

BODY-ALINE™

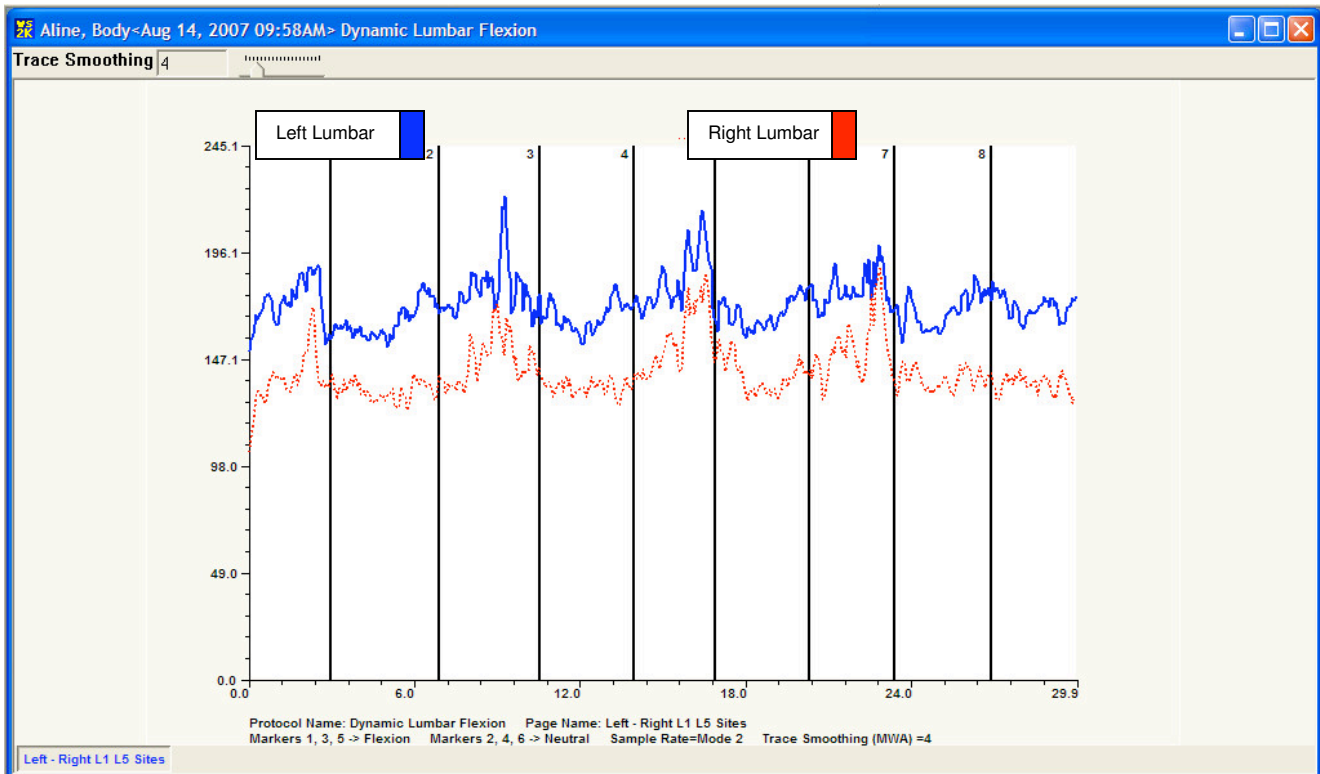
The Effect of the BODY-ALINE Exercise on Selected Postural Muscle Groups - As Determined by Electromyogram (EMG).

Introduction

A study was conducted by Noble Chiropractic Wellness & Nutrition - A Division of CNSI (Carpentersville, IL) & Beyond the Curve LLC. (Carpentersville, IL) to determine the effectiveness of the BODY-ALINE exercise machine in stimulating certain muscle groups related to posture. The muscles groups chosen for the experiment were the Erector Spinae group (presented in Experiment #1) and the Mid-Trapezius, Rhomboids Major & Posterior Deltoid groups (presented in Experiment #2). A dynamic surface electromyogram (EMG) was used to measure the electrical impulses of these muscle groups at rest & during contraction.

Experiment #1

EMG electrodes were placed on the male test subject along each side of the spine (L1 & L5), in order to measure the electrical response of the Erector Spinae Muscle Group during the execution of the BODY-ALINE exercise movement. After the electrodes were placed, the male test subject was then instructed to perform the back extension portion of the BODY-ALINE exercise movement for a total of 4 times (repetitions). The following graph shows the results of the EMG test.

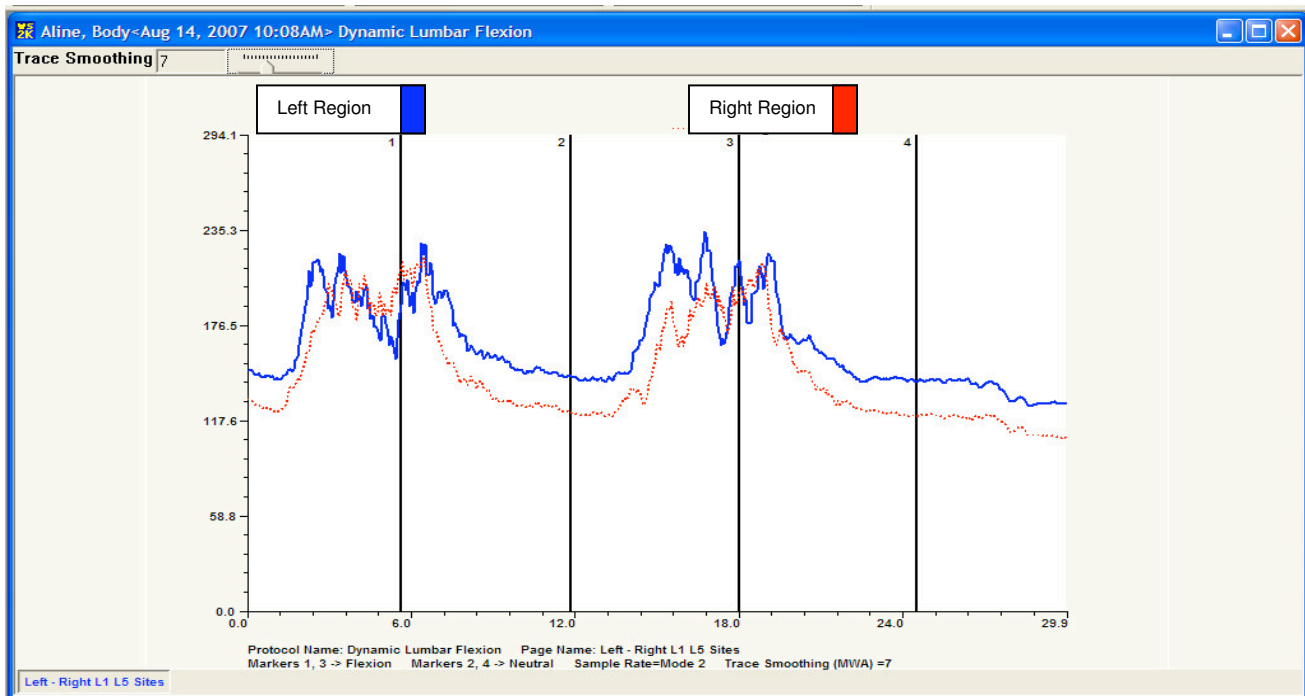


The response of the left & right lumbar regions of the Erector Spinae Muscle Group is indicated by color. The blue line represents the activity of the Left Lumbar Region & the red line represents the activity of the Right Lumbar Region. The execution of the exercise movement and corresponding level of muscular activation is indicated by the point-by-point position of the lines on the above graph - to comprise the EMG reading. A peak (high point) in the line (reading) indicates increased muscular activity (contraction). A low point in the line (trough) indicates decreased muscular activity (rest). As you can see, the chart reveals a pattern of increased muscle activation, followed by a decrease in muscular activation, then increased muscle activation and so forth. This pattern coincides exactly with the patterning of the exercise movement. As the male test subject leaned backward to perform the back extension portion of the movement, the Erector Spinae Muscle Groups (Left & Right Lumbar Regions) contracted concentrically – as indicated by the peak in the readings. As the user leaned forward to the

start position of the exercise movement (rest), the Erector Spinae Muscle Groups (Left & Right Lumbar Regions) relaxed – as indicated by the trough.

Experiment #2

Electrodes were placed on the male test subject at various locations along the rear of each shoulder & shoulder blade (toward the spine), in order to measure the electrical response of the Mid-Trapezius, Rhomboids Major & Posterior Deltoid Muscle Groups during the execution of the BODY-ALINE exercise movement. After the electrodes were placed, the male test subject was then instructed to perform the rearward arm rotation portion of the BODY-ALINE exercise movement for a total of 2 times (repetitions)*. The following graph shows the results of the EMG test.



The response of the left & right regions of the Mid-Trapezius, Rhomboids Major & Posterior Deltoid Muscle Groups is indicated by color. The blue line represents the activity of the Left Region & the red line represents the activity of the Right Region. The execution of the exercise movement and corresponding level of muscular activation is indicated by the point-by-point position of the lines on the above graph - to comprise the EMG reading. A peak (high point) in the line (reading) indicates increased muscular activity (contraction). A low point in the line (trough) indicates decreased muscular activity (rest). As you can see, the chart reveals a pattern of increased muscle activation, followed by a decrease in muscular activation, then increased muscle activation and so forth. This pattern coincides exactly with the patterning of the exercise movement. As the male test subject rotated his arms rearward to perform the rearward arm rotation portion of the exercise movement, the Mid-Trapezius, Rhomboids Major & Posterior Deltoid Muscle Groups (Left & Right Regions) contracted concentrically – as indicated by the peak in the readings. As the user rotated his arms forward to the start position of the exercise (rest), the Mid-Trapezius, Rhomboids Major & Posterior Deltoid Muscle Groups (Left & Right Regions) relaxed – as indicated by the trough.

** The number of repetitions of the rearward arm rotation was limited to two because the time increment for both tests was the same, and the rearward arm rotation takes about twice the amount of time to execute, when compared to the back extension.*

Summary

As clearly indicated by the EMG readings in Experiment #1 & Experiment #2, the execution of the BODY-ALINE exercise movement provides significant stimulus to the Erector Spinae, Mid-Trapezius, Rhomboids Major & Posterior Deltoid Muscle Groups – by forcing them to contract concentrically, in order to overcome the tension of the exercise movement. The strength level & degree of neuromuscular control of these muscle groups is vital to supporting the spine & maintaining good posture. By stimulating these muscle groups, with one single motion, the BODY-ALINE improves neuromuscular control & increases the strength of these muscle groups. Thus, providing a safe & effective means of posture maintenance & correction for most people.