

**An Assessment of the Pulling Force in a
Simple to Use Portable Spinal Traction Unit - The Spinal Stretch®**

ABBREVIATED VERSION

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The purpose of this study was to assess pulling forces on the pelvis produced by a new, lightweight, portable, inexpensive spinal traction device, the Spinal Stretch®

Thirteen individuals (4 females) between the ages of 18 and 62 volunteered to participate in a single testing session lasting less than 5 minutes. The subjects had varying amounts of experience with the SpinalStretch ranging between naive users to those using the device for over 2 months. The subjects reported histories of low back pain ranging from no pain to chronic low back that had persisted over several years. None of the subjects were in acute distress at the time of testing. Subjects were weighed on a physicians balance scale to the nearest 0.5 lb.

A 0 to 200 lb spring scale was calibrated over its entire range in 10 lb increments and found to provide accurate (scale reading ± 0.5 lb of the true weight) and reproducible force measurements. The distal end of the end of the Spinal Stretch traction strap was attached to the proximal end of the spring scale while the distal end of the scale was attached to an eye bolt screwed into a wall at a level of 8 inches from the ground. Subjects affixed the waist strap snugly around the waist just above the iliac crests, and assumed a sitting position on a carpeted surface with their knees bent. After applying tension to the traction strap to extend it to its full length, subjects assumed a supine position while keeping their knees bent.

The first trial included use of the chest belt (Figure 1) which was wrapped around the chest just below the axilla. This chest strap has small rubber ribs which “grab” the carpet and reduce subject sliding, a normal occurrence as tension is increased. The second trial was performed without the chest strap. In both trials, subjects alternated slow pulling and pushing movements on the tensioning handle. The ratcheting the traction strap resulted in increased pull on the waist strap and consequently the pelvis. The upper body (above the waist strap) did not move.

Figure 1.



Subjects continued to slowly pull and push the tensioning handle further increasing the pull on the waist strap until they felt a comfortable pull. Subjects were instructed to continue ratcheting the tension strap until they felt themselves starting to slide toward the wall, i.e., the pull on the waist strap was sufficient to not only pull the pelvis, but also the upper body. After stabilizing the greatest individual tension achieved, the scale was read to the nearest 0.5 lb.

RESULTS

Figure 2 illustrates individual results for both test conditions in which pulling force on the waist strap is expressed as percent body weight. Figure 3 shows group averages for trials 1 and 2. In the first trial in which subjects wore the chest strap, the average pulling force on the waist strap, and thus the pelvis, was 95.4 lb (range 68 to 136 lb). This represented 55% of the individual subject's body weight. In trial 2 where the chest strap was not worn, the average pull for all 13 subjects was 74.5 lb (range, 49 to 100 lbs) or 43% of body weight. The 21 lb mean difference between the pulling force of SpinalStretch with and without the chest strap was statistically significant, $P=0.012$ (Figure 5).

Figure 2.

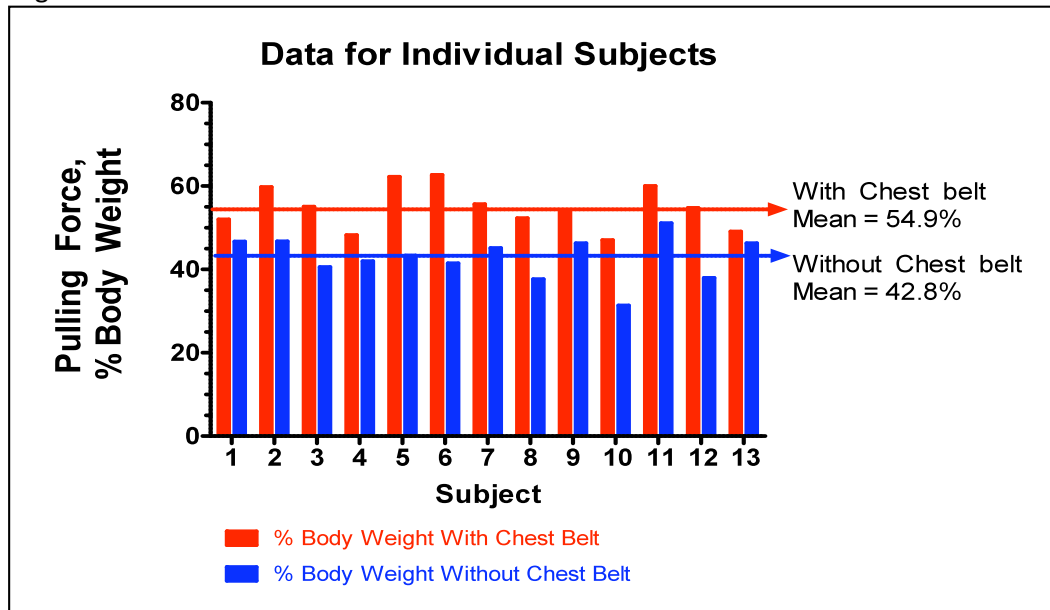
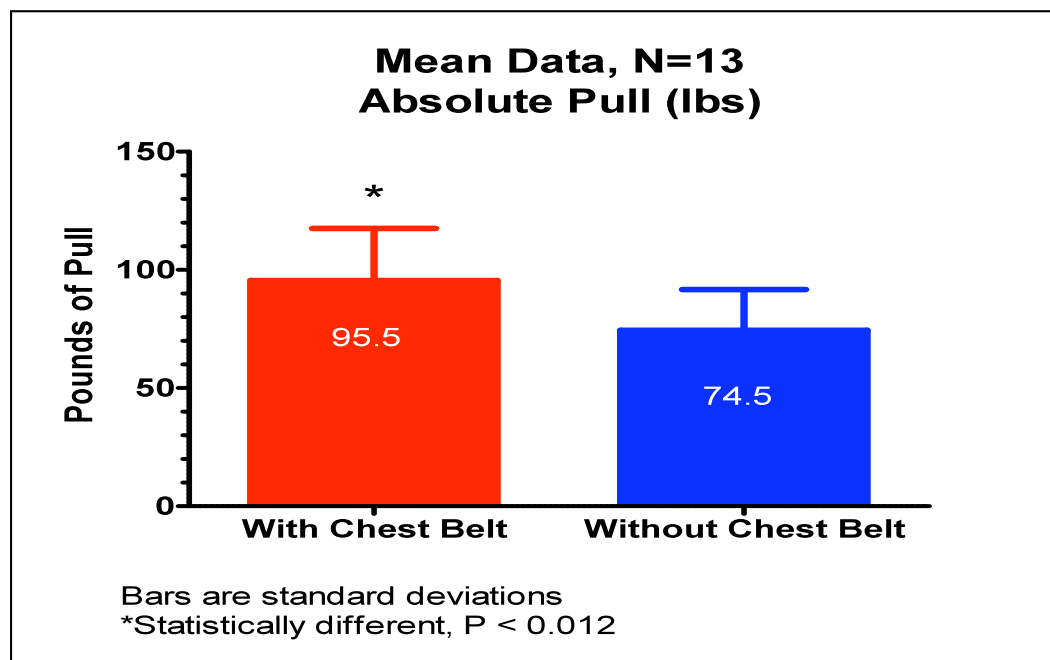


Figure 3.



CONCLUSIONS

An inexpensive, lightweight, portable spinal traction device, (Spinal Stretch®) has been shown to exert pulling forces on the pelvis that average 43% to 55% of an individual's body weight.