

How your discs support your spine

Your disc is like a jelly donut



Figure 1. Your disc is like a jelly donut that supports the spine but can also lose its jelly filling if put under too much stress

Your disc is like a jelly filled donut that facilitates movement of your spine, acts as shock absorption and serves as a spacer so that nerves can exit between your vertebrae. Just like a jelly filled donut your disc has the ability to compress in response to environmental pressures (like exercise) and then re-fill with fluid later. This shock absorption and recovery is a way of protecting your bones from constant stress. However, when your discs compress and lose some of their jelly filling on a chronic basis, they may get to the point when they are unable to re-fill with fluid. At this point their ability to aid movement, absorb shock and maintain space for nerves becomes compromised.

Your disc is composed of very strong collagen fibers as well as a high water content which facilitates a high degree of pressure within the disc; this allows nutrients to pass to cells within the disc and maintain its health and functional strength. A well hydrated disc is both strong and pliable due to the high pressure and nutrient supply. When the disc is well hydrated and health it can support the axial load (downward weight) of the body; it can be even stronger than the bony vertebral bodies surrounding it!

What do discs do?

Disc health is important for the spine to be maximally functional. Healthy discs allow the spine to move freely and attain maximal range of motion because they allow each of the joints in the spine to function optimally. Healthy discs are also able to act as shock absorbers at each joint within the spine. They are able to slightly compress and save the vertebral bodies from sustaining too much stress. Fully hydrated and healthy discs range from 7-10 millimeters in height; this enables nerves to exit the spinal cord and freely control the entire body. However, when discs compress, the space between vertebrae through which nerves exit becomes smaller. When this happens there is often impingement on the nerves. This means that the brain and body are not able to communicate effectively (see nerve section).



Figure 2. If discs are healthy and strong they measure 7-10 mm on average. If they are compressed that means they are not fully rehydrating and may need treatment.

Causes of disc compression

The causes of disc compression are either acute (injury) or progressive (acquired through daily habits). Discs can be acutely injured by activities such as falls, improper lifting or repeated strains. While injuries can occur and be quite impairing, the vast majority of disc compression is progressive and due to things like improper posture, static activities, or excessive weight.

1. Improper posture (for more info see posture section) – discs become compressed because poor posture leads to uneven distributions of axial load, most often gathering at the base of the spine
2. Static activities – puts prolonged stress and weight on particular joints and discs causing more compression and associated fluid loss. If these activities are participated in regularly there is a risk of the disc becoming less and less able to re-hydrate.
3. Excessive weight – can cause more load on the discs.



Over time your discs may change in their essential components, meaning that instead of being fluid filled to sustain nutrient delivery and overall disc health, the disc can become more fibrous, less fluid filled and less able to deliver nutrients to all cells in the disc. This can lead to the development of degenerative disc disease when it becomes biologically more difficult for your discs to automatically re-hydrate themselves.

How to help discs rehydrate?

Sleep!

Your discs naturally re-hydrate overnight while you sleep. Over the course of the day your disc loses fluid, however, healthy discs are able to completely recover overnight. Within the disc there are molecules that actively attract water from the surrounding tissue. That's why you are taller in the morning! You can actually lose and regain up to 20% (15-25 mm) of disc height. This capability is only present in non-degenerated discs so make you take care of them!

Hydrate!

Hydration is also very important for re-hydrating discs. As mentioned, your discs attract water but that means there has to be adequate amounts in the surrounding tissue in order to re-hydrate. Make sure you drink two thirds your weight in ounces of water (eg. Weight = 130, water = 87 ounces/day). Also, add another 18 ounces for every 45 minutes of exercise.

Decompression therapy

Decompression is an express way of rehydrating your discs. Decompression creates negative pressure within the disc thereby forcing it to act like a vacuum to suck up fluid. This allows discs to improve function in only 10-15 minutes. It also facilitates re-hydration in discs that are damaged to the point of being unable to re-hydrate naturally overnight.

There is an important distinction between traction and decompression therapies. Traction therapies is often thought to aid in spinal health which it does to a certain extent, however, traction is actually just an elongated stretch of the muscles supporting the spine. Decompression on the other hand acts by providing very light traction in an oscillating fashion. The light pull strength means that the stretch receptors within muscles are not activated, this means that the muscles can remain relaxed during the entire treatment. The oscillation of pull tension to release creates a pumping like mechanism so that the disc acts even more like a vacuum and maximum re-hydration can occur.