



The Wellness Family

Dr. Pagnani Keeps You Informed

Balance and Chiropractic

There are many aspects of everyday life that we don't really value until they're missing; balance is definitely one of these. Since it is a vital part of normal daily activities such as: walking, bending over to put on or take off shoes, showering and washing hair, grocery shopping and getting out of a chair – any change can be both noticeable and annoying.

Interestingly enough it's also one of our most complicated involuntary functions. There are several systems, mechanisms and body parts involved in something that seems pretty straight-forward and simple. The truth is, it's neither.

Proper Balance

The ability for the body to maintain a proper balance is dependent upon three primary factors. The first is the sensory system which must accurately receive information as to your body's relative position to your environment. Are you standing, sitting or lying down? The sensory systems that affect balance include everything from vision and inner ear motion sensors to the sense of touch on your feet, ankles and other joints in your legs.

The second factor to affect balance is your brain's ability to process this information once it's received. The third and final factor, your muscles and joints must coordinate their movements in order to maintain balance.

Balance control is automatic, in that it doesn't require our conscious attention to maintain; however, if something interferes with that state, we will have to exert quite a bit of effort to correct it.

Standing and Walking

When standing still and walking, the concerted effort between the muscles and ligaments in the spine, legs and feet is significant. Many studies have been done to determine just how much proper balance will affect posture and gait.

Based on an inverted pendulum model, David Winter, PhD, assessed and determined that balance is a vital part of standing and walking. His study found that the entire spine, as well as most of the body's neuro-sensory systems, are involved in balance while standing and walking. As a matter of fact, the only muscles that had a negligible effect are those found around the ankle.

When considering balance during walking it's important to keep in mind what happens to the center of mass and the center of pressure during the process and how it applies to posture and gait. Based on the biomechanics of the human body there are three mechanisms that allow us to maintain

balance while walking. First is the moving of the center of pressure in respect to standing upright which affects the center of mass. Second is accelerating the body around the center of mass. The application of an external force is the third.

In other words, maintaining our center of mass is the most vital part of balance and our body uses many different muscles, ligaments, senses and mechanisms to do so while standing and walking. Without these internal forces working together properly, we would struggle to stand upright and walk straight.



A properly functioning nervous system is going to play a vital role in balance.

The primary systems most involved with walking are the vestibular and proprioceptive systems. The vestibular system tells the brain about balance and moving against gravity while the proprioceptive systems helps our bodies to coordinate the movement of our arms and legs in an efficient manner.

Potential Problems and Causes

Balance is typically found to be affected when someone experiences dizziness, to use this term loosely. Some people who report feeling dizzy have clarified that it feels like the room is spinning around them or that they are turning. Others have used the terms floating, lightheadedness or giddiness. Regardless of the description, this may be the sign of a problem.

The most common cause of balance problems tends to be an inner ear issue. Anything from an ear infection to hearing loss may cause a loss of balance. Benign paroxysmal positional vertigo or BPPV happens when tiny crystals within the ear get dislodged and begin to move around within the ear. This results in motion signals being sent to the brain when there really is no motion, thus causing that dizziness.

Other types of vertigo include central or neurological vertigo, post-traumatic vertigo and vascular vertigo to name a few. Central or neurological vertigo is a dizziness that is the result of a problem in the balance center of

the brain rather than the ear. This type of dizziness is much less common than inner-ear related dizziness. Post-traumatic vertigo is the result of a head injury, concussion or whiplash. Vascular vertigo is a dizziness caused by problems with the blood supply to the inner ear or the balance center of the brain. In each of these cases, symptoms may include severe dizziness and difficulty maintaining balance when walking.

Additional balance problems may be the result of weakened muscles, joints or vision. As we get older, our body will naturally begin to wear down. Since so much of the body's systems are involved in balance, it's natural for it to be affected.

Finally, a typical but not commonly considered source of balance problems is prescription medications. Many prescription medications will list dizziness as a side-effect but if it's not discussed with the patient they may not realize it's the cause.

These are just a few of the potential issues that may affect balance. There are many more including but not limited to: acoustic neuroma, arteriosclerosis, hyperventilation, labyrinthitis, ototoxicity, peripheral fistula, peripheral vestibular disorders and tinnitus.

Recommended Exercises

There are several exercises that can be done to help maintain or improve balance. For instance, standing on one leg for an extended period of time. The purpose of these exercises is to make all of those mechanisms in your body that maintain balance work together so, while making your body maintain balance is useful, the process of shifting your weight from one leg to the other then standing on that one leg for several minutes is going to be more beneficial.

If you're looking for a regulated exercise program that will help with balance, consider Yoga, Tai Chi or Pilates. All of these disciplines requires moving the body into specific positions and then maintaining them. Vriksasana or Tree Pose, for example, is a Yoga pose that requires balancing on one leg.

Also note that the balance center of the brain plays a vital role, making brain exercises equally valuable. Any exercise that will integrate sensory input and strengthen motor skills while exercising balance and stability will be beneficial. Examples would be running, skipping, jumping, climbing, swinging and crawling. If an older child doesn't want to get down on all fours and crawl around, then make it fun by creating an obstacle course: they climb over some barriers and crawl under others. Dr. Monika Buerger, an expert in neurosensory integration and contributing author in the *Pediatric Chiropractic* textbook, says that physical activity is a valuable source of brain exercise.

The Chiropractic Factor

To better understand how chiropractic care may influence your balance, consider just how many different bodily systems, mechanisms and muscles, joints, etc. are involved in maintaining it.

The central nervous system is made up of the brain, spinal cord and the nerves that go out to the muscles, organs and glands. A misalignment in the spine may cause nerve interference which in turn may affect the processing of messages from the brain to those muscles, organs and glands. As such, a properly aligned spine is vital to a properly functioning nervous system and, because the nervous system controls all bodily systems, it is also vital to balance.

Since the sacrum and ilium are the bones closest to our legs and hips, it's logical that a misalignment here would affect our gait and, in turn, our balance; but any spinal misalignment has the potential to affect balance. Even misalignment of the atlas, which is the vertebra at the very top of the spine, could be an issue. As the balance center of the brain must send messages through the spinal cord to the rest of the body, this is also a logical conclusion.

A properly functioning nervous system is going to play a vital role in balance so be sure to discuss any concerns with your Family Wellness Chiropractor today.



*Dear Patient,
Dr. Pagnani is dedicated to providing you with the absolute best in family wellness care. So take a moment today to discuss with your Family Wellness Chiropractor any concerns you may have regarding your family's overall health and wellness.*

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