

**WHITE BLOOD CELL COUNT**  
**RESPONSE TO FULL SPINE**  
**ADJUSTMENTS**

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## **Abstract**

**Objective:** The objective of this study is to assess the changes in the immune system, specifically, white blood cell count, after receiving a full spine Activator adjustment.

**Setting:** Activator adjusting room and Blood lab at Logan college of Chiropractic.

**Design:** Single blind experiment

**Participants:** Two groups were used in this study, a control group, and a treatment group, who received a full spine Activator adjustment. There were a total of 18 subjects used 8 control and 10 experimental.

**Main Outcome Measure:** WBC

**Intervention:** Full spine activator adjustment

**Results:** The results were compared to previously defined normal white blood cell count values and the efficacy of a full spine Activator adjustment was assessed. Of the 20 subjects that were used, results reveal that the adjustment group did increase in white blood cell count values, by an average of 0.2 .

**Conclusion:** Although this is not a significant change, it is clear that there does exist an intimate relationship between the nervous system and the immune system that needs to be studied further.

## **Introduction**

The body functions only as a direct result of signals from the nervous system. This is true for every function and every cell in the body, including the immune system. The body protects the brain and the spinal cord by way of the skull and the vertebral column. The vertebrae within the vertebral column can become misaligned from their optimal position and irritate the cord and the nerves exiting the cord. This irritation can cause malfunction in any tissue that is being innervated by that nerve below the point of irritation by either increasing or decreasing nerve function due to the irritation. Without the proper nerve supply to all cells within the body they cannot perform or function the way they were designed.

There are two theories in chiropractic describing what happens when a vertebrae becomes misaligned. The first states that irritation to a nerve will cause the nerve to be "pinched" causing a decrease in the function of that nerve. White blood cells are the most important defense mechanism we have in our bodies and if these cells are not receiving the proper nerve supply the production of new generations of cells will be decreased (1). As a result our bodies cannot build up the proper mechanisms to fight off infections.

The second theory holds that irritation to a nerve will actually cause the nerve to become facilitated or overactive, and the function of that nerve will be increased. The question then becomes is an

increase in function good or bad. Too much input into the immune system can actually be harmful as can be seen in an allergic response. Allergies can be interpreted as an overreaction by one's nervous system as a defense against a threat to the organism (4). Since there is a possible facilitation to the nerve, the body sends to many defensive mechanisms to the site of invasion and causes an overreaction. If the immune system were working properly the body would recognize the allergen and dispose of it without us even knowing anything had happened. Much more research is needed on these topics, so it will make it clearer to understand how and why our bodies respond in these ways.

It is hypothesized in this study that Full-Spine Adjustments will improve immune function by increasing circulating white cells following an Activator adjustment. If the nerve impulse is adequate, the body should produce and distribute the proper quantity and quality of infection fighting white blood cells more efficiently. Correction of any spinal misalignments could then be correlated to changes in an individual's WBC differential.

### **Materials and Methods**

For this experiment subjects were solicited from the student body at Logan College of Chiropractic. After all subjects were recruited, they were individually informed about their participation, the

risks and benefits of the adjustment, and the risks and benefits of having blood drawn. Once explanations were in place and all their questions were answered, the subjects were asked to sign a consent form allowing their blood to be drawn and them to be adjusted.

The Lab Technician (Diane) had the subjects sit down in the phlebotomy chair. She then took blood from the subjects. She used a 1.5 inch 21 gauge needle for this procedure. Diane immediately took the blood sample to the Cell Dyne 1600 instrument and put the sample in to be analyzed. The subjects were then sent to the Activator room to be adjusted.

Upon arrival the subjects waited quietly for the 15 minutes. The subjects then were placed onto an Activator table, analyzed, and adjusted by Dr. Bays using Activator Protocol. Dr. Bays adjusted each patient using an Activator III instrument. The areas that were adjusted and the time of adjustment were recorded as the adjustment took place. After the adjustment was completed the subjects were sent back to the phlebotomy lab for the second blood draw. After the second blood draw the subjects were released to go home.

### **Results:**

The results of this study are presented in Appendix A and B. The eighteen subjects were divided into two groups. The first group was given a real activator adjustment while the second group was given a

sham adjustment. The average baseline white blood cell count for the adjusted group was 6.43 and for the control group was 6.375. The average WBC after the adjustment was performed for the test group was 6.63. The average value for the control group post sham adjustment was 6.387. Therefore, the average increase in WBC for the test group was 0.2 while for the control group it was 0.0.

These results were analyzed using a paired t-test. The t-test indicate that the measured changes in WBC were insignificant.

### **Discussion:**

Even though there has been a lot of material written on the relationship between the immune system and the neuroendocrine system, there remains a need for more controlled studies to prove this relationship exists (1). This study is attempting to pave the way for future studies. Chiropractors have known for years that the upper thoracic spine has a great deal of influence on the immune system. It was the goal of this study to demonstrate this relationship. The results of this study did not turn out as expected and there are many explanations for this.

First, although the force of the adjustments was kept constant, the adjustment itself was not. All the subjects had different segments

adjusted. Of the ten test subjects, only five had their upper thoracic adjusted.

Second, there were too many variables that could have affected the results. For example, subjects were allowed to eat in between adjustments and having their blood taken.

Third, WBC is not an accurate measuring tool. It would have been more appropriate to check the change in macrocyte level because they have a quicker turnover time.

Finally, future studies need to employ more subjects. This study only employed 18 subjects. To be significant, at least 100 subjects were needed.

The implication of this study is that it has the potential to change the perspective of the general public as to the impact chiropractors can have on their health. Society could move away from the model of back pain and neck pain to a more general model of wellness. There was evidence of a slight change in the level of WBC in the test group which is a promising sign for future studies.

### **Conclusion**

This study was an attempt to build upon previous research showing the effects of chiropractic adjustments on the immune system. Studies by Brennan et al support a relationship between the chiropractic adjustment of the thoracic spine and increased immune

function (3,4,5,6,&7). This study attempted to show a WBC elevation following a chiropractic adjustment. The findings of this study, although statistically insignificant, support the need for more controlled studies with a greater number of subjects.

The implication of similar studies of greater magnitude would be of importance to care givers in all fields. The relationship between structure and function would extend beyond neurology into immunology. This concept has the potential of completely changing the goal and means of the modern medical model: from an outside-in intrusive model to one of optimizing function through structure without introducing unnatural substances into the body. It would also affect the exploding cost of health care in the United States by offering a no crisis-based option for health.

It is our hope that others will build upon this study, that future studies will eliminate the errors inherent in this one.



## References

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## APPENDIX A

<b>Subject ID#</b>	<b>Baseline WBC</b>	<b>Post Adj. WBC</b>	<b>Change</b>
101	5.5	5.7	0.2
103	5.4	5.6	0.2
106	4.9	4.6	-0.3
107	6.6	6.9	0.3
111	8.4	8.6	0.2
112	5.6	5.9	0.3
114	6.1	6	-0.1
115	8.5	8.9	0.4
116	6.9	6.9	0
117	6.4	6.6	0.2

## APPENDIX B

<b>Subject ID#</b>	<b>Baseline WBC</b>	<b>Post Adj. WBC</b>	<b>Change</b>
102	5.2	5.1	-0.1
104	7.2	6.8	-0.4
105	5.8	5.5	-0.3
108	7.7	7.7	0
109	4.9	5	0.1
110	6.7	7.5	0.8
113	5.4	5.2	-0.3
118	8.1	8.3	0.2