



The Biomechanics Forum: Guest Editorial



BY KEVIN ROSENBLOOM,
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For the Love of Orthotics

In this guest editorial, Kevin Rosenbloom tells us how he developed a love affair with biomechanics.

We recently attended The Western Podiatry Conference at Disneyland. It wasn't the first show we've done since the pandemic, but it was the first show that we were able to do with our entire executive team: Jeff Root, Jacob Karp and Kathy Root. We saw many old friends and made new friends. We heard a lot of kvetching and a lot of stories about troublesome patients and the sorry state of biomechanical education and knowledge amongst our peers. Now, it wasn't all complaining—we also heard stories of success, unique cases solved and happy patients. It all got me thinking about how much I love seeing patients and sharing knowledge through education, listening, examination, deduction, and troubleshooting; and it also got me thinking about how lucky I am to be in a profession where I get to provide similar support to thousands of podiatrists across the country who all share similar experiences with their patients. It reminded me of the first time I fell in love with helping people and their foot problems.

It was 1991 and I was eleven years old. My father and I were participating in a 25-mile bike ride, which was a long ride for me. Toward the end of the ride, I was tired and my dad kindly let me hang on to the back of his shirt, pulling me on my

bike for the last mile. I was exhausted, and this turned out to be a bad idea. Our handlebars hooked up and caused us to lose control—he turned into me and fell over onto me and my bike. I was wearing a helmet, but my head, ribs and legs were tangled and dragged under his weight. I ended up in the emergency room with some stitches and a bruised ego. My mom,

conscious fifth graders. Here was a pamphlet that actually gave instruction and described what was important for the performance of a shoe.

Dr. Rob

This chiropractor ended up being an important part of my pursuit of solutions to foot and shoe issues. He was a versatile chiropractor who

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however, was concerned about possible injury to my back, and later that week, she brought me to her chiropractor. In the waiting room of that chiropractor I found an interesting pamphlet amongst the other educational pamphlets. The pamphlet was titled "Is it a good shoe?", and inside was an overview of a shoe's construction: the heel counter, the vamp, the fit of the toe box, the shank in the sole, etc. I was fascinated by this because my friends at school were obsessed with Air Jordans, Bo Jacks, LA Gear and all the cool sneakers that showed status and offered feelings of self-worth to status-con-

would use "applied kinesiology", prescribe physical therapy and strengthening exercises, and evaluate gait. He even went so far as to instruct my mom to not allow anyone in my family to wear a new pair of shoes until he checked them to make sure they aligned their bodies symmetrically and kept them in balance. Thus when I would get a new pair of shoes, I could not wear them outside until "Dr. Rob" checked them out and gave them his "a-okay". I would wear my new shoes with my back facing him and he would palpate and examine my back, hips, thighs, knees and an-

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Kevin B. Rosenbloom discussing biomechanics with a patient at Weil Foot & Ankle Institute Jan 2005. Photo: Patient's husband

The author discussing biomechanics with a patient at Weil Foot & Ankle Institute Jan 2005. Photo: patient's husband

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kles with a gentle touch. He would move up and down my lower extremity at least twice before confirming that it was an okay shoe for me to wear. Now, I don't really know how much of this was a "show" and how much

I when I was given that kind of attention and care.

One thing that Dr. Rob introduced me to, at age eleven, was Spenco arch support in-

and adapt to flat ground. Fortunately, in adulthood, I've learned to use orthotics in moderation and strengthen the muscles that control my hip joints, along with my PT and peroneal longus muscles to create an arch and bring my forefoot to the ground while my subtalar joint is in neutral.

Patients love to know if they are normal and how they compare to the normal.

soles. Now, I had a pretty bad history of back pain, headaches and all sorts of excuses as the son of a hypochondriac Jewish mother, but these aches and pains in my knees and back were genuine. I could not run

the mile in fourth grade without my back and knees hurting severely. I remember being in a Sears department store and collapsing from excruciating pain in my lower back. Dr. Rob recommended the arch supports as he noticed that I had flat feet and some weakness in my lower extremities.

The Magical Shoe Department

After the success I had with Dr. Rob and some relief via basic arch supports, I was able to participate in many activities as a youngster. Rock climbing, backpacking and skiing (all introduced to me by my father) were my favorite activities. I ran loose with different groups, including the Sierra Club. Being a pretty outgoing, confident, and obnoxious kid, I shared my experiences with fellow skiers, backpackers and climbers about how I was able to solve discomfort and pain in my body with some arch supports, proper shoes and strengthening exercises.

In 1996, I was sixteen years old, and an older friend of mine was applying for a job at REI, an outdoor retailer in the suburbs of Chicago. I went with my friend, applied and was offered a job as a stock boy. After a month of unloading deliveries and stocking shelves, I was promoted to the sales floor, where I could shine.

In the back of the warehouse was a dusty Superfeet Corkvac system with a highchair, an oven, a vacuum press and all the inventory I needed to make custom insoles. No one at the store knew how to make these things. When prompted, the manager would say "oh yes, we used to have someone that knew how to make custom Superfeet insoles but they don't work here anymore." I took the liberty of pulling out and dusting off the machine, reading the instruction manual and playing with the devices to make insoles for coworkers.

Shortly after, a representative from Superfeet came in and gave

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I took the liberty to pull the machine out, dust it off, started reading the instruction manual and playing with the devices to make insoles for coworkers.

was scientific, but I do know that I now perform a similar exam on my patients. My exam is not really to verify if the shoe balances or not (maybe I/we should), but rather to share with the patient my observations about their body and how it compares to other human bodies. Patients love to know if they are normal and how they compare to the normal, where they might be tight or where they might be atrophied on one side compared to the other limb. Patients eat up this observation and feedback, and so did

Fast forward to today, and I'm well aware that I have a significant structural forefoot varus in my feet. And not surprisingly, I have a varus in my hands and wrists as well. This lends itself to another possible genetic correlation and the structural design similarities between the upper and lower extremities within one set of human genes. I digress; however, I should mention that my childhood forefoot varus caused midfoot, rearfoot, knee and hip compensation to allow my feet to stabilize my body



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the employees and I an inservice on how to sell Green and Blue Superfeet. He grabbed my calcaneus and squeezed the fat pad while pounding the plantar aspect of my heel, showing me that a gathered fat pad under the calcaneus provided much more natural cushioning than allowed when the fat pad dispersed to the sides. This was one of Superfeet's secrets to comfort, a deep heel cup. This, along with several other pearls, is what got me hooked on helping people with their feet.

I always found it interesting that, compared to the rest of the store where clothing, camping, canoes, kayaks, bikes, and other sports gear were sold, the shoe department was always busy. I would look across the store and see that the other departments had a customer here and there, but the shoe department always had a fantastic crowd. People would spend inordinate amounts of time trying on shoes and talking about what was comfortable and what would cause blisters and about which were the correct socks for their backpacking or climbing trip coming up. Some customers were hiking the Appalachian trail, and some were even climbing Mt Everest. They would bring in their orthotics, pull them out, place them in different shoes and walk through the fake simulations of rocky trails and inclines, as if they were actually on the side of a mountain.

I just loved this interaction and found absolute joy in helping people find the correct shoe for their feet and activity. I had had years of experience as a youngster, with Dr Rob analyzing my lower extremity and validating if the shoes my mother bought me were good for me or not, and I now ate up this opportunity to do the same for my customers in the shoe department at REI. I would measure both their feet sitting and then standing. I would hold my hands over their midtarsal joints as they would sit to stand and ask them to twist their hips as they stood in place with my hands



Ross Anderson
All American
Record Holder

Ross Anderson, "Fastest American on Two Feet"

over the tops of their feet feeling the midtarsal joints and subtalar joints articulating and moving—one foot supinating while the other foot was pronating. It was fascinating to me, a kid in high school, listening to their complaints while pulling from the stockroom different Vasque and Zamberlan for wide feet, Asolo and La Sportiva

had found and self-taught Dennis Brown's Corkvac system. After Thanksgiving, the ski gear came out and I had the opportunity to heat up the cork and mold it to feet before grinding it down to fit the boot liner. Cuff alignments, while matching the frontal plane tibial alignment to the equipment so that customers stood in neutral position and the ski was flat on the snow, forward lean adjustments, which measure how much angle the cuff has in the sagittal plane, and drilling and stretching plastic to accommodate bunions, Haglunds, accessory naviculars, etc was the stuff I dreamt of.

It wasn't until 2002 when I was in college and working at a ski shop in Durango, Colorado that I decided insoles, shoes and orthotics were what I was going to do with my life. Professional skier Ross Anderson

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brands for narrow feet and choosing Sorbothane or Spenco or Superfeet insoles to match the shape of their arch. I would make sure my customers had the best fit to allow them to perform their activity to the best of their ability. They would never tie their own shoes, I was down on my knees or on the fitter stool focused on learning the shapes and movement of their feet, providing full service showing customers the correct way to tie their new boots.

My Second Love Affair

During the winter I developed another love affair: ski boots. With my genu valgum and forefoot varus, I excelled at skiing since the age of five. I had begun teaching skiing at nights at Wilmot Mountain, a small ski area just north of Chicago, and

came in and needed some boot work to be done. I was ready to make him some custom insoles, and then I observed his feet. He had the flattest yet most stable feet I had ever seen. His feet presented like steel foundations. I had already modified his boot to be rigid with extra rivets and to make his ankle dorsiflexed as much as possible. He was going for the land speed record to be the fastest skier in the world. All he needed was a flat insole to take up some boot volume. He had absolutely no contour to the bottom of his feet and adding contour would have jeopardized his performance. He currently holds the American speed skiing record title, clocking in at 154.06mph.

By this time, I had already had the chance to work with Olym-

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pic athletes at Mt. Hood Summer Ski Camp, where Olympic athletes trained on a glacier in the summer. We recorded video footage and watched the skiers move as little as possible, while squeezing themselves as fast as possible between gates on the slope at 85mph. The correct equipment, binding cant, cuff alignment and adjustment of their custom-shaped “plug boot” was used to match their anatomy to shave hundredths of a second off their run. Insoles and orthotics were essential for some athletes and, strangely, not so essential for others.

What stands out from that time in my mind today is not a professional athlete, but an average customer, John, from the front range of Colorado. He was about 72 years old with silver hair and had been skiing his whole life. He was in town and needed some new boots for his upcoming day at Wolf Creek. He came into the shop, the Ski Barn, on Main Street, and I fit him in my usual style. I measured both of his feet, sitting and standing. I measured the length

and distribute the load of the skier against the boot by distributing load across the boot liner’s surface area.

I told John that it could take a few days to push the new and fresh tight liner out, but it was better to be snug than loose. It is normal to break down a ski boot liner so it fits comfortably and not too tight. John

gies—like foot drop with a Turbomed XTERN, or my favorite pathology, metatarsalgia, or forefoot overuse injury—are some of the most challenging yet rewarding problems to solve. These situations typically involve listening and coaching my patient while devising a plan of design for orthotics and encouraging proper shoe gear

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tried his new boots the following day; he then showed up at my shop that evening with an enormous ear-to-ear smile and a huge cake he had picked up at the grocery store. It wasn’t just the cake that he brought for me and my associates that I appreciated, but it was the gesture that he drove an hour and a half in the wrong direction to bring that cake, shake my hand and tell me that after skiing for over 60 years and several custom boot jobs, this was the best-fitting and most

modification. I’m often saying to my patients, “Donate those shoes and buy these others instead.”

What we do is “simple, but not easy”, a great quote I got from the venerable Justin Wernick, DPM. We are performers, we are educators and we are caregivers in our communities—we don’t just fix patients’ feet, but actually improve and change our patients’ lives.

Despite the inevitable complaints, the frustrations of insurance companies and the “princess and the pea” patients, I still love what we do. I love what podiatrists do across this country. We are providing a valuable service that so many countries go without. People suffer with their foot pain and have limited access to knowledgeable clinicians to provide orthotics and surgery when needed. The pathologies we treat are not life-threatening, but they do threaten and reduce the quality of life. If a patient is operating at 75% with plantar fasciitis, but we can help them get to 85% or 90% of their life potential, then we serve an important value to others and to society in general. Millimeters go miles with our feet and lower extremity. The opportunity we have designing custom patient-specific orthotics is limitless in scope and never-ending. **PM**

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from heel to 1st MTP, and I observed the width and shape of his feet. I asked him to walk back and forth barefoot. I held both his feet with the palms of my hands on the top of his arches while he stood and twisted so I could feel his pronation and supination. With the knowledge I had gained up to this point, I pulled a pair of Tecnica Icon boots and made him a pair of custom Superfeet insoles so every bone and joint in his foot was in neutral while under the direct plumb line of his ASIS (anterior superior iliac spine). The goal is simple for fitting ski boots—reduce the amount of work the wearer has to do to reduce the metabolic burn rate

comfortable boot he had ever worn. As a result, he had the best day on skis ever. Pretty amazing for a guy who had been skiing his whole life, over sixty years. I was thrilled!

Hooked on a Feeling

I was hooked on the feeling of being appreciated for a job well done, and I continue to be hooked on that feeling when patients come back for a second, third or tenth pair of orthotics and follow up for shoe recommendations. I’ve had patients cry tears of happiness when their feet or body had been in so much pain and a simple orthotic changes the quality of their life. Sorting out patholo-