

# Equipoise: Removable Solutions For Today's Dentistry

Michael J. Goodman, CDT

In recent years we have seen significant advancements in many areas of restorative dentistry. Great strides have been made with implants, all porcelain restorations and digital technologies, to name but a few.

However, when the topic of discussion becomes removable restorative dentistry, little has been brought forth to improve this maligned and misunderstood discipline. Without a pedagogy in place, dentistry continues to struggle to find consistent solutions for many edentulous predicaments, especially when free-end saddles are involved. For the most part, removable restorative designs have been addressed as a "blind science". Often the dental laboratory alone must decide how to design and fabricate a prosthesis.

When biomechanics are not in place to properly protect hard and soft tissues, inconsistent and unpredictable results will follow. The objectives of design have been more focused on esthetics and/or retention without enough concern for stability and patient compliance. The Third National Health and Nutrition Study<sup>1</sup> should have been enough evidence to propel dentistry to find a consistent proven approach to RPD design. A system is needed that is both clinically and scientifically proven based on physics and engineering principles, created to be consistent with physiological movement. There is a system in place that meets all the criteria necessary. That System is **Equipoise, The Complete Removable Restorative Dental System.**

Equipoise (of Latin origin, meaning Equal Balance or something that creates a

balanced state, usually by counterbalancing some other force or thing)<sup>2</sup> is a complete removable restorative dental system, designed to be used in virtually all removable restorative situations. The Equipoise systematic approach always ensures forces will be exerted primarily along the long axis of the tooth. These kind and gentle movements based on inefficient leverage forces are designed to strengthen the periodontal structures while protecting and preserving the abutment teeth.<sup>3</sup> The Equipoise philosophy works as well today as it did nearly 70 years ago when Herman W. Goodman created the system in the early 1940's.

Mr. Goodman, a very accomplished technologist and general manager of Brown Dental Laboratory, and later the owner of Goodman Dental Laboratory, had become disenchanted with the results he was seeing with RPDs due to flawed design principles. When he became determined to find a superior design system, he started with the simple premise: if RPDs are based on levers, we need to find how these forces can best be distributed. He recognized that RPDs were really "simple machines" based on lever efficiency. The less efficient the lever is during function, the less damaging the force is on the abutment teeth as well as the periodontal structures.<sup>4</sup>

In 1948, Mr. Goodman wrote the thesis "*The Design of Partial Dentures*" along with Louis M. Heil, Professor of Physics, at The Cooper Union for Advancement of Science and Art, New York, NY. This thesis explains and validates leverage forces

and balance of force principles related to tooth preparations.

## Minimally Invasive Dentistry And Equipoise

Dentistry, as it evolves, is constantly in search of superior, less invasive techniques that are more predictable and less damaging to the abutment teeth and the surrounding periodontal structures. Equipoise, when used on the existing dentition involves simple, minimally invasive preparations into enamel which are necessary to properly direct forces along the long axis of the tooth. (Figure 1-2.) Enameloplasty has been proven to be safe when properly burnished or polished.<sup>5</sup> It is always better to prepare teeth to guide forces than not prepare and ultimately compromise teeth to traumatic forces. The philosophy of tooth preparation requires rests so as to make the RPD toothborne, and requires undercuts and guide planes to direct forces inefficiently so as not to inflict damage. (Figure 3-5.)

Equipoise is also minimally invasive when utilized in fixed/removable prosthodontics. Because Equipoise generated forces are consistent with physiological movements, as little as a single abutment can be used in free-end saddle designs. (Figure 6.)

The hallmarks of the Equipoise Complete System are the Equipoise C&L attachments. The Equipoise intra-coronal semi-precision C-rest (counterpoise) is made up of a male/female component system, dove-tail in design and made of iridium platinum. The C-rest is very small and strong.



Figure 1. Rest & Guide Plane



Figure 3. Inward Bevel



Figure 5. Equipoise Clasp Assembly

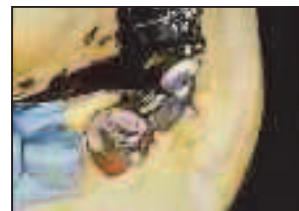


Figure 7A. C-Rest assembly under castings in metal



Figure 2. Interproximal Guide Plane



Figure 4. Lock in Rest



Figure 6. Single abutment C-Rest Crown



Figure 7B. Finished C-Rest & L-Spring

(Figure 7A-7B.) It requires no over-contouring or over-building of the abutment tooth. The C-rest insures stability during function and at rest with 1.5 thousandth of an inch differential in size between the male and female components. This allows for slight lateral and rotational movements to occur, consistent with natural movements during mastication. (Figure 8.)

The L-Spring retentive device is universal in size and shape, and easily replaced chair-side. (Figure 9.) This ensures the integrity of the prosthesis and allows the patient to leave with their Equipoise RPD prosthesis with retention fully restored. The L-Spring also allows for ease of insertion and removal with a pre-measured tolerance of 2.5 ounces to resistance. With little resistance, the L-Spring allows for minimal forces during both insertion and removal to help protect the abutment tooth.

### Class I and Class II Levers and Their Efficiencies

During mastication, all RPDs will function as a Class I lever. If the lever is efficient, then it will create damaging forces upon the abutment tooth, the surrounding tissues and the underlying bone. In order to reduce damaging lateral movements, a vector force must exert along the long axis of the tooth.<sup>6</sup> Prepared rests are needed to utilize the abutment teeth and to act as the fulcrum. A back action clasp is designed with the only purpose of retaining the prosthesis at rest when properly indicated. The weight of the appliance should be all that is required of the retention clasp.

What is missing in most designs, especially with one or two free-end saddles, is stability. Without stability, function is limited and patient compliance and comfort are compromised. All Equipoise designed prostheses focus on stability as the most impor-

tant element to successful function. A guide plane created next to the rest and opposite the edentulous area is what is necessary to insure that the vector force applies along the long axis of the tooth. The guide plane is created between the abutment tooth and adjacent tooth; approximately 1/2 millimeter is taken off of both. Guide planes are also created on all isolated abutment teeth, always next to the rest seat. (Figure 10.) Remember it is always more important to properly direct forces than to allow uncontrolled forces to ultimately destroy the abutment tooth and the surrounding tissues. The significance of directing the primary force along the long axis through the guide plane allows the Class I lever to remain inefficient. It is the guide plate that is indirectly retaining the prosthesis during function while the clasp moves away and out of contact below the height of contour. It is this guide plate that keeps the lever inefficient and eliminates lateral and rotational stress. Motions which are consistent with physiological movement are why all Equipoise designed RPDs have the ability to strengthen the periodontal structures while protecting and preserving the abutment tooth.<sup>7</sup>

While the guide plane indirectly retains the Equipoise prosthesis during function as an inefficient Class I lever, the Equipoise designed clasp retains the RPD as an inefficient Class II lever.<sup>8</sup> The prepared rest, along with the guide plane, act as the fulcrum. The clasp (retentive device) moves in the same direction as the effort arm and the denture base, with the clasp now acting as an inefficient Class II lever, required only to hold the weight of the appliance in place.

With the principles of Equipoise utilized, the inefficiencies of the levers enable even compromised abutments to be used in virtually all design scenarios. These leverage forces also allow Equipoise to be used as a successful implant supported prosthe-

sis. As little as two implants are all that is needed for stable implant-supported success. (Figure 11-13.)

Just as Equipoise is consistent with physiological movement on natural dentition, it is also successful on implant-supported abutments. Research has proven that if less than 150 microns of lateral motion is placed on implants they will flourish. The amount of lateral movement the Equipoise C&L attachments impart is well within these parameters.<sup>9</sup> This fact, along with proper saddle coverage and tooth placement, ensures absolute success in implant-supported removable prosthetics.

With retention occurring at rest, the forces applied are only to hold the weight of the appliance in place. During mastication, when only stability is required, the stress releasing male and female C-Rest components create highly inefficient movements. Maxillary prostheses require minimal palatal coverage along with coverage of the tuberosities. Mandibular prostheses require coverage of retro-molar pads.

The C & L implant design is less costly and less invasive than the bar-retained overdenture. With only two implants needed for full-mouth rehabilitation, the C&L implant-supported RPD, unlike the bar-retained overdenture, places no undo forces on the underlying bone. (Figure 14-16.) The C-rest stabilizers always keep the prosthesis secure, with the L-Spring retentive device retaining only during the dislodging motions, therefore, there is no unwarranted lateral torque on the implants.

### Summary:

The Equipoise Complete Removable Restorative Dental System and philosophy of design work well for today's dentistry. The inefficient leverage forces enable Equipoise to be used for virtually all situa-

*continued on next page*



Figure 8. C-Rests, male & female

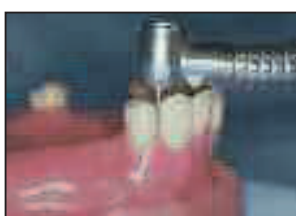


Figure 10. Equipoise guide plane



Figure 12. Custom Implant Post



Figure 14. C&L PFMs on Implants



Figure 16. Facial View of C&L Implant Supported RPD



Figure 9. L-Spring & Ceramic Core



Figure 11. Implant Transfer Impression Model



Figure 13. C&L Abutments with Semi-Precision Implant Frame

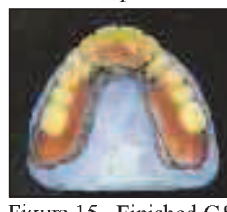


Figure 15. Finished C&L Implant Supported RPD

## Equipose...

continued from previous page

tions with partially or fully edentulous areas. Equipose can be used with new materials, such as a toothborne thermo-plastic appliances and zirconia. Equipose enables the dentist to fill an important niche in their practice when strictly fixed implants and fixed prosthodontics are ruled out because of financial or physiological reasons. Equipose makes RPDs an enjoyable part of any restorative dental practice, by making them Predictable, Profitable and Rewarding.

<sup>1</sup> U.S. Department of Health and Human Services and National Center for Health Statistics. Third National Health and Nutrition Examination Survey, 1988-1994: NHANES III examination data file (CD-ROM). Hyattsville, Md.: U.S. Department of Health and Human Services, Centers for Disease Control and Prevention; 1996. Public use data file documentation 76,200.

<sup>2</sup> Webster's Random House Dictionary

<sup>3</sup> Seltzer, Neal, DMD. *Predictable Removable Partial Dentures Using Proper Design and Rest Preparations*. DENTISTRY TODAY, Sept. 2007.

<sup>4</sup> Seltzer, Neal, DMD. *Predictable Removable Partial Dentures Using Proper Design and Rest Preparations*. DENTISTRY TODAY, Sept. 2007.

<sup>5</sup> 1991 El Mangoury et al., Journal of Clinical of Orthodontics.

<sup>6</sup> Jerome J. Goodman, DDS, *Equipose The Proven Partial Denture System*. (Roseland, NJ, 1989, 9)

<sup>7</sup> Goodman, DDS, *Equipose The Proven Partial Denture System*, 9

<sup>8</sup> Seltzer, Neal, DMD. *Predictable Removable Partial Dentures Using Proper Design and Rest Preparations*. DENTISTRY TODAY, Sept. 2007.

<sup>9</sup> Shohet, Harmon, DMD (1969). Relative magnitudes of stress on abutment teeth with different retainers. Journal of Prosthetic Dentistry, 21(3), 267-281. Page 274. Read before the Greater NY Academy of Prosthodontics, NYC.



*Michael J. Goodman is a graduate of the University of Florida in Gainesville, College of Arts and Sciences and a graduate of Magna Institute of Dental Technology, specializing in crown & bridge and dentures.*

*Mr. Goodman is now President of the Equipose Dental Center, which encompasses the Equipose Dental Laboratory, Inc., and Equipose Dental Consulting, LLC. He certifies dentists and also trains and licenses dental laboratories in the principles of Equipose, and distributes Equipose products and attachments. He has been published in several dental journals.*

*Mr. Goodman can be contacted at 800-999-4950 or via e-mail at [equiposidental@msn.com](mailto:equiposidental@msn.com).*

## From the President-Elect...

continued from page 4

But, I can hear you thinking, "Branding costs money". So before we even consider the value and potential yield of an investment in branding and weigh that with the opportunity cost of not branding effectively, I would like to suggest a simple measure that will lay a strong foundation for whatever branding efforts we undertake in future. I am referring to cultivating a culture of recognition among our membership. Let's begin as an organization to recognize the efforts of our members when they represent the AGD positively in their community or practice.

Marketing experts talk of "living the brand" by which they mean conducting yourself in accordance with the values of your organization. Our members do that every day in a variety of ways, many of which have significant positive impact on others. It's time to practice that strategy proven by the Mouseketeers and hold our banner high. Let us know what you have done recently to advance the cause of dentistry in your practice or community so that we can write about it. When we foster a culture of recognition we can establish a consistent narrative of the valuable contributions that AGD members are making and we will begin to get the recognition we deserve.

## From the Regional Director...

continued from page 5

operation we are the 7th generation and we benefit from what was started some generations ago.

I also remember reading a saying that, "you will start to discover the meaning of life when you plant shade trees under which you know you will never sit." It always seemed poignant to be part of something bigger than myself and share in creating a legacy for others. To be sure, it causes me to question, how can we become better stewards of the legacy we have been given? How can we judge the usefulness of our meetings? What did we accomplish that is a direct benefit to our members? Is there a new metric for our meetings that we could be using to identify a new standard of meeting efficiency?

So what does it all mean? Well it is perhaps an answer that has a different flavor for each one of us, but which still holds an essential main ingredient. And while there may be no way I can be sure of your definition I will wager that like me you are hoping to leave something of value behind.

## From the National Trustee...

continued from page 5

at the Ryman Auditorium, which was the original home of the Grand Ole Opry.

Next year the meeting will be held in Detroit. Unfortunately, Detroit has been in the news recently due to its bankruptcy. Detroit is not the first US city to declare bankruptcy, but it is the biggest. I had the opportunity to visit Detroit a few years ago when I was serving as Division Coordinator. I had heard all the stories about Detroit prior to my trip, but they were all wrong.

I stayed at the hotel in the GM building next to the Detroit River. I walked along the river every morning and watched people running and walking with their families. I also had the opportunity to go to a Tigers game at Comerica Park and I walked both ways to the stadium. I walked over to the downtown casino and lost some money, and ate at many of the local restaurants.

The Detroit convention center is in the process of being updated and it will be ready for our 2014 meeting, and it is conveniently located within walking distance of the downtown hotels.

I realize that the Detroit AGD Annual Meeting is almost a year way but I invite you to join me there next June. As usual, the meeting will feature top notch speakers such as Dr. Ronald Jackson, Dr. Carl Misch, and Dr. John Kois. Rev Up Your Education with High-Octane CE!