The Click

John R Droter DDS
Annapolis, Maryland

Hello. I am:

John R Droter DDS
Annapolis, Maryland

Milestones

Visiting Faculty LD Pankey Institute 2008-

Visiting Faculty Spear Education 2013-2020

Visiting Faculty Orthodontic Program
Washington Hospital Center 2000-2012

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

Facial Pain Diagnosis

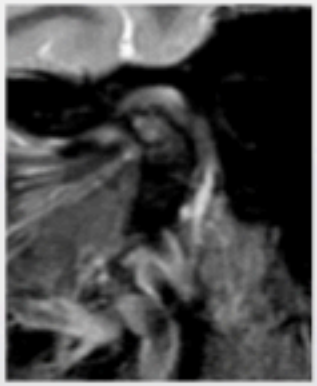
Diagnostic Tools

1 Written and Oral History
2 Observation
3 Physical Exam
- Muscle Palpation
- Joint Palpation
- Joint Auscultation
- Joint Motion

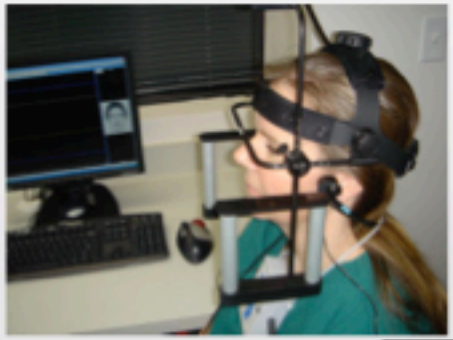
4 Anterior Stop Test
5 Sleep Airway Screening
6 CT Scan
- MRI
- Blood Tests

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

<u>Biometrics</u>
Joint Vibration
Jaw Tracker
Electromyography
T-Scan

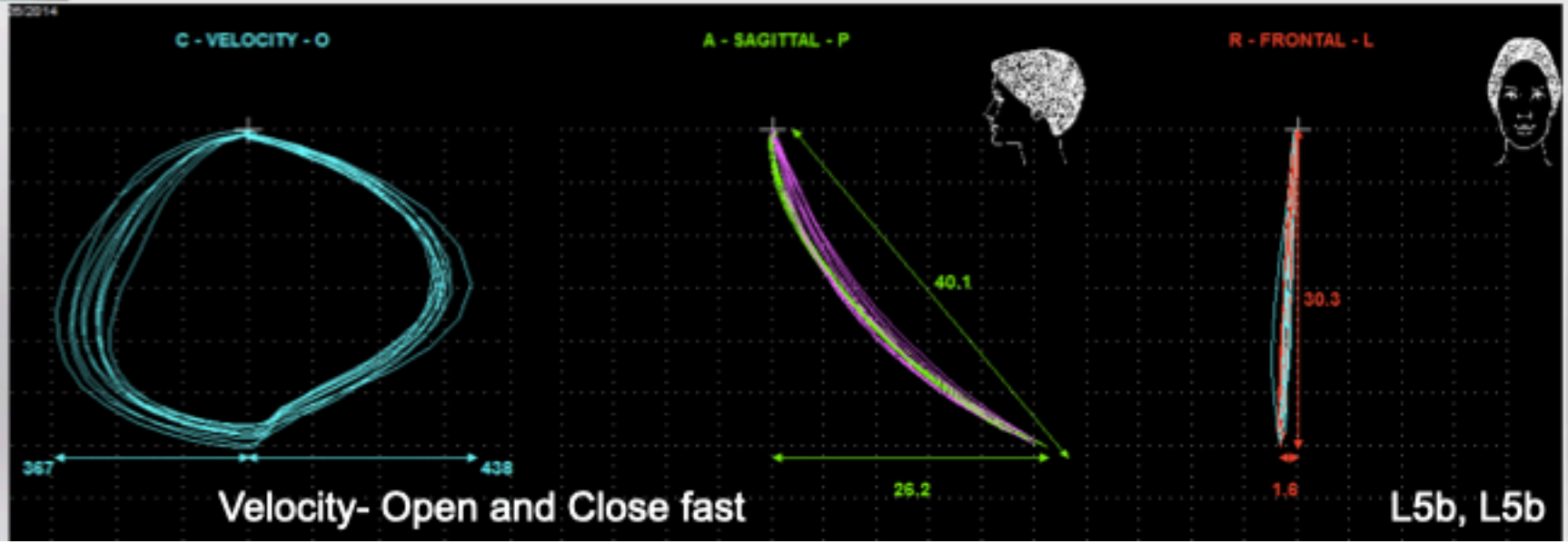


BioResearch Jaw Tracker



Normal TMJ- Motion

ROM- 40-55mm
Velocity 300+mm/sec
Consistent arc open/close
sagittal path
Straight frontal path



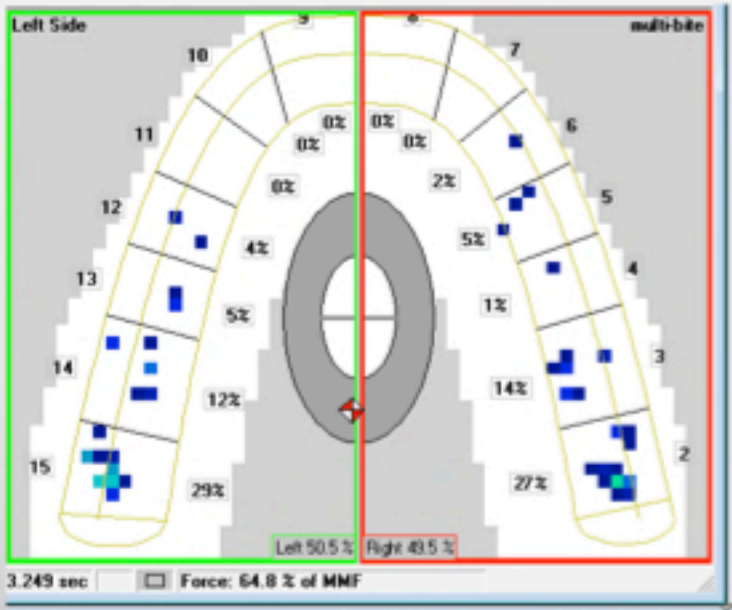
Velocity- Open and Close fast

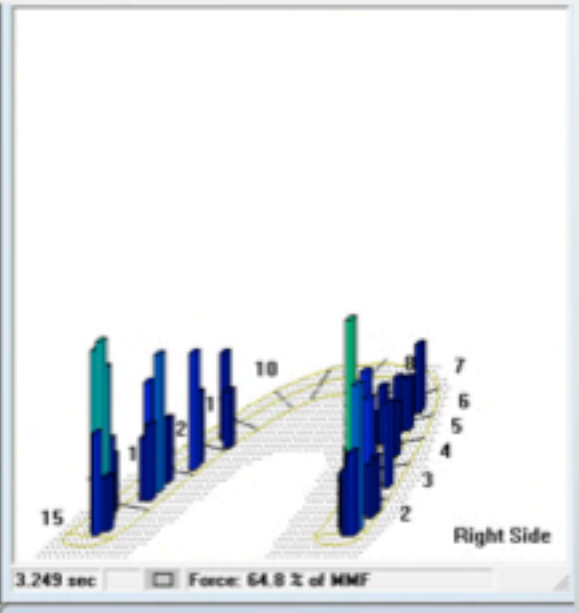
L5b, L5b

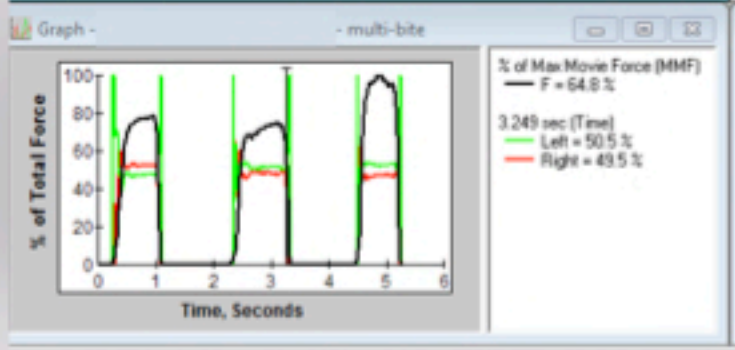
Time Force Graphic Representation of the Occlusion

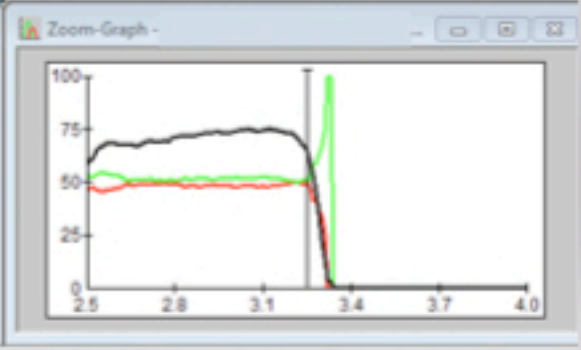
T-Scan Gives you:
Timing
Intensity
Location
Distribution

"Occlusion in Slow Motion"
Regular 10 msec intervals
Turbo 2.5 msec



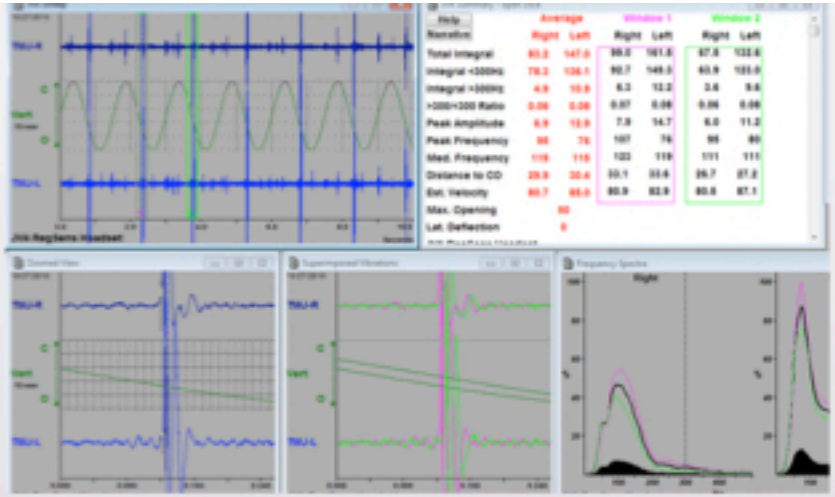






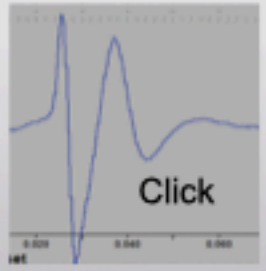
Joint Vibration Analysis

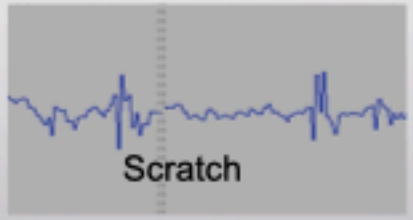
Objectively measures and quantifies joint vibrations during motion which is an indication of cartilage health

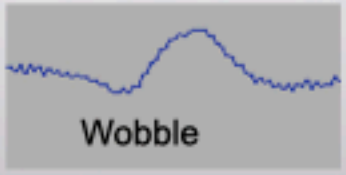


Based on Sonar.
It is not a microphone

Three main types of sounds





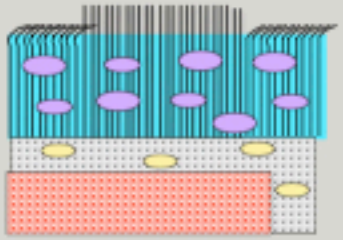


Disc Reduction
Disc Dislocation
Adhesion crackle
tooth tap

Osteoarthritis
Pseudo Disc
Damaged Cartilage

Disc Subluxation
Joint Subluxation
Disc Reduction
Disc Dislocation

JVA measures the health of the cartilage



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.

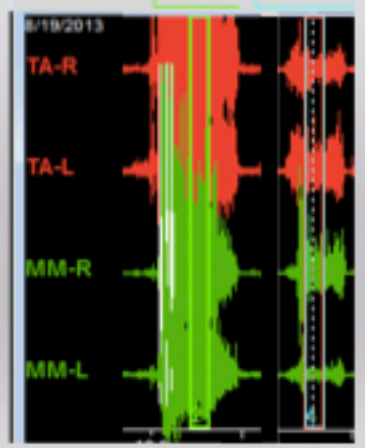
BioResearch EMG

BioResearch mScan

Diagnostic Palatal Anterior Stop

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

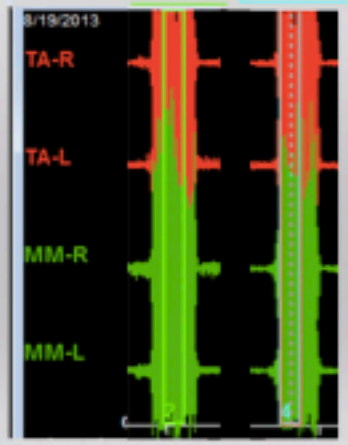


Major decrease in muscle power with D-PAS

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

Disclosures:

Atomic Skis- Sponsored.
I got stuff.

LD Pankey Institute TMD Course
Honorarium

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

APS
ArrowPath Sleep

Living Tree Dental Lab
High Quality Dental Orthotics
Royalties on my designs

LIVING TREE
DENTAL LAB

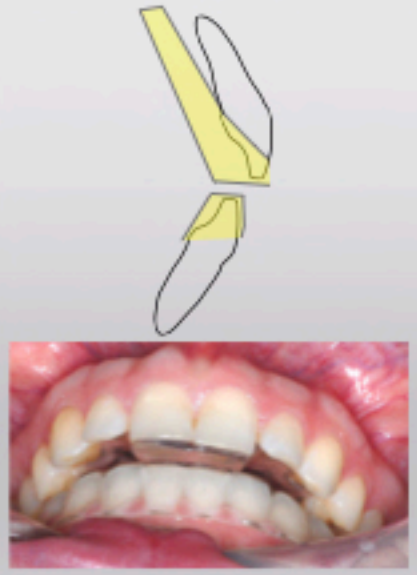
Ski Coach for National Ski Patrol
Level 3 Certified Professional Ski Instructors of America

Living Tree Dental Lab
(865) 509-4509
connect@livingtreelab.com

3D Printed Orthotics

D-PAS
Diagnostic-
Palatal Anterior Stop

Brux-PAS
with lower Essix



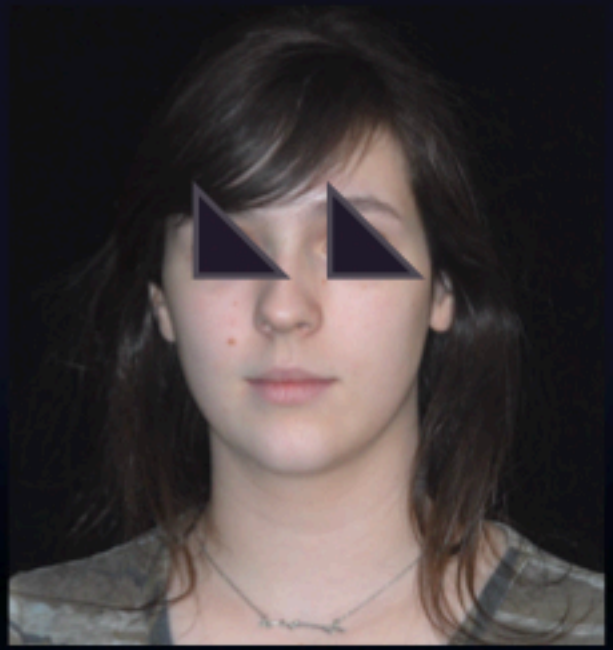
Hard Lower Posterior Stop
with upper essix

Hard Lower Full Coverage
Centric Relation Orthotic

Ms EW

John R Droter DDS
Annapolis, Maryland

Age 16
Jaw started clicking at age 13
Jaw now locking daily, jaw pain, difficulty chewing at age 16



Age 16

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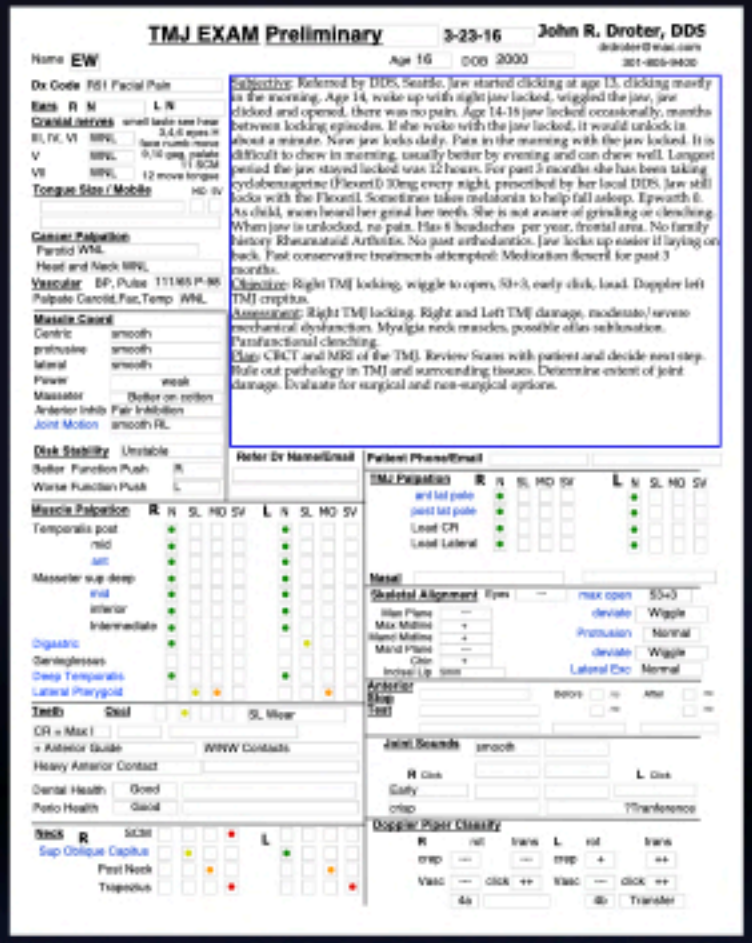
History
Muscle and Joint Palpation
Joint Auscultation



TMJ EXAM Preliminary 3-23-16 **John R. Droter, DDS**

Name **EW** Age 16 DOB 2000

Dx Code R51 Facial Pain

Subjective: Referred by DDS, Seattle. Jaw started clicking at age 13, clicking mostly in the morning. Age 14, woke up with right jaw locked, wiggled the jaw, jaw clicked and opened, there was no pain. Age 14-16 jaw locked occasionally, months between locking episodes. If she woke with the jaw locked, it would unlock in about a minute. Now jaw locks daily. Pain in the morning with the jaw locked. It is difficult to chew in morning, usually better by evening and can chew well. Longest period the jaw stayed locked was 12 hours. For past 3 months she has been taking cyclobenzaprine (Flexeril) 10mg every night, prescribed by her local DDS. Jaw still locks with the Flexeril. Sometimes takes melatonin to help fall asleep. Epworth 6. As child, mom heard her grind her teeth. She is not aware of grinding or clenching. When jaw is unlocked, no pain. Has 6 headaches per year, frontal area. No family history Rheumatoid Arthritis. No past orthodontics. Jaw locks up easier if laying on back. Past conservative treatments attempted: Medication flexeril for past 3 months.

Objective: Right TMJ locking, wiggle to open, 53+3, early click, loud. Doppler left TMJ crepitus.

Assessment: Right TMJ locking. Right and Left TMJ damage, moderate/severe mechanical dysfunction. Myalgia neck muscles, possible atlas subluxation. Parafunctional clenching.

Plan: CBCT and MRI of the TMJ. Review Scans with patient and decide next step. Rule out pathology in TMJ and surrounding tissues. Determine extent of joint damage. Evaluate for surgical and non-surgical options.

Refer Dr Name/Email

Patient Phone/Email

Ears R N L N

Cranial nerves

Tongue Size / Mobile

Cancer Palpation

Parotid WNL

Head and Neck WNL

Vascular BP, Pulse

Palpate Carotid,Fac,Temp WNL

Muscle Chord

Centric smooth

protrusive smooth

lateral smooth

Power weak

Masseter Better on center

Anterior Inhib Fair Inhibition

Joint Motion smooth RL

Disk Stability Unstable

Better Function Push R

Worse Function Push L

Muscle Palpation R N SL MD SV L N SL MD SV

Temporalis post

mid

ant

Masseter sup deep

mid

inferior

Intermediate

Digastric

Sternleglossus

Deep Temporalis

Lateral Pterygoid

TMJ Palpation R N SL MD SV L N SL MD SV

ant lat pole

post lat pole

Least CR

Least Lateral

Nasal

Skeletal Alignment Eyes

max open 53+3

deviate Wiggle

Protrusion Normal

deviate Wiggle

Lateral Exc Normal

Anterior Slop Test

Joint Sounds smooth

R Click

L Click

Early

crisp

Teeth Class

SL Wear

CR = Max I

= Anterior Guide WNW Contacts

Heavy Anterior Contact

Dental Health Good

Perio Health Good

Neck R SCM L

Sup Oblique Capitus

Post Neck

Trapezius

Doppler Piper Classify

R rel trans L rel trans

crep Visc click ++ Visc click ++

4a 4b Transfer

Age 16

Age 13 Jaw clicking started on waking

Age 16 Jaw locking with pain

DDS Rx Flexeril

TMJ EXAM Preliminary

3-23-16

John R. Droter, DDS
drdroter@mac.com
301-805-9400

Name **EW** Age 16 DOB 2000

Dx Code R51 Facial Pain

Ears R N L N

Cranial nerves smell taste see hear

III, IV, VI	WNL	3,4,6 eyes H
V	WNL	face numb move
VII	WNL	9,10 gag, palate 11 SCM 12 move tongue

Tongue Size / Mobile MO SV

Cancer Palpation

Parotid WNL

Head and Neck WNL

Vascular BP, Pulse 111/65 P-98

Palpate Carotid,Fac,Temp WNL

Muscle Coord

Centric	smooth
protrusive	smooth
lateral	smooth
Power	weak
Masseter	Better on cotton
Anterior Inhib	Fair Inhibition
Joint Motion	smooth RL

Subjective: Referred by DDS, Seattle. Jaw started clicking at age 13, clicking mostly in the morning. Age 14, woke up with right jaw locked, wiggled the jaw, jaw clicked and opened, there was no pain. Age 14-16 jaw locked occasionally, months between locking episodes. If she woke with the jaw locked, it would unlock in about a minute. Now jaw locks daily. Pain in the morning with the jaw locked. It is difficult to chew in morning, usually better by evening and can chew well. Longest period the jaw stayed locked was 12 hours. For past 3 months she has been taking cyclobenzaprine (Flexeril) 10mg every night, prescribed by her local DDS. Jaw still locks with the Flexeril. Sometimes takes melatonin to help fall asleep. Epworth 0. As child, mom heard her grind her teeth. She is not aware of grinding or clenching. When jaw is unlocked, no pain. Has 6 headaches per year, frontal area. No family history Rheumatoid Arthritis. No past orthodontics. Jaw locks up easier if laying on back. Past conservative treatments attempted: Medication flexeril for past 3 months.

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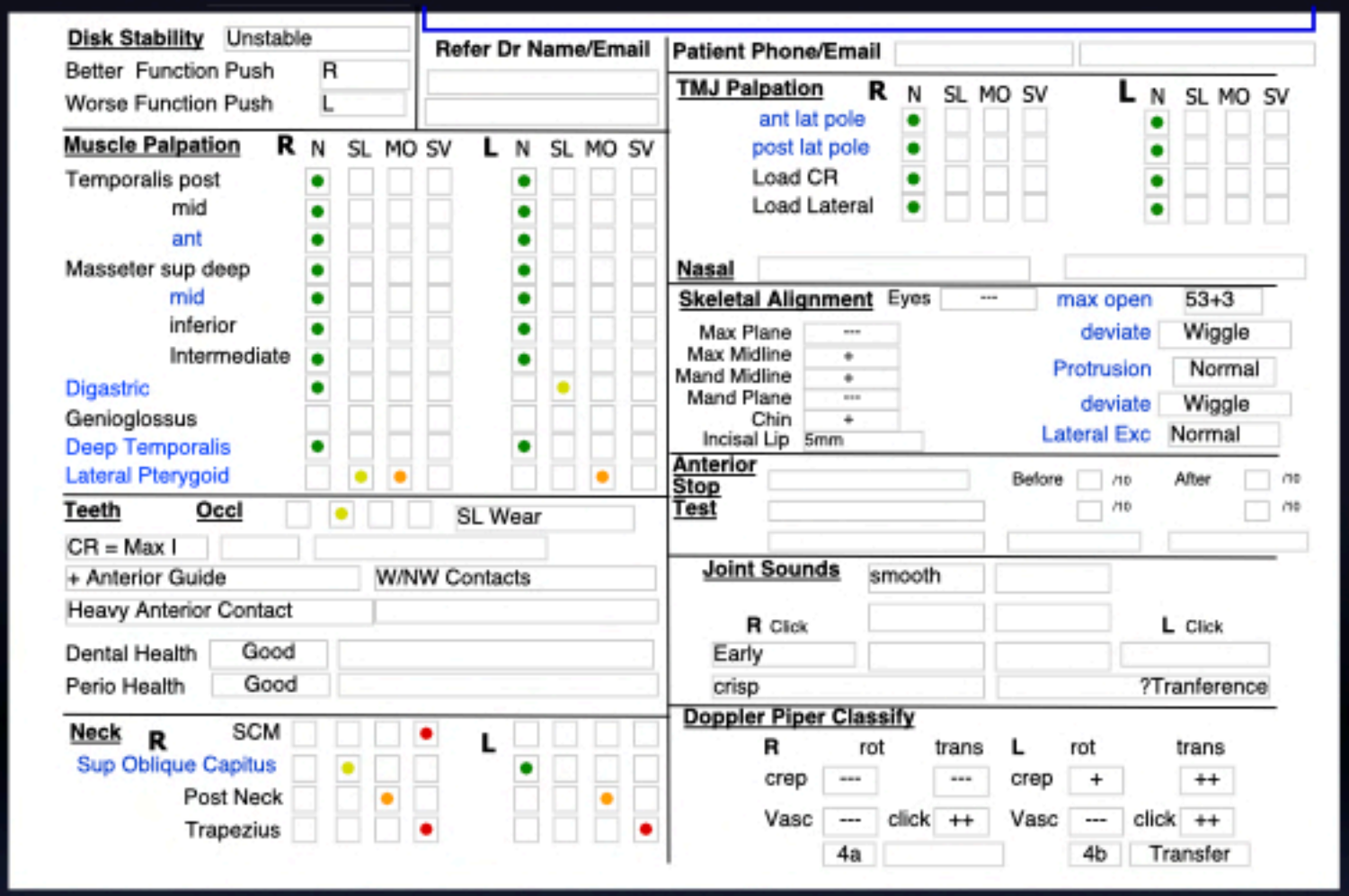
Age 16

Muscle and Joint Palpation
Joint Auscultation



Disk Stability Unstable
Better Function Push R
Worse Function Push L

Refer Dr Name/Email

Patient Phone/Email

Muscle Palpation

	R N	SL	MO	SV	L N	SL	MO	SV
Temporalis post	●				●			
mid	●				●			
ant	●				●			
Masseter sup deep	●				●			
mid	●				●			
inferior	●				●			
Intermediate	●				●			
Digastric	●					●		
Genioglossus								
Deep Temporalis	●				●			
Lateral Pterygoid		●	●				●	

TMJ Palpation

	R N	SL	MO	SV	L N	SL	MO	SV
ant lat pole	●				●			
post lat pole	●				●			
Load CR	●				●			
Load Lateral	●				●			

Nasal

Skeletal Alignment Eyes ---

Max Plane	---	max open	53+3
Max Midline	+	deviate	Wiggle
Mand Midline	+	Protrusion	Normal
Mand Plane	---	deviate	Wiggle
Chin	+		
Incisal Lip	5mm	Lateral Exc	Normal

Anterior Stop Test Before /10 After /10 /10

Teeth **Occl** SL Wear
CR = Max I
+ Anterior Guide W/NW Contacts
Heavy Anterior Contact

Dental Health Good
Perio Health Good

Joint Sounds smooth

R Click	L Click
Early	
crisp	?Tranference

Neck R

	R				L			
SCM				●				
Sup Oblique Capitus		●			●			
Post Neck			●				●	
Trapezius				●				●

Doppler Piper Classify

R	rot		trans	L	rot		trans
crep	---		---	crep	+		++
Vasc	---	click	++	Vasc	---	click	++
	4a				4b		Transfer

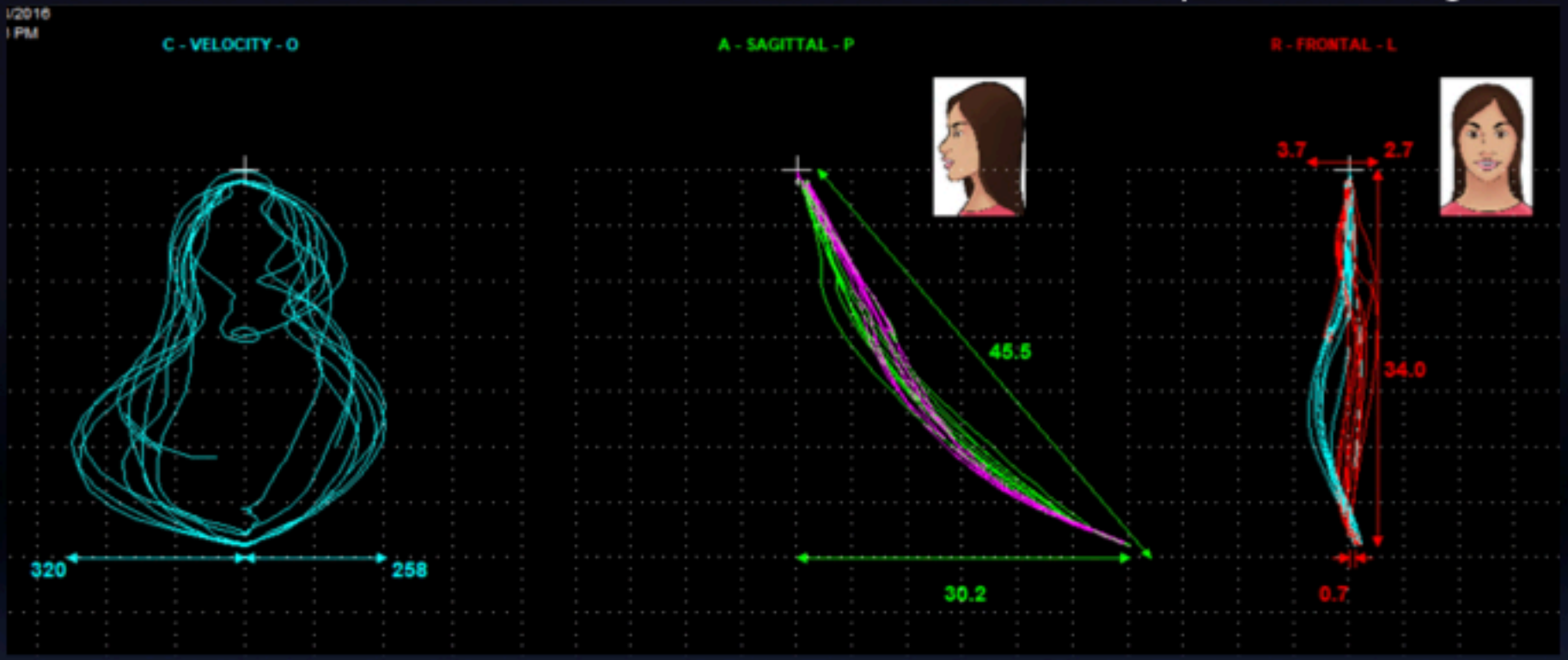
Age 16

BioResearch Jaw Tracker: Velocity

"Jaw Gymnastics" to open and close

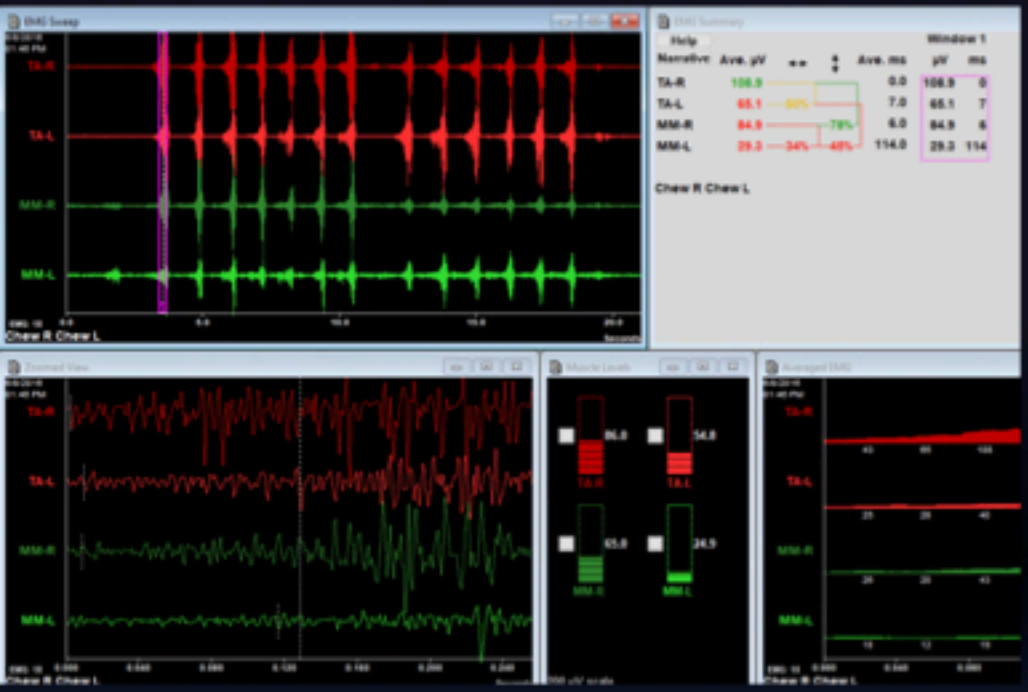
Inconsistent Velocity

Inconsistent / Deviated Open and Closing Path

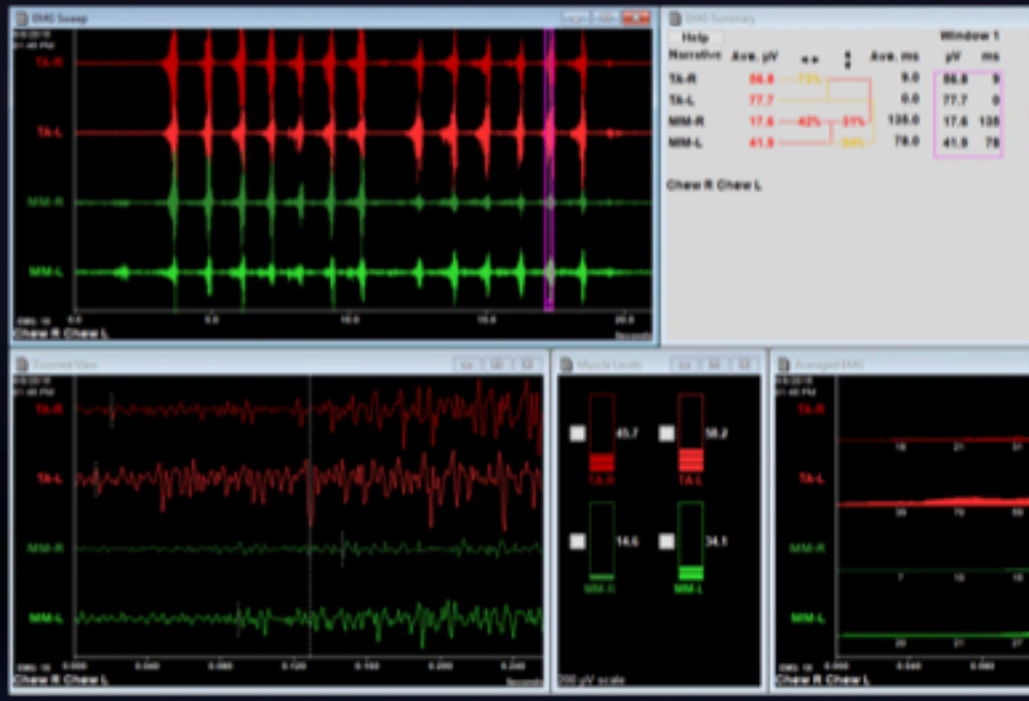


EMG Chewing
Chew gum 6x on right followed by 6x on left

Chew Right- Temporalis Dominate

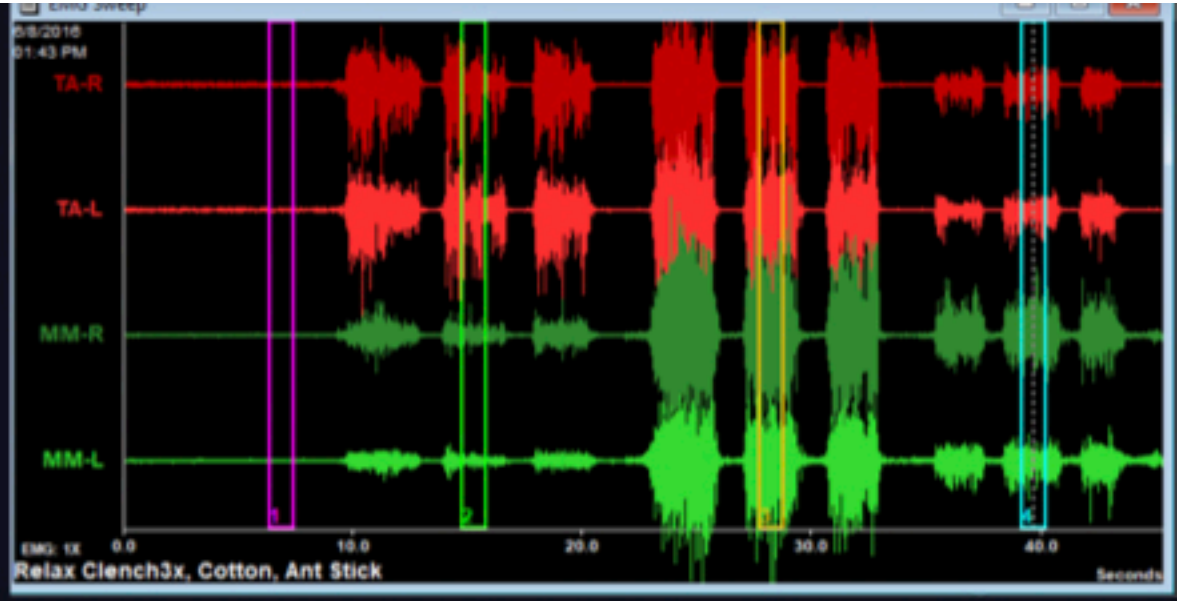


Chew Left- Temporalis Dominate



Age 16
EMG Relax Clench Test-

1. Relax- RL Temporalis not relaxing
2. Clench Teeth- Very Weak RL Massters
3. Clench Cotton- RL Masseters Strong
4. Anterior Clench- Good muscle inhibition

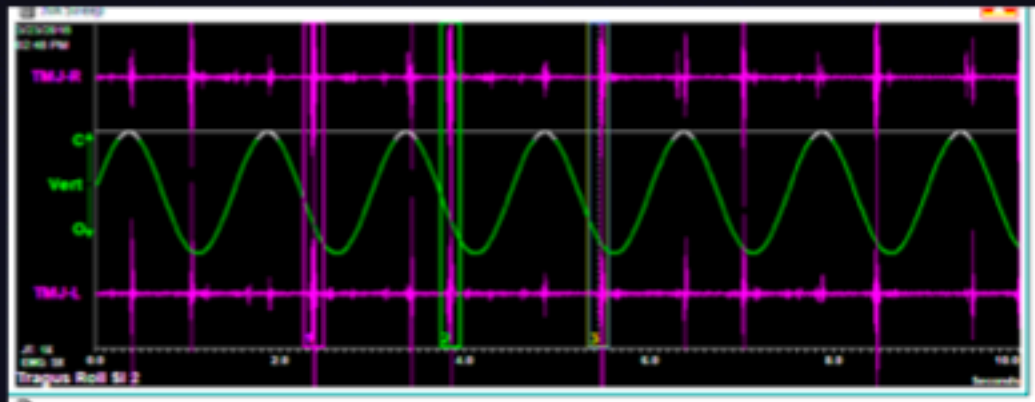


Help
Narrative

	Ave. µV			Ave. ms	Window 1 µV	Window 1 ms	Window 2 µV	Window 2 ms	Window 3 µV	Window 3 ms	Window 4 µV	Window 4 ms
TA-R	26.8	91%	68%	16.0	2.7	--	29.6	20	58.4	0	16.7	28
TA-L	29.4			25.0	2.6	--	33.5	0	65.8	0	15.5	75
MM-R	39.5			76.0	1.7	--	11.2	227	100.0	1	45.0	0
MM-L	26.7	68%	91%	11.0	1.9	--	6.9	--	74.3	1	23.6	21

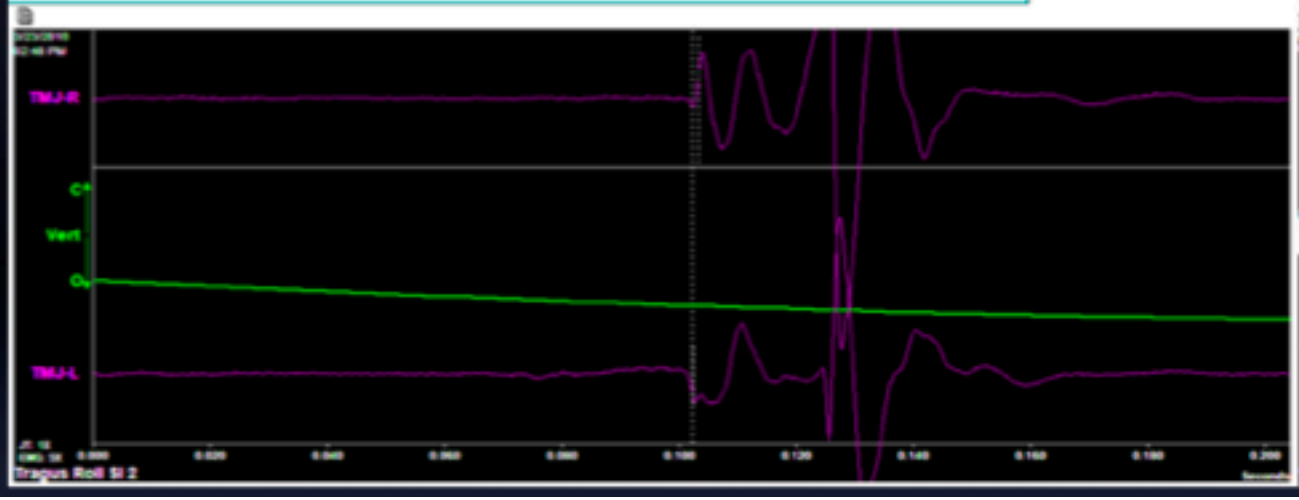
Age 16

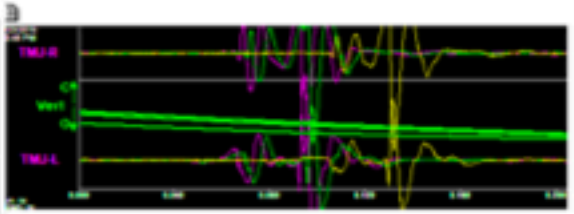
Joint Vibration Analysis
Early opening click vibration Right and Left TMJ, Complex : 148 Pa

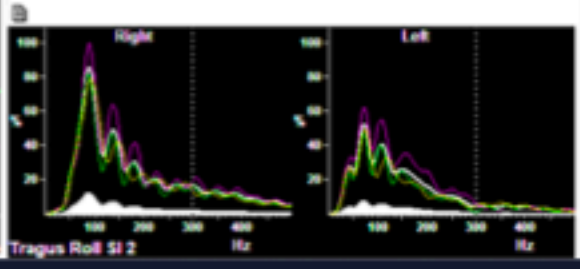


Help / Narrative	Average Right	Average Left	Window 1 Right	Window 1 Left	Window 2 Right	Window 2 Left	Window 3 Right	Window 3 Left
Total Integral	148.8	96.1	169.0	120.1	135.8	82.3	141.6	86.0
Max. Opening		56						
Integral <300Hz	120.6	86.2	136.2	110.6	109.7	73.6	116.7	74.5
Integral >300Hz	28.3	9.9	33.8	9.5	26.1	8.7	24.9	11.5
>300/<300 Ratio	0.23	0.11	0.25	0.09	0.24	0.12	0.21	0.15
Peak Amplitude	12.5	7.6	14.5	9.0	11.9	7.0	11.5	7.2
Peak Frequency	88	73	88	73	83	68	93	73
Med. Frequency	142	122	146	122	142	117	146	122
Est. Velocity	95.0	95.2	112.3	113.1	104.2	104.2	68.4	68.4
Distance to CO	42.4	42.3	39.4	38.9	37.6	37.6	60.4	60.4
Lat. Deflection		0						

Tragus Roll SI 2

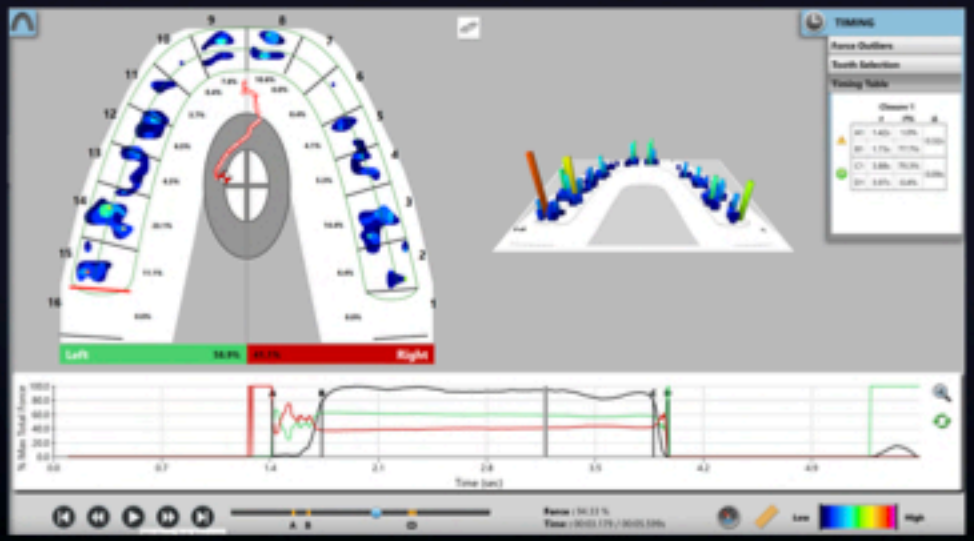


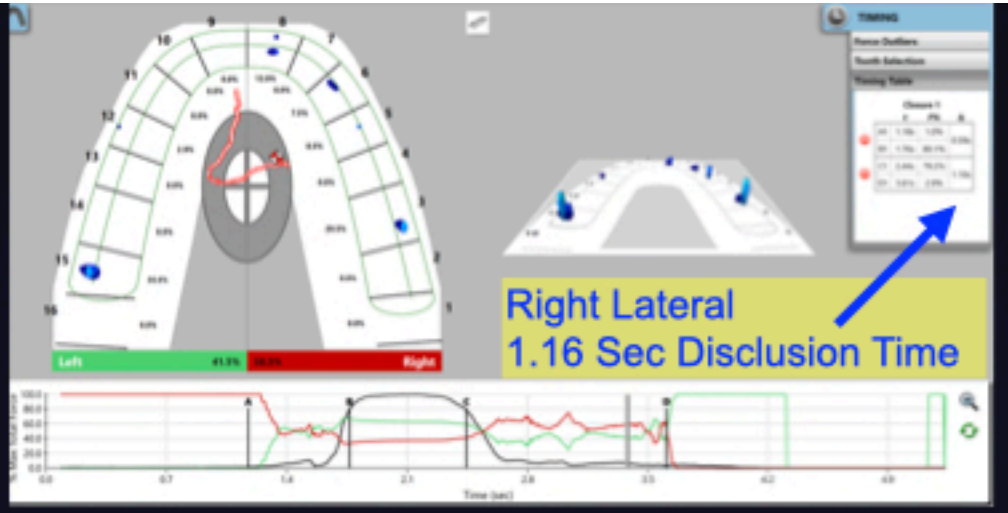


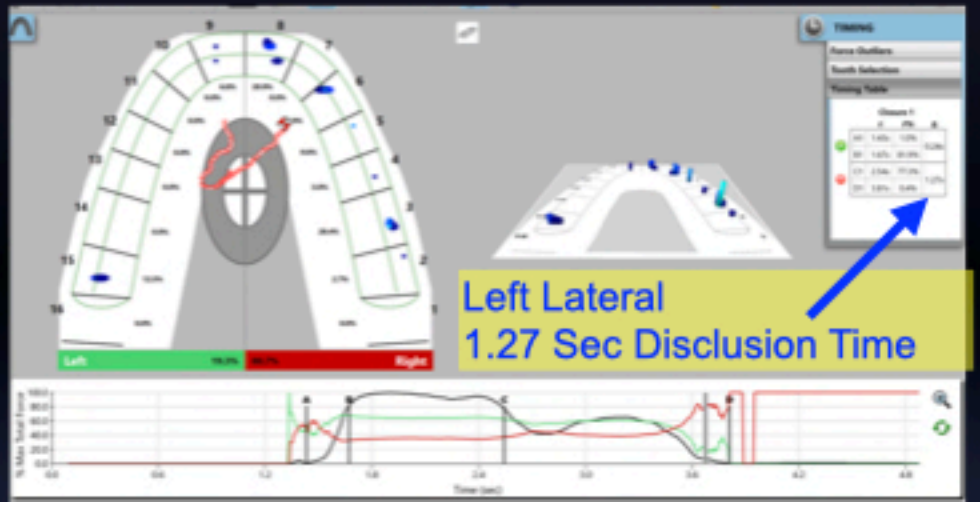


Start Occlusion TekScan

Max Intercuspation Force
Right 41.1%
Left 58.9%





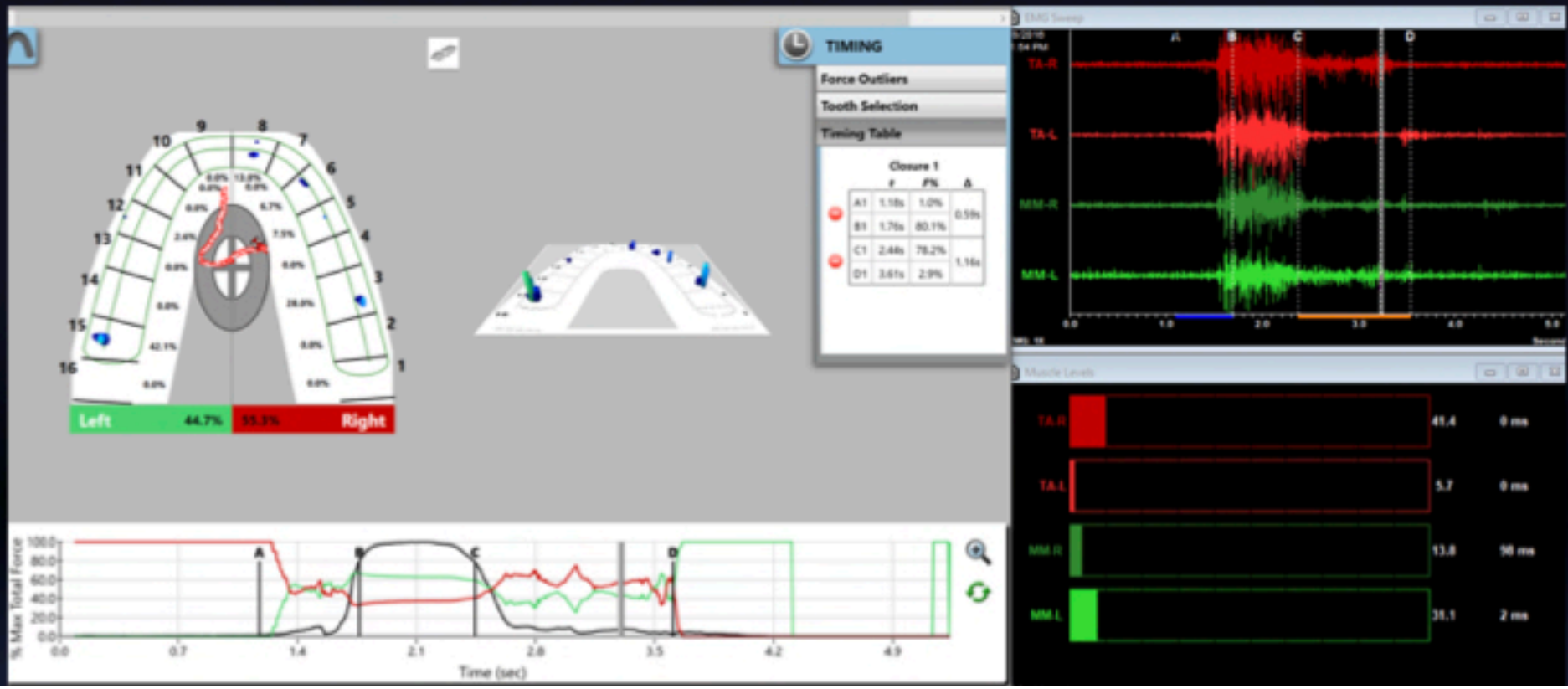


Muscle harmony occurs when disclusion is less than 0.4 seconds

Tek Scan EMG Link

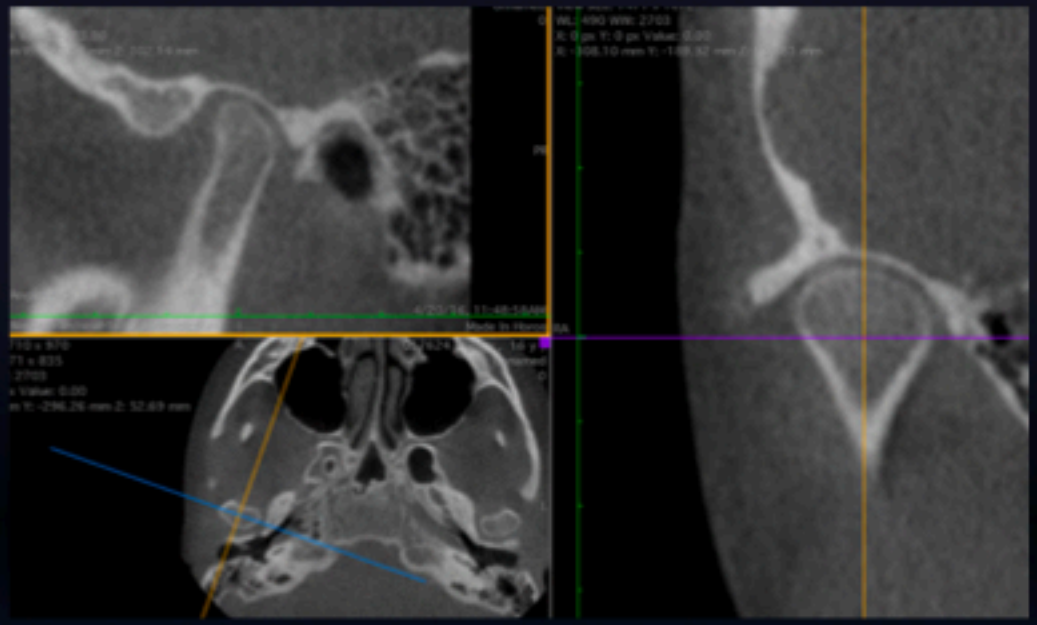
Right Lateral Excursion

At 0.9 seconds still has posterior contacts
Right Temporalis and Left Masseter still contracting

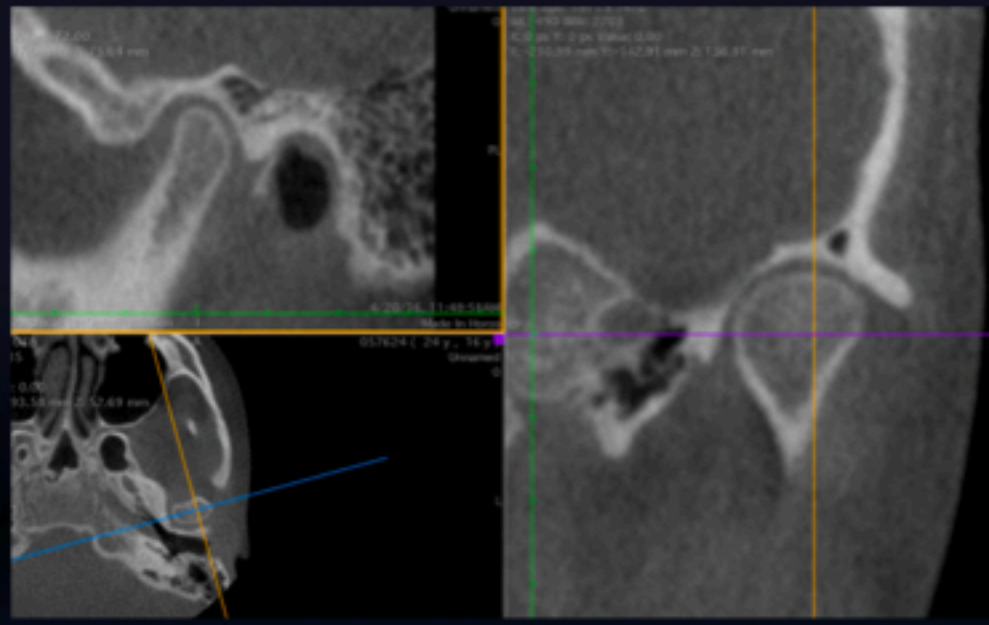


Age 16

CBCT
Right TMJ

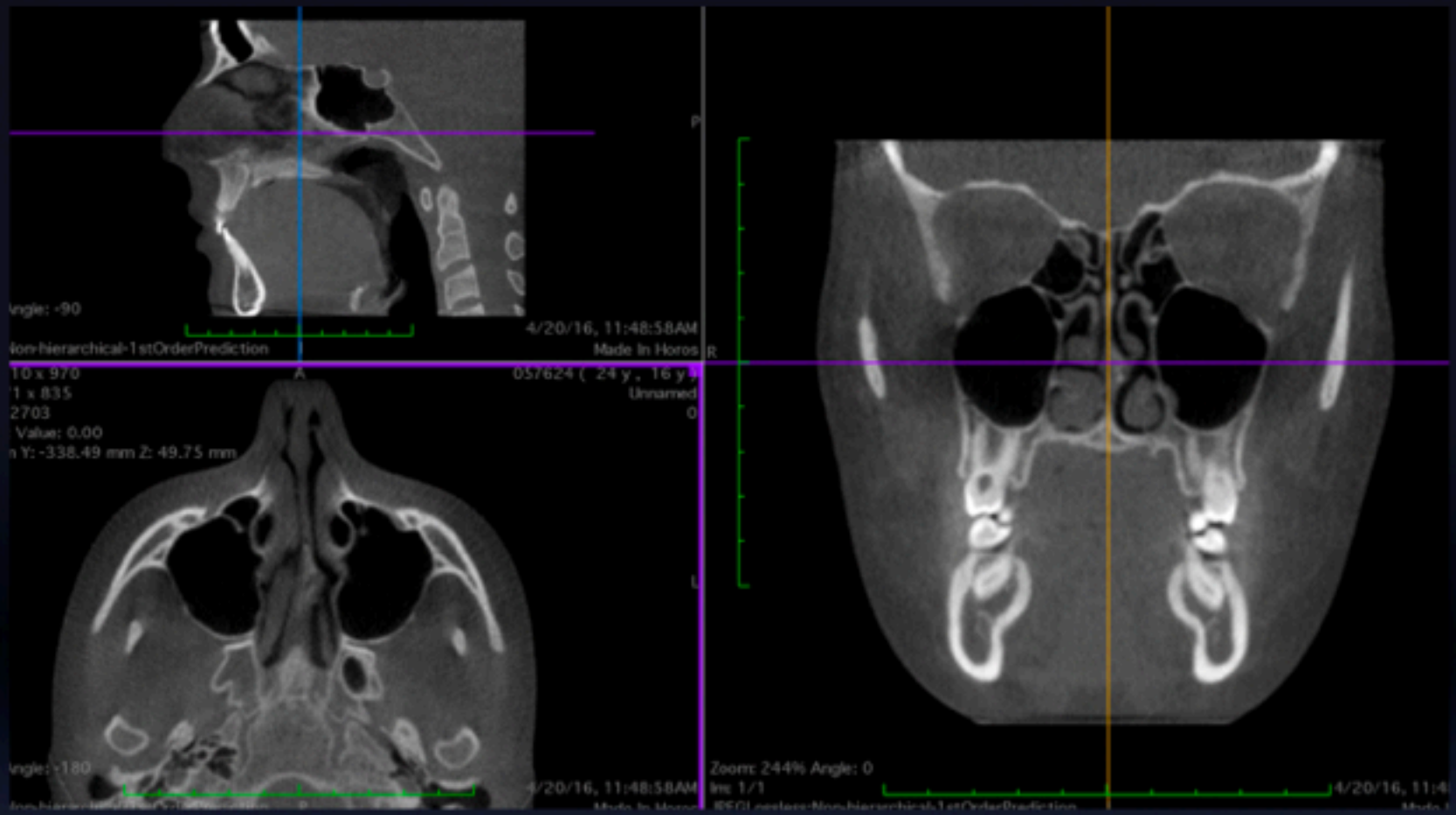


CBCT
Left TMJ



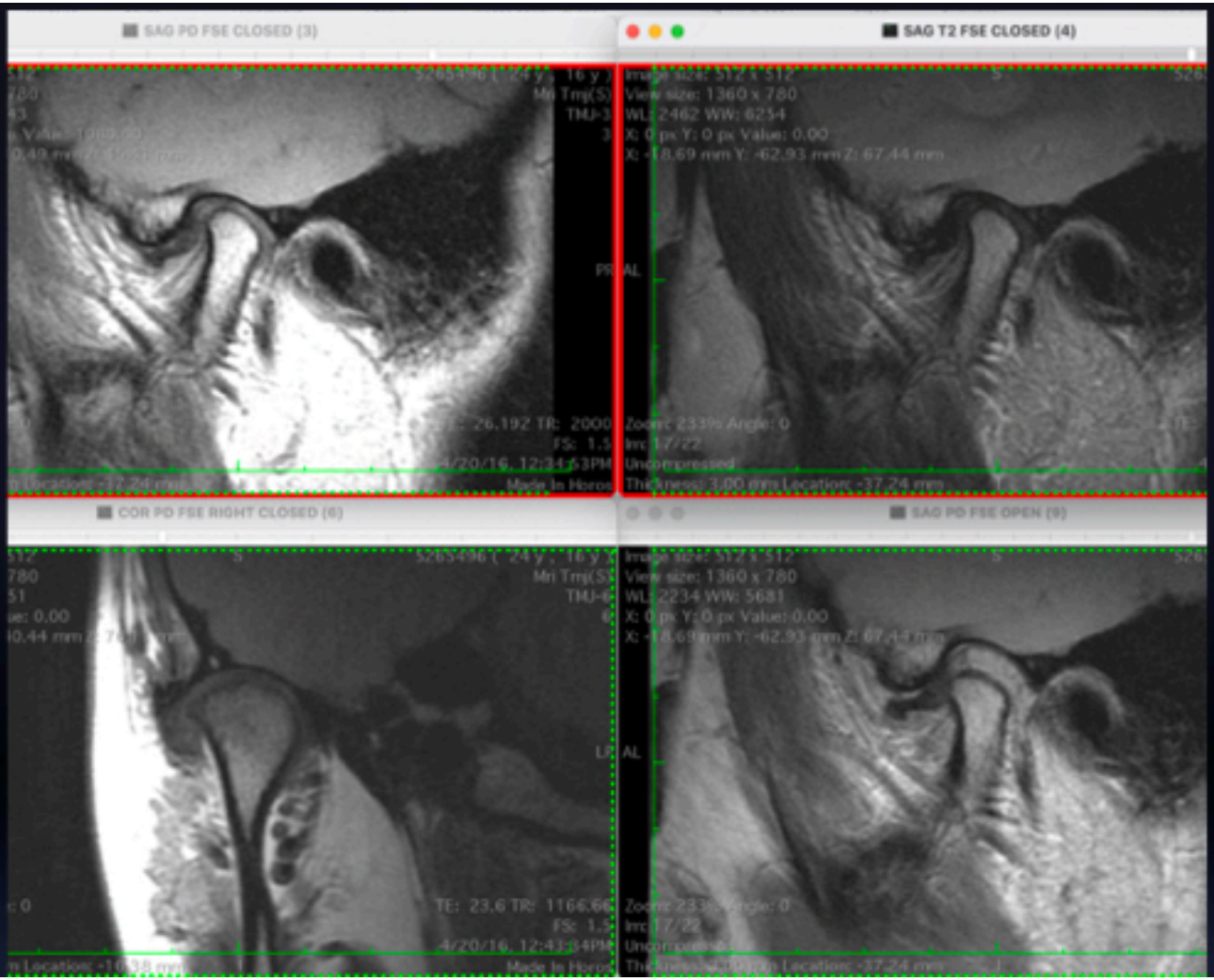
Age 16

CBCT
Sinus Airway



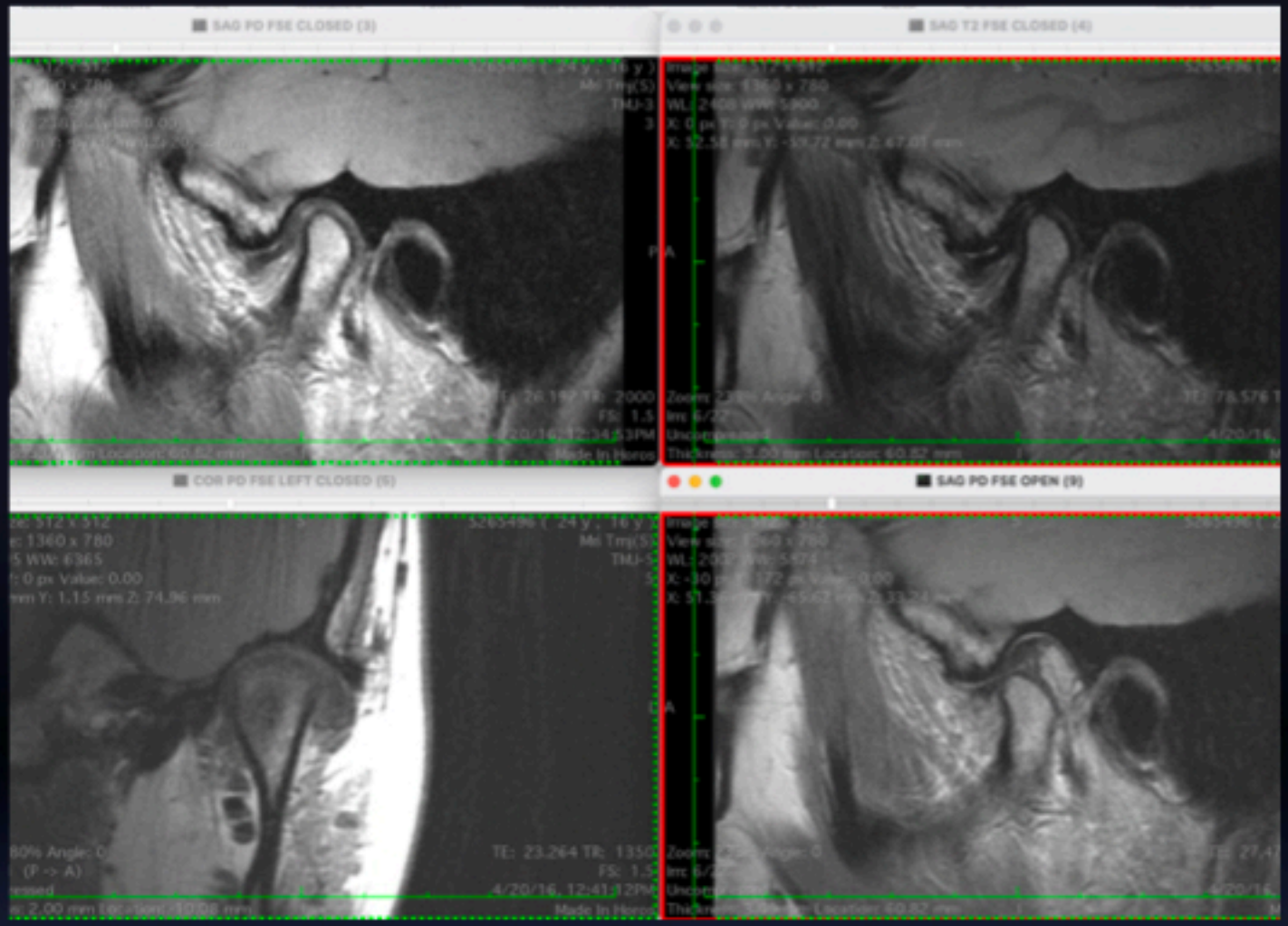
Age 16

MRI
Right TMJ
Piper 4b/a
Anterior Lateral



Age 16

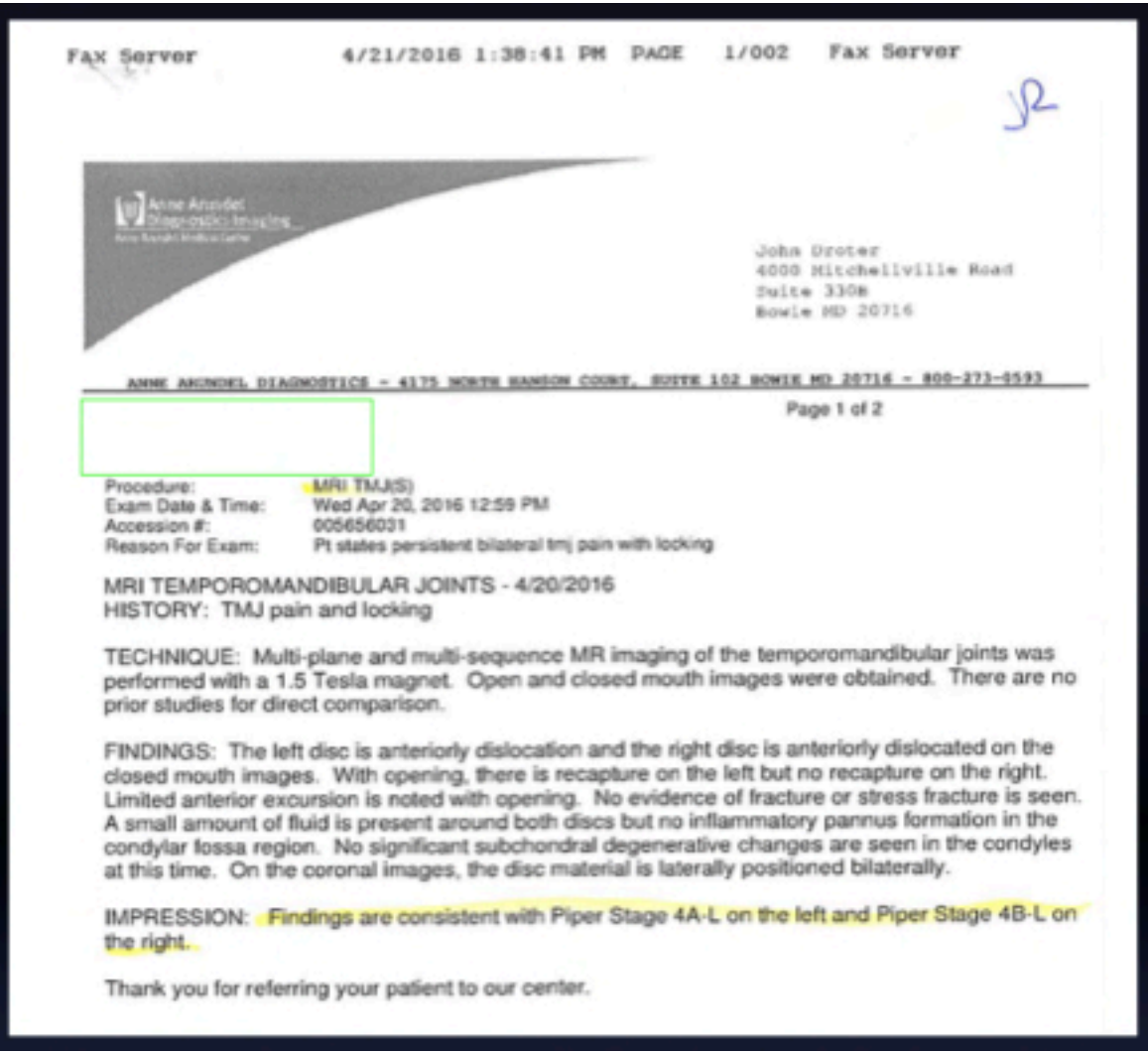
MRI
Left TMJ
Piper 4a
Anterior Lateral



Age 16

MRI Radiologist Report

Right Piper 4b/a Anterior Lateral
Left Piper 4a Anterior Lateral
Bone Marrow is normal



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Anne Arundel Diagnostic Imaging

John Droter
4000 Mitchellville Road
Suite 330B
Bowie MD 20716

ANNE ARUNDEL DIAGNOSTICS - 4175 NORTH RANSON COURT, SUITE 102 BOWIE MD 20716 - 800-273-6593

Page 1 of 2

Procedure: MRI TMJ(S)
Exam Date & Time: Wed Apr 20, 2016 12:59 PM
Accession #: 005656031
Reason For Exam: Pt states persistent bilateral tmj pain with locking

MRI TEMPOROMANDIBULAR JOINTS - 4/20/2016
HISTORY: TMJ pain and locking

TECHNIQUE: Multi-plane and multi-sequence MR imaging of the temporomandibular joints was performed with a 1.5 Tesla magnet. Open and closed mouth images were obtained. There are no prior studies for direct comparison.

FINDINGS: The left disc is anteriorly dislocation and the right disc is anteriorly dislocated on the closed mouth images. With opening, there is recapture on the left but no recapture on the right. Limited anterior excursion is noted with opening. No evidence of fracture or stress fracture is seen. A small amount of fluid is present around both discs but no inflammatory pannus formation in the condylar fossa region. No significant subchondral degenerative changes are seen in the condyles at this time. On the coronal images, the disc material is laterally positioned bilaterally.

IMPRESSION: Findings are consistent with Piper Stage 4A-L on the left and Piper Stage 4B-L on the right.

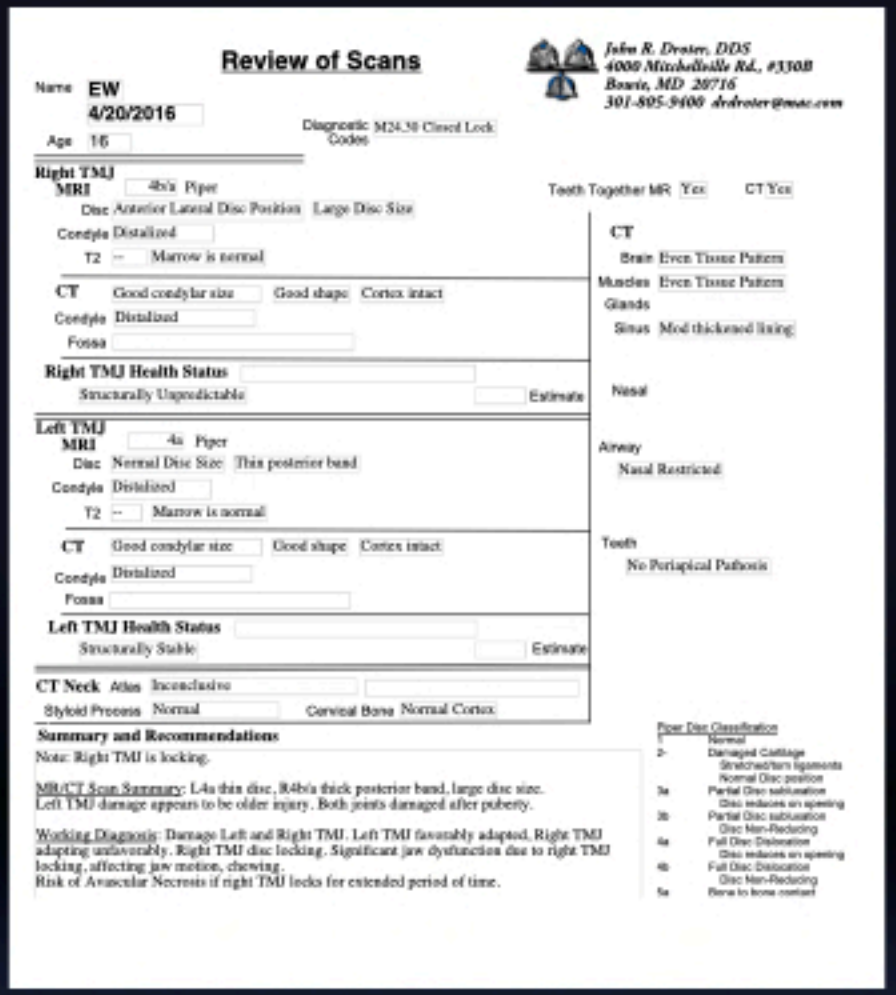
Thank you for referring your patient to our center.

Age 16

My CBCT and MRI Interpretation

Right and Left condyles Good size and shape
Right and Left condyles Distalized

Right Piper 4b/a Anterior Lateral
Left Piper 4a Anterior Lateral
Bone Marrow is normal



Review of Scans

John R. Droter, DDS
4000 Mitchellville Rd., #3308
Bowie, MD 20716
301-805-9400 drdroter@mac.com

Name EW
4/20/2016
Age 16
Diagnostic Codes M24.50 Closed Lock

Right TMJ MRI 4b/a Piper
Disc Anterior Lateral Disc Position Large Disc Size
Condyle Distalized
T2 -- Marrow is normal

CT Good condylar size Good shape Cortex intact
Condyle Distalized
Fossa

Right TMJ Health Status
Structurally Unpredictable Estimate

Left TMJ MRI 4a Piper
Disc Normal Disc Size Thin posterior band
Condyle Distalized
T2 -- Marrow is normal

CT Good condylar size Good shape Cortex intact
Condyle Distalized
Fossa

Left TMJ Health Status
Structurally Stable Estimate

CT Neck Atlas Inconclusive
Styloid Process Normal Cervical Bone Normal Cortex

Teeth Together MR Yes CT Yes

CT
Brain Even Tissue Pattern
Muscles Even Tissue Pattern
Glands
Sinus Mod thickened lining
Nasal
Airway
Nasal Restricted
Teeth
No Periapical Pathosis

Summary and Recommendations
Note: Right TMJ is locking.

MR/CT Scan Summary: L4a thin disc, R4b/a thick posterior band, large disc size.
Left TMJ damage appears to be older injury. Both joints damaged after puberty.

Working Diagnosis: Damage Left and Right TMJ. Left TMJ favorably adapted, Right TMJ adapting unfavorably. Right TMJ disc locking. Significant jaw dysfunction due to right TMJ locking, affecting jaw motion, chewing.
Risk of Avascular Necrosis if right TMJ locks for extended period of time.

Piper Disc Classification
1 Normal
2- Damaged Cartilage
Stretched/torn ligaments
Normal Disc position
3a Partial Disc subluxation
Disc reduces on opening
3b Partial Disc subluxation
Disc Non-Reducing
4a Full Disc Dislocation
Disc reduces on opening
4b Full Disc Dislocation
Disc Non-Reducing
5a Bone to bone contact

Group Discussions:

Could anything have been done at age 13:
Jaw clicking on waking?

What are the options now at age 16:
Jaw locking daily, jaw pain, difficulty chewing at age 16?

John R. Droter, DDS
drdroter@mac.com
301-805-9400

The Click

John R Droter DDS
Annapolis, Maryland

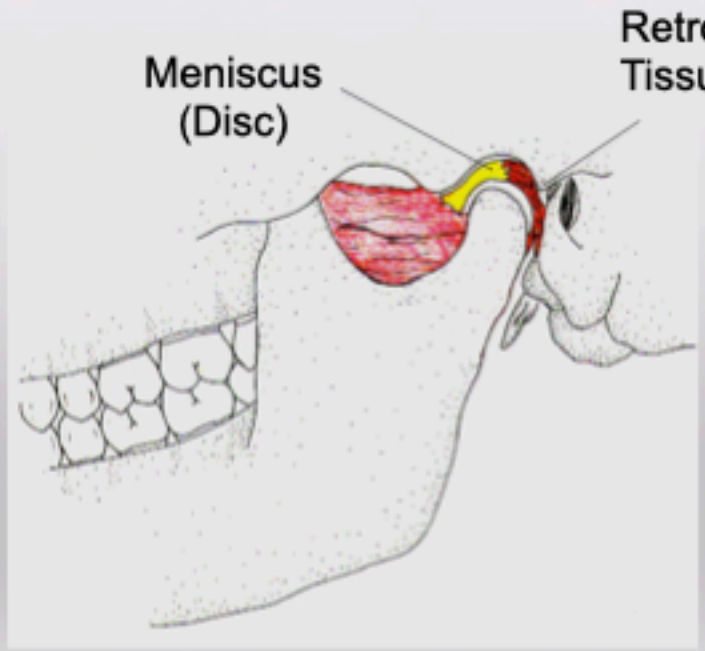
Rotate
Slide
Pivot

Solid end point closing
Ligamentous end point opening

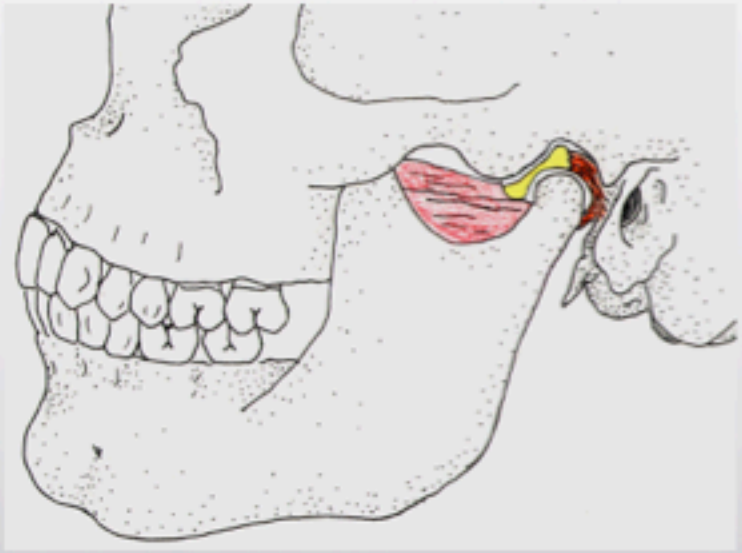
A joint joins two bones that allows movement between the two bones

TMJ has 2 Joint Compartments:

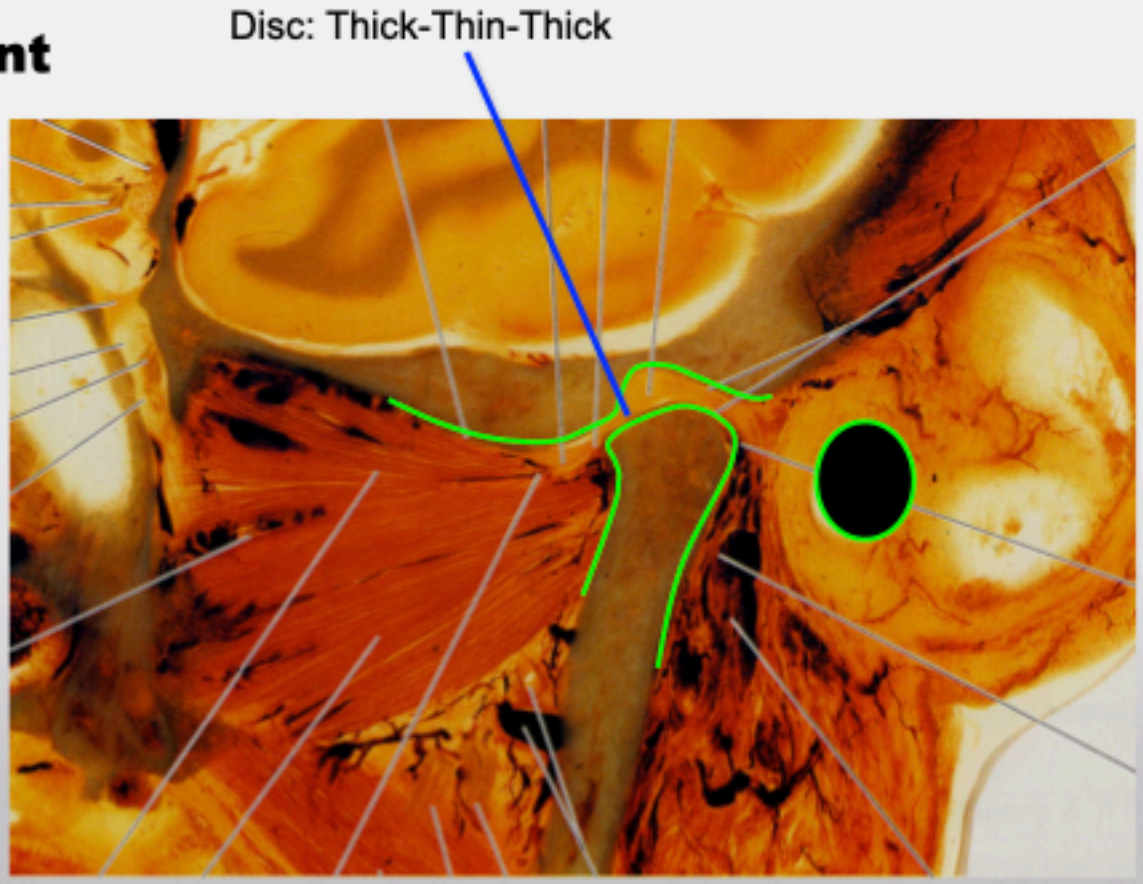
Upper- Translation
Lower- Rotation



The Temporomandibular Joint



Ear
Sideways “S” Fossa
Condyle
Disc- Thick Thin Thick



Oblique Sagittal View
Romrell, Mahan

Normal TMJ

Discal Ligaments attach Disc to Condyle

Synovial Tissue
- Covers Front , Back and Sides
- Collapsed due to negative joint pressure

Disc viewed from above

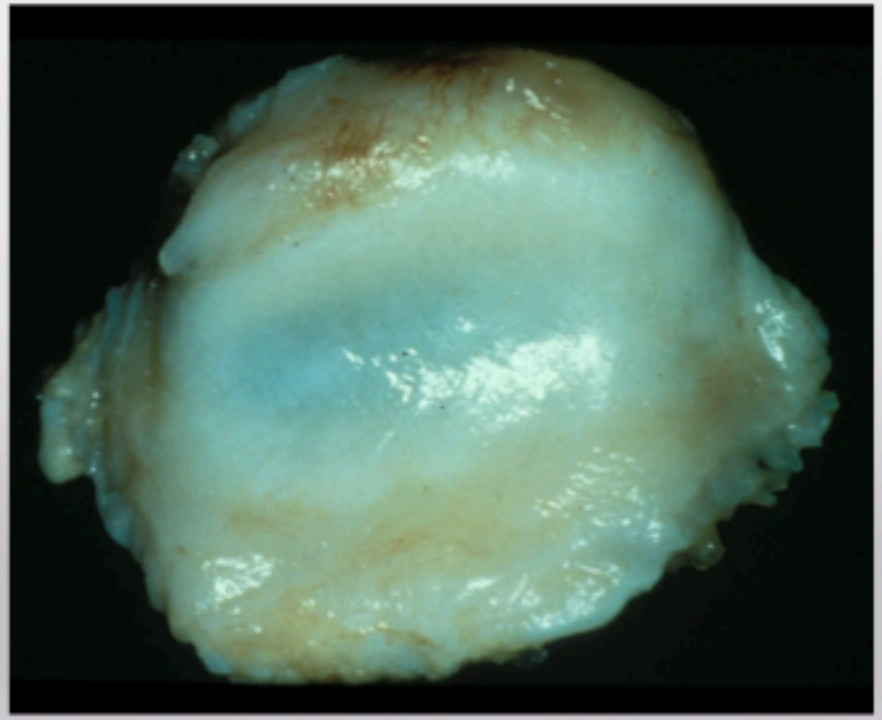
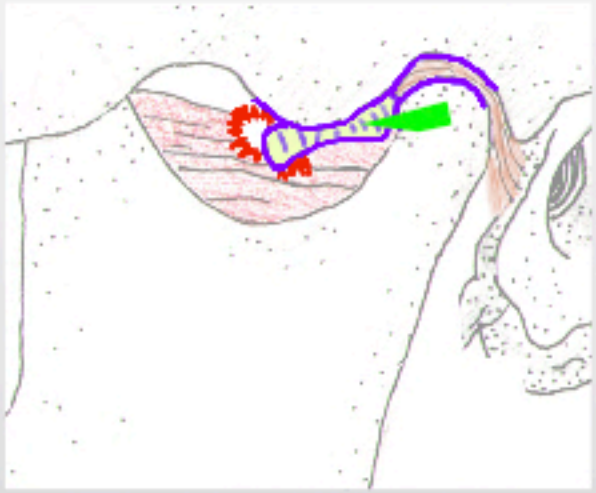


Photo Courtesy of Dr Henry Gremillion

Damaged TMJ- Anteriorly Dislocated Disc



Torn or stretched Meniscal ligaments

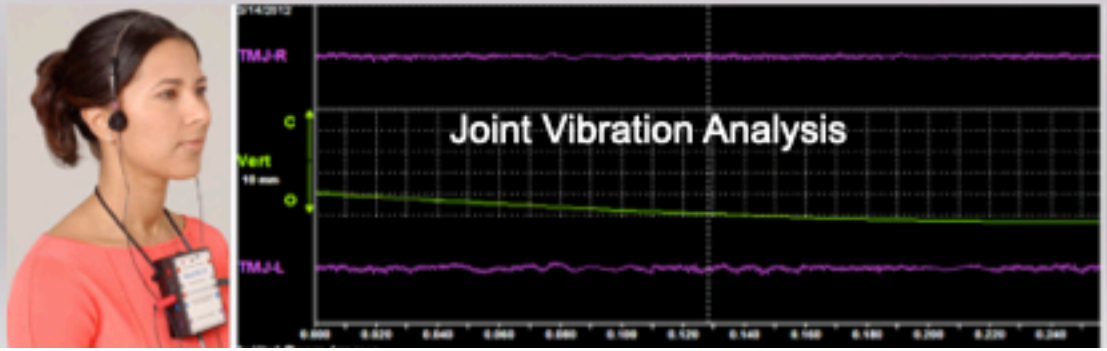
Anterior Dislocated Disc

Damaged Synovium

Retrodiscal Tissue pulled up and over the condyle
- Retrodiscal tissue in direct contact with fibrocartilage
- Major Increase in friction
- Retrodiscal tissue adapts into fibrous “pseudodisc”

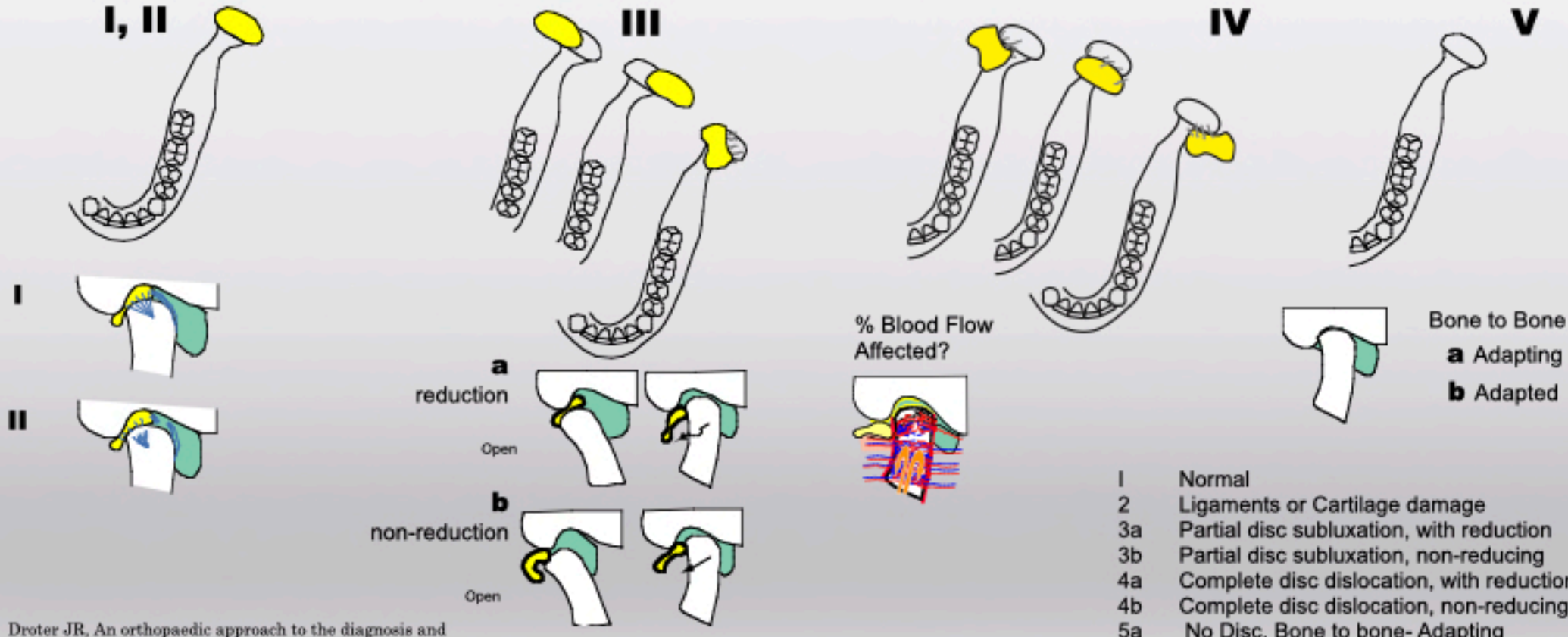
85% of all damaged joints adapt favorably without treatment

Cartilage sliding on tissue creates vibrations that can be detected



Dr. Mark Piper's Classification

Left TMJ



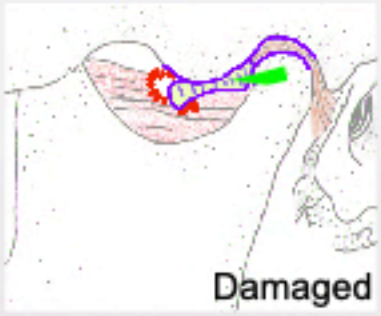
I	Normal
2	Ligaments or Cartilage damage
3a	Partial disc subluxation, with reduction
3b	Partial disc subluxation, non-reducing
4a	Complete disc dislocation, with reduction
4b	Complete disc dislocation, non-reducing
5a	No Disc, Bone to bone- Adapting
5b	No Disc, Bone to bone- Adapted

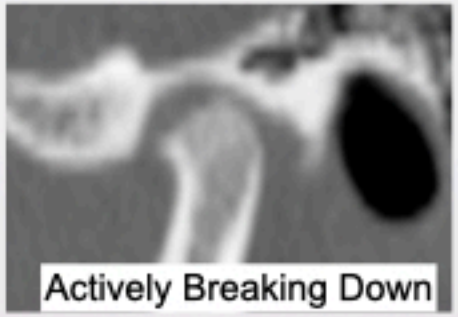
Droter JR, An orthopaedic approach to the diagnosis and treatment of disorders of the temporomandibular joint. Dent Today 2005 Nov;24(11):82, 84-8

Basic Orthopedics

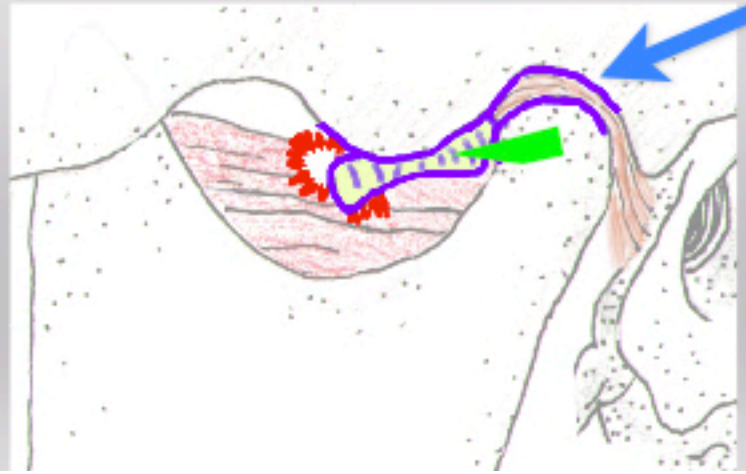
Joints are either
- Healthy or
- Damaged

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

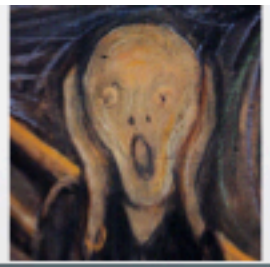
Pseudo-disc

Tissue Fibrosis

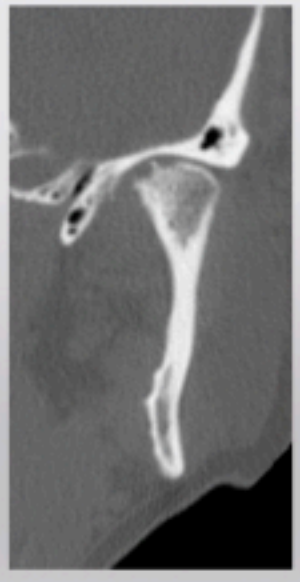
Symptoms of Temporomandibular Joint Osteoarthrosis and Internal Derangement 30 years after Non-Surgical Treatment.

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



Damaged TMJs



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

→ Occlusal Muscle Dysfunction
Osteoarthritis
Mechanically Dysfunctional

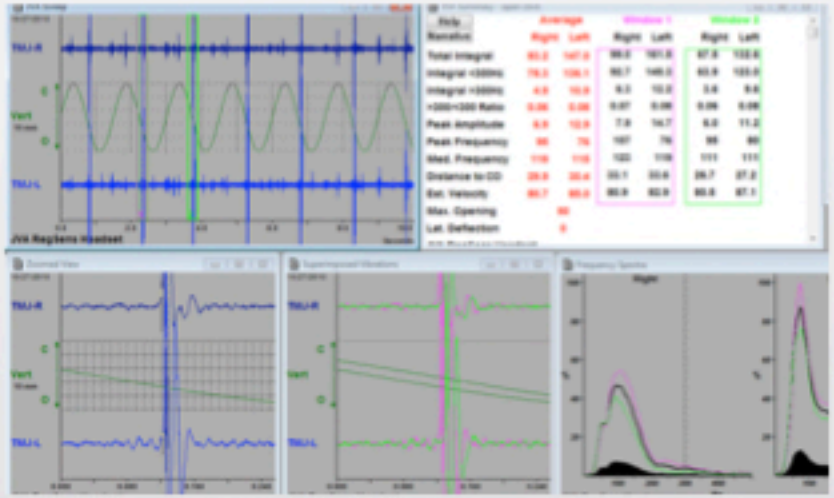
→ Avascular Necrosis

Progressive Condylar Resorption

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

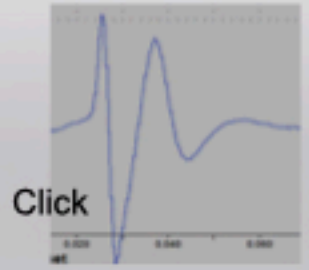
Joint Vibration Analysis

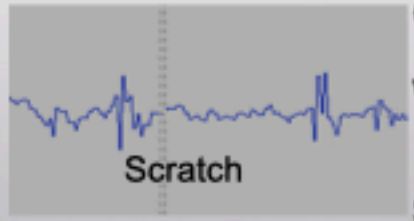
Objectively measures and quantifies joint vibrations during motion which is an indication of cartilage health

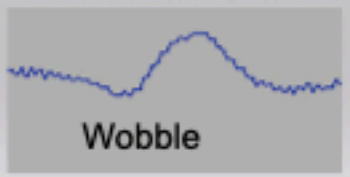


Based on Sonar.
It is not a microphone

Three main types of sounds





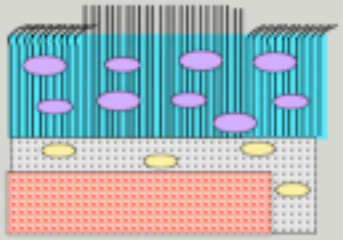


Click
- Disc Reduction

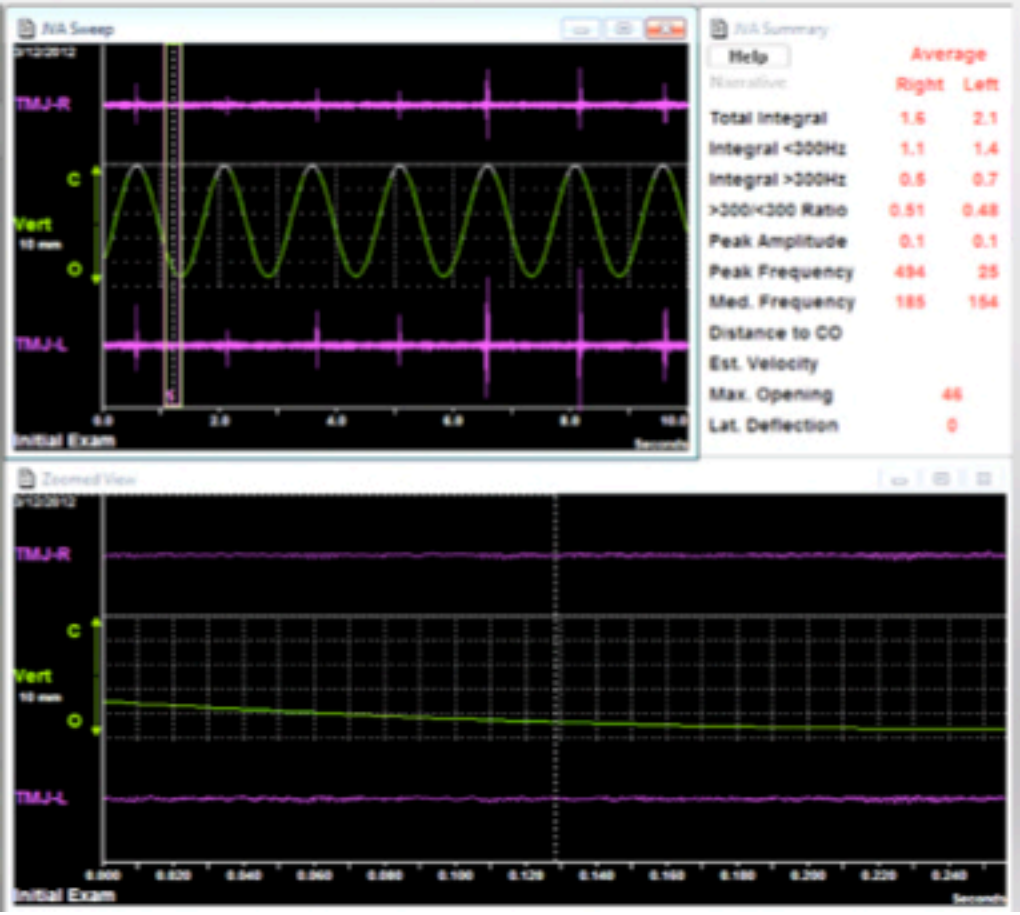
Wobble
- Disc subluxation
- Joint subluxation

Scratch
- Oseoarthritis
- Tissue against cartilage (Piper 4b)
- Rough cartilage- clenching

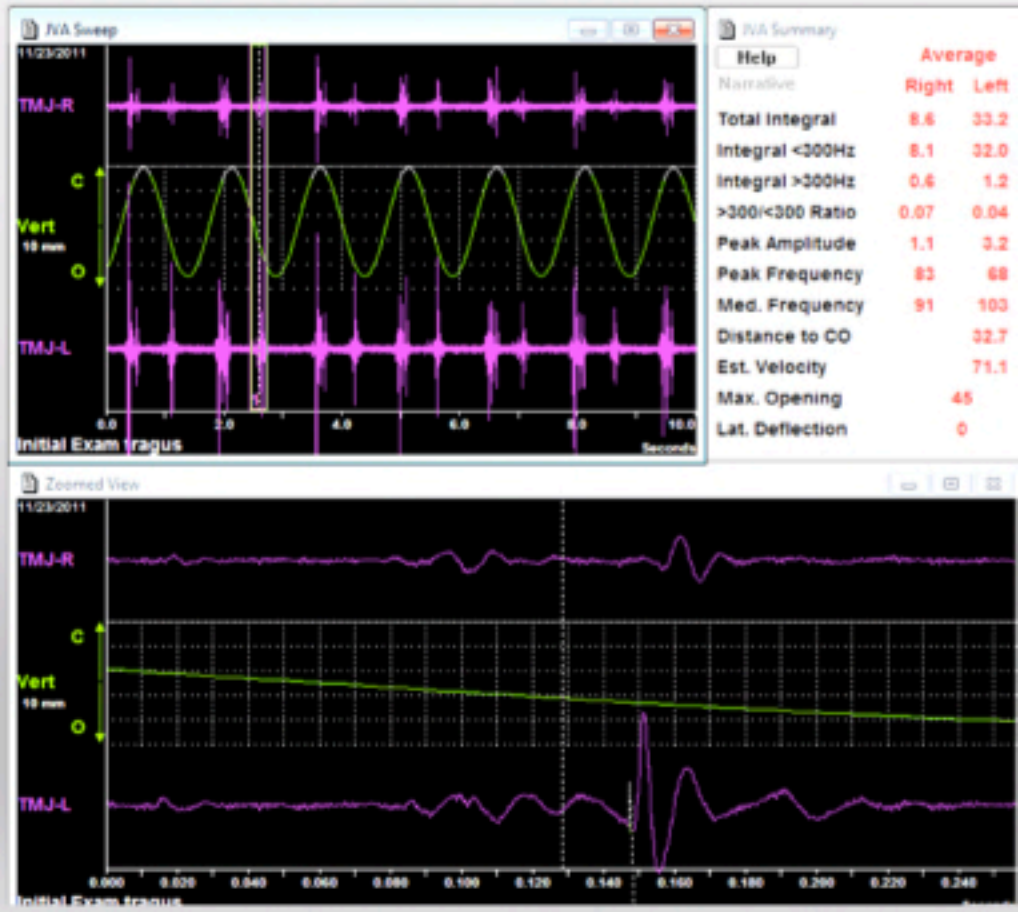
JVA measures the health of the cartilage



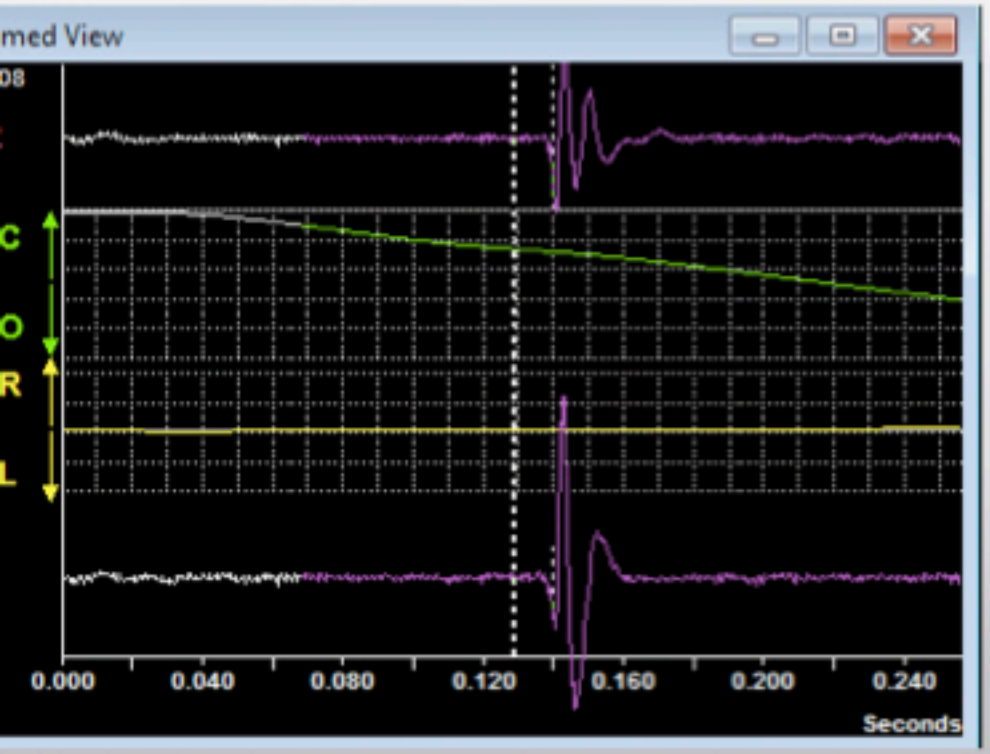
Healthy or Damaged?

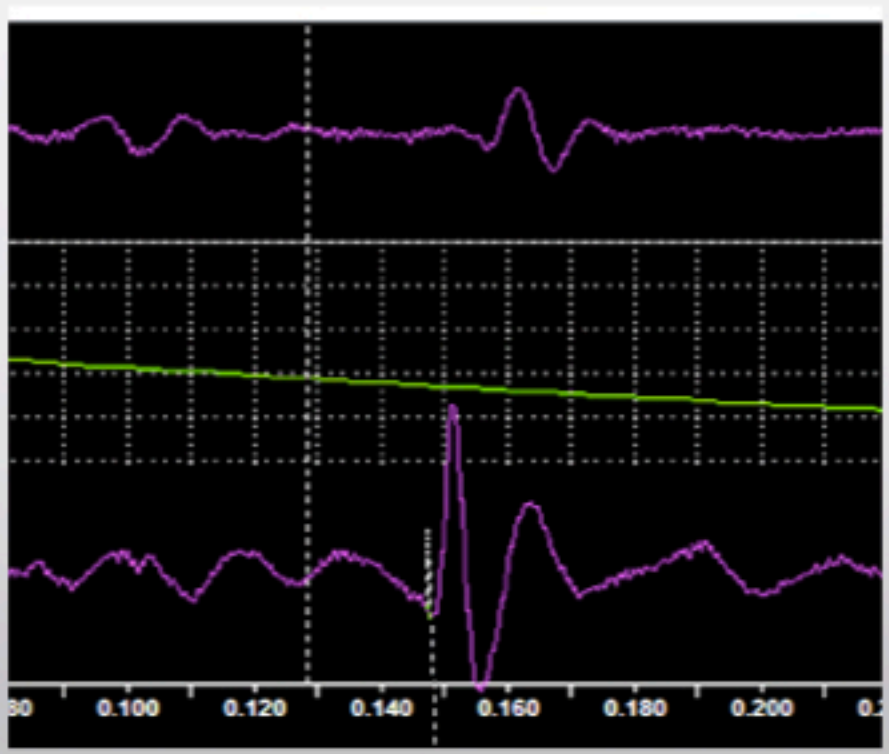


Healthy or Damaged?



Simple or Complex



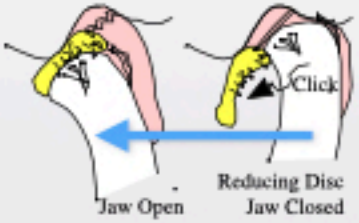


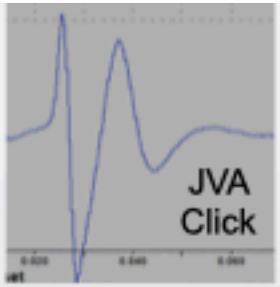
Simple left click with transference vibration to right
L4a

Complex Click
L3a, R4b

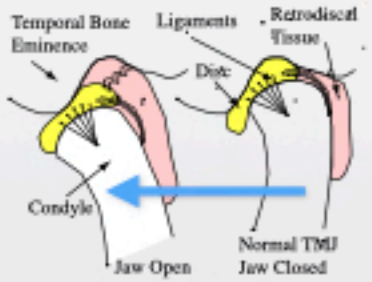
Differential Diagnosis of TMJ Clicking

Disc Reduction





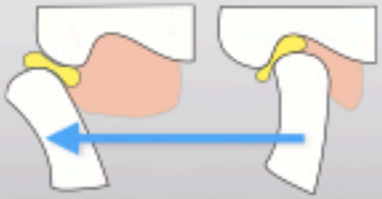
Normal



Adhesive Click

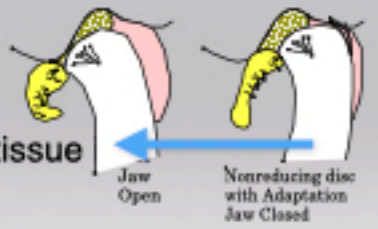
"Sticky Disc" - Disc sticks after prolonged clenching, then releases

Eminence Thud



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

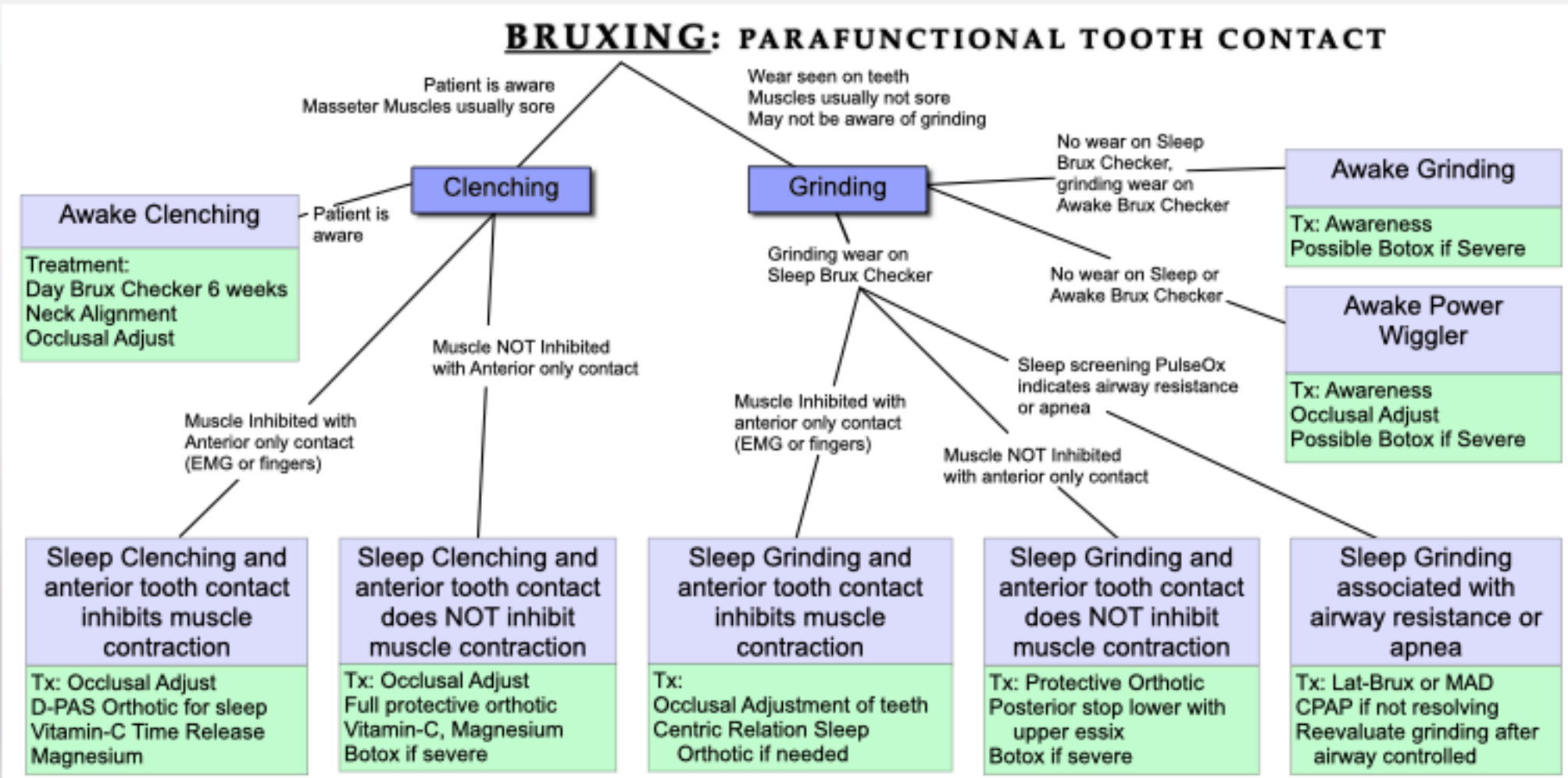
Adhesion Crackle



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

3a Condyle Distalized, Disc is in proper location, Lateral pole click on translation

BRUXING: PARAFUNCTIONAL TOOTH CONTACT



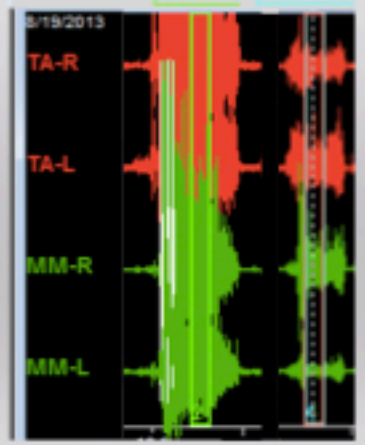
3. Are the TMJ muscles inhibited from full contraction with anterior only tooth contact?

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

Diagnostic
Palatal Anterior Stop
Orthotic

Patient with muscles
inhibited by anterior only contact

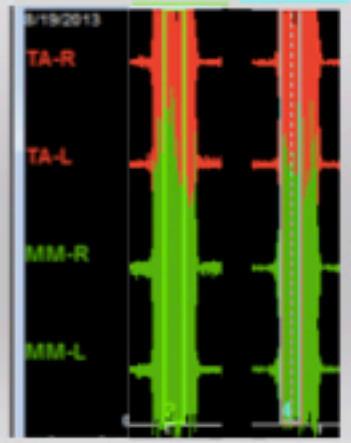
	Clench MaxIC	Anterior Stop D-PAS
	µV	µV
TA-R	100.6	15.7
TA-L	108.9	25.3
MM-R	115.4	25.5
MM-L	70.5	6.8



Major decrease in muscle power with D-PAS

Another Patient with muscles NOT
inhibited by anterior only contact

	Clench MaxIC	Anterior Stop D-PAS
	µV	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

Choosing the Correct Night Guard

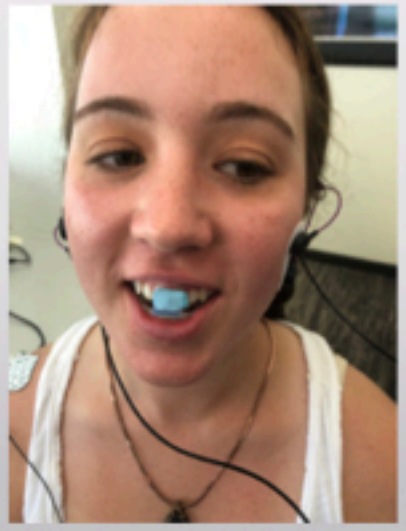
www.APSleep.com

APS
ArrowPath Sleep

M-Scan EMG
Electromyography

Clench back teeth

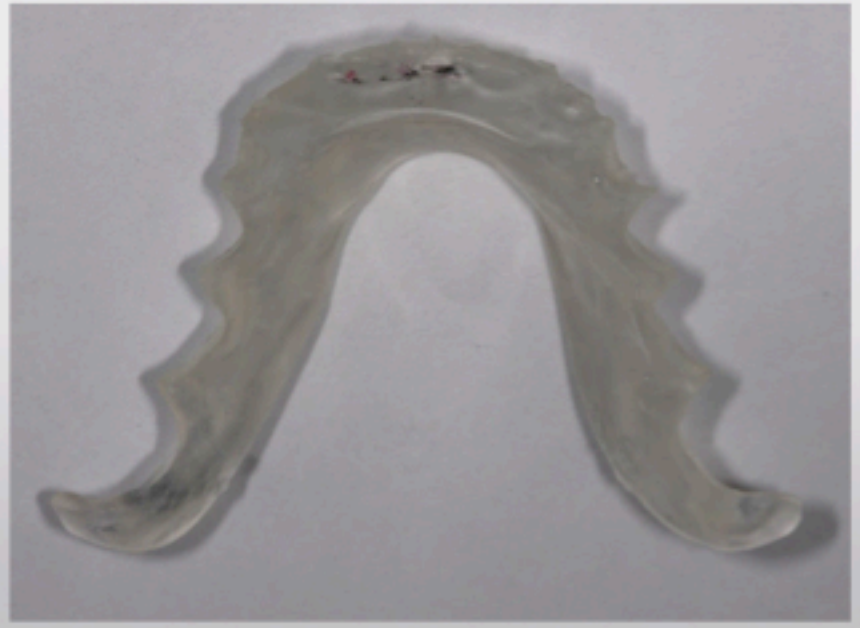
Clench
anterior stop

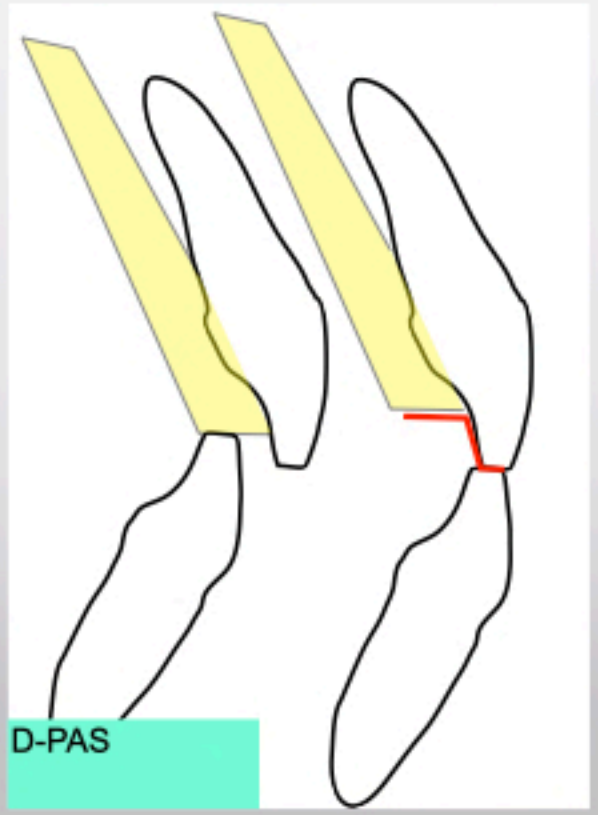


Can place moderate force on front teeth

<u>Clench</u>
Back teeth +250 µv
Front teeth +121 µv

Diagnostic Palatal Anterior Stop
D-PAS





Basically an upper Hawley with anterior stop without clasps or wire

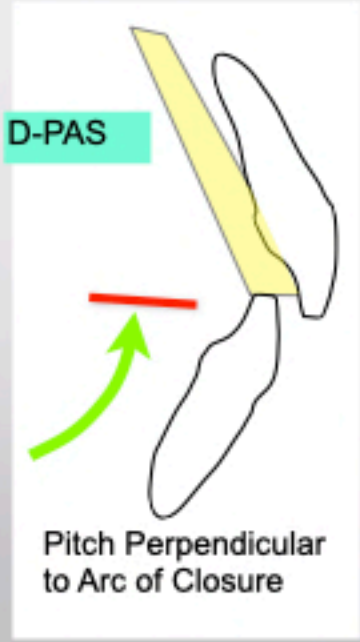
Diagnostic Palatal Anterior Stop

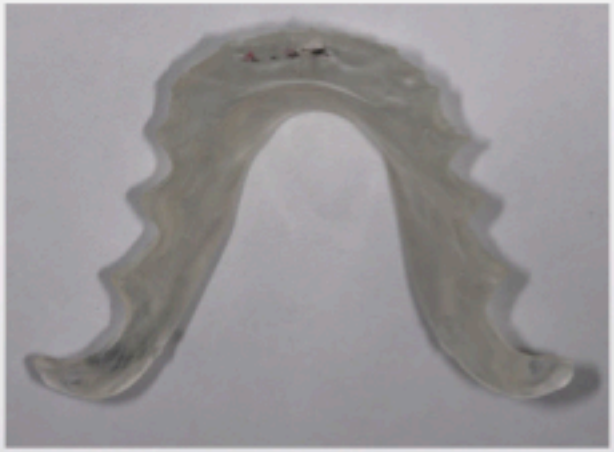
D-PAS Test: Wear 2 weeks for sleep, and occasional daytime

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



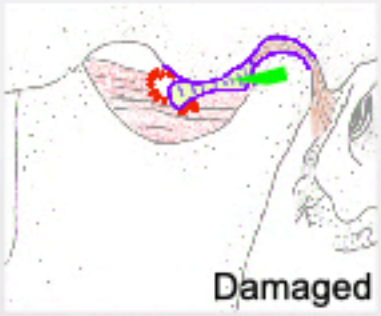


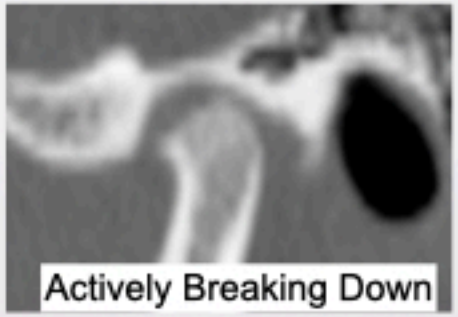
Stapelmann H, Türp JC. The NTI-tss device for the therapy of bruxism, temporomandibular disorders, and headache…..BMC Oral Health. 2008 Jul PMID: 18662411

Basic Orthopedics

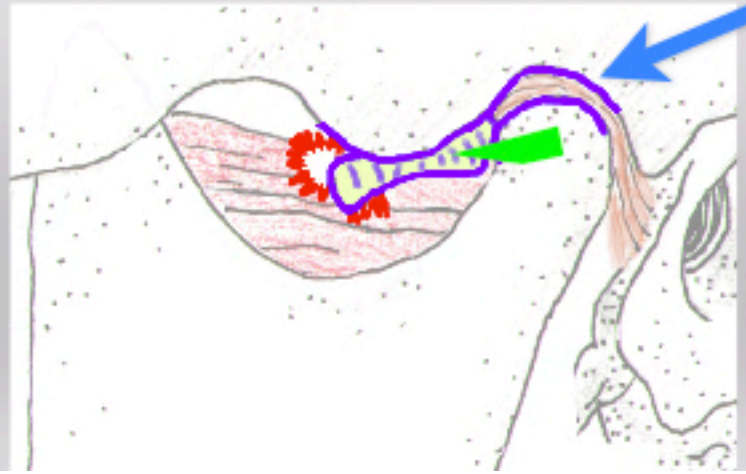
Joints are either
- Healthy or
- Damaged

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

Ms EW
Treatment

John R Droter DDS
Annapolis, Maryland

Age 13: Jaw clicking on waking

Answer these 4 Questions

1. What kind of click did she have?
   - Disc Reduction
   - Adhesive Click “Sticky Disc”
   - Eminence Thud
   - Adhesion Crackle

2. Were the Joints:
   - Healthy or
   - Damaged

3. Were the Joints:
   - Actively Breaking Down
   - Adapting
   - Adapted

4. What damaging parafunction should have been managed/ treated?