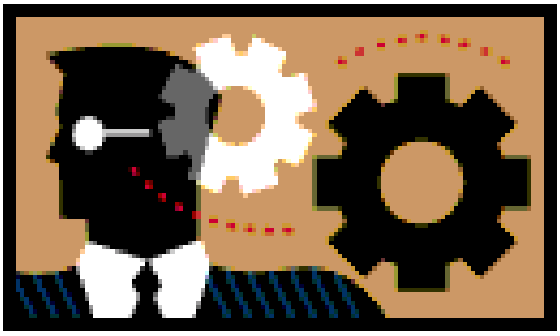
Recent scientific articles have begun to explore the role of gait (walking) and how the body balances itself while it is moving in patients with scoliosis[1,2]. These studies have proven that there are differences in how people with scoliosis walk and move, compared to people without scoliosis. After a while, the brain develops a pattern to help the body balance.

Scoliosis is 3-dimensional. If you only look at the sideways curvature, you are missing the big picture, because compression and rotation of the spinal column are also involved. Similarly, walking is a 3-dimensional process – it is not simply moving forward. In the normal pattern of walking, there is a twisting of the shoulders and a simultaneous counter rotation in the hips[3,4]. The head must yaw (bend slightly to the left and right) to compensate for this motion and keep the eyes level[5].



In patients with scoliosis, this normal pattern is absent.

The hips and shoulders do not rotate opposite each other, and the head does not move.

The main righting reflex of the body is the eyes; if the head is not moving to keep the eyes level, it suggests that scoliosis may create problems with balancing.

Further research supports this conclusion; scoliosis patients tend to have a more difficult time balancing, on average, than non-scoliosis patients[6]. Typically, scoliosis patients must slow down their walking speed, and stiffen their upper spine significantly, to maintain their balance when walking.

Restoring normal patterns of movement in scoliosis patients is more difficult than one might suspect. You cannot simply tell someone to walk differently; the brain creates a pattern, and it falls into this pattern automatically, even when the biomechanics of the spine are altered. When the body falls into this old pattern, it can re-enforce imbalances in the muscles, and cause the spine to shift back to its old position.

In order to prevent this, we must "reprogram" the brain.

Whole Body Vibration therapy is very effective in "erasing" the old pattern; the second step is programming a new pattern.

This is the purpose of the Tightrope Exercise. Walking along a narrow line very slowly forces the brain to focus very carefully on balancing, and increases the speed at which this "reprogramming" can be done. Spinal weights change the biomechanics of the spine, and allow new patterns to be learned. We may also use Horizon glasses to support the curve in the neck, or even an eye patch to cover one eye.

Why cover up one eye? Just as people have dominant hands, they also have dominant eyes. In the general population, this tends to be the right eye, but most scoliosis patients have a left dominant eye (try lining up like you were going to shoot a bow or a rifle; whichever eye would line up with the sight is most likely your dominant eye). This is important because the spine tends to line up over the dominant eye, and we tend to rely upon our dominant eye more than the other. When we cover that eye, we force the brain to "throw out" all of its patterns, and line everything up with the right eye instead. As mentioned before, the eyes are the primary righting reflex of the body, so the way your entire body balances itself is changed (*so not only do we have a new way of looking at scoliosis treatment, we also treat scoliosis with a new way to look!*).

1) **Gait analysis in patients with idiopathic scoliosis. Kramers *et al*, *Eur Spine J* 2004; 13:449-56**

2) **Locomotor skills and Balance Strategies in Adolescent Idiopathic Scoliosis. Mallau *et al*, *Spine* 2007; 32(1):E14-E22**

3) **Patterns of spinal motion during walking. Crosbie *et al*, *Gait Posture* 1997;5:6-12**

4) **Head and trunk stabilization strategies during forward and backward walking in healthy adults. Nadeau *et al, Gait Posture* 2003;18:134-42**

5) **Head stabilization during various locomotor tasks in humans. Pozzo *et al, Exp Brain Res* 1990;82:97-106**

6) **Influence of different types of progressive idiopathic scoliosis on static and dynamic postural control. Gauchard *et al, Spine* 2001;26:1052-8.**