

The Effects of Logan Basic Technique on Bilateral Weight Balance

Researchers: Kelly Watts and Jennifer Welch

Advisor: D. Patrick Montgomery, D.C.

Logan College of Chiropractic

## **Abstract**

**Purpose:** The purpose of this research project is to challenge whether muscle imbalance, and therefore weight balance, can be improved in a positive manner through the use of Logan Basic Technique, apex adjustment, as we are told in coursework for this technique.

**Methods and Materials:** In order to determine muscle imbalance, participants were required to undergo a pre-screening process using a Chirotron, which provides a six-way bilateral screening method for balance. Subjects were required to participate in a pre adjustment and post adjustment muscle balance analysis once a week for three weeks for a total of three adjustments. The study population was limited to the Trimester 4 class at Logan College. From this class, thirteen volunteers came forth for pre-screening analysis but only eight students met all qualifications to participate and six completed the study. No control group was used. The adjustment was performed by a licensed clinician, well-qualified in Logan Basic Technique, using the apex contact on a Zenith Hi-Low model 220 table.

**Conclusion:** Support for the hypothesis was inconclusive; the results of the study showed little to no correlation to change. There was a change in balance after the adjustment, however this change is unpredictable and differs not only from subject to subject but within the subject individually. There also were no significant improvements carried over from one week (adjustment) to the next.

**KEYWORDS:** Logan Basic Technique, sacrotuberous ligament, bilateral weight balance, Chirotron, chiropractic

## Introduction

The purpose of this research project is to challenge the hypothesis that muscle imbalance, and therefore postural weight balance, can be improved in a positive manner through the use Logan Basic Technique, apex adjustment, as we are told in class.

In order to determine muscle imbalance, bilateral weight scales have been an accepted fixture in chiropractic practices for years as a means to objectively determine improvement in a patient receiving chiropractic care. It has been part of the chiropractic philosophy that if a person has major subluxations, he/she is likely carrying their body weight unevenly, and that the person's balance will improve as these subluxations are corrected.

According to the Logan Basic Methods textbook, as long as there remains a symptom of strain in muscle tissue as a result of abnormalities of the body framework, such a muscle is capable, with slight assistance, of restoring its subluxated attachments to their normal relationship. The slightest force exerted on either of its attachments, directly or indirectly, tends to approximate its points of attachment and result in a decreased strain of the muscle. Therefore, the necessary amount of force applied to improve postural distortion is dependent upon the nature or degree of the patient's postural distortion or muscular imbalance <sup>(3,4,5)</sup>. The most commonly applied contact of Logan Basic Technique, the apex contact, specifically contacts the sacrotuberous ligament, as it attaches to the sacrum. Recent cadaver studies have shown that this ligament is instrumental in bridging the lower extremities to the upper torso, ending its fascial relationship at the brow <sup>(9)</sup>. Therefore, it could be assumed with accordance to Logan Basic Methods philosophy that the sacrotuberous ligament influences the entire spine.

Two similar studies have been performed in the past by Logan student researchers, one in 1990 and one in 1996. Overall, their results were mixed and inconclusive <sup>(1,2)</sup>.

## **Hypothesis**

It is hypothesized that the bilateral weight balance will improve after the treatment intervention (Logan Basic apex adjustment). It is also hypothesized that the improvement will be sustained and further improved, that is that the initial imbalance from left-right will be decreased upon subsequent visits with further improvement post-adjustment.

## **Materials and Methods**

The system of Logan Basic Methods uses structural analysis from radiography combined with postural and clinical examination findings to determine and apply specific low-force adjustments to the pelvis and spine <sup>(5)</sup>. The most commonly applied contact of Logan Basic Technique, the apex contact, specifically contacts the sacrotuberous ligament, as it attaches to the sacrum, which connects the ischial tuberosity to the anterior aspect of the sacrum. This ligament is believed to play an integral role in the stability of the pelvis, especially during nutation and counternutation. The cardinal signs of Logan Basic Technique are “HELPS”—high iliac crest, erector spinae tension, lowest freely moveable vertebrae rotation, pain over the sacroiliac joint, and sacrotuberous ligament tension. From these signs, the clinician determines the side of sacrotuberous ligament contact <sup>(3,4,5)</sup>.

The Chirotron model 6800 weight analyzer (Chirotron Inc., Seattle, Washington) contains six separate force plates, two for each foot and one for each heel. The scale averages readings for eight seconds during the measurement. It presents a print out showing total weight, weight in each quadrant, difference in weight (in pounds) from left to right, percent weight shift from LR to AP and the ratio of LR to AP<sup>(6)</sup>. From this information, calculations on total weight on the left foot and right foot respectively were completed by the researchers.

Subjects were recruited from the current Trimester 4 class at Logan College. These students have recently (within four weeks from start of study) had full-spine AP and lateral X-rays taken as part of their Logan Basic technique class. The radiographs of the accepted subjects were analyzed by the student researchers in accordance with Logan Basic Technique marking system.

The initial parameters for inclusion in the study included a starting imbalance of right to left weight distribution of at least ten pounds. This was later modified to include those who had a difference of at least seven pounds during the pre-screen process, due to a lack of qualified participants. If the subject had a known scoliosis, he/she was also excluded from this study. The aim was to have a minimum of 20 participants in the study. However, after four weeks of classroom visits and announcements, only 13 total students volunteered for pre-screening, of which eight qualified and six began the study.

There was a pre-adjustment weight balance analysis on each subject prior to the adjustment. The subject removed his/her shoes and emptied his/her pockets before standing on the Chirotron. The subjects were placed on the Chirotron and were directed to look straight ahead during the analysis. The subject was monitored during this assessment by the researchers to ensure consistency and minimize shifting once on the Chirotron unit. If the subject was seen to be shifting during the weight measurement, the subject was immediately asked to step off the Chirotron unit, the unit was allowed to reset, the subject was repositioned on the unit, and a new measurement was taken. After the analysis the subject was taken by the clinician to the adjusting room, walking approximately 100 feet from the Chirotron unit. The cardinal signs were evaluated on the subject by the clinician, and the appropriate apex contact was administered. A Zenith Hi-Low model 220 table was used during the adjustment. The subject then walked 100 feet back to the Chirotron unit for a post-adjustment weight analysis. The clinician administering the adjustment had no knowledge of the Chirotron results

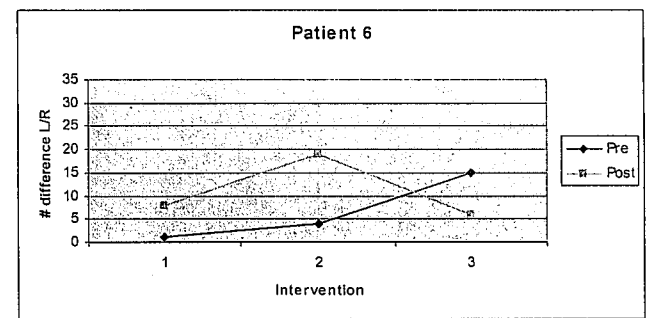
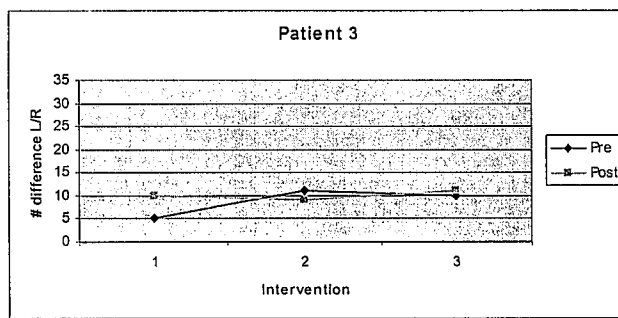
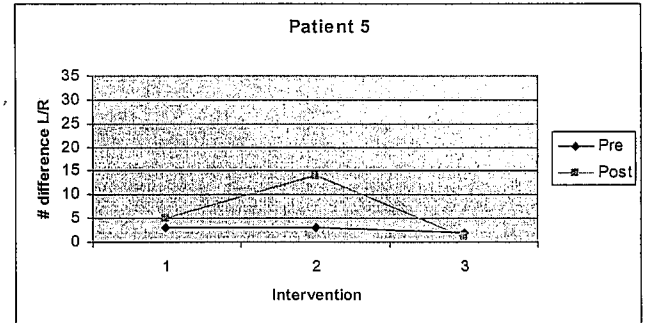
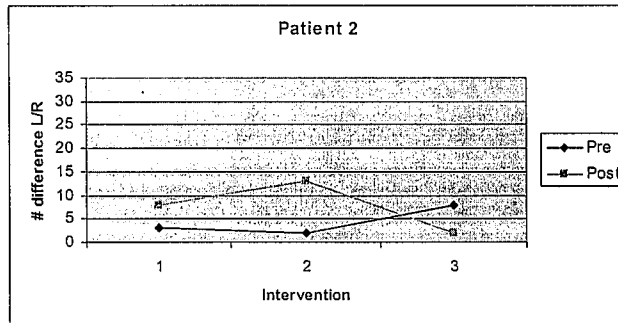
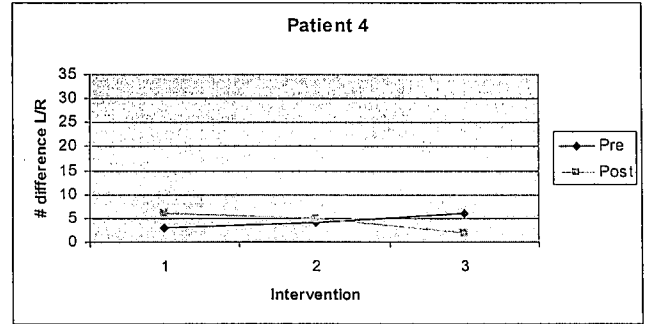
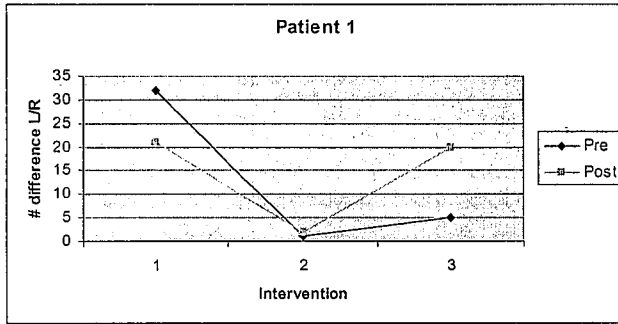
(amount of weight imbalance or side of weight imbalance) before or after the adjustment was given to the subject. The subjects came in once per week for three weeks, for a total of three adjustments.

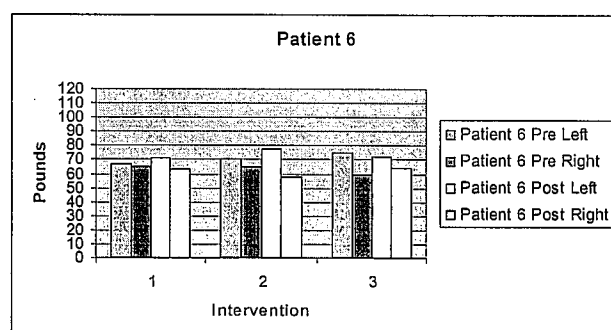
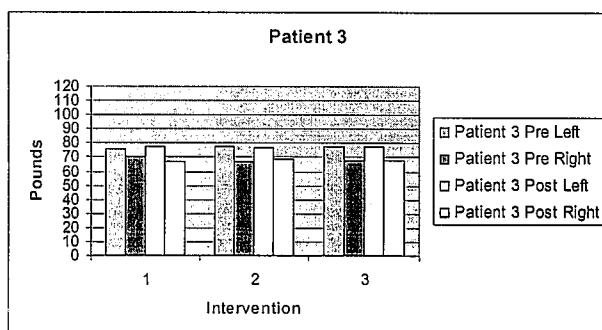
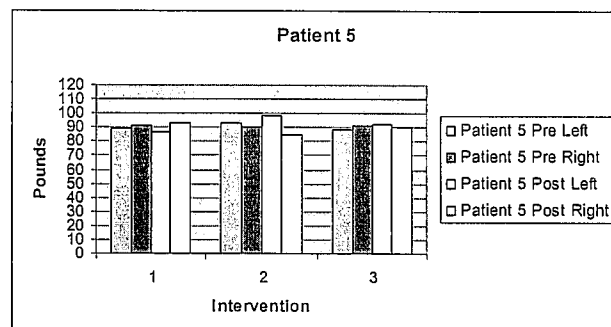
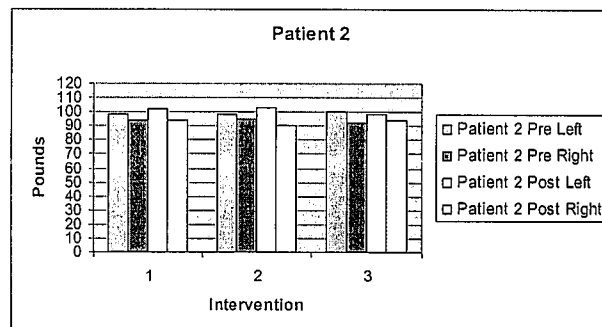
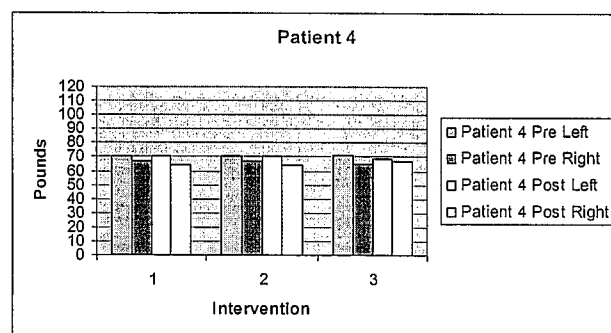
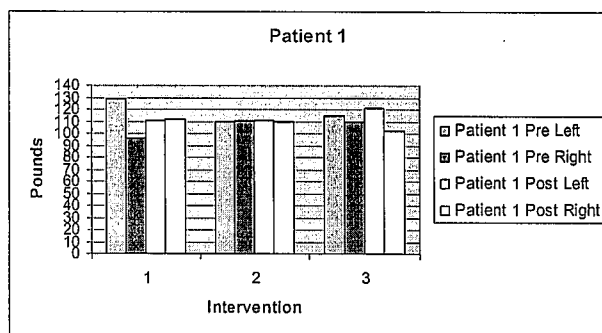
## **Results**

Below are two sets of graphs. The first graph shows the difference in pounds from left to right, as calculated by the Chirotron, before and after each intervention. It was expected that the purple line (post-adjustment reading) would be below the blue line (pre-adjustment reading) for each subject and each intervention.

The second set of graphs is the total weight on the left and right foot, respectively, as calculated from the readings on the Chirotron. These graphs show left and right weight bearing both before and after each intervention for each subject.

"HELP" signs were documented by the adjusting clinician before each adjustment. The side of apex contact was determined and administered by the clinician. The side of contact remained the same throughout for Patients #1, #2, and #4, with some variability in side of contact for Patient #3, #5 and #6. This does not appear to have changed the overall trend.





## Discussion

The results of the study were inconclusive. There seems to be a change in balance after the adjustment, however this change is unpredictable and differs not only from subject to subject but within the subject individually. There also were no significant improvements carried over from one week (adjustment) to the next.

Previous studies performed used bathroom scales for their analysis. The Chirotron unit was selected for this study to minimize error and offer more data for analysis. The 1990 study by Jordan and McEvilly used two groups of twelve subjects; one group



received a Logan Basic adjustment, the other received a sham treatment. Only one intervention was used for their study and a standard deviation of three pounds was allowed between pre and post treatment weight analyses. Their study did not show a positive correlation between the adjustment and weight balance (it also looked at leg length discrepancies). The study by Goulet, et al in 1996 had 11 subjects, five of which were in a control group, and the remaining six subjects received Logan Basic adjustments, per their individual treatment plan. That study did report a correlation between Logan Basic adjustments and weight balance.

This study used a specific number of interventions (three) for consistency of data collection and the Chirotron six-way scale as a more sensitive method of measurement. While measurements in the anterior-posterior (AP) plane were recorded for each subject, they were not analyzed specifically within this study. This study looked at changes from left to right overall. There is some risk of human error while subjects are standing on the Chirotron unit. If the subject shifts his/her weight during the calculations, the results could be skewed. This risk was minimized as much as possible by the researchers, who monitored the subjects during this process, however it can not be entirely eliminated. It may also be possible that changes post adjustment could be altered by the gait of the subject as they walk back from the adjustment room to the Chirotron unit.

## **Conclusion**

The hypothesis that Logan Basic adjustments positively affect weight balance is not supported at this time. The hypothesis that such improvements, if any, will be sustained and further improved is also not supported at this time. The results of the study were unpredictable and inconclusive. There does appear to be a change in balance after the adjustment. However, there was little consistency of improvement or of further imbalance noted between subjects from one intervention and from one

intervention to the next. Additional studies with a larger sample group and an increased number of adjustments, with a shorter interval between adjustments, may produce more reliable or consistent results.

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