Jumping
Flashing
Shooting

Pricking
Boring
Drilling
Stabbing
Lancinating

Sharp
Cutting
Lacerating

Pinching
Pressing
Gnawing
Cramping
Crushing

Tugging
Pulling
Wrenching
Searing

Hot
Burning
Scalding
Stinging

Tingling
Itchy
Smarting
Aching

Dull
Sore
Hurting
Splitting
Heavy

Tender
Taut
Rasping

Tiring
Exhausting

Sickening
Suffocating

Fearful
Frightful
Terrifying
Vicious

Punishing
Grueling
Cruel

Wretched
Blinding

Annoying
Troublesome
Miserable
Intense
Unbearable

Spreading
Radiating
Penetrating
Piercing

Tight
Numb
Drawn
Squeezing
Tearing

Cool
Cold
Freezing

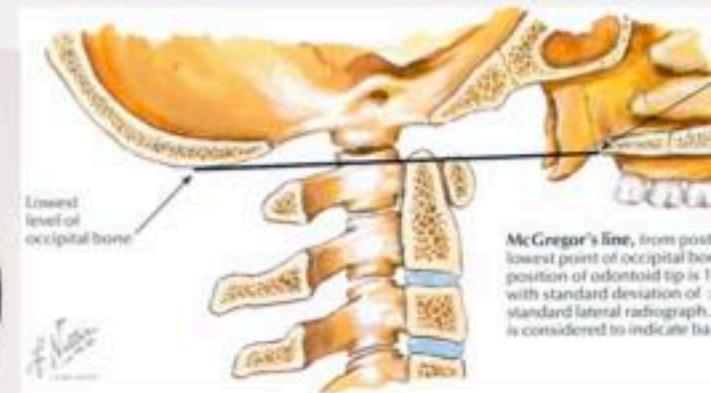
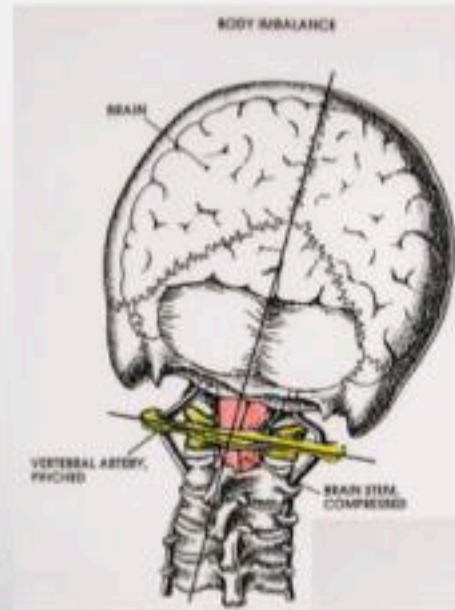
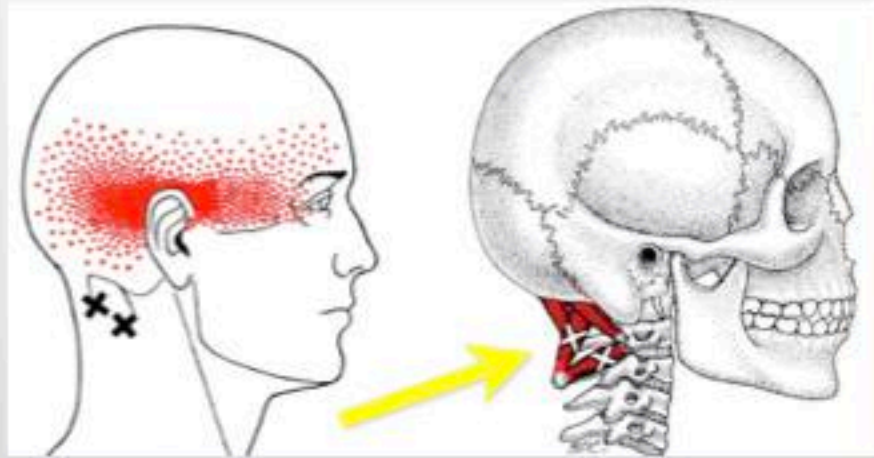
Nagging
Nauseating
Agonizing
Dreadful
Torturing

Atlas

John R Droter DDS
Annapolis, Maryland

Annapolis, Maryland
John R Droter DDS

What is this knot of muscle at base of skull?
Will neck alignment affect jaw alignment?



Skull is 10 lbs supported
by occiput on atlas

My observations years ago:

Could not get rid of the suboccipital knot, no matter what tx.

While most OMD patients improved with occlusal therapies, some had persisting neck symptoms

Migraines managed but not eliminated with medication and ideal occlusion

Suboccipital acupuncture helped some migraines

Treatments tried in past to eliminate suboccipital knot: Physical Therapy, TENS, Ultrasound, Neck Manipulation by PT, Massage, Triggerpoint Injections, Acupuncture- Suboccipital, Chiropractic, CR Appliance followed by Equilibration

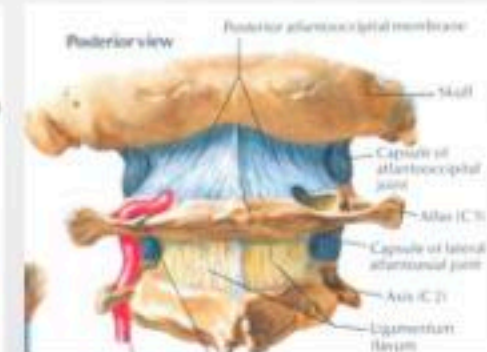
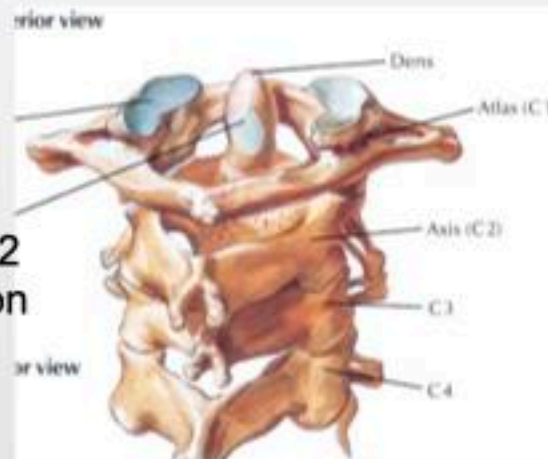
Atlas (C1)

Top bone of spinal cord supports the skull



No disc C1-C2
Allows Rotation

Discs are Hyaline Cartilage
Fibrous union: 8° rotation

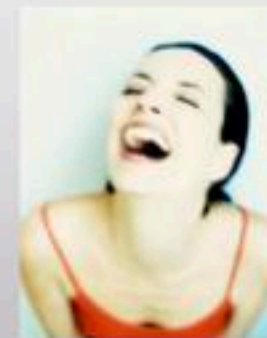


Atlas is attached to the skull by ligaments



Rotation:

Atlas to skull	4°
C1 to C2	160°
C2 to C3	8°
all others	8°

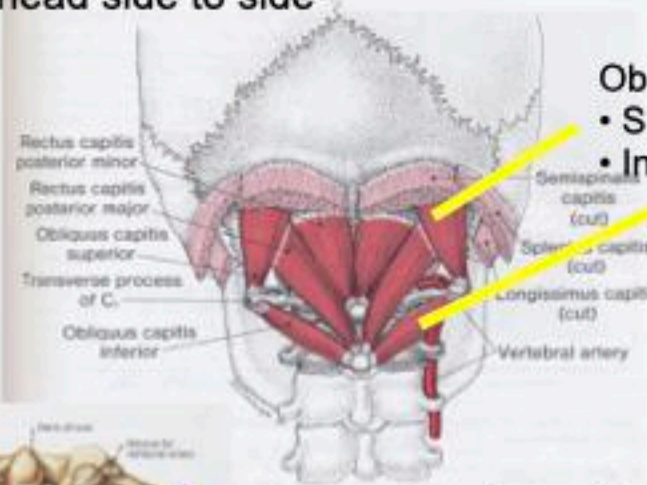


Flex-Extend:

Atlas to skull	25°
C1 to C2	20°
C2 to C3	12°

C1/C2 allows you to turn your head side to side

Chapter 17 / Suboccipital Muscles 303



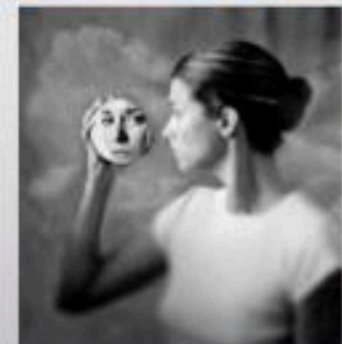
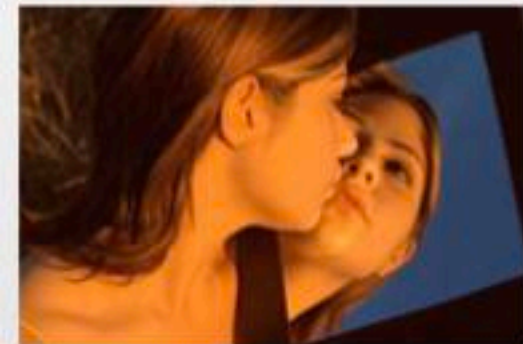
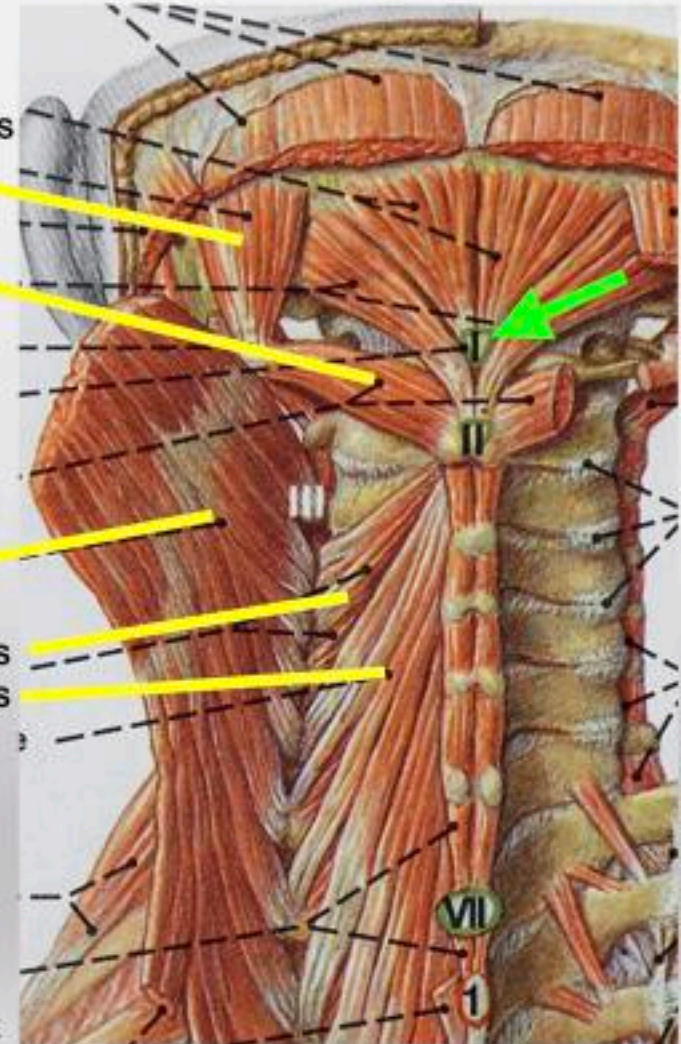
Oblique Capitus
• Superior
• Inferior

Semispinalis Capitus

Multifidus
Semispinalis Cervicus

Atlas spinal process
not attached
to a lower
transverse process

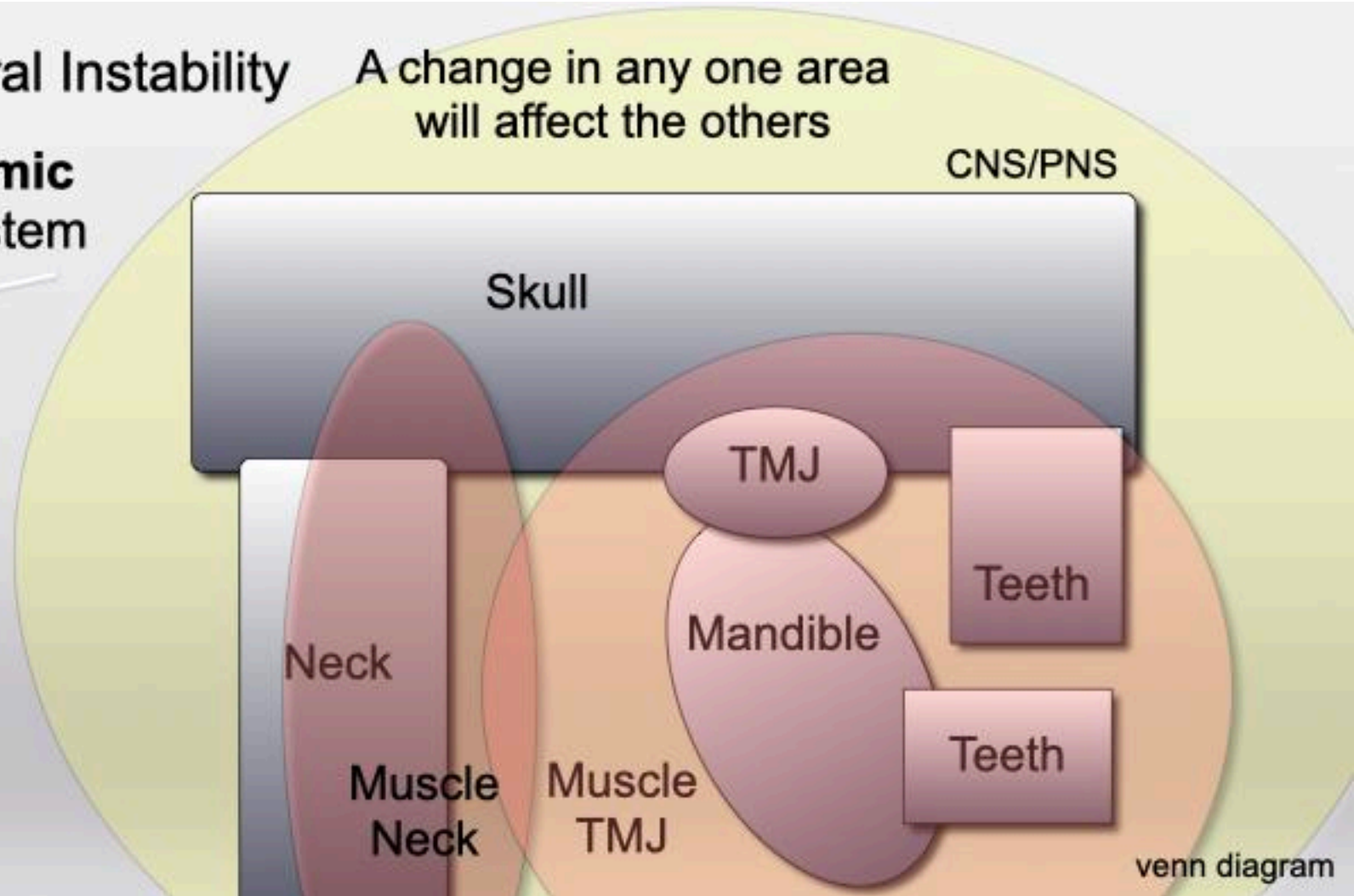
From Clemente's Anatomy Book



Neck and Postural Instability

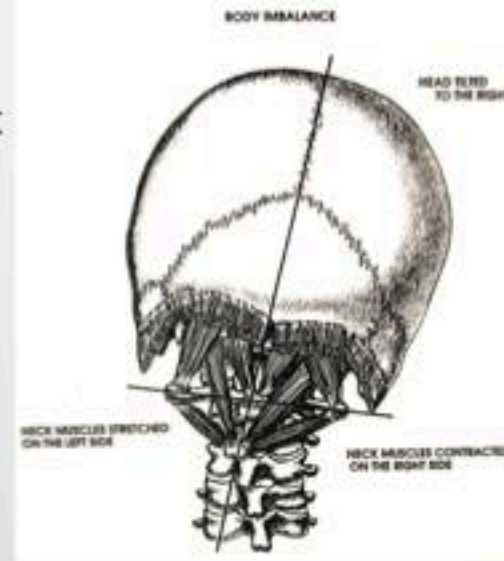
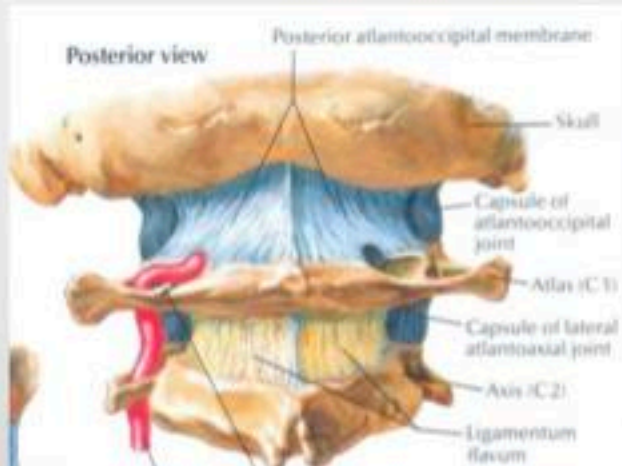
A change in any one area
will affect the others

This is a **dynamic**
orthopedic System



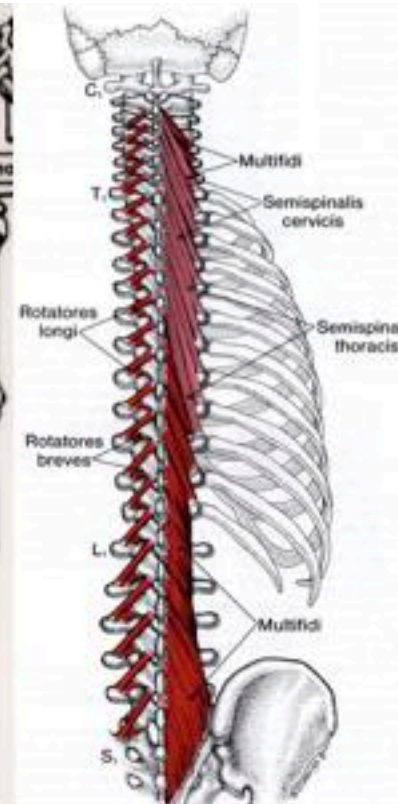
Atlas Subluxation

Trauma tears or stretches C1/ Skull ligament



Atlas Subluxation causes muscle bracing throughout the whole spinal muscle complex. One hip will be elevated giving the appearance of a short leg.

A change in any one area will affect the others
This is a dynamic orthopedic System



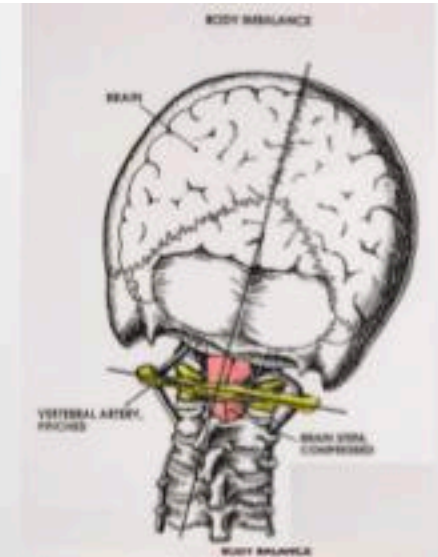
Atlas Orthogonal Adjustment

Dr. Roy Sweat

Atlas Orthogonist
Branch of Chiropractic Medicine

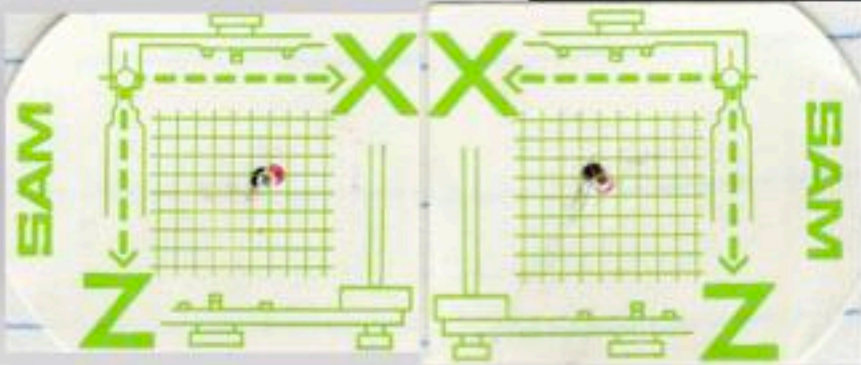


Uses sound wave to move atlas,
disrupts muscle bracing



Atlas (C1) Observations:

Once atlas is reduced, other therapies progress much better.
Atlas can subluxate again as ligaments are still damaged
The longer atlas is in, the more likely it will stay in
Cartilage and bone changes shape over time.
Occlusion will be different with atlas in and atlas out, about 0.5mm
Occlusal appliances can help stabilize the atlas once it is reduced
Glucosamine helps neck become stable- ?cartilage adaptation?



CR Changes with Atlas position

?Pressure on Occiput moves
Temporal bone?

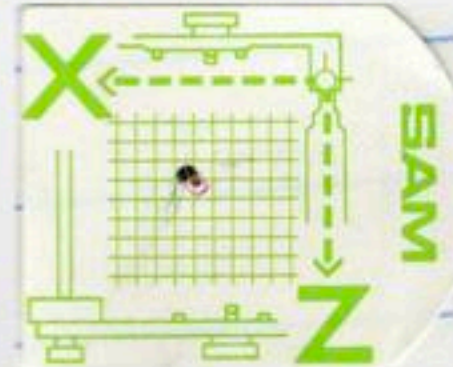
Put your teeth together and bend
neck side to side



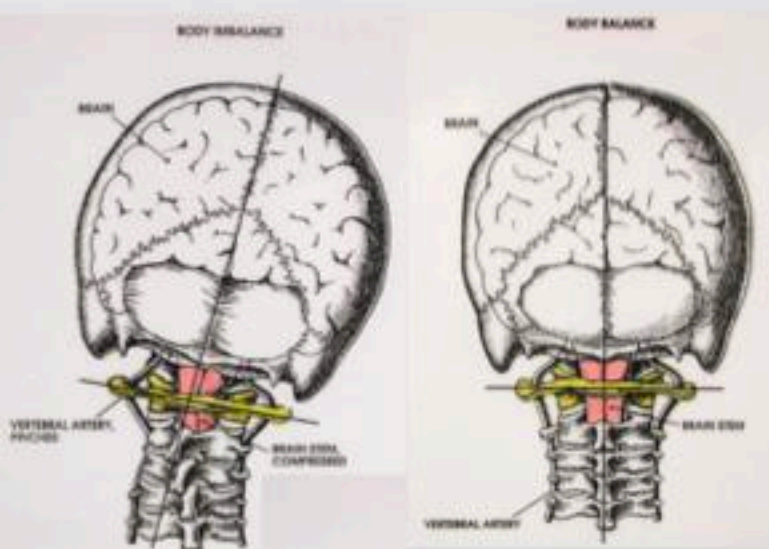
SAM Articulator Verichuck



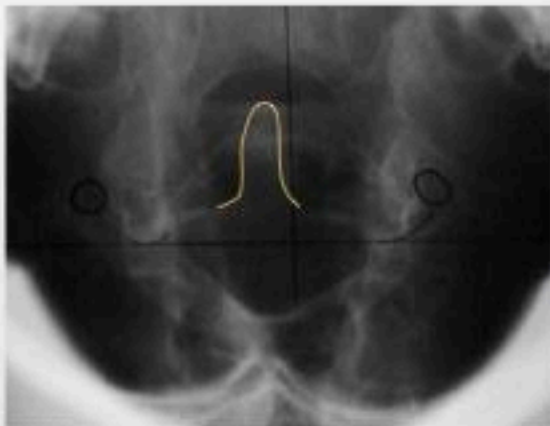
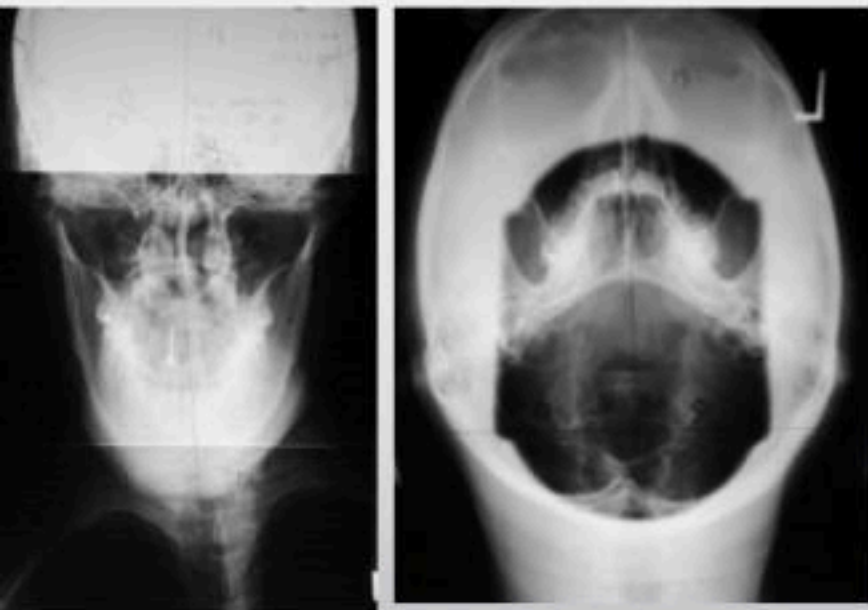
Right Condyle
Black- Atlas Out
Red- Atlas in shifts
condyle up and
forward 0.6mm



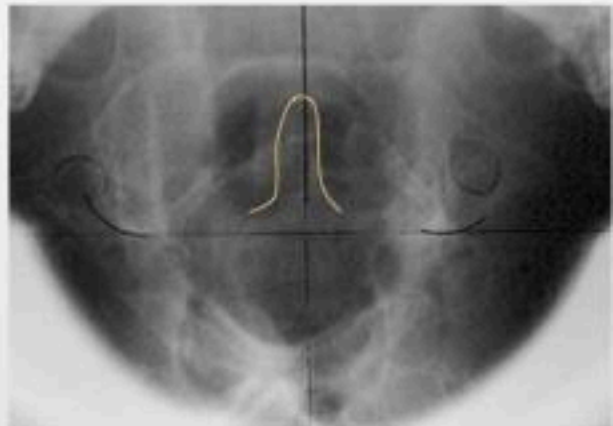
Left Condyle
Black- Atlas Out
Red- Atlas in shifts
condyle down and
back 0.5mm



My Neck



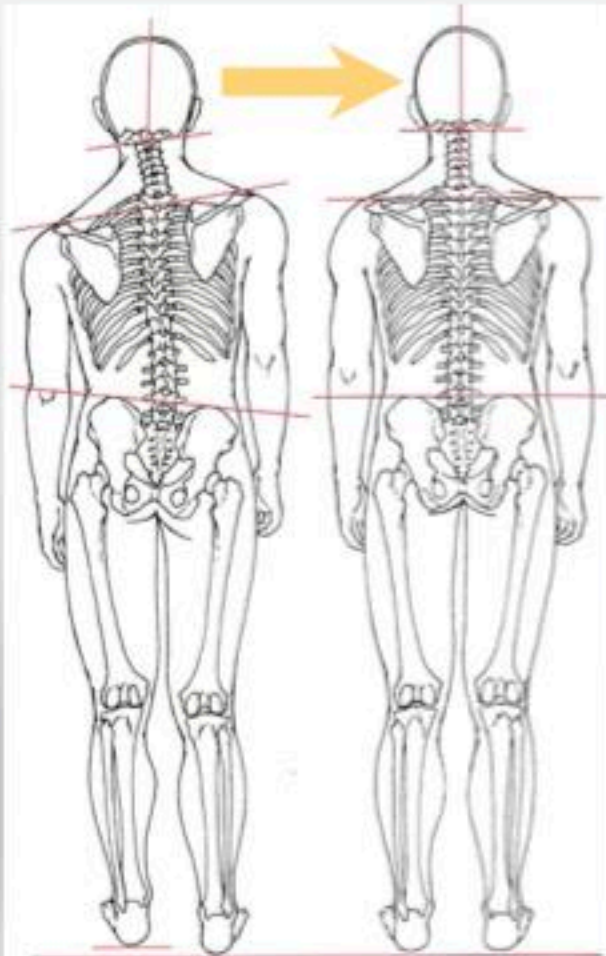
Before Atlas Adjustment



After Atlas Adjustment



Atlas Reduction



Many therapist place a heel lift thinking it is a leg length discrepancy

With atlas reduction the hip drops and the knot at the base of the skull clears instantly

Note: you do not get perfect realignment of all the bones as illustrated, but it is a start.

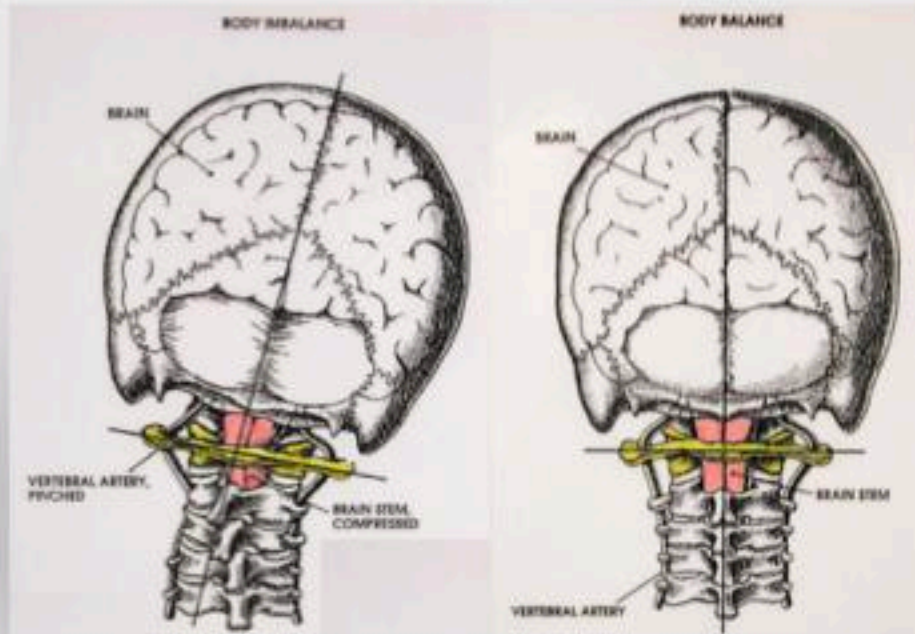
Finding An Atlas Orthogonist

www.atlasorthogonality.com

My Observations

50% of Atlas Doctors seem to be good

Most snappers and crunchers are useless or dangerous



Atlas Orthogonist is only group of therapist I have found who can get rid of muscle knot at C2

