

PA 26 – Cerebellum Function

Did you know that chiropractic spinal adjustments can change the way your cerebellum functions? The cerebellum is known as the 'little brain' within your brain. This little structure at the back of your brain is incredibly important. For example, the cerebellum is extremely important for us to be able to perform everyday movements and tasks such as walking and reading and writing. It is also essential to being able to stay balanced and upright. The cerebellum does not initiate movement, but it contributes to the coordination, the precision, and the accurate timing of your movements. It does this by comparing all the inputs it receives from the sensory systems of the brain and body, and integrates and processes these inputs and then fine-tunes your movements so they are perfectly coordinated and timed so you are not clumsy.

The cerebellum is not just important for balance and accurate coordinated movements, but it's also important for other cognitive tasks such as being able to pay attention to a task, or for language as well as the way we relate to fear and pleasure responses. And we know that the cerebellum is very important for learning new movements and skills.

Brain scientists have done several research studies exploring how chiropractic care impacts the function of the brain, and have even looked at specifically, cerebellum function. It turns out that proper movement of the spine is in fact very important for the brain, in particular for how it knows where you and all your body parts are in space. And since the cerebellum is known to influence this inner brain map of the body as well, these brain scientists have specifically tested whether adjusting the spine could impact the way the cerebellum processes information as well as the way it 'talks' to both the perception and movement centers in the brain.

These brain scientists used sophisticated machines to measure brain waves (or electroencephalography) and showed that spinal adjustments do appear to change the way the cerebellum processes sensory information.¹ They have also used machines called transcranial magnetic stimulation to measure how the cerebellum 'talks' to the movement centers in the brain and showed that spinal adjustments changes this as well.¹ They did not stop here, and also measured the way the brain controls overarm throwing movements, because it's well known that the cerebellum is very important for controlling such movements.^{2, 3} Throwing is a skill which is highly dependent on intact cerebellum function. People with damaged cerebellums fail to release the ball when they are throwing at an optimal time in over arm throwing leading to slower ball speeds and resulting in slower elbow extension velocities and accelerations. There is also an absence of elbow extension deceleration at the end of the throw and slower wrist flexion velocities. What these researchers found was that spinal function also influences the way people perform arm throwing movements.

This series of research studies, along with lots of other studies show us that even if you are not in pain, if your spine is not working well, this can impact the way your brain, including your cerebellum, perceives how you are sitting or standing and where your arms and legs are and how they move.^{1, 4-6}

Your spinal function can impact how coordinated you are and how well and how accurately you move your body. This can impact you all day every day. Even taking a simple step involves your brain and cerebellum perceiving the terrain, planning the movements needed, to sense how you move and to sense where you want to put your foot down and to coordinate this entire process with pin point perfection. Another cool study conducted in Auckland, New Zealand, has shown that a period of chiropractic care even in older adults was able to improve these people's brain's ability to sense where

their foot was and to help them process visual and sound information at the same time faster and more accurately, and to be able to take a faster step if they wanted to.⁴

All this research shows us that your spinal function is very important for your ability to learn new movements and that chiropractic adjustments can help with learning new movements.⁶

So, are you trying to learn a musical instrument or a sport? Are you struggling with reading and writing? Do you find that you are clumsy? Do you trip over your own feet and knock your elbows on door frames? Or do you stub your toe often? Maybe you need to see your family chiropractor. It may be time to have your brain's coordination, learning and balance systems fine-tuned too.

References

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