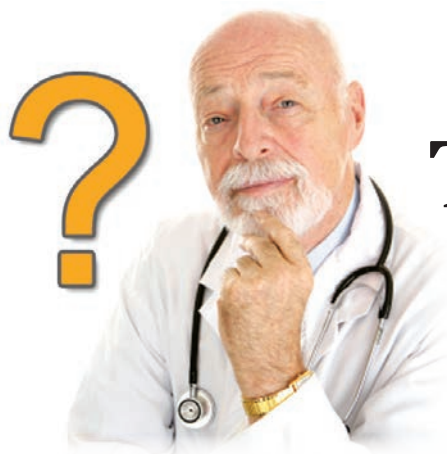




BY JARROD SHAPIRO, DPM



Truths, Half-Truths, and Falsehoods

What happens when the facts you rely on turn out to be untrue?

Practice Perfect is a continuing every-issue column in which Dr. Shapiro offers his unique personal perspective on the ins and outs of running a podiatric practice.

Sometimes, you're going about your business, doing your "thing" (whatever that might be), and all of a sudden, someone comes along and throws what you know into chaos. That thing you "knew" previously (what you thought was a truth) turns out to be a falsehood. In podiatry, there is a lot of opportunity for this to occur because of the weak research that has plagued much of our literature in the past.

When that piece of information one thought to be true turns out to be false, it can be very disorienting. Imagine what it must have been like for those people who once thought the world to be flat and then learned of our spherical planet? How about when Galileo proved heliocentrism, that Copernicus was correct and the Earth revolved around the Sun rather than the Earth being the center of the universe? Boy that must have thrown people for a loop! No wonder Galileo spent the rest of his life under house arrest.

History is full of these unwelcome realizations that changed our thinking for the better. Darwin's evolution by natural selection, for example, is still argued by some—those who just can't

accept reality. For more than 1,300 years, the medical community believed Hippocrates' idea of the humors, made almost permanent by Galen. Disease, they thought, came from the imbalance of the four humors: blood, yellow bile, black bile, and phlegm. This remained the common knowledge until 1543, when Andreas Vesalius published the first human anatomical dissections in his *De Humani Corporis Fabrica* and other great physician scientists moved our knowledge forward. It makes you wonder where bunion pain would fit into this!

With all this build-up, you may be expecting a revealing of some new revolutionary change in lower extremity medicine. Sorry. This is not going to happen. There are a lot of these pieces of "knowledge" that we take as truths without question, only to learn of their falsehood later. You have to love it when that happens.

Dr. Robert Christman is one of our national experts on lower extremity imaging. He always has an enlightening perspective on foot and ankle radiography. By the way, he has a series of excellent radiographic anatomy papers recently published in *JAPMA* that are worth your reading time.¹⁻⁵

The idea of the atavistic cuneiform and its contribution to hallux valgus deformities came up, and Dr. Christman noted a study from 2002 that refuted the atavistic cuneiform's appearance on radiographs.⁶ These researchers exam-

ined 515 randomly sampled medial cuneiforms and first metatarsals, measuring the amount of obliquity of the distal surface of the medial cuneiform. They then re-assembled the joint and took radiographs with the bones in rectus, inverted, and everted positions at declinations of 0, 10, 20, and 30 degrees.

To be brief, they found first that there was no correlation between the truly atavistic cuneiforms and what was seen radiographically. They also found that, as the first ray declination increased, there appeared to be an increase in the supposed atavism. An inverted position of the ray also increased the likelihood of radiographic atavism. This was explained by increased overlap of the cuneiform on the first metatarsal.

This has some real importance for our profession when considering etiology and treatment of hallux valgus deformity, especially for those of us who perform the Lapidus bunionectomy. A false atavism on radiographs may cause us to incorrectly evaluate the radiographs during our surgical planning, leading to unexpected intra-operative issues.

Along the same vein, Christman, placed significant doubt on another institutionalized radiographic concept, metatarsus primus elevatus. Without getting too bogged down in the details, the researchers took lateral radiographs of a standardized foot phantom with

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the central beam angled at nine different locations and at 80, 85, and 90 degrees from vertical. They then measured the first ray “elevatus” using a specialized grid system. They found that the distance between the first and second metatarsals increased as the tube head was angulated closer to vertical and when directed more superiorly.⁷

Clearly, this is important, since, for many of us, the determination of surgical procedures for bunionectomies is significantly affected by the radiographic appearance of metatarsus primus elevatus (think of the Youngswick modification of the Austin procedure or the Lapidus). Now, it’s hard to doubt the existence of this deformity, but Christman’s research provides, if nothing else (and there is actually more), a cautionary statement about the importance of precision in obtaining radiographs.

On that note, one final research study should be mentioned that puts the kibosh on another well-entrenched falsehood. Robert Daryl Phillips, DPM and colleagues performed a pilot study looking at the motion of the medial column. The prevailing opinion about first ray hypermobility is that it comes from the first tarsometatarsal joint. Perhaps we’ve already known this one to

be false because of how many the radiographs we’ve seen which displayed dorsiflexion of the medial column at this joint. It’s very rare, to say the least.

Phillip’s study some years later was very pleasing to see. Ten female volunteers were fitted with reflective markers at 12 anatomical points and asked to walk across a walkway while being videotaped. The recorded images were digitized and various angular measurements were determined. They found that the majority of plantarflexion motion of the medial column of the foot was at the first naviculocuneiform joint with little motion occurring from the other medial column joints (including the 1st tarsometatarsal joint).⁸

Despite the fact that this was a pilot and deserves further study, these results are consistent with what’s seen clinically. And, of course, this has very large potential clinical significance. How many Lapidus procedures are performed due to “first ray hypermobility”? How many Lapidus bunionectomies end in recurrence possibly due to our failure to address the true cause of excess joint motion in the foot? Perhaps we should be performing more naviculocuneiform fusions for hallux limitus. Only more research can answer these questions.

Truths, half-truths, and falsehoods.

How much of what we practice is based on incorrect information? It will take more research by smart people like those in the references to keep questioning the status quo and move us from an incorrect “the sun revolves around a flat Earth” to a correct round Earth heliocentric model. Let’s keep questioning the status quo and continue to find and weed out those half-truths and falsehoods until we’re left with nothing but the truth. **PM**

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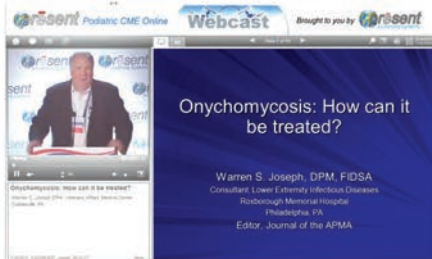
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Dr. Shapiro is editor of PRESENT Practice Perfect. He joined the faculty of Western University of Health Sciences, College of Podiatric Medicine, Pomona, CA in 2010.


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