Dawson Update

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Special Edition

Comments from Pete Dawson re:

The Real Truth about CR

In the past months, I have been deluged with requests to comment on, or to agree or disagree with an article by Bill Dickerson entitled, *The Truth About CR*, and companion articles by James Carlson, *The Mandible in Centric Relation*, and a second article, *The Accu-Liner™*. We received more than 40 copies of these articles by mail or fax asking me to comment. In addition, my staff at the Center has been handling an increasing number of comments and questions by phone calls…and a load of e-mail commentaries.

What is different about the flood of e-mails, and apparently the stimulus for all the questioning, is that they appear to represent a campaign based on multiple, expertly written testimonials about how CR, face bows and other things we have taught, are all wrong…and how those who couldn't make our concepts work had found success with enlightened "new" concepts at the Las Vegas Institute.

I'm not involved with all the politics that have permeated the cosmetic dentistry turf wars, but I know there are some good people who are trying very hard to bring a better understanding of function and total masticatory system harmony to cosmetic dentistry. The e-mail war has erupted, and if it weren't so personalized against different camps it would be a good thing. It won't be won by testimonials. There are good reasons why testimonials are given no weight in scientific writing. The benefit of understanding basic concepts will win in the long run. Hopefully, this new Internet technology may get the real truth to more dentists who are open to the facts, and want only to do what's right for their patients. In that light, the opportunity for open discussion and critique can be good for dentistry.

I hope the following straightforward comments are helpful.

Preamble

to the Commentary

Since my name has been injected into a barrage of e-mail discussions regarding the sinfulness or sainthood of Bill Dickerson and Jim Carlson, I think it is best that I speak for myself.

First of all, I will take the position that both Bill and Jim are honorable people who have been brave enough to put their strong beliefs into writing. That is good, because it opens the door for discussion of specific issues. I am not the least bit interested in judging anyone's motives, nor will I engage in any personality attacks. I prefer to believe that we can be gentlemanly in our disagreements and since I have some serious disagreement with some of the things that have been recently published by the above named gentlemen, I will try to be very clear about what those disagreements are. My views should not come as a surprise to anyone who has actually read my books, course manuals, or the many articles in the literature. For those who do not read, there have been ample opportunities during the past 40 years to listen firsthand to hundreds of seminars in which I have stated what I believe and why I believe what I believe. The first five volumes of my Masters Library on Concepts of Complete Dentistry are also available to anyone who wishes condensed versions of the most important principles that I teach.

I start this discussion with the above preamble in order to make it clear that I do not intend to rewrite my life's work on the Internet. I have other agendas that are more important. For now, however, I will do my best to clarify points with which I differ. I do this because I have been inundated with requests to comment on statements made on the Internet and in articles on "The Truth about CR" and on the "The Accu-Liner™." I think disagreements have serious consequences if not understood.

I'll be specific. I'll comment on actual quotes from *current* articles or from the Internet:

Dickerson: *"It is by everyone's account, difficult for the average dentist to 'accurately' romance the mandible to some 'reproducible' position."*

Comment: It is true that the average dentist does not accurately locate CR. It is not true that it is difficult to do it. The problem is that most dentists graduate from dental school with no understanding of TMJ physiology or anatomy or basic biomechanics of mandibular movement. It is impossible to understand occlusion without an understanding of how the position and condition of the TMJs affects the occlusion. That is what CR is all about. The fact that dentists, who do not understand CR, don't do a good job recording it, does not mean it is not a very learnable procedure…and a very important one.[5]

The location of the correct condylar axis is always the starting point for occlusal analysis, as well as occlusal treatment of any kind.

Dickerson: *"Even the teachers of these techniques claim that few can master this procedure."*

Comment: That is not what our experience has been. At our Center we typically have 20 dentists per class locating and verifying an accurate CR by the end of the first morning and they verify repeatability with needlepoint preciseness with multiple bite records (using a Centric Chek instrument). With further practice, the procedures become progressively easier. But the main objection I have is the inference that if it takes effort to learn it, it must be wrong. C'mon folks, we're in a profession…If it is important, just learn it or don't pretend to be a professional.

Dickerson: *"Even if a dentist is trained to do this, it (CR) is not necessarily a functioning physiologic position."*

Comment: Mounting cases in CR, as I have done thousands of times, consistently shows that for teeth that can touch in CR, facets of wear always go all the way to CR. If the jaw doesn't function in CR how do we get wear facets on teeth that interfere with CR? The fact is that CR is physiologic. In the absence of deflective tooth inclines, coordinated masticatory muscle activity automatically and consistently pulls the condyles into CR during firm closure. The main purpose of smooth, permissive occlusal splints is to eliminate deflective tooth inclines so the muscles can close the jaw wherever muscle wants to move it. When free to do so, the muscles routinely pull the condyle-disk assemblies up into CR during closure. For anyone wishing to get a better understanding of occlusion, you couldn't have a better starting place than a better understanding of CR and its effect on coordinated vs. uncoordinated masticatory muscle function.

In **coordinated** muscle function, the inferior lateral pterygoid muscles release as elevator muscles contract. This pulls the condyles up and completely (and physiologically) seats them into centric relation.

Dickerson: *Quoted an article by Bernard Jankelson and Fray on the "Effect of variation in manipulative force on the repetitiveness of Centric Relation registration"—"depending on applied force…a discrepancy between CR and CO increased by 34% and 54% respectively…The data questions the choice of mandibular manipulation for its predictable repetitivness."*

Comment: It is interesting that at least eight published studies have all concluded that bilateral manipulation is the most accurate and most consistently repeatable of all methods tested. Studies also showed that the myomonitor had the greatest error and was the least repeatable. It must be noted that unlike the article from which this quote came, none of the authors of these studies had a vested interest in the myomonitor. Bernard Jankelson was a friend of mine and the developer of the myomonitor. When Sig Ramfjord and I proved to him (in our clinic) that the myomonitor did not locate correct centric relation, as originally claimed, he changed the terminology to "myocentric."

A

B

Note the difference in muscle activity when comparing CR (A) to the forward posturing dictated by a myocentric recording (B). If the occlusion is harmonized to the forward (myocentric) position, the lateral pterygoid muscles must resist the elevator muscles every time the jaw closes. Patients are always most comfortable at A with the resultant coordinated peaceful neuromusculature.

Dickerson: *"Jaws don't work on hinges."*

Comment: Since when? Anyone who has ever recorded a kinematic hinge axis location would find such a comment incredulous. Of course jaws open and close on a hinge…and the hinge axis can translate from CR forward down the eminentiae and back. Furthermore, the axis of rotation that goes through the medial poles of both condyles permits pure rotation on a fixed axis in CR for about the first 20mm of opening.

Carlson: *"The axis of rotation of the mandible during opening is located in the sub atlas area of the neck, not in the head of the condyle."*

Comment: I'm sorry, but no one with any knowledge of jaw mechanics is going to buy this one. It is just dead wrong…and it is easy to prove that it is wrong.* The precise location of the hinge axis can be determined by a kinematic hinge axis locator…and it is not in the neck. The axis goes right through the medial poles of the condyles.

* Sicher H. *Functional Anatomy of the Temporomandibular Joint,* in Sarnat B. G. (Ed.): *The Temporomandibular Joint,* 2nd ed., Springfield, IL, Charles C. Thomas, 1964.

Dickerson: *"The occlusal plane…cannot accurately be achieved with a face bow transfer."*

Comment: This is nonsense. A face bow, properly taken, can not only establish a plane of occlusion in all dimensions and in correct relationship to the skull, it also relates both upper and lower arches to the correct condylar axis. In combination with correct location of the anterior teeth, the Curve of Spee can easily be determined with preciseness. I think maybe the misconception about the accuracy of a face bow is the result of believing the jaw hinge is in the neck. The combination of an accurate centric relation record and a proper face bow recording has stood the test of time with too many thousands of patients for me to accept that it doesn't work.

Carlson: *re: The Accu-Liner™ "…is a Class II, non-arcon (not a hinge axis) articulator. It permits horizontal and vertical motion but does not orient the motion to the temporomandibular joint."*

Comment: When I studied The Accu-Liner™ manual, I tried to see if there was some way such an instrument could have value. It is possible that technicians who are not accustomed to working on face bow mounted cases could use the fence for the hamular notches to get a reasonably acceptable occlusal plane just from the model. I can remember many years ago as an apprentice technician, I was taught to place a strip of base plate wax at the back of a clop clop articulator to set the hamular notch on when the occlusal plane

was difficult to determine from existing teeth. That same principle should work for The Accu-Liner™ (but at considerably more expense than the wax strip.) I can't see any other factor to recommend this instrument, and I see a lot of things wrong with the whole Accu-Liner™ concept. It is based on the serious misconception that the jaw does not hinge. That actually produces some major problems with occlusal harmony and especially if any change in vertical is attempted with models mounted on The Accu-Liner™.

Carlson: *"Using The Accu-Liner™, the bite can be opened in the lab. Vertical dimension can be adjusted in the lab without the dentist spending time at the chair tediously equilibrating the case during insertion."*

Comment: The jaw does not open up and down. It opens on a hinge…and you can't open on a hinge through the condylar axis and then close (or open further) on a different path such as moving the hinge to the neck. That is a basic fact of anatomy and biomechanics. You will produce occlusal interferences with every change of vertical unless your instrument is opening or closing on the same axis as the mandible is (the condylar axis). That is why a face bow is needed and why it works.

Dickerson: *"The comfortable position of the mandible is determined by the muscles, not joint anatomy."*

Comment: This statement lacks a tremendously important understanding of TMJ anatomy. For the masticatory muscles to function in the most peaceful, coordinated way there must be harmony between the teeth and the TMJs. Centric relation is the only jaw position that can guarantee an interference free occlusion in which the inferior lateral pterygoid muscle can release contraction in coordination with elevator muscle contraction. The resultant coordinated musculature can assume a predictably comfortable mandibular position if the joints are free to completely seat in their respective sockets. Both the muscles and the joint anatomy are important. Muscles are hyperactivated by structural disharmony. They don't work independently of the bones they attach to.

Clayton Chan (as quoted by Dickerson): *"I have never once seen a case in CR with low EMGs and the patient says they are relaxed with no pathology."*

Comment: They were NOT in CR. Sorry, but if you are not comfortable you are not in CR. That is diagnostic. I don't just ask. I prod. After occlusal treatment of any kind, I ask every patient to close and clench as hard as they can. I ask them to grit their teeth and grind in all directions. If they can elicit any sign of discomfort, I know I'm not finished because when I have complete harmony with CR, it is impossible for the patient to feel discomfort in the joint. It is a load bearing joint and when it is properly aligned with its disk and fully seated (so all forces go through avascular non-innervated structures, and it's not braced down the eminence by muscle) there are no nerves or blood vessels to compress or muscles to stretch. The lateral pterygoid stays passive (peaceful) even during maximal clench. All teeth are contacting simultaneously with equal intensity. This equals comfort. It is achievable and predictable by anyone who is willing to learn the principles.

Carlson: *"Patients whose intercuspation coincided with the retruded mandibular position (centric relation) were said to be in the terminal hinge position."*

Comment: Centric relation has not been defined as "most retruded" for more than 30 years (See the glossary of prosthodontic terms.). The purpose of bilateral manipulation is to find and verify the uppermost position of the condyle disk assemblies against the eminentiae. That is why CR is defined as anterior-superior…and predictable results depend on determining that position accurately.

Dickerson: *"Manipulating the jaw adds the potential of human error to our diagnosis."*

Comment: This is true if you are still shoving the jaw back. It is not true if manipulation is done correctly. Bilateral manipulation, correctly performed, will win the contest for accuracy and repeatability every time over unguided closure if occlusal interferences are present. This is so because deflective tooth inclines program the muscles to avoid the interference during jaw closure, causing displacement of one or both TMJs when the bite record is made. If the condyles

are not held on the CR axis during closure, deflective tooth interferences can be missed. I can't count the number of so called "chronic TMD" patients that have been referred to me because they didn't respond to occlusal therapy, who had occlusal interferences that were only detected when we held the condyles in CR during closure. If we can rule out other layers of pain, and there are no intracapsular disorders, it is a slam-dunk to get these patients completely comfortable on the same day the occlusal harmony is reestablished. And anyone can learn to do this!

Dickerson: *"Our mandibles are seated where the muscles, the joints and the teeth all harmonize together physiologically and confirmed with OBJECTIVE DATA. Not reaffirmed by some subjective feeling of arrogance and tradition."*

Comment: Does this mean that anyone who disagrees is arrogant. I'll risk it. I believe there is value in some of the electronic recording devices. I welcome any source of accurate documentation and I look forward to continuous improvements in these modalities. But we have to be sure we are interpreting the data correctly. As an example, there is no question that muscle relaxation can be achieved by TENS type pulsing, but achieving a comfortable resting length for the elevator muscles should not be misinterpreted as an objective determination of the vertical dimension of occlusion. The VDO is not determined by resting length. It is determined by the repetitive contracted length of the elevator muscles. Furthermore, the VDO cannot be determined by whether a patient is comfortable. That is a popular, but seriously misguided belief. Actually, vertical dimension is unrelated to comfort. From a comfort standpoint, patients can almost immediately adapt to changes in the VDO. We can absolutely achieve the exact same level of comfort at a closed vertical, the same vertical (as maximal intercuspation), or an increased vertical as long as we do it with the condyles in CR…and follow some other well established rules.

There are four dimensions of the vertical dimension of occlusion. The zygoma-to-angle dimension is determined by the repetitive contracted length of the elevator muscles. It is this dimension that determines the jaw to jaw relationship at which the teeth erupt toward each other until they contact. The resting length of muscle can change, but this dimension is surprisingly constant. If it is violated, it will regain the dimension. Several studies have verified the constancy of this position. Resting length (no matter how it is achieved) is irrelevant to VDO. Teeth are not supposed to contact when the jaw is at rest.

I have a real problem with the claims that most patients are overclosed and need to have their occlusion built up to the vertical established by electronic instrumentation. There is no need or no value in using bioelectronic modalities for determining the VDO. The repetitive contracted length of the elevator muscles has already done it for us (at maximal intercuspation). This dimension is measurable from zygoma to the angle of the mandible where the masseter muscle lives.

There is nothing wrong with altering vertical dimension up or down if it is needed for conservative correction of an occlusal problem. But the repetitive contracted length of the muscles will return the zygoma-to-mandible dimension back to where it was. Neither the increase in vertical, nor the changes back to the original vertical will cause discomfort or damage IF there is contact all around the arch. There is much more to understand about this, including the effect of condylar displacement on the VDO at the anterior teeth. My hope is that anyone who plans to do restorations on 28 teeth will first understand a lot more about vertical dimension…and all the other very critical factors of occlusion before he or she buys into simplistic approaches to complete mouth reconstruction.

Dickerson: *"What medical doctor ever manipulates a joint in a so called seated position when treating an injury or pathologic joint problem in the orthopedic medical profession? NONE."*

Comment: Load testing of joints is standard diagnostic procedure for orthopedic physicians. The load testing process starts with gentle compression and if no tenderness results, gradual increments of increased compression is applied. Load testing is a reliable method for learning if the source of pain is in the joint structures. The basic rule for dentists is, "If you can't load the TMJ with complete absence of tenderness or tension, find out why before proceeding with occlusal alteration. We can do that…and we can classify the exact type of intracapsular disorder and determine the specific structures which are the source of the pain. And…the process is very learnable.

Carlson: *"Use posterior guidance to determine anterior guidance."*

Comment: The anterior guidance is not determined by condylar guidance or any other posterior guidance. Anterior guidance requires a completely separate determination based on several factors that are unique to each individual patient. The dominant factors are the neutral zone which is determined by the many variations of tongue vs. lip pressures, the envelope of function, the lip closure path, phonetics and esthetics. We have very specific guidelines and very learnable methods for determining a precisely correct anterior guidance. No guesswork is required. It is obvious that many of the anterior restorations we see, look artificial, are unstable, and fail because one or more of these guidelines have been ignored.

One thing is certain, you cannot determine the correct anterior guidance from an Accu-Liner™.

Anterior guidance is not determined by posterior guidance. It is determined by the envelope of **function** which is directly related to neutral zone positioning of the anterior teeth. Note differences in anterior guidance that commonly occur even if the envelope of **motion** (shaded area) is similar. Precise determination of upper incisal edge position is critical to long term stability as well as best esthetics.

General Comments:

It should be obvious that we have disagreement on many issues. Frankly, we have several more that we didn't discuss. These disagreements will not be settled by testimonials…especially claims of superiority over concepts that are not understood and are falsely criticized. When I see statements that "all cases in CR…are compromised with too many clinical musculo-skeletal signs and symptoms," all the testimonials about the greatness of the man who made that statement, cannot make that statement correct. I know the statement is false. I know it, not only from many years of careful observation, I know it is false from a physiologic, anatomic, and biomechanic standpoint. I know it is false from EMG studies. Furthermore, there are thousands of dentists who do understand CR, and who also know it is false.

The Internet opens up new opportunities to get issues out on the table where they can be debated. There is a risk in writing down what we believe because if we are wrong, we expose our ignorance. But I believe we can make wonderful changes in bringing dentistry to a higher level of maturity if we can honestly debate out the points where there is disagreement. Let's get past all the hype and the self-serving testimonials. They settle nothing.

I have tremendous concern for the integrity of our profession. During the past few years I have seen some of the finest dentistry I've ever seen, by dentists who are combining the use of new esthetic materials, with an understanding of masticatory system function. But sadly, I have also seen some of the worst dentistry since I've been a dentist…done by dentists claiming to be "cosmetic dentists." The saddest thing about this is that most of these doctors are honest and trying to do the right thing…but they don't have a clue about total masticatory system harmony. They don't have any understanding about the TMJs or occlusion, or anterior guidance, or the neutral zone or the envelope of function…or vertical dimension…or some of the other critical criteria that have to be satisfied to achieve predictable, long term maintainable health and harmony.

The problem is that many do not know what they don't know…so they get duped into fast track complete mouth reconstructions without knowing what is required to really do them right. Let's commit to something better than that! There is so much more to quality dentistry than the adhesive of the month. I see some really bright stars emerging from the cosmetic dentistry ranks. I see an almost frantic quest for more understanding of function and I really believe that the esthetic revolution can be converted into one of the most dynamic positive influences in the history of dentistry. But if this is going to happen, the leaders of the revolution are going to have to learn the basic fundamentals and skills that underpin the concepts of complete dentistry. I commend those in leadership positions who are trying to do just that.

NOTE: I've tried to be direct in my comments. In trying to minimize the verbiage, a lot of supporting information must be left out. Anyone interested in getting the whole story can take advantage of the following:

1. Dawson, P.E. *Evaluation, Diagnosis, and Treatment of Occlusal Problems.* 2nd ed. St. Louis: Mosby, 1989
   Please read it before criticizing the principles we teach.

2. The Masters Library on Concepts of Complete Dentistry (start with Volume 1 on Centric Relation.)

   The next three articles explain a lot of needed information about CR and the relationship of occlusion to the TMJs. (Very current information.)

3. Dawson, P.E. *New definition for relating occlusion to varying conditions of the temporomandibular joint.* J. Prosthet Dent 1995:74:619-27.

4. Dawson, P.E. *A classification system for occlusions that relates maximal intercuspation to the position and condition of the temporomandibular joints.* J. of Prosthet Dent 1996: Vol. 75, No. 1, pg. 60-66.

5. McKee, J.R. *Comparing condylar position repeatability for standardized versus nonstandardized methods of achieving centric relation.* J. Prosthet Dent 1997: Vol. 77, No. 3, pg. 280-84.

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