

Arch Collapse Is Inevitable - But Here's How You Can Help

Mark Charrette, DC

On Aug. 1, 2007, an eight-lane, steel-truss arch bridge spanning the Mississippi River in Minneapolis [collapsed](#). The causes? Stress, time and *plastic deformation* - the same reasons a foot arch collapses.

Materials are both elastic and plastic, but some are more elastic while others are more plastic. Those that are more elastic return to their original shape after a stress is removed from them (like a rubber band). Those that are more plastic (like a plastic bag) don't.

When cars drive over a bridge, the concrete and steel bend a little and then spring back to their original shape. In other words, a bridge is elastic under a low load. If the materials are sound, then cars can drive over the bridge for years. *Its elasticity actually keeps it from collapsing.*

But this works only up to a point. Over time, those small elastic movements cause the materials to stretch, break down and lose their strength. A low load applied over a long time eventually causes the bridge's *plasticity* to come into play. Unless it's reinforced, it will eventually collapse.

Arch Collapse Is Inevitable

The same thing happens with your feet: As you walk around every day, the ligaments, tendons and fascia in your feet bend to help withstand tearing and stretching. But over a period of years and decades, the repetitive stresses slowly break them down, eroding the support for the bones and joints of your feet. These long-term lengthening forces decrease the elasticity of the foot's connective tissues and result in a sagging of the foot's arch.

Unlike other fibers in the body, the fibers that make up the ligaments, tendons and fascia in your foot aren't very elastic - they're more plastic. So, when they're stressed past their structural limit, they collapse. Like a bridge stressed beyond its breaking point, the foot's arch becomes permanently deformed. You can build a new bridge. But building a new foot isn't an option.

Arch Collapse and Back Pain

The feet are the foundation of the body. While 99 percent of all feet are normal at birth, 8 percent develop troubles by age 1, 41 percent at age 5 and 80 percent by age 20.¹ By age 40, nearly everyone has a foot condition of some sort.

Most of us develop strong, flexible arches in childhood. Over the long term, the repetitive stresses of daily life lengthen the connective tissues, causing a slow breakdown of the normal support for the bones and joints of the feet and a decrease in elasticity, eventually leading to a sagging of the foot's arch.

This gradual breakdown allows those stresses to move into the legs, the pelvis and ultimately the spine. Back pain is often what brings patients into a chiropractor's office, but treating the feet

might seem counterintuitive to someone with a sore back. If doctors can recognize and clearly explain the foot-spine connection, they can help to optimize their patients' overall health.

Orthotics Can Help

Many conditions start in the feet, but eventually contribute to health concerns farther up the kinetic chain, such as in the spine. Custom-made functional orthotics can help preserve the body's optimal foot-spine connection.

As people age, the foot's connective tissues become even less elastic, making collapse even more likely, whether from repetitive stress or sudden, heavy stress. Custom-made orthotics can help with plastic deformation in two ways: by preventing collapse in the first place or by raising your foot's arch back into place after it's already collapsed.

I always recommend orthotics that remove the biomechanical stress from the body by supporting all three arches of the foot. *Once the feet are adjusted, the orthotic helps to hold the adjustment, and plastic deformation becomes irrelevant.*

If your patients spend long periods of time on their feet, are athletic or are beyond the age of growth, the likelihood of permanent plastic deformation is high. Their chiropractic care will work best when supplemented with custom orthotics and shoes for every level of activity. When they understand the concept of permanent plastic deformation, they'll realize the importance of wearing orthotics and will accept this as a permanent form of treatment and support. They'll also appreciate your caring, expertise and interest in their long-term health!

Reference

1. Schafer RC. *Chiropractic Management of Sports and Recreational Injuries*. Williams & Wilkins, 1982: p. 517.

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