



The Uberization of Podiatric Biomechanics

New practice-building solutions abound for DPMs willing to embrace change

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65

What Is Uberization?

The concept of “Uberization” represents transparency, corporate elimination of inefficiencies, and, perhaps most significantly, an ongoing effort to better accommodate the desires of both workers and customers. Improved customer satisfaction is the driver that sometimes causes the process to challenge and, if necessary, circumvent traditional bureaucracy and legislation. Saying that an industry needs to be “uberized” often reflects an unwillingness to change, modernize, and sufficiently attend to consumers’ needs.

How Has Uber Disrupted the Taxi Industry?

Uber has grown to be in 58 countries in only six years by employing such technologies as GPS tracking, smartphones, and automated payments to make travel more con-

venient for consumers. One of the things that passengers most appreciate is that by securely keeping credit cards on file, there is no need to open one’s wallet as happens in a regular taxi. Billing is quick, paperless, clearly explained, and almost always less expensive than would have been customarily paid. Even in instances when cars are in short supply and there is a shift to “surge pricing” (increased prices commensurate with increased demand), the reason for the rise is clearly explained upfront. Most passengers conclude that a more expensive ride is better than no ride at all.

What’s Ripe for Uberization?

Uberization is most likely to affect industries that have been resistant to change, are inefficient, highly regulated, do not offer high value, and cater to large and growing mar-

kets. As Uber and other ride-sharing companies are challenging traditional taxi services, technologies are making healthcare in general, and podiatric biomechanics in particular, more convenient, effective, and less expensive for consumers. As has occurred with Uber, the value created to consumers is bumping into long-established routines and regulations, but is bound to create change too powerful for long-established patterns to contain.

Why Healthcare Is Ripe for Disruption

Healthcare is rapidly changing in terms of how it’s delivered as well as because of newly developed technology. While changes in medical technology may not yet be as obvious to the public as what’s occurred in the consumer world, much is sure to change in the near future. In the

Continued on page 66

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Biomechanics (from page 65)

past, most medical technology products were focused solely on clinicians. Change, though, is afoot as companies strive to develop products that focus first on the needs of patients and their caregivers.

The Apple Watch and other “wearables” have brought to the fore awareness of the coming change in consumers’ relationship with technology. We are starting to wear computers and will probably soon have the opportunity to have devices implanted into our bodies to connect with our communication systems, cars, and homes. In healthcare, highly evolved sensors and powerful algorithms offer the promise of proactive, personalized care.

Traditional medical products are developed with an emphasis on physical and cognitive usability. Looking ahead, products will need to meld with our bodies, homes, and lives in a much more intimate way, to create deeper connections between our cognitive, physical, and especially emotional needs. We are already seeing more empowered patients. People increasingly expect immediate availability of customized information and thirst for personal health data whether it be steps walked in a day, calories burned, or hours slept. They want to research their health choices, make their own diagnoses, and evaluate their care providers.

How Healthcare Has Already Begun to Be Uberized

Who would ever have imagined that the iPhone would be used as an otoscope, thermometer, and to FaceTime with doctors 24/7? Healthcare’s use of technology and the contribution of non-physician providers to streamline and improve the patient experience is having a profound impact on how patients obtain care. Just as it has become customary for people to book their own airline tickets and hotel reservations, it’s now common practice for patients to schedule doctors’ appointments via a practice website.

Increasingly, non-physicians are providing services that in the past were only performed in doctors’ offices.

Rather than wait weeks to see a general practitioner, many see physicians’ assistants and nurse practitioners at one of the thousands of walk-in clinics at Walgreens, CVS, and Walmart. CVS plans to improve the care it provides at over 1,000 walk-in medical clinics and 7,600 retail stores via a partnership with IBM and its Watson cognitive supercomputer. This new approach to care will be facilitated from over 70 million patient records to improve how it cares for patients with chronic illnesses.

such as an aging population, a growing incidence of disabilities, chronic and lifestyle diseases, increased focus on improving quality of life, innovations in orthotic production and modeling technologies, growing awareness towards orthopedic ailments, and a rise in sports injuries. At the same time, the market is restrained by growing healthcare budget restraints, poor healthcare reimbursement and payment models, as well as the high cost of custom-made orthotic devices.

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Other examples of how healthcare delivery has been disrupted in the past few years include:

- The Affordable Care Act created online comparisons of health exchanges that make shopping for health insurance a lot like looking for a new car.

- “Doctors on call” apps offer the ability to communicate with a specialist for treatment recommendations. “Doctor on Demand” offers, for \$40, a physician or pediatrician who consults via video.

- “Heal” is a smartphone app similar to Uber, but instead of a car, a doctor shows up at your door within an hour, for a flat fee of \$99.

- When there is no choice but to go to an actual physician’s office, choosing the right specialist now is made more personal via the use of rating websites like Healthgrades, BestDoctors, as well as comprehensive sites like Yelp and Angie’s list.

Why Podiatric Biomechanics Is Particularly Ripe for Uberization

According to IndustryARC, the orthotic devices market was valued at \$3.0 billion in 2014 and is forecast to reach \$4.3 billion by 2020, growing at an annual rate of 6% from 2014 to 2020.¹

The market is driven by factors

Podiatric medical education has changed tremendously since Merton Root, DPM created the first Department of Podiatric Biomechanics at the California College of Chiropractic in San Francisco in 1966. Podiatric biomechanics supported the running boom of the 1970s and ‘80s when an estimated 25 million Americans took up some aspect of jogging. Orthopedic residencies and sports medicine fellowship programs were created to develop experts in this emerging podiatric subspecialty. Unfortunately, while demand for orthotic devices is growing, podiatric medical education in these areas has been de-emphasized.

Training in lower extremity biomechanics, pathomechanics, and sports medicine is no longer offered by the colleges to the degree that was standard through the ‘80s and ‘90s. Standardization of podiatric residency training is preparing young physicians in training to manage patients medically and surgically but has reduced the opportunity for specialization in podiatric biomechanics.

After years of double digit increases in health insurance premiums, the rate of growth has slowed. One of the ways that insurance companies have kept costs in check has been by increasing annual deductibles, i.e., the

Continued on page 68

Biomechanics (from page 66)

amount patients must pay out of pocket each year before insurance coverage applies. Patients tend to resist going to the doctor when they have to pay the entire cost out-of-pocket; the larger the annual deductible, the longer such an effect impacts utilization. As such, patients seek non-physician alternatives for care of their podiatric biomechanical afflictions.

Insurance companies have placed checks on physicians' opportunity to provide all that they prescribe. Healthcare plans have implemented such protocols as requiring prior authorization and reducing limits on the number of pairs of orthotics and other durable medical equipment. Patients needing foot orthotics, AFOs, and shoes are increasingly required to be referred to contracted vendors. While the Affordable Care Act provides health insurance for millions of people who previously lacked coverage and includes certain minimum benefits, foot orthotics, ankle foot orthoses, and shoes are not part of its basic services.

The first place most patients now head when they experience lower extremity discomfort is the Internet. There are apps, websites, articles, and forums describing most every possible condition. Not only do patients research their conditions, they research the best way to get relief. One of the main drivers is convenience. Patients can research home remedies, how to order products over the internet, and where they can find retail solutions. Patients discover the variety of specialties that cater to their biomechanical needs, including pedorthists, orthotists, physical therapists, medical suppliers, and even pharmacists. For the educated, savvy patient, going to the doctor is the place to go only after other modes of treatment do not work out.

How Disruption Is Already Occurring in Podiatric Biomechanics

Podiatric solutions are delivered differently today than how they were provided years ago. For podiatrists amenable to change, there are a multitude of new technology solutions that offer ways to increase efficien-

cies, improve communication, and improve quality of patient care.

In the past, podiatrists could grow their practices based on the quality of care, word of mouth, public speaking and, when they got lucky, mention in a newspaper or magazine article, or a spot on TV. There are now many, many more

Casting/Scanning

Foot scanners are becoming more commonplace. They offer practitioners increased efficiency versus traditional plaster casting and, as an added bonus, a sizzle factor to patients. Their cost has decreased enough so that they are sometimes offered free when accompanied by

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opportunities for podiatrists to make themselves known to the public to distinguish themselves as experts in treating disorders associated with lower extremity biomechanics. Today's podiatrists blog, tweet, use social media and deliver webinars to develop their reputations.

Evaluation

Fundamental to connecting a biomechanical etiology with symptomology is a thorough biomechanical assessment. The tractograph is being replaced with force measurement sensors, video gait analysis for measuring joint range of motion, electronic foot sizing, and accelerometers for balance assessment, fall detection, and prevention.

Prescription

For a number of years, there has been the promotion of "evidence-based medicine" proven treatment protocols based on determination of the patient's condition. An extension to this approach takes the assessment out of the hands of the physician and relies on collection of digital data to create assessment and generate a plan of care. Such an approach was recently presented by Epic Health Systems at a White House Conference on Aging. Epic is creating a clinical decision support tool for patient falls prevention, based on CDC guidelines, that is intended to make it easier for healthcare providers to screen for falls, intervene to reduce risk, and provide follow-up care.

a sufficient volume of orders sent to a lab. The most recent iteration of scanning technology is replacing floor scanners with ones that use iPads. Some are tied to companies, others work with various labs that charge a per-case fee.

While the cost has been dropping, there have been advances in systems that allow fast and easy video motion analysis. While more sophisticated systems using multiple cameras offer the advantage of displaying motion from different directions, some programs are extremely easy and free for use via an iPad application. Such systems display angles to compare foot and leg position and measure joint ranges of motion. They show before and after positions using different devices to objectively demonstrate the effect of foot orthoses, shoes, and/or AFOs on gait patterns and foot position.

Ordering

Increasingly, vendors offer a broader range of biomechanical devices in an effort to provide one-stop shopping. It has become easier to provide patients with packages of foot orthotics and even AFOs together with properly-fitting prescription shoes. Electronic health records systems are becoming increasingly better at automatically ordering prefab items and maintaining inventory levels based on diagnoses and treatment plans. The ultimate goal is to streamline the selecting, ordering, and fitting of the most appropriate device

Continued on page 70

Biomechanics (from page 68)

to address the biomechanical etiology of patients' complaints. Bundling of products also offers podiatrists advantages in terms of discounted shipping fees and better-coordinated customer service.

Manufacturing

An advantage of collecting large volumes of digitized data is the opportunity to discover associations that would otherwise never be understood in smaller quantities or without such analysis. The outcome is increased speed, decreased cost, and improved reproducibility. KLM's System Rx is based on a study of over 300,000 pairs of orthotics that showed that certain foot shapes occur more often than others. Of the several thousand determined orthotic shapes, 99 were determined to be made for patients 70% of the time. System Rx shells consist of these 99 shapes. The sizing process starts by selecting a shell based on shoe size, heel width, arch height, and comfort. While such an approach to fitting relies on a measure of patient subjectivity, it stands to reason that with standardized sizing of orthotic devices, it will become possible to accurately capture critical foot measurements via a scan, so as to allow selection of the appropriate device.

Utilizing pre-fabricated devices (that have the same shape as custom-made but are created by a different process, are mass produced and selected based on measurement, the other custom fabricated from scratch) distorts traditional definitions of foot orthoses and has implications relating to insurance reimbursement.

Orthotic companies have introduced additive manufacturing or 3-D printing with the ability to use material in new configurations and combinations, offering fenestrated, lightweight, thin though structurally strong devices not possible with traditional, reductive production techniques.

Marketing

Digital marketing programs make it possible for podiatrists to create and maintain specific, ongoing digital campaigns to established pa-

tients, to referring specialists, and to the general public at large. Never has it been easier to reach more potential patients in a personal way, at less cost.

Education

The Internet eliminates many inefficiencies in education and offers increasingly comparable ways for providers and patients the opportunity to learn all aspects of patient care. Open access to information via the internet, including video and high

resolution animation, makes subject matter much more understandable, requiring providers to be better skilled in order to offer patients true value in terms of care.

How Podiatrists Can Use the Uberization of Lower Extremity Biomechanics to Their Advantage

In order for podiatrists to benefit from the Uberization of lower extremity biomechanics, it is fundamental to think about "patient-centricity", the idea that patients are at the center of what you do, and beyond. Patients are connected to a much larger ecosystem that includes

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resolution animation, makes subject matter much more understandable, requiring providers to be better skilled in order to offer patients true value in terms of care.

Where Healthcare Is Heading

We might very well be living in a world 20 years from now where patients receive personal care around the clock delivered by "virtual coaches", electronic monitors that keep tabs on body position, motion and activity. Doctors may become responsible for remotely overseeing a pool of patients using their own virtual care team.

Today we say, "Use this cane to walk," or "Use this pump; it'll save your life," and assume that users will readily adopt these products. When health companies create products in the future, they will increasingly focus on how these products fit into the larger context of people's lives. More and more, companies will be considering the needs and desires of patients and caregivers, not just of clinicians.

There are opportunities for healthcare providers to change things to shift healthcare's focus toward the patient. Successful medical products will put the patient's needs first and foremost. Uber has succeeded using such an approach. Ignoring the patient will be fatal for health solutions companies; they will be the new taxi

physicians, caregivers, pharmacists, insurance providers, pharmaceutical manufacturers, and even retailers operating in the "health and wellness" space. Figuring out what will work best requires broad and nuanced understanding of all these parties and how they engage with one another.

Be exceptional. It's increasingly important to stand out from the varied crowd of specialists providing lower extremity biomechanical care. It's necessary to be readily obvious to consumers searching the Internet to figure out the way to solve their problems—to be the person they have to see.

Collaborate. Partner with other specialists who offer complementary services including physician therapists, athletic trainers, shoe stores, orthotists, pedorthists, home health care workers, and orthopedists.

Never stop learning. There is a world-wide community of practitioners who share information about lower extremity biomechanics. "Podiatry Arena" is a listserv that offers a wide list of topics that attracts a large number of leading lower extremity biomechanics practitioners. Attend biomechanical seminars offered by the American Academy of Podiatric Sports Medicine, ACFOAM, and the Pedorthic Foot Care Association. Also, examine seminars sponsored by

Continued on page 72

Biomechanics (from page 70)

manufacturers and trade groups. The *Pedorthic Newswire* is another regularly distributed vehicle that answers topic questions relating to orthotics and shoe-fitting of both a therapeutic and political nature.

Delegate and Elevate

Podiatrists can take maximum advantage of technical advances by focusing on doing those tasks that cannot be done by anyone else. For everything else, consider the benefit of “physician extenders”. Trained associates can be of greatest benefit when podiatrists create processes that attract patients and allow those patients to get the information they want and schedule their own appointments. With sufficient direction, physician extenders can learn to evaluate, determine care, and monitor patient progress. There is a new service called “Central Casting” that

makes it possible to hire a certified pedorthist on a biweekly basis to see patients scheduled for shoes, foot orthotics or custom foot orthoses.

Early podiatric researchers established the foundations of foot and lower extremity biomechanics that now exist within the international biomechanics community. The research revolution which has been made possible by powerful advances in computer and biomechanical technologies has led to alternative theories of foot function and foot orthoses treatment. DPMs will continue to become better at providing improved treatment outcomes for their patients with mechanically related pathologies of the foot and lower extremities if they continually strive to keep abreast of the latest foot and lower extremity biomechanics technology, theory, and research in order to improve their knowledge of the complex function of the foot and lower extremity.³ **PM**

References

¹ The Report “Orthotic Devices Market—By Type (Knee Braces & Supports, Ankle Braces & Supports Upper Extremity Braces & Supports and Others), By Application (Injuries, Chronic Diseases, Disabilities, Pediatrics) and By Geography, Forecast 2014-2020”, Published by IndustryArc, Manufacturing Innovations & Increasing Awareness towards Orthopedic Ailments Will Drive Orthotic Devices to a \$4 Billion plus Market by 2020

² <http://hitconsultant.net/2015/02/17/the-uberization-of-health-care/>

³ <http://www.podiatrytoday.com/article/6436#sthash.TUzXgMbw.dpuf>



Dr. White is
Founder of SafeStep
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