WHY AND WHEN SPLINT AND OCCLUSAL THERAPY WORKS

CORYDON PALMER DENTAL SOCIETY
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Warren F. Jesek DDS, MAGD

- Graduated Loyola University in 1979.
- AGD member for 36 years.
- Private Practice in Decatur Illinois 36 years.
- Pankey Institute Alumni and was a teaching assistant for the TMJ dissection course.
- Had my own mouth restored in 1992.
- Have had an in house crown and bridge lab for 25 years.
- AGD Pace Certified Provider as Jesek Seminars.

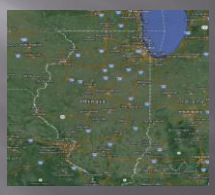
THE THINGS THAT WE HAVE IN COMMON FAR OUTNUMBER AND OUTWEIGH THOSE THAT DIVIDE US.

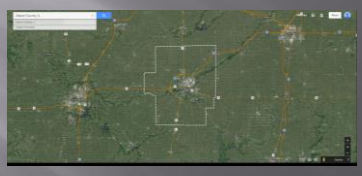
Walt Disney

Conflict of Interest Statement

The products that I discuss are the ones that I have chosen to use. I have no interest or financial gain in their companies.

Where I'm from





Course Description

- This course will give the attendees an introduction to the role of dental occlusion in pain in the head and neck area. Participants will leave with the ability to determine if dental therapy will help their pain patients and be taught the history taking and examination guidelines for differentiation.

Literature Support

- I can support my methods with current and historical literature and have more than 400 articles on file in my office.
- I maintain a literature library in my office.
- I will email you a 24 page bibliography if you so desire it.

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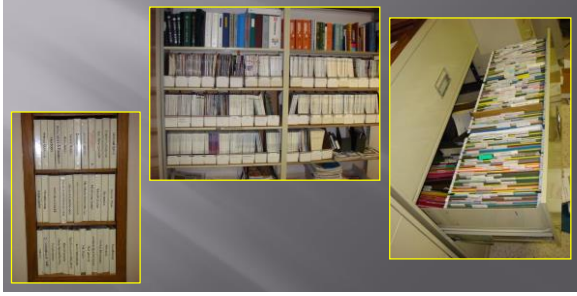
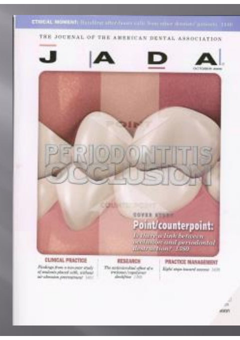


The products used are those preferred by Dr. Jesek. He receives no support from any of these manufacturers. There are other products available that are similar.

Dentistry's "Hippocratic" Oath

My primary responsibility is to my patients, and I shall dedicate myself to render, to the best of my ability, the highest standard of oral health care…therefore, let all come to me safe in the knowledge that their total health and well-being are my first considerations.

The Dentist's Pledge, as adopted by the American Dental Association



Orofacial pain and occlusion: Is there a link? An overview of current concepts and the clinical implications

For 35 years I have studied the textbooks written by the masters and reviewed the literature on all sides of the argument. The techniques that I will share with you did not originate with me.

I am going to declare a summary judgment for the case that supports the use of splints, equilibration and other irreversible treatments for the resolution of temporomandibular disorders that are causally related to occlusomuscle disorders.

I searched the literature published in the five years prior to publishing this article in the AES Contact with the criterion of Occlusal splints, Occlusal Equilibration and TMJ. The result was 42 articles. From these, I selected various quotes to share that reflect the current controversies facing occlusal splints and occlusal adjustments

All Splints and Occlusal TMD Treatments are Not Created Equal:

We Need to Raise the Standard

Many of us are well meaning and caring clinicians, who have found, studied and implemented treatment protocols that provide our patients with comfortable muscles of mastication and occlusions that support over all long lasting results. We need to continue to pursue occlusal excellence and find consensus among those of us that know that occlusion and TMD are causally linked.

"The paradigmatic shift to evidence-based dentistry (EBD) that relates to occlusal therapy, selective occlusal adjustment (OA) and stabilization splints therapy (SS) for TMDs has had an unfavorable impact on the teaching of many of the important aspects of occlusion needed in dental practice. The teaching of OA systematically in dental schools has been nearly abandoned because of the belief that OA is an irreversible procedure and gives the impression that it is without merit elsewhere in the management of occlusion." (1)

1. Ash MM Jr., Occlusion, TMDs, and dental education. Head Face Med. 2007 Jan 3;3:1. Review.

The doubters of occlusal therapy seem to find some sense of nobility in saying nothing works and suggest we should neglect the principles of good dentistry. The ignorance of what a well designed and adjusted appliance and occlusion is a travesty.

"A hundred times a day, I remind myself that my life depends on the labors of other men, living and dead, and that I must exert myself in order to give, in the measure as I have received, and am still receiving."

Albert Einstein

"In dentistry, you have no competitors, only colleagues."

- Dr. L.D. Pankey

I feel that people who say occlusal therapy is ineffective would not recognize a good splint if they saw it. Splints in their hands are ineffective because they are not properly designed or adjusted to a proper level of precision.

- Jesek

Henry Tanner taught that one of the main values of using a splint was to confirm that there was a direct connection between the signs and symptoms that the patient was experiencing due to occlusal disharmony.

If after a complete examination and resulting diagnosis of an occlusomuscle disorder a splint does not significantly reduce or eliminate the signs and symptoms, the splint is not adjusted properly and more preciseness is necessary or more time is needed for the mandible to reposition.

The splint and occlusal therapy naysayers have been so successful in confusing the dental and medical profession that dentists fear that splints and occlusal therapy are almost malpractice.

It seems like dentistry does not want to accept any direct causal relationship of TMD and occlusion. If it was accepted that occlusal correction or proper occlusion relieved TMD signs and symptoms, then poor occlusal treatment outcomes from orthodontics, operative and restorative procedures would cause TMD symptoms such as headaches and pain.

I feel that splint therapy gets no respect. Acrylic is haphazardly placed in mouths with the hope something will improve. Most often these inaccurate appliances do not help and some other therapy is proposed and occlusal therapy is wrongly abandoned. The problem may lie in the fact not enough attention is being placed on the condition and heath of the TMJ's as they relate to occlusion. There seems to be no standard of care.

We should not throw away the wisdom and teaching of occlusal therapy of the past preserved in our textbooks and literature written by such dental giants as Nathan Shore, Sig Ramford, Major Ash, L.D. Pankey, Pete Dawson, Peter Neff, Jeff Okeson, Terry Tanaka and so many others. Several private educational centers are doing their best to pass on this knowledge.

The standard of care in my office is to treat the signs and symptoms of occlusomuscle disorders. Many cases can be treated with full mouth equilibration of the natural dentition as taught for over fifty years by the masters that have belonged to the AES. Frequently, I will deliver and adjust an appliance over a three to six month period or until the condyle disc assembly is stable and mandibular migration has stopped. I prescribe 24 hour splint wear.

The occlusion is then adjusted only after a repeatable center of rotation for the condyle is achieved by rehabilitating the condyle disc assembly to a state of health and proper function. This means that my restorative cases, TMD cases and orthodontic referrals are designed and adjusted to have the condyles in centric relation or adapted centric relation in maximum intercuspation. (15)

15. Dawson P Functional Occlusion: From TMJ to Smile Design, Mosby, St. Louis, 2007.

DENTISTRY TODAY MARCH 2016


VIEWPOINT

Splints and Occlusion Get No Respect

OBJECTIVE

Ease **splint therapy** frustration and produce predictable results with...

definitive **diagnosis**,

definitive **treatment planning**,

and

definitive **treatment**.

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TREATMENT PROCESS

Definitive Diagnosis

- *Complete examination using proper diagnostic tools.*
- *Differentiate occlusal muscle problems from other problems.*

Definitive Treatment Planning

- *Classify occlusion*
- *Design mandibular splint*

Definitive Treatment

- *Choose equilibration, orthodontics, restorative, etc.*

THE GOAL OF OCCLUSAL SPLINT THERAPY

REHABILITATE THE TEMPOROMANDIBULAR JOINTS AND MUSCLES OF MASTICATION

SPLINT THERAPY GOALS

- Healthy, fully seated condyles that will allow a repeatable center of rotation for jaw function
  - Elimination or significant reduction of all joint sounds, ie *clicking, popping, grating and crepitus*
  - Rehabilitation of joint condyle assembly from Piper 2's and 3's to 1's
- Healthy muscles of mastication.
  - Your patients should be able to chew gum comfortably, just as they should expect to walk around the mall and not have unjustifiable pain in their leg muscles.

Jasat Seminars

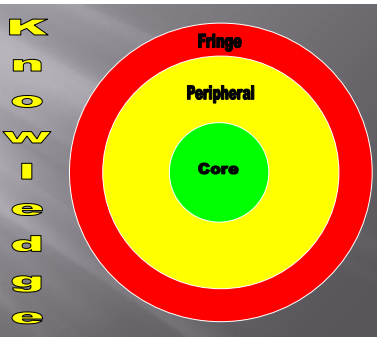
We are trying to keep this from happening.

THE RESULTS OF SPLINT THERAPY SHOULD BE MAXIMUM HEALTH, COMFORT AND FUNCTION OF THE MASTICATORY SYSTEM.

5 STEPS OF THE SPLINT THERAPY PROCESS

1. Complete examination using proper diagnostic tools to ensure proper diagnosis.
2. Differentiate occlusal muscle problems from other problems.
3. Properly design a mandibular splint.
4. Deliver splint with intent to rehabilitate condyle/disk assembly.
5. Definitive treatment.

Jasat Seminars

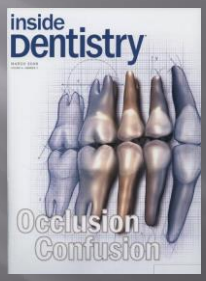


Learning Objective #1

- Attendees will be able to demonstrate to their patients the connection of dental malocclusion and their pain.

"Systematic elimination of occlusal interferences significantly reduces the incidence of requests for treatment for TMD-related symptoms. The result is in line with the common clinical opinion that occlusal factors are causally related to TMD."

Kirveskari P, Jamsa T.
Presented at the American Equilibration Society February 2008



"Interestingly, the literature is replete with assertions that a stable occlusion is a prerequisite for durable dentistry—whether purely restorative or cosmetic in nature. A patient's occlusal scheme has the potential to impact not only the longevity of the restorations that are placed, but also the long-term health of the patient's oral environment when function and soft tissue factors are taken into consideration.

-Allison M. DiMatteo, BA, MPS (2008)
"Pounding on the Occlusion Pulpit" Inside Dentistry 4(3):103-110

"The frequency of headache dropped significantly in patients whose occlusion could be successfully adjusted to stability, except in the classical migraine group."

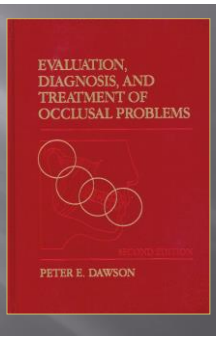
-Pentti Kirveskari (1998)
"Occlusal Risk in Temporomandibular Disorder" Presented at the 11th International Conference for Orthodontists in Munich

"Fourth, there is evidence-based support for the use of occlusal splints and biofeedback in the treatment of TMD."

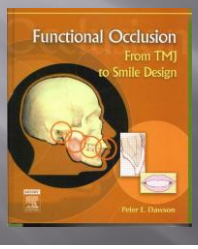
-Donald J. Rinchuse, & Jeffrey T. McMinn (2006)
"Summary of evidence-based systematic reviews of temporomandibular disorders" 130:715-20

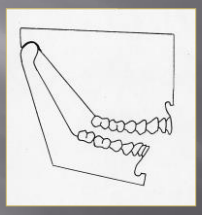
"There can be no doubt that a definite association exists between occlusal interferences and traumatic temporomandibular joint arthritis."

Granger, (1985); Lindblom, (1953); Markowitz and Gerry, (1949); Posselt and Addiego, (1958).

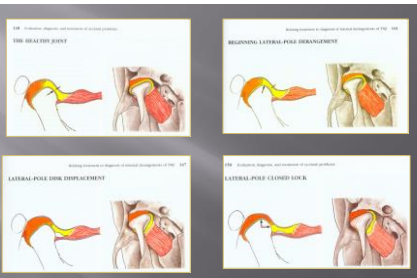


Dawson, Peter. Functional Occlusion-From TMJ to Smile Design. Mosby, Inc: St. Louis, Missouri, 2007.





Peter E Dawson



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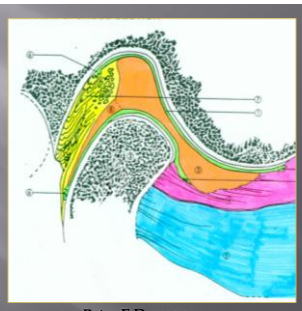

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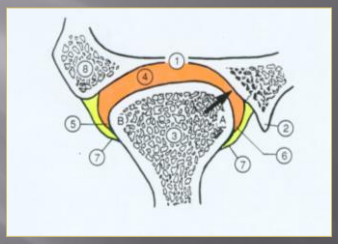

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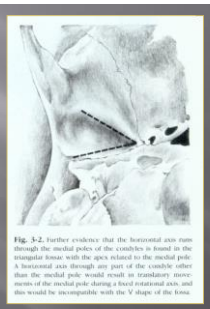


Fig. 3-2. Further evidence that the horizontal axis runs through the medial poles of the condyles is found in the triangular fossae with the apex related to the medial pole. A horizontal axis through any part of the condyle other than the medial pole would result in translatory movements of the medial pole during a fixed rotational axis, and this would be incompatible with the V shape of the fossa.

Peter E Dawson

When you see that splint or occlusal therapy does not work what do you do?

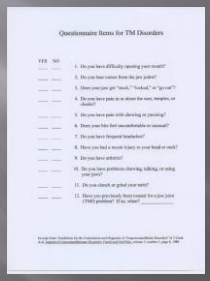
- What do you do when you see a root canal failing?
- What do you do when they have perio pockets everywhere and regular scalings are just not enough?
- What do you do you find a root tip?
- Do you say that dentistry has no answer?
- No you refer it to someone else in the field.

Clues that dentistry is the answer

- Pain on chewing in muscles of mastication
- Pain or difficulty in holding mouth open
- Avoidance of chewy or difficult foods
- Avoidance of chewing gum to pain
- Any TM joint sounds and noises
- Patient knows what side they chew on and they are not avoiding obvious bad or missing teeth
- Wear on anterior or posterior teeth
- Posterior teeth missing in a healthy mouth-----a story like, it hurt, they did a root canal, then a crown – it still hurt– they retreated it---it still hurt– I had it pulled ---- it still hurts over there
- Several root canals on one side and the joints sound awful
- Pain or tenderness over the TMJ's
- History of mouth locking open or closed

Screening Exam

- Pops, clicks, wear, complaints.
- Wear, tooth mobility, sensitive teeth.
- Ask "How many headaches do you have in a month?"
- Give them a questionnaire.


Questionnaire Items for TM Disorders

YES NO

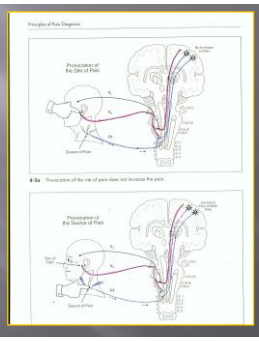
1. Do you have difficulty opening your mouth?
2. Do you hear noises from the jaw joints?
3. Does your jaw get "stuck," "locked," or "give out"?
4. Do you have pain in or about the ears, temples, or cheeks?
5. Do you have pain with chewing or yawning?
6. Does your bite feel uncomfortable or unusual?
7. Do you have frequent headaches?
8. Have you had a recent injury to your head or neck?
9. Do you have arthritis?
10. Do you have problems chewing, talking, or using your jaws?
11. Do you clench or grind your teeth?
12. Have you previously been treated for a jaw joint (TMJ) problem? If so, when? _____

Excerpt from: Guidelines for the Examination and Diagnosis of Temporomandibular Disorders" in T.J.Clark, et al, Journal of Craniomandibular Disorders: Facial and Oral Pain, volume 1, number 1, page 8, 1987.

Why we hate treating TMJ

- Getting paid by insurance is a pain in the butt.
- It takes too much time---I can make money faster doing fillings and crowns.
- Some of these people are nuts.
- No one agrees on how to treat it.

- What do you do when they have 4 splints in a bag?
- What do you know if they say they keep breaking their splints in the back?



Ways to Improve Your Splint Therapy Success

- Mounted models in centric relation not centric occlusion.
- Take the bite at the vertical dimension that you will make the splint.
- Use adjustment protocol that seats the condyles.
- Make sure that you are treating an occlusal muscle disorder.

HERE ARE THREE PRODUCTS TO HELP YOU GET CENTRIC RELATION BITE AND IMPROVE YOUR TREATMENT OF TMD.

Anterior Deprogrammers

"During the routine oral examination, the signs and/or symptoms of occlusal disease must be noted and the patient educated about the need for further diagnosis and treatment."

-Jose-Luis Ruiz, & Thomas A. Coleman (2008)
"Occlusal Disease Management System: The Diagnosis Process" Compendium 148-156

"Better care can be provided to patients if occlusal disease and/or temporomandibular disorders are detected early and properly treated. Treating occlusal disease can lead to a long, healthy life of the dentition as well as to restorative success.

-Jose-Luis Ruiz, & Thomas A. Coleman (2008)
"Occlusal Disease Management System: The Diagnosis Process" Compendium 148-156

A HUGE ROLE

The examining dentist should be able to accurately describe the relationship of the occlusion to the position and condition of the Temporomandibular Joint

"Excellence is to do a common thing in an uncommon way."

- Booker T. Washington

Jesse Seminars

Step 1

COMPLETE EXAMINATION PROCESS

- Complete medical history
- Range and path of motion testing
- Muscle provocations test
- Load testing of TMJ
- Joint auscultation with doppler and stethoscope
- Complete dental exam
- Mounted study casts

Jesse Seminars

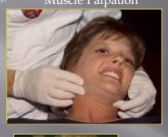
Step 1
Complete Examination

Diagnostic Tools

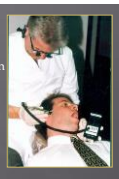
- Medical and dental history
- Muscle exam
- Mounted study models
- Bimanual manipulation
- TM Joint auscultation

Step 1
Complete Examination

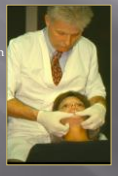
Muscle Palpation



Doppler Auscultation



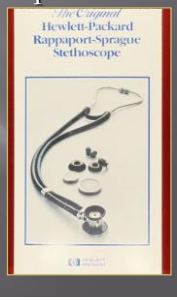
Bimanual Manipulation



Mounted study models

Step 1
Complete Examination

Stethoscope



"To make or not to make a splint? That is the Question!"

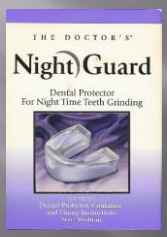
Splints are only effective in treating the problems created by occlusal muscle disorders.

Myth:
"Evidence Based Research is the Only Literature that You Should Believe"

- It is pure non-sense to throw out good historical clinical observations and wisdom.

Dylina, T.J. A common-sense approach to splint therapy. *The Journal of Prosthetic Dentistry*, November 2001. "Sufficient credible literature exists to help provide an understanding of and a treatment protocol for the use of splints for temporomandibular disorders and bruxism problems."

You can buy a night guard at Walmart for $18.95



- It says it is similar to the dental protector recommended by many dentists, only you do the fitting yourself in about 5 minutes.

"Physical Self-Regulation Training for the Management of Temporomandibular Disorders" Carlson, Bertrand and others, *Journal of Orofacial Pain* 2001; 15:47-55

Finally, given the availability of data suggesting that the efficacy of splint therapy could be caused by any one or a combination of factors, including *placebo effect*, spontaneous remission, the natural fluctuations or progression of a condition, and the therapeutic alliance between the provider and the patient, the effectiveness of the PSR protocol for reducing pain severity and improving incisal opening suggests a therapeutic effect beyond that yet obtained with current practice standards.

Weaknesses in Physical Self-Regulation

- Started with 71 in program, 27 dropped out, only 44 entered program
- Only 32 showed up for the 26 week evaluation and 21 of these were taking the same pain medications as at the beginning
- Average duration of pain of the sample was 52.3 months
- Splints only worn at night and only adjusted once

Step 2
Differentiate

SIGNS AND SYMPTOMS of occlusal muscle disorder

Signs are what *we* look for and record

- Tooth wear and mobility
- Tender muscles and trigger points
- Limited range of motion
- Muscle incoordination
- Intracapsular pathology

Symptoms are what the *patient* knows about

- Headache
- Popping / clicking
- Tooth sensitivity
- Ear ache / neck stiffness

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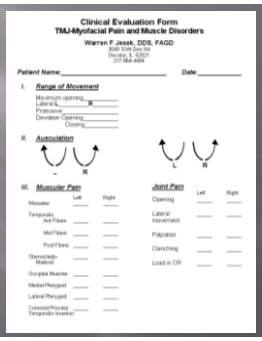
Step 2
Differentiate

We need to quit treating the symptoms of pain only

- Saying ,oh you have pain because you grind or clench your teeth, let's make you a splint, is like saying, oh you want to go somewhere, let's get in a car and go for a ride and see where we wind up.

Why don't we wait until you have some pain before we fix these teeth?



Clinical Evaluation Form
TMJ-Myofacial Pain and Muscle Disorders

Warren F Jasek, DDS, FAGD

Patient Name:_____ Date:_____

I. Range of Movement

Maximum opening_____
Lateral L_____ R_____
Protrusive_____
Deviation Opening_____
Closing_____

II. Auscultation

III. Muscular Pain

	Left	Right
Masseter		
Temporalis Ant Fibers		
Mid Fibers		
Post Fibers		
Sternocleido-Mastoid		
Occipital Muscles		
Medial Pterygoid		
Lateral Pterygoid		
Coronoid Process Temporalis Insertion		

Joint Pain

	Left	Right
Opening		
Lateral movement		
Palpation		
Clenching		
Load in CR		

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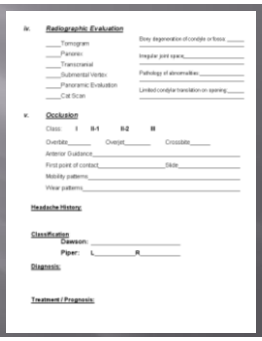

IV. Radiographic Evaluation

_____Tomogram
_____Panorex
_____Transcranial
_____Submental Vertex
_____Panoramic Evaluation
_____Cat Scan

Bony degeneration of condyle or fossa _____
Irregular joint space_____
Pathology of abnormalities_____
Limited condylar translation on opening_____

V. Occlusion

Class: I II-1 II-2 III

Overbite_____ Overjet_____ Crossbite_____
Anterior Guidance_____
First point of contact_____ Slide_____
Mobility patterns_____
Wear patterns_____

Headache History:

Classification
Dawson: _____
Piper: L_____ R_____

Diagnosis:

Treatment / Prognosis:

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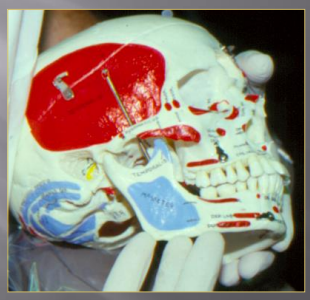
MUSCLE PALPATION

97

Muscles of Mastication: Basic Anatomy Review

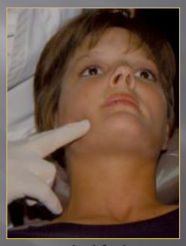
- Masseter
- Temporalis
- Medial pterygoid
- Lateral pterygoid

Step 2
Differentiate



Jesse Seminars

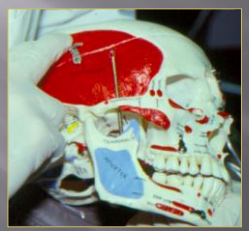
Masseter-insertion

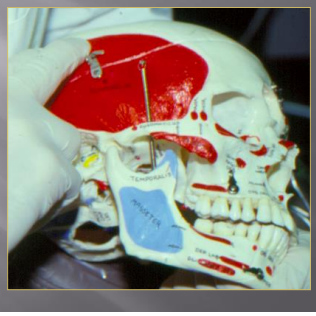


Jesse Seminars

Masseter-origin

Temporalis

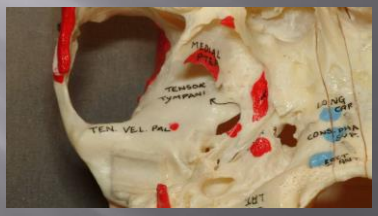




Insertion of temporalis and lateral pterygoid muscles

Medial Pterygoid

Medial Pterygoid



Tensor Veli Palatini, Laterial Pterygoid, Tensor Tympani

"Simultaneously, the volume of venous plexus observed between the medial pterygoid muscle and tensor veli palatine muscle was increased.

-Oshima T, et. Al. (2007)
"Involvement of Pterygoid Venous Plexus in Patulous Eustachian Tube Symptoms" Acta Otolaryngology 127(7): 693-9.

"Stuffiness of the ear may be a symptom of medial pterygoid TPs. In order for the tensor veli palatini muscle to dialate the Eustachian tube, it must push the adjacent medial pterygoid muscle and fascia aside; in a resting state, the presence of the medial pyterygoid helps keep the Eustachian tube closed. Tense myofacial TP bands in the medial pterygoid mucsle may block the opening action of the tensor veli palatini on the Eustachian tube producing ear stuffiness."

"Myofascial Pain and Dysfunction", TheTrigger Point Manual, Janet G.Travel, MD and David G. Simopns, MD.

Range of motion and palpation

Stethoscope


Palpation

- Where?
- How hard do you press?

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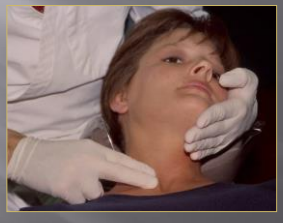
Masticatory System Function

- Harmony versus disharmony
  - Occlusomuscle disorder

Trigger Points

- Jump sign
- "Myofascial Pain and Dysfunction", The Trigger Point Manual, Janet G.Travel, MD and David G. Simopns, MD.

Sternocleidomastoid



Why we use Bimanual Guidance

- It is the most accurate method to position the mandible in centric relation
- It achieves the most physiologic position for the condyle-disc assembly.
- It provides a method of verification of:
  - The correctness of the position
  - The alignment of the condyle-disc assembly
  - The integrity of the articular surfaces
  - It is fast and uncomplicated if manipulation is done correctly.

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"The Concept of Complete Dentistry" Pete Dawson

- "The correctness of the occlusal relationship is dependent on the correctness of condyle positioning when the occlusion is corrected."

125

- The dentist can diagnose the health and condition of the TMJ's as related to the maximum intercuspation of the teeth before beginning any treatment.

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"MUSCLE IS ALWAYS INVOLVED WHEN THERE IS A DISHARMONY BETWEEN THE TEETH AND THE CONDYLES."

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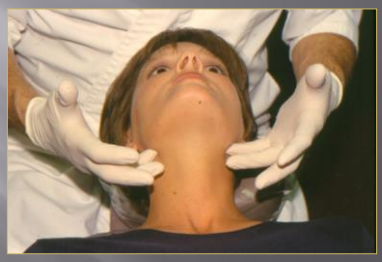

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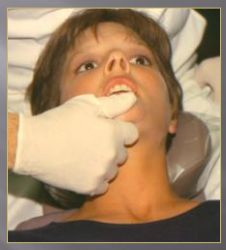

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Bimanual Guidance Support Articles

Comparing condylar positions achieved through bimanual manipulation to condylar positions achieved through masticatory muscle contraction against an anterior deprogrammer: a pilot study.
Authors: McKee JR
http://www.ncbi.nlm.nih.gov/pubmed/16198178

Comparing condylar position repeatability for standardized versus nonstandardized methods of achieving centric relation.
Authors: McKee JR.
http://www.ncbi.nlm.nih.gov/pubmed?term=(James%20R.%20Makee%5BAuthor%5D)%20AND%20Comparing%20condylar%20position%20repeatability%20for%20standarized%20versus%20nonstandaradized%20mehtods%20of%20achieving%20centric%20relation%5BTitle%5D

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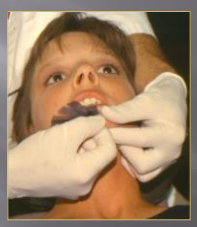

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Learning Objective #2

- Participants will be able to diagnose occluso-muscle problems that a dentist can best treat.

Learning Objective #3

- Pain practitioners will leave with the ability to judge which dental referrals will benefit their patients the most.

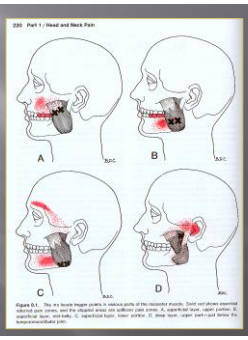
Learning Objective #4

- Participants will be able to identify adequate from inadequate dental therapy.

Soft Splints like this are of no use for treating head and neck pain. Their only use should be as athletic mouth guards.

Step 2
Differentiate

Janet Travel
Trigger points



Step 2
Differentiate

Classify the Occlusion

- Dawson 1,1a,2a, etc.
- Dawson, P. A classification system for occlusions that relates maximum intercuspation to the position and condition of the temporomandibular joints. *The Journal of Prosthetic Dentistry.* 1996

Step 2
Differentiate

Classification of occlusions as they relate to maximum intercuspation of the occlusion and the position and condition of the Temporomandibular Joints

Step 2
Differentiate

Dawson Types

- Type I - Maximum intercuspation occurs in harmony with a verifiable centric relation
- Type IA - Maximum intercuspation occurs in harmony with an adapted centric relation
- Type II - Condyles must displace from a verified centric relation for maximal intercuspation to occur
- Type IIA - Condyles must displace from adapted centric posture for maximum intercuspation to occur
- Type III - Centric relation or adapted centric posture cannot be verified
- Type IV - The occlusal relationship is in a state of progressive disorder because of pathologically unstable and actively progressive deformation of the TMJ's

Step 2
Differentiate

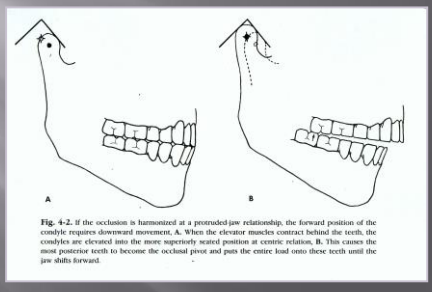


Fig. 4-2. If the occlusion is harmonized at a protruded jaw relationship, the forward position of the condyle requires downward movement, **A**. When the elevator muscles contract behind the teeth, the condyles are elevated into the more superiorly seated position at centric relation, **B**. This causes the most posterior teeth to become the occlusal pivot and puts the entire load onto these teeth until the jaw shifts forward.

The goal of any occlusal therapy or restoration should be to rehabilitate your Dawson 2's and 3's to Dawson 1's;
in other words,
to make **CO** equal **CRO**.

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Step 2
Differentiate

Piper's Classification of TMJ Pathology

- Stage I - Normal TMJ. All intracapsular structures intact
- Stage II - Intermittent click
- Stage III A - Lateral pole click
- Stage III B - Lateral pole displacement with lock
- Stage IV A - Medial pole click
- Stage IV B - Medial pole lock
- Stage V A - Perforation with acute Degenerative Joint Disease (DJD)
- Stage V B - Perforation with chronic Degenerative Joint Disease (DJD)

Step 2
Differentiate

The difference between success and failure is....
Knowing the health and condition of the TMJ's as related to the maximum intercuspation of the teeth before beginning any treatment.

Jesuit Seminars

Splint therapy is just part of definitive treatment

Okeson, et.al. (Kemper and Moody)

- *J. Prosthet. Dent.*48:711(1982), found that regardless of whether the symptoms were acute (less than 6 months) or chronic (more than 6 months), patients treated with occlusal splints worn 24 hours a day had significant improvement in observable pain scores and maximum comfortable opening at follow-up.

Beard and Clayton

Journal of Prosthetics, 1980

- Found that the use of splint therapy was therapy, not treatment, because when the splints were removed, the PRI (dysfunction) scores increased.
- Patients who did not wear the splints 24 hours a day had less reduction PRI scores.

Why do splints work and what do you do when they don't?

Step 3 Design

SPLINTS WORK WHEN THEY ARE APPROPRIATELY PRESCRIBED, DESIGNED AND DELIVERED.

The Tanner Mandibular Appliance
Henry Tanner, Continuum, p. 23-34, 1980.
Excellence in Dentistry: Mandibular Repositioning Appliances
Samuel H. Davis, Dental Management, June 1989.

Jesse Seminars

"The Tanner Mandibular Appliance," Henry Tanner, Continuum, p. 23-34, 1980.

- The Tanner Mandibular Appliance is a multipurpose, removable, hard acrylic splint worn over the lower teeth. Its applications as a diagnostic tool include provision of symptomatic pain relief in temporomandibular joint dysfunction; confirmation of the relationship of occlusion to the signs and symptoms; and alleviation of muscle spasm, pain, and neuromuscular disruptions that prevent a patient from arcing in the centric relation pathway of closure.

"Excellence in Dentistry: Mandibular Repositioning Appliances, Sam Davis, *Dental Management*, June, 1989, p. 42-48.

- The MRA is a *passive* type of appliance in that it does not actively hold the mandible in a position with inclines or indentations to recapture a displaced disk, as has been written in the literature. Instead, it is flat planed in all posterior contact areas and thus allows the mandible to reposition to a physiologically stable position as the muscles relax and the disk begins to stabilize in its proper position.

Step 3 Design

Splints that DO NOT SEAT THE CONDYLES OFTEN FAIL.

Step 3
Design

When the splint is not adjusted properly, the condyles are not allowed to seat, resulting in a loss of natural condylar guidance. The splint will track and the patient's muscle pain will not resolve.

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Step 3
Design

When the condyles are seated there is a large slide from CR to CO

Only one tooth contacts the splint when patient is in CR.

Step 3
Design

Segmental Appliance

Step 3
Design

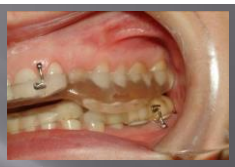
Condyles seated using bimanual manipulation

Step 3
Design

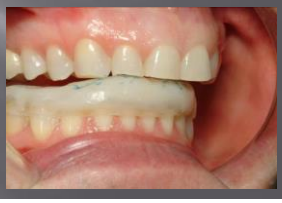
Bite with condyles seated

Myotronic bite with condyles down and out of fossa in a muscle braced postion.

Two splints at a time often fail to seat the condyles.

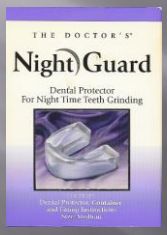


Patient converted to a mandibular centric relation appliance.



Over the counter appliances

You can buy a night guard at Walmart for $18.95



- It says it is similar to the dental protector recommended by many dentists, only you do the fitting yourself in about 5 minutes.

Poor splint design results in an excessive amount of dentistry

SPLINT DESIGN PRINCIPLES

- Cover all the teeth in one arch.
- Equal and simultaneous contact of as many posterior teeth as possible with both condyles seated.
- Immediate disclusion of all posterior teeth in excursive movements.
- Harmonious anterior guidance on the centrals, laterals and cuspids.

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Step 3 Design

1st point of contact with patient in CR is on the crown on # 10

Step 3 Design

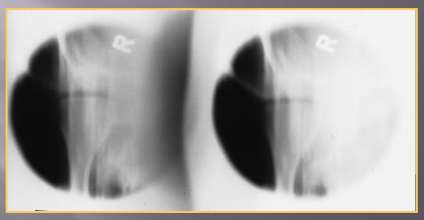
1st point of contact is on # 15

A master in the art of living draws no sharp distinction between his work and his play;
his labor and his leisure; his mind and his body; his education and his recreation.
He hardly knows which is which. He simply pursues his vision of excellence through whatever he is doing and leaves to others to determine whether he is working or playing. To himself, he always appears to be doing both.

Francoise Rene Auguste Chateaubriand

Tomography

Sagittal



Coronal

MAXIMUM INTERCUSPATION
CONDYLES *NOT* SEATED

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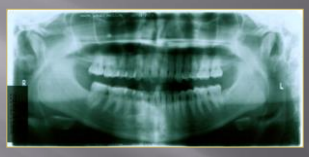

This dentist was drinking her cold drinks through a straw and wanted me to do a root canal on tooth number 11.

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CONDYLES SEATED
USING
BIMANUAL MANIPULATION

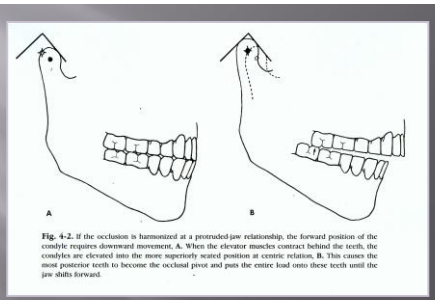
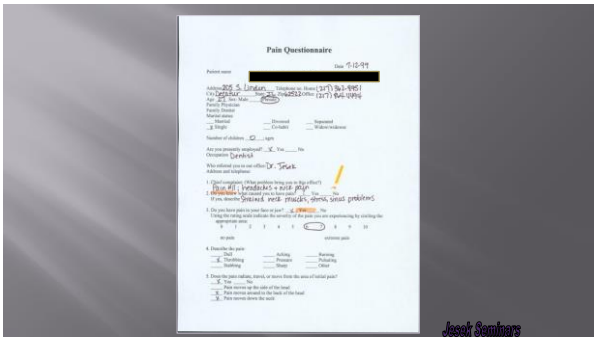


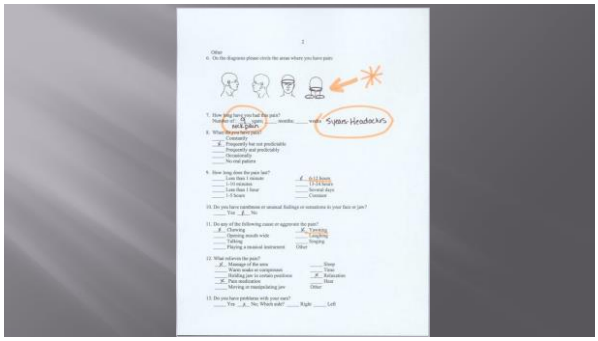
Fig. 4-2. If the occlusion is harmonized at a protruded jaw relationship, the forward position of the condyle requires downward movement, A. When the elevator muscles contract behind the teeth, the condyles are elevated into the more superiorly seated position at centric relation, B. This causes the most posterior teeth to become the occlusal pivot and puts the entire load onto these teeth until the jaw shifts forward.

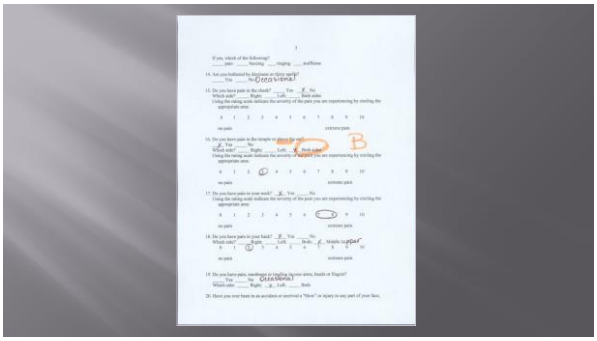
Peter E. Dawson

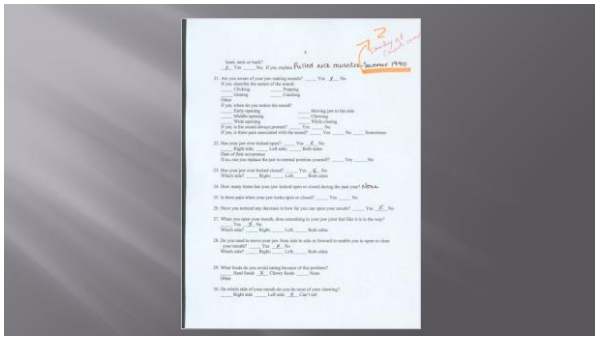

Condyles seated
Jesse Seminars

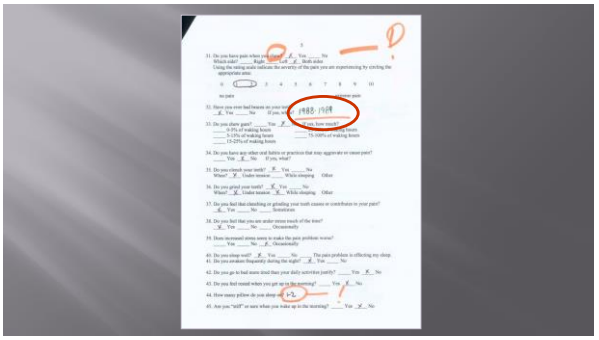

First point of contact
with condyles seated is between tooth
numbers 15 & 18

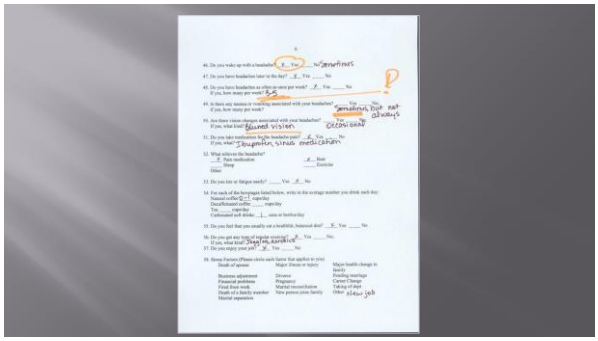

Pain Questionnaire
Jesse Seminars

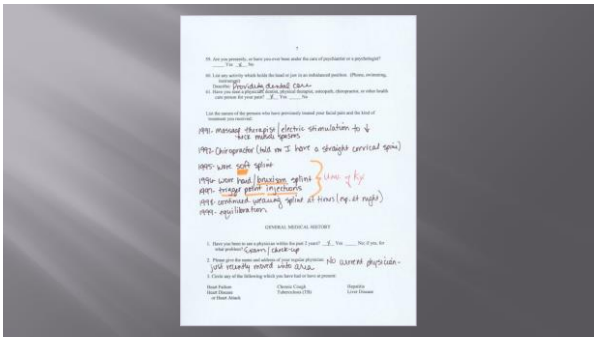

Sinus Headaches

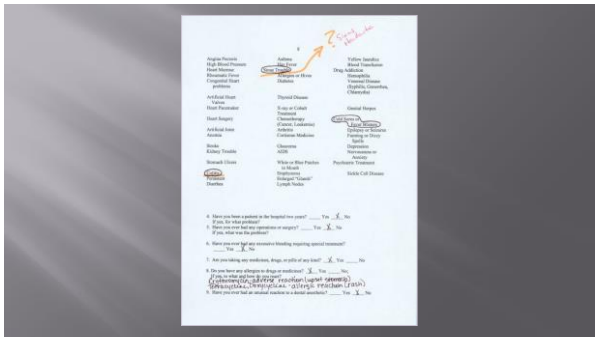


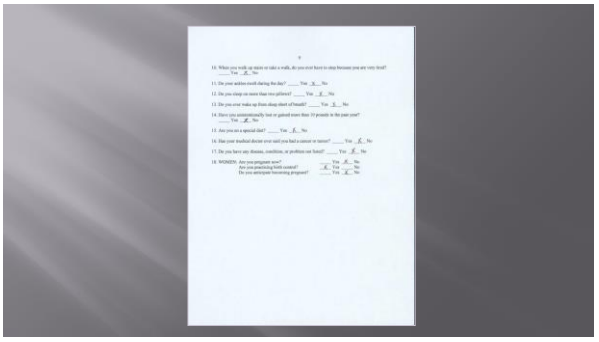












Long Form Pain Questionnaire-Explained

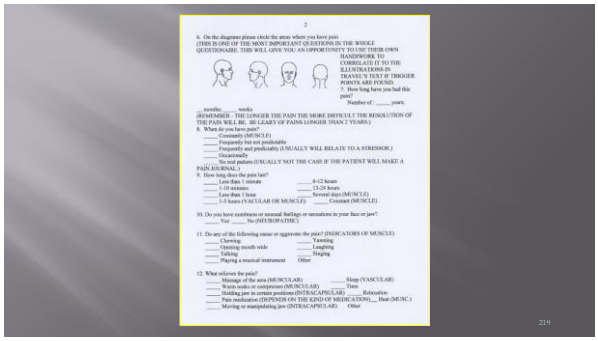
Pain Questionnaire

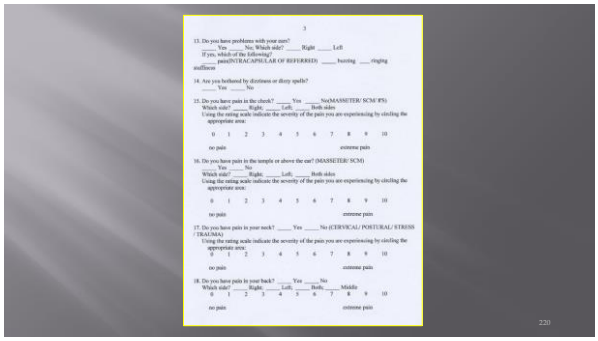
Date:

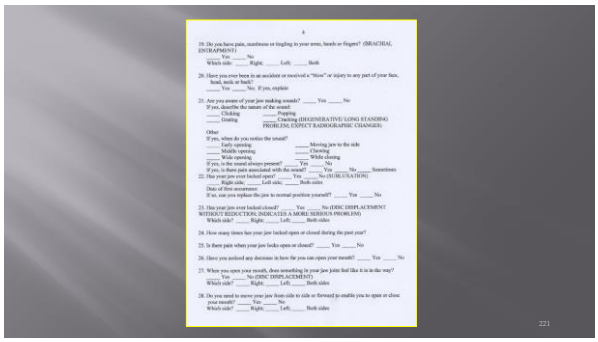
Patient name:
Last First Middle

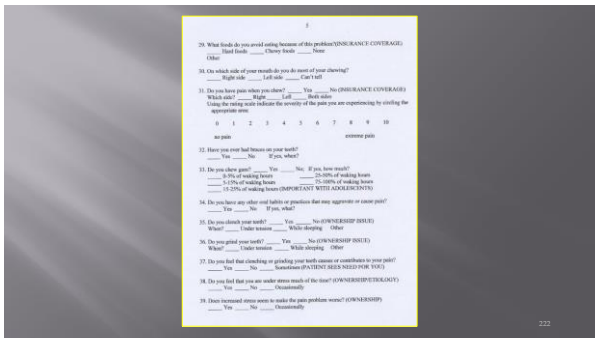
Address: _____ Telephone no. Home:
City _____ State _____ Zip _____ Office:
Age _____ Sex: Male _____ Female
Date of Birth:
Family Doctor:
Marital status:
___ Married ___ Divorced ___ Separated
___ Single ___ Co-habit ___ Widow/widower

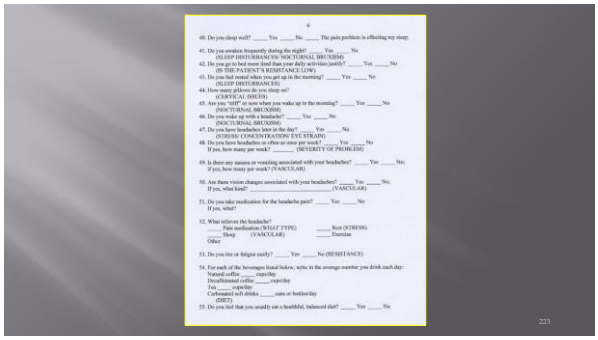
Number of children _____; ages:
Are you presently employed? ____ Yes ____ No
Occupation:
Who referred you to our office:
Address and telephone:
A. Chief complaint: (What problem bring you to this office?)
(BE SURE TO ASK THE PATIENT TO TELL YOU IN THEIR WORDS WHAT THEIR PROBLEMS IS)
1. Do you know what caused you to have pain? ____ Yes ____ No
If yes, describe (THIS WILL OFTEN POINT YOU TO TRAUMA OR RECENT DENTAL WORK)
2. Do you have pain in your face or jaw? ____ Yes ____ No
Using the rating scale indicate the severity of the pain you are experiencing by circling the appropriate area:
0 1 2 3 4 5 6 7 8 9 10
no pain extreme pain
(THIS SERVES AS A BROAD OVERVIEW)
3. Describe the pain:
____ Dull (MUSCLE) ____ Aching (MUSCLE) ____ Burning (NEUROPATHIC)
____ Throbbing (VASCULAR) ____ Pressure ____ Pulsating (VASCULAR)
____ Stabbing ____ Sharp ____ Other
4. Does the pain radiate, travel, or move from the area of initial pain? (REFERRED PAIN)
____ Yes ____ No
____ Pain moves up the side of the head (MASTICATORY OR CERVICAL)
____ Pain moves around to the back of the head (CERVICAL)
____ Pain moves down the neck (CERVICAL)
Other

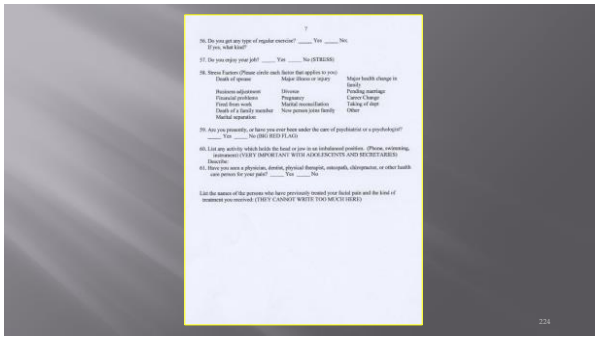






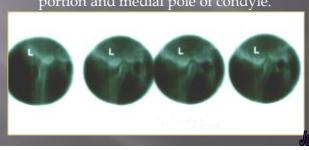






Corrected linear tomograms

Sagittal views with cuts at lateral pole, middle portion and medial pole of condyle.



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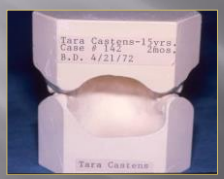
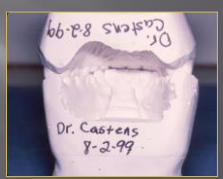
Pre-Orthodontic Models taken June 1987

High School Sophomore



TMD Diagnostic Models taken August 1999

Practicing dentist

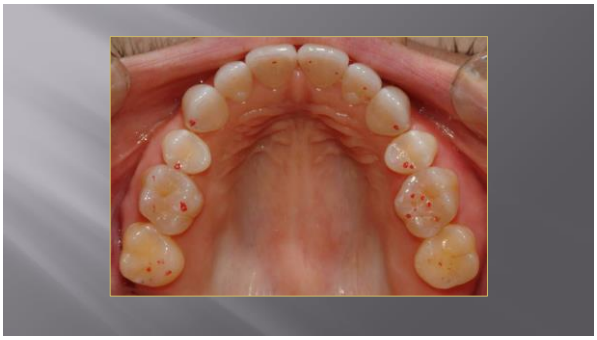


June 1987

August 1999


Jasat Seminars


Jasat Seminars



"Precision occlusal splints and the diagnosis of occlusal problems in myogenous orofacial pain patients"

Glenn M. Kidder, DDS, FAGD n Roger A. Solow, DDS

March/ April 2014 *General Dentistry*

Occlusal correction may play a significant role in the treatment of myogenous orofacial pain when a structural problem is confirmed with objective occlusal analysis. There is extensive literature showing adverse occlusal forces are not beneficial to the patient and should be corrected as part of optimal care. It is the dentist's responsibility to assess the structural component of each patient's problem set. Precision OS therapy can assist this evaluation and preview the effect of definitive occlusal correction.

Aad Zonnenberg

#265. Zonnenberg AAJ, Mulder J, The efficacy of a specific stabilization splint, J Craniomandibular & Sleep Pract 2014:32(1)68-74

- Case Controlled Study
- Tanner stabilization appliance and leaf gauge, exercises from a PT
- N= 55 with DDwoR, 37 with limited opening (5 dropped out)
- N= 27 for normal control subjects
- 89.1% success rate at increasing opening $\geq$ 40mm
- 3/, the treatment period lasted less than 3 months (8.1%), for 13 patients, between 3 and 6 months (35.1%), and for 17 patients, between 6 and 12 months (45.9%), in total 89.1% within a year of splint treatment.
- **29/50 had "total resolution of signs and symptoms", i.e. absence of pain and normal ROM Axis I, 50/50 self-proclaimed**

KELLY H.

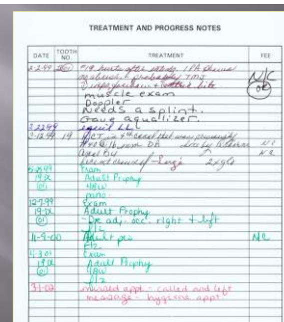
29 year old female.

Chair side assistant.

Major complaint: Pain in lower left jaw.

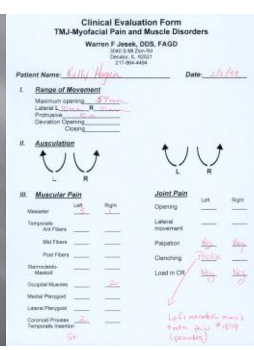
Classified as:

Dawson 2 Piper L 2, R 2



TREATMENT AND PROGRESS NOTES

DATE	TOOTH NO.	TREATMENT	FEE



Clinical Evaluation Form
TMJ-Myofacial Pain and Muscle Disorders
Warren F Jesek, DDS, FAGD

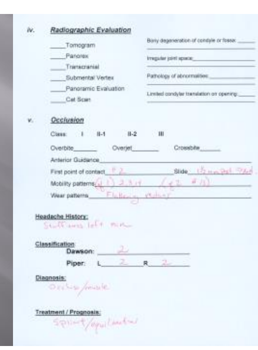
Patient Name: Date:

I. Range of Movement

II. Auscultation

III. Muscular Pain

Joint Pain



IV. Radiographic Evaluation

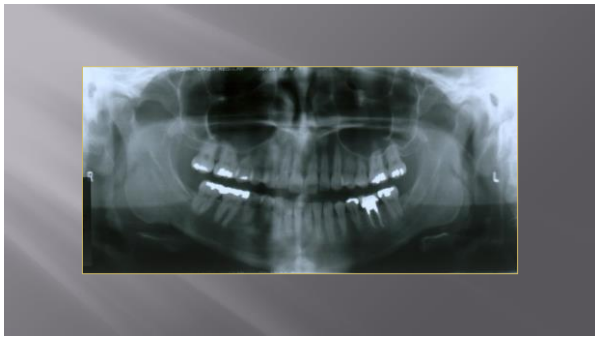
V. Occlusion

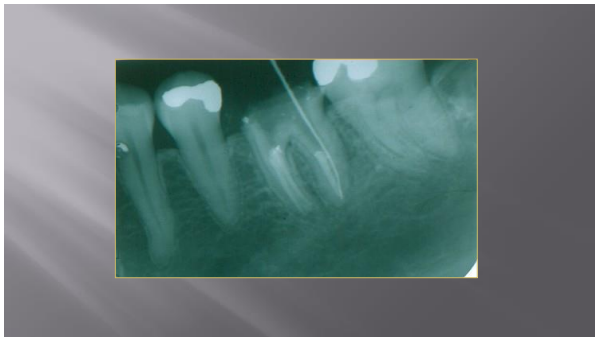
Headache History:

Classification:
Dawson:
Piper: L R

Diagnosis:

Treatment / Prognosis:





SARA, S.

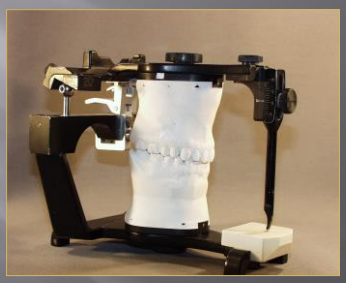
It is inadequate therapy if a splint is used to eliminate pain and the occlusion is not adjusted as part of the treatment.

First point of contact with condyles seated is between tooth numbers 15 & 18

SMACK, SMACK, SMACK, SQUEEZE!!

Denar Slidematic Self Centering Face Bow

Centric Relation Bite Record using Schyler Wax and Aluwax. This bite must capture the interocclusal relationship before any interferences cause the condyles to displace.



Mark 1st point of contact to verify accuracy of mounting.

First point of contact with condyles seated is between tooth numbers 15 & 18

Jeeat Seminars

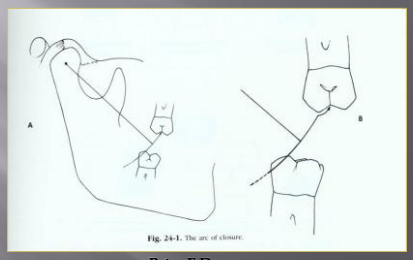


Fig. 24-1. The arc of closure.

Peter E Dawson

When I decide to fabricate and deliver a splint, I have already planned to alter the patient's occlusion to eliminate arc of closure or line of closure interferences by equilibration, orthodontics, restorative dentistry,oral surgery or a combination of the above.

Errors in Any Splint Method

- Bite recording errors, poor technique.
- Mounting errors.
- Design errors.
- Delivery inaccuracy.
  - Not fully seated.
  - Ontaglio reline may introduce more error, especially if condyle disc assembly is loose and unhealthy.
  - Resurfacing inaccuracies due material slumping or patient jaw movement.

Goals of Splint Design

- Equal and simultaneous contact of as many posterior teeth as possible with both condyles seated.
- Immediate disclusion of all posterior teeth in working and balancing movements.
- Harmonious anterior guidance on the centrals, laterals and cuspids.

The splint that I use to treat occlusomuscle disorders caused by arc of closure or line of closure interferences is a modification of the Tanner Appliance that has been called a Mandibular Repositioning Appliance.

The delivery appointment of the splint should allow time for the muscles to seat the condyle/disc assembly as fully as possible and overcome any inaccuracies of the process.

My primary goal today is to expose you to a technique that can be used to improve your splint therapy immediately.

I will explain the technique twice, first using an animation and then clinical slides only.

NOW FOR THE MORE DETAILED CLINICAL EXPLANATION.

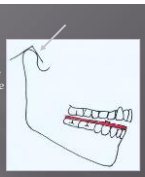
Before beginning any adjustments of the splint you must be sure that it fits the teeth and is stable.

After the splint is seated, begin by removing all contacts posterior to the contact of the maxillary 1st bicuspids.

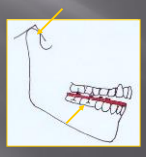
The purpose of choosing to perfect the occlusion on the two most anterior posterior teeth is to allow the mandibular condyles to fully seat in the glenoid fossae before the posterior contacts are added to the splint.

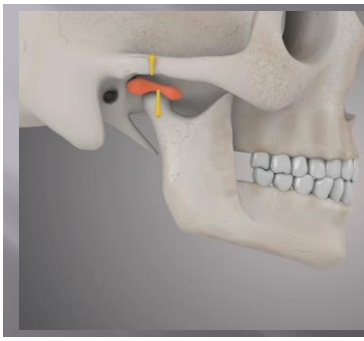
- Condyle not seated
- 1st bicuspids only teeth in contact with splint

- Condyle given time to seat



- Condyle seated
- Add posterior stops to splint

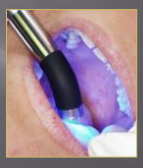




All posterior contacts have been removed from the splint except the lingual cusps of the maxillary 1st bicuspids.

Use mylar strip as "feeler gauge" to measure intensity of contacts on bicuspids during guided closure.

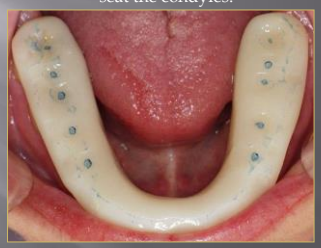
A small amount of light cured acrylic is added to the areas of the posterior stops on both sides, cured in the mouth and cured further in the lab.



Step 4
Deliver

The light cure add on technique is more accurate and faster than self cure acrylic.

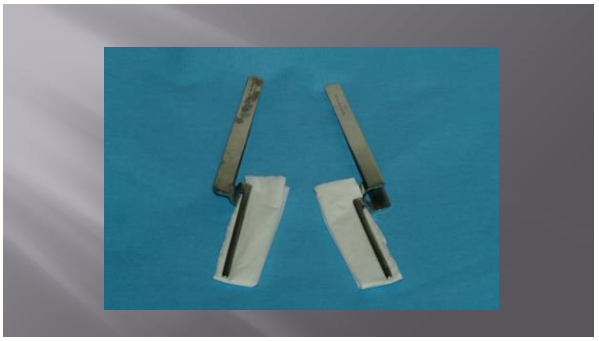
The posterior stops have been added after the muscles have been given time to seat the condyles.



The next step is to add on the anterior guidance which will be harmonized with the condylar guidance.

The anterior guidance is added and the pitch and bevel is developed.

The anterior guidance transfers from cuspid to lateral, to central.



I HAVE FOUND USING THIS SPLINT THAT MY DEFINITIVE OCCLUSAL TREATMENTS ARE MORE SUCCESSFUL. I CAN EQUILIBRATE, RESTORE OR MOVE TEETH USING UNGUIDED CLOSURE IN CENTRIC RELATION WHEN SPLINT THERAPY HAS PROVIDED A HEALTHY CONDYLE DISC ASSEMBLY WITH A REPEATABLE CENTER OF ROTATION.

Most of the patients that I treat with a splint result in full mouth equilibration and/or just good restorative dentistry on decayed and damaged teeth.

Full mouth restorations are for the severely worn or badly broken down mouths.

IF YOUR SPLINTS ARE TRACKING IN THE POSTERIOR AND YOU HAVE ADEQUATE ANTERIOR GUIDANCE,THE CONDYLES ARE NOT SEATED.

Requirements for stability of occlusion

- Stable stops on all teeth when the condyles are in centric relation
- An anterior guidance which is in harmony with the border movements of the envelope of function
- Disclusion of all posterior teeth in excursive movements

- The goal is to allow unguided muscle closure to seat the condyles as fully as possible without posterior interferences.
- The result is a healthy repeatable center of rotation of the condyle disk assembly that will make the patient more comfortable and make any dental restoration easier and more predictable.

Splint Facts

- Initial seat of appliance takes approximately 2-3 hours, only 3-5 adjustments needed later.
- 24 hour wear is a must for 1-6 months duration. No more regular wear after definitive treatment (equilibration, restorative, ortho).
- Taking a splint out to eat is like taking off a cast on your knee and running a half mile.
- After splint therapy, a new bite is taken and models remounted for final prep for definitive treatment (equilibration, ortho, restorative).
- Fair fee is my fee for 3 or 4 units of crown and bridge. A small price compared to untreated TMD in medical bills and missed work.

Step 5
Definitive Treatment

Requirements for stability of occlusion

- Stable stops on all teeth when the condyles are in centric relation.
- An anterior guidance which is in harmony with the border movements of the envelope of function
- Disclusion of all posterior teeth in excursive movements

Jesse Sanders

Step 5
Definitive Treatment

Step 5
Definitive Treatment

AFTER EQUIL

"Self-directed treatment is the first line of therapy and includes education plus absolute avoidance of harmful behaviors, regular daily thermal treatments, repeated (every 2 hours) jaw and neck stretching, and a daily nonimpact aerobic exercises program. Unfortunately, these methods have no good evidence basis beyond common sense."

-Glenn T. Clark (2008)
"Classification, Causation, and Treatment of Masticatory Myogenous Pain and Dysfunction" Oral Maxillofacial Surgery Clinics of North America 20: 145-157

"In addition, for myofascial trigger points, the data on botulinum toxin injections into the trigger points is not sufficient yet to make a recommendation."

-Glenn T. Clark (2008)
"Classification, Causation, and Treatment of Masticatory Myogenous Pain and Dysfunction" Oral Maxillofacial Surgery Clinics of North America 20: 145-157

It is inadequate therapy if a splint is used to eliminate pain and the occlusion is not adjusted as part of the treatment.

"As the physician of the masticatory system, the dentist is in a unique position to evaluate whether or not structural disease, deformity or disorder has occurred. No other medical specialist has the necessary training to evaluate masticatory system harmony or disharmony. Only the dentist is trained (or should be) in the analysis of dental disorders, occlusal factors, masticatory muscle function, and temporomandibular joint evaluation…information that is essential for accurate diagnosis of masticatory system problems."
Dawson

Psychosocial Model Vs. Mechanical Model

- "The procedure of occlusal equilibration does artificially what nature intended the dentition to do naturally. The teeth were not designed to retain all their enamel throughout life. By natural wearing of the enamel at a normal rate, the occlusion should compensate for various changes in the condition of the dental organ so that it will continue to function properly. Actually, if it were left completely to natural causes to establish proper compensation, the result would be a functional malocclusion concomitant with the following possibilities;
  - (1) the teeth will wear, move or fracture;
  - (2) the periodontium will resist or degenerate;
  - (3) the temporomandibular joint will resist or be traumatized;
  - (4) Imbalance of the neuromuscular system will occur;
  - (5) any combination of the four possibilities mentioned above will occur.
- -The Effects of Occlusal Equilibration – Nathan Allen Shore (1959)

Niles Guichet 1996

- "An occlusal equilibration of the natural dentition is a very complex precision surgical procedure."
- "Performing an occlusal equilibration on the natural dentition is typically not a prerequisite for graduation from dental school. Therefore, many dentists in all areas of the profession have no applied skills in this procedure."

Farrar (1982) stated that through the years there is a gradual yet distinct regressive remodeling of the joint, which can be accelerated in disease states such as degenerative arthritis and can alter the occlusion. He concluded that nearly all persons have some degree of occlusal discrepancy caused by joint remodeling, therefore the need to carefully evaluate the occlusion not only before treatment, but also after.

"The use of traditional opioids in FM patients is controversial and generally not recommended by experts in masticatory muscle pain."

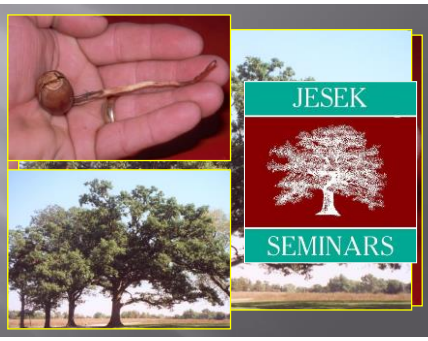
-Glenn T. Clark (2008)
"Classification, Causation, and Treatment of Masticatory Myogenous Pain and Dysfunction" Oral Maxillofacial Surgery Clinics of North America 20: 145-157

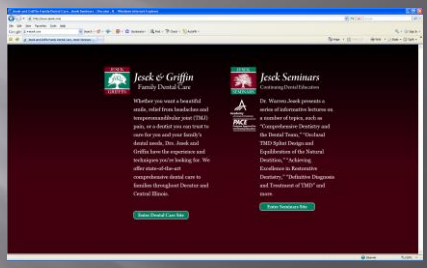
We need to quit treating the symptoms of pain only

- Saying ,oh you have pain because you grind or clench your teeth, let's make you a splint, is like saying, oh you want to go somewhere, let's get in a car and go for a ride and see where we wind up.

The difference between success and failure is….

Knowing the health and condition of the TMJ's as related to the maximum intercuspation of the teeth before beginning any treatment.





DIAGNOSIS AND TREATMENT OF OCCLUSOMUSCLE/TMJ DISORDERS

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