

MY TWO BEST FRIENDS JUST MET (Biomechanics in Exodontia)

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I've had the same two best friends for over 35 years who didn't meet...until recently. Today, the effectiveness of the three of us is more synergistic than I ever could have imagined.

The older friend is called "Martial Arts." We met while I was in Lincoln High School in Brooklyn, New York in the early 1960's. We have remained close friends through all the years and through all my relocations. Currently, we get together at least four evenings a week, logging in over ten hours of quality time each week.

My other good friend is "Dentistry." We met in the late 1960's, and have enjoyed a wonderful and mutual relationship that will continue to grow until long after I stop clinical practice. We get together 5 days a week. I am as passionate about my daytime Dentistry as I am with my evening Martial Arts. I love them equally, but not identically, just as I do my two daughters, Becca and Ariel.

For as many years as I can remember, I would preach and teach to dental students and staff that Dentistry is all "anatomy and physics," with a sprinkling of math and management. Then, to my karate students, I would reinforce that 90% of Martial Arts is "anatomy and physics," with a little strength and a focus on timing. Last year, however, we all three met and merged at the intersection of Biology and Mechanics. Let's call this place **Biomechanics**.

For my first 28 years of practice since graduating from Tufts, I considered myself quite adept at oral surgery. I was very skilled at extractions, and considered it perhaps my

greatest strength as a general dentist. I would typically extract several dozen teeth each week, fracturing some, recovering most roots, and only tiring after doing several in a row. I often experienced wrist fatigue and physical exhaustion, but I accepted that as part of the job. Such is no longer the case.

Biomechanics to the rescue. My Martial Arts masters taught me to "use the larger muscles to perform the work that is best performed by the larger muscles, and use the smaller muscles to perform work that is best performed by the smaller muscles. The larger muscles generate power and the smaller muscles direct it." I learned to "use the hip, not the hands." As I applied these basic principles of body mechanics, my punching and kicking improved to where I could train for one to two hours nightly and barely break a sweat. I elevated the "anatomy and physics" to the more effective realm of "economy of movement, efficiency of motion." I was a third degree black belt learning basic level one biomechanical concepts to make me work smarter and better, not harder. It worked-- consistently and repeatedly. I was not doing anything foreign or new. I was merely applying to dentistry (specifically exodontia or tooth extractions) the principles initially taught to me by martial arts grandmasters.

A few years ago, two obese friends rode their bicycles from Rochester, NY to visit me in Frederick, Md. When they arrived, they were not in the least bit tired or sweaty. I was astonished at how they could ride so much, be so overweight, and not be tired after long trips. My physician friend explained that he and his wife had become so expert at changing gears and using their body weight

and hip movements to their advantage, that bike riding was nearly effortless. For them, bike riding was no longer an exercise program, but an efficient means of transportation.

I remember asking a skinny woodsman how is it that he consistently beats out all the other larger lumberjacks at the annual tree sawing contest. He replied, "I make no motion that is not absolutely necessary for sawing the tree. No wasted movement whatsoever." Many of us have seen 5'2 oriental aikido and aiki-jitsu masters toss much larger opponents across the room with seemingly effortless grace.

I am not now and never expect to be in any of those enviable categories. However, I have started to apply those principles with extraordinary results. I can now extract 75 teeth in one day with no manual or wrist fatigue at all. I have extracted as many as 80 teeth in one hospital Operating Room day with no hint of physical exhaustion. I have extracted hundreds of teeth in a row before fracturing a single root. The teeth and the patients have not gotten easier, nor have I gotten younger. It is all a matter of correctly applying the principles of biomechanics.

After preliminary use of a periosteal elevator and/or small elevator, I grasp the tooth with the appropriate forcep. I then pretend my hand is in a plaster cast, and cannot rotate nor luxate. My wrist barely moves. My hips take over. They move up and down; they rotate clockwise and counterclockwise, and they make figure 8 movements like a dancer. The knees bend up and down while my back remains vertical. I do not appreciably move my arm, my hand or my wrist. I have the large muscles do the work for the small muscles. The hand and the forcep merely go

along for a free ride. They get the credit but do very little work.

In addition to the biomechanical principles, I am also mindful of the Eastern concept of the three dan tiens. Anatomically, these three points correspond approximately to the naval (lower – physical), solar plexus (middle – emotional) and forehead between the eyes (upper – mental or spiritual), vertically aligning the front center of the body. When aligned, the body is at maximum strength.

I keep my body in proper alignment, and make certain that my wrist/hand/forcep do not extend beyond the silhouette or shadow outline of my body. If my wrist/ hand/forcep complex or my dan tiens are out of alignment, I am weaker and lose my maximum efficiency. This is similar to the lever arm, where the further one is from the fulcrum, the more force is required to move the arm. Keeping the arm in close to the body results in less effort and energy to effect a movement. I do not want my arm unsupported and far away from my body. That is when I fatigue and fracture teeth.

Learning more about biomechanics would allow a dentist to extract teeth with less effort and fewer complications. Acquiring a little knowledge of the Eastern concepts of dan tiens may enhance that base even more so. It may lead to a more satisfying and successful exodontia component to your clinical practice.

I fully expect to continue my close friendship with Martial Arts and Dentistry for many, many years. Fatigue and inefficiency have no place in these relationships. For me, continued use of proper biomechanics will keep this intersection clear, upright and aligned.

Sensei Dr. Harvey Levy holds a third degree black belt in Tang Soo Do karate and a second degree black belt in Dillman Karate under Master Dr. Matt Hayat. Dr. Levy also trains in Brazilian jiu jitsu under Master Carlson Gracie Jr., and Filipino Modern Arnis. Dr. Levy is the former president and Executive Director of the Maryland Academy of General Dentistry, and has maintained a private family dental practice in Frederick, Maryland since 1980.