

BIOMECHANICS – Past, Present, and Future

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The orthodontic profession is exposed to new ideas and new appliances every year. However, it is important to keep in mind that new ideas and new appliances do not eliminate the need to understand the fundamental biomechanics that will remain with the orthodontic profession throughout the future. It is becoming more common, with the improvements in orthodontic appliances, that the orthodontist shows signs of discarding many of the basic principles of biomechanics.

When the prescription bracket was developed, it was originally hoped that the need to bend and twist archwires, for insertion into the brackets, would be eliminated for the most part. However, not only does the orthodontist find it necessary to make such bends and twists to individualize the needs of the patient, but there are now well over 2000 prescription brackets on the market. This alone should allow the orthodontist to recognize that there is sufficient variation in crown morphology, treatment changes in occlusal planes, etc., that a design in bracket slots, etc. cannot meet the demands of every patient we treat. It is no wonder that orthodontists so often find it necessary to change from one type of prescription bracket to another, only to discover problems still exist in finding a single bracket design that meets the needs for our patients.

Finally, archwire shape has forever presented problems to the orthodontic profession, particularly during the earlier stages of treatment. Because archwire shape is not the predominant determinant of desired orthodontic force systems, many undesirable side-effects have taken place during the earlier stages of treatment and have lead to the use of transpalatal arches, lingual arches, lingual attachments, crossbite elastics, etc. In over 53 years of practice, the author of this presentation has never used any of these and has never found it necessary.

It will be the purpose of this presentation to demonstrate the fallacy of these approaches and to present a solution for the clinically oriented orthodontist.

LEARNING OUTCOMES:

- 1. Avoiding the mistake of “visualizing wire shape” in order to predict tooth movement.**
- 2. Understanding the importance of removing archwires as a mandatory phase of treatment.**
- 3. The fallacy of Shape Driven Appliances.**
- 4. The advantages of Partial vs Full Appliances.**