

# The Lost Art of Equilibration

by Norm Culver, DDS

What are your thoughts on equilibration. Is it necessary? Do you even really care about it? If not, how come? Are you afraid of it? Do you understand it?

Here's what Dr. Peter E. Dawson says about it from his book *Functional Occlusion: From TMJ to Smile Design*: "If the importance of occlusion in dentistry were universally understood, no dentist would even consider practicing without a working knowledge of the principles and skills required for successful occlusal equilibration."

Equilibration is actually quite simple. In fact, in the 1995 *JADA* article "Abnormal Occlusal Conditions: A Forgotten Part of Dentistry," the godfather of modern dentistry, Dr. Gordon Christensen writes it's as simple as balancing tires on an automobile, or shortening one leg on a four-legged table when it won't stand without movement.

Are you afraid to do equilibration because you think your patients will have trouble adjusting to it? In my experience, that's never the case. In fact they usually say it feels better.

Do you avoid equilibration because you think grinding makes the teeth sensitive? If it does, the sensitivity rarely sticks around for too long. That is because, when you do it right, there's usually little grinding to be done (and what is done is where the enamel is its thickest).

Do you think it's too hard to justify equilibration to patients? Not once you've learned how simple the procedure can be and how it can improve symptoms. The key to patient acceptance is like anything else. It starts with a thorough exam and a careful explanation of your findings at the first appointment when the impression is fresh.

Do you think equilibration isn't profitable enough? Not when you've learned to do one in 30 minutes, and along with other treatment. I don't know why equilibration has to be so complicated. Let's say you could simplify the process. Then you could do more of them and get faster at it. Remember the "90-second crown?" Wouldn't equilibration be more profitable if you could do it faster? Yes, a complicated equilibration takes more time, but routine equilibration doesn't.

Think it's not covered by insurance? Not so. About half of them are covered and the other half of them are usually worth it to patients for the benefits.

Think removable appliances are better because they're reversible? Well, restorations aren't, but you do plenty of those! Wouldn't your patients who wear removable appliances love to get rid of them for an occlusion that feels better?

Equilibration might be the most overlooked and misunderstood area of dentistry. It's an easy procedure to learn and relatively easy to do. So why isn't it done more? Dentists know little about it, shy away from it and often find reasons for not doing it. That's because the answer as to whether or not equilibration should be done varies from recommending it whenever teeth are restored to almost never doing it. So how are dentists to know what to do?

Think of it this way. Done properly – which isn't difficult to do – equilibration can cause no harm. Drs. Dawson and José dos Santos Jr. agree (see page 171 of the book *Occlusion: Principles and Treatment*). That's because, instead of establishing any new occlusion, it only frees whatever occlusion the patient might already have.

Looking at this issue another way, why should an equilibration ever be done? Because several of dentistry's leading key opinion leaders have shown that it can be of great benefit to patients. It can ease TMJ symptoms, prevent grinding and fractures, improve function and even help periodontal disease.

Take one example: abfractions. These are the little notches at the cemento-enamel junction that were once thought to be caused by acidic foods. Now they're believed to be caused by stresses from occlusion – and adjusting the occlusion for these stresses is the answer. That's what equilibration is all about.

What about other examples like bruxism and TMJ? If proper equilibration causes no harm, then why not at least try it in some of these cases. In hundreds of cases, I have not only found that equilibration can help these conditions, but can prevent patients from having to wear appliances.

What about mobile teeth, perhaps associated with vertical bone loss? If an equilibration can make these teeth tighter, how

can it be said that the equilibration has not helped? What about related problems that are said to be neuromuscular? Wouldn't a traumatic type occlusion contribute to that?

If you haven't turned to another article by now, I'm going to explain exactly how a basic equilibration can be done. It's a simplified way I've developed over the years after learning from the early experts like Pankey, Jankelson and Dawson.

Equilibration really comes down to a simple three-step procedure: 1) Correction of eccentric contacts, 2) Adjustment of working and balancing sides and 3) Improvement of anterior guidance and cosmetics. Furthermore, with some experience, it can usually all be done in two short appointments.

If the equilibration is being done for mobility or for symptoms, then a third appointment might be necessary in order to assure that the mobility or symptoms have subsided and this would of course require more time.

I've already discussed a few indications for equilibration, but what about cases with heavy wear (especially when some crowns are being done on those patients)? It could be a one-time opportunity to perhaps establish a better occlusion rather than perpetuating whatever occlusion the patient happens to have.

What about the contraindications? Some of the usual ones are inter-capsular TMJ problems, severe bruxing and pure muscle disorders. Some of these conditions can be hard to determine and, even though equilibration or appliances might help, it's usually better to refer such patients to a qualified specialist. How do you determine if a TMJ problem is inter-capsular? Perhaps by load testing with upward joint pressure or by the use of a



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deprogramming device. Other probable contraindications for equilibration are cases with Class III occlusion, full cross-bite and lost vertical dimension.

Of course it all starts with the exam. First, ask the patient about grinding, clenching, sore masticatory muscles and sensitive teeth. Then examine the patient for the following: limited mandibular movements, signs of clenching or grinding, degree and pattern of occlusal faceting, occlusal and cervical sensitivity, abfractions, occlusal fracturing and cracked teeth, hyper-mobility, vertical bone loss, and muscle and joint tenderness.

The first step in an equilibration is to determine centric relation. This too is controversial, but it can usually be determined by easy hand manipulation of the mandible into centric relation closure. It can also be determined with a deprogrammer. The advantage of a deprogrammer is that it requires no manipulation. After wearing the deprogrammer, the patient simply taps the teeth together in what should then be a centric relation position. The advantage of manipulation is that it can be done “right now” without the necessity of fabricating, fitting and monitoring a deprogrammer.

Using either of these methods, contacts, which prevent occluding in centric relation, are marked by lightly tapping the teeth on a sensitive ribbon. These contacts, called eccentric prematurities, are lightly ground with a rotary instrument and preferably, “hollow-ground” to preserve tooth structure. The usual rule here is to grind only on inclined planes and preserve the tips of “stamp cusps.” These cusps are the all-important centric stops, which maintain vertical dimension and I prefer doing most of this adjusting on the mesial inclines of the uppers rather than compromising the lower buccal cusps.

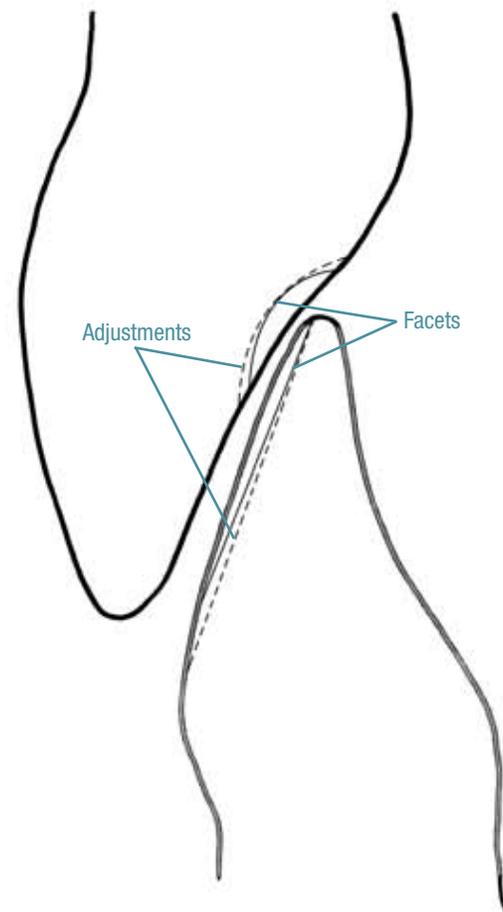
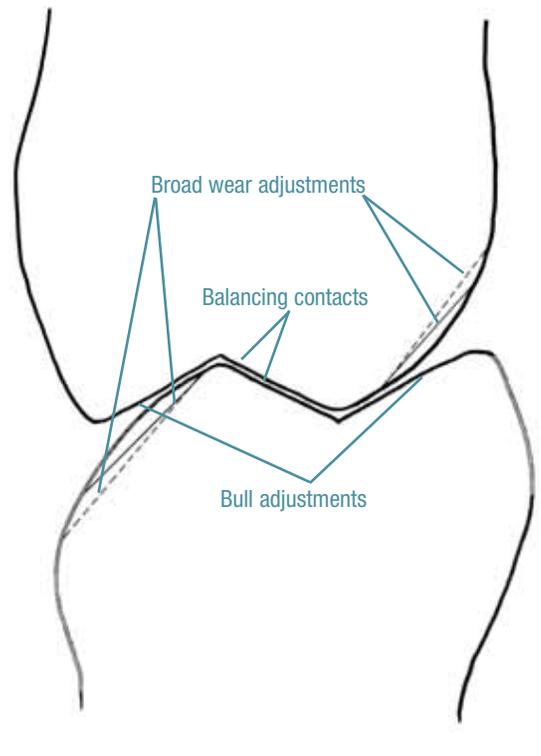
This process of marking and adjusting is continued in the same manner until all premature contacts are removed and there’s no more slide when the patient closes into full centric relation occlusion (CRO). This means that cusp tips are probably now contacting flat areas of opposing teeth and that centric occlusion (CO) and centric relation (CR) match. This adjusting creates what is called a “long centric,” which is a flat antero-posterior slide.

Once the removal of eccentric prematurities is accomplished, lateral working and balancing excursions need to be addressed. With a cuspid rise occlusion however, there should be few such corrections needed because the cuspids cause posterior disclusion with little if any lateral contact.

The next question is how to register, or mark, the excursive movements. Since manipulating or directing a patient through these movements can be difficult, I simply ask them to bite on the ribbon and grind all around on the back teeth. This is not only simpler but usually also marks a wider range of mandibular movements.

Balancing contacts need to be adjusted first because they can not only interfere with working occlusion but they’re considered destructive, even pathologic. This is the opposite from full dentures where contact on both sides may be needed to stabilize the dentures. After any such balancing interferences are removed, further balancing and working contacts need to be adjusted together because, as working contacts are adjusted, for instance, it can bring more balancing contacts into play on the opposite side; and vice-versa as balancing contacts are adjusted.

Exactly where should balancing contacts be adjusted? On the upper or the lower teeth (See sketch)? Either way, the necessary amount of this adjusting could compromise some stamp cusps. Adjusting the buccal inclines of the upper lingual cusps could remove some to that cusp tip; and adjusting



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the lingual incline of the lower buccal cusp could do the same thing to that cusp tip. Of the two choices, I'd rather adjust the uppers and keep the lower buccal cusps, which seem more centrally located over the ridges.

In adjusting the working side, this is where the old "bull" rule applies. That is, the adjusting should be done on the buccal of the uppers and the lingual of the lowers (See sketch on previous page). This is the only good choice because adjusting the opposing surfaces would otherwise affect both stamp cusps.

Another reason for adjusting lower molar lingual cusps is because these are the cusps that are most likely to fracture off badly and this adjustment can prevent it.

Furthermore, these lingual cusps are usually unneeded, non-working cusps and this adjustment alone can be one of the biggest benefits of an equilibration. Therefore, these areas should be adjusted plenty and the lingual edges rounded off so they'll be easier on the tongue. Note that, except for this adjustment, almost all the adjusting so far will have been done on the upper teeth.

Next comes the anteriors and most of this adjusting should usually also be done on the uppers. That's in order to even the protrusive excursions without changing the centric contact (See sketch on previous page). If however, there are long heavy facets, which commonly occur on the labial surface of the lower incisors, those facets, in order to improve incisal function, should be adjusted by removing all but their incisal-most ends.

What about the deep wear depressions that sometimes form in upper cingulum areas? The best choice here is to keep the deepest parts of these depressions, which are centric contacts, and from there, flatten out the facets to a more normal anatomy (See sketch on previous page).

Beyond these anterior adjustments, the incisal edges should also be adjusted for cosmetics.

There's one other adjustment that's not usually addressed. It's common to have broad areas of wear on the buccals of lower and the linguals of upper, especially molar surfaces. These facet should be adjusted (as shown on the sketch) reducing all but their occlusal ends. The purpose of this adjustment is reshape the teeth to a more normal anatomy with better cusp-to-fossa relationships. This reduces the food table, directing forces to more limited areas for more effective mastication. It also creates vertical rather than lateral forces in line with the long axis of the teeth.

How about finishing an equilibration? Again, keeping it simple, I usually only use finishing burs for the concavities and softened sandpaper disks for the convexities.

What about implants? The same principles apply to equilibrating implant teeth as constructing them in the first place. Implants are osseo-integrated and immobile so they need axial loading as much as possible, with vertical rather than lateral forces, in line with the long axis of the teeth. Any adjustments should end up with only one area of contact with the implant no matter how wide the opposing tooth. That contact should be at the axial center of the implant, directly over the implant, both bucco-lingually and mesio-distally, with one centric stop. There should be a "centric platform" with plenty of freedom of movement and short enough cusps (of either the implant or the opposing tooth) so there's no contact in any excursive movements. This means flat or nearly flat occlusion depending on the amount of cuspid rise.

Finally, how about fees? If the equilibration is being done along with other treatment and if it can be done in about 30 minute's time, doesn't \$200 sound reasonable – both for you and for the patient? And if it's being done separately, in two or more appointments, does at least two or three times that fee sound reasonable, depending on the estimated required time?

To summarize, even though equilibration might seem hard to justify, there are times it's harder *not* to justify and what I've presented is a way to make it as practical and simple as possible. ■

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### Author's Bio

**Dr. Norm Culver** has practiced general dentistry for 37 years in Renton, Washington, and has performed thousands of equilibrations. He has written numerous articles for dental publications, and has seminared for 15 years and can be reached at 360-378-7145 or [www.equilibrationseminars.com](http://www.equilibrationseminars.com).



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