# Standing posture and upper cervical misalignment:

## -a practice-based retrospective review of 300 cases

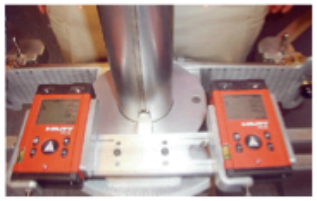
**Michael Thomas**, D.C. , **Russell Friedman**, D.C. , **Robert Rectenwald**, D.C., **Virginia Thompson,** M.S.

## Introduction

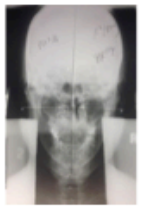
- Standing posture and upper cervical alignment have long been clinically recognized as inter-related factors by orthogonally-based upper cervical chiropractors.
- A practice-based, pre-post-adjustment retrospective study of assessment measures by Quantum Spinal Mechanics chiropractic procedures collected measured aspects of standing posture and orthogonally-based upper cervical radiographs.
- Attempts to describe these misalignment assessments & their relationships in a presenting upper cervical care patient population will help guide future studies.

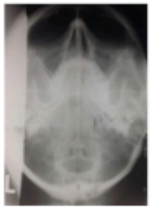
## Methods

- Assessment measurement, data double entry verified, of 300 randomly selected case files from 2009-2011 were analyzed.
- Data Recorded
  - Standing posture data included: bilateral weight balance, pelvic anteriority/posteriority and C7/T1 spinous movement in the frontal plane, were recorded.
  - Orthogonally–based upper cervical radiographs with defined radiographic measures of the upper cervical spine and skull were used
- Statistical analysis compared datasets to determine if any associations or correlations were present.



**Modified Anatometer with lasers**





**Nasium, Vertex, Lateral Cervical Pre-Radiographs**

## Results

| Male | Female | Age (mean) | Caucasian | African American | Hispanic Latino | Native | Asian |
|---|---|---|---|---|---|---|---|
| 194 | 106 | 48.29 yrs | 284 | 13 | 1 | 1 | 1 |

Change in alignment descriptive statistics.

| | N | Minimum | Maximum | Mean | Std. Deviation |
|---|---|---|---|---|---|
| Leg Change | 300 | -2.000 | .125 | -.60625 | .342002 |
| Weight Change | 300 | -74.000 | 16.500 | -9.40033 | 9.852421 |
| Weight % Change | 300 | -15.892 | .103 | -.18560 | 1.205595 |
| Pelvic Rotation Change | 300 | -24.000 | 7.000 | -3.89133 | 3.613805 |
| Fixed Point Change | 300 | -6.000 | 9.000 | -.61253 | 1.164690 |
| C1 Lateral Change | 300 | -7.000 | 2.250 | -1.76275 | 1.156567 |
| Head Tilt Change | 300 | -12.250 | 3.000 | -1.73767 | 1.827810 |
| Odontoid Change | 300 | -6.500 | 2.000 | -1.25500 | 1.204730 |
| Body Center Change | 300 | -6.500 | 2.000 | -1.26667 | 1.211719 |
| C2 Change | 300 | -14.500 | 3.250 | -2.71233 | 2.482423 |
| Lower Angle Change | 297 | -11.000 | 5.000 | -2.14099 | 2.021620 |
| Plane Change | 300 | -5.000 | .750 | -1.02417 | .794814 |
| Atlas/odontoid Change | 300 | -2.000 | .250 | -.29583 | .476653 |
| Angles (4th) Change | 299 | -5.750 | 1.250 | -.37458 | .604574 |
| C1 Rotation Change | 300 | -6.000 | 3.000 | -1.55208 | 1.345804 |

There appears to be a statistically significant improvement in alignment measures from pre- to post-treatment for each of the variables in this sample at the $p < 0.05$ level. It may be concluded on average, the intervention resulted in increased alignment for the patients in this sample. Clinical significance is unknown.

| | No Change | Improvement | Worsening |
|---|---|---|---|
| Supine Leg | 4 | 295 | 1 |
| Weight | 2 | 276 | 22 |
| Weight % | 4 | 273 | 23 |
| Pelvic Rotation | 22 | 258 | 20 |
| Fixed Point | 68 | 213 | 21 |
| C1 Lateral | 1 | 295 | 4 |
| Head Tilt | 9 | 274 | 17 |
| Odontoid | 47 | 238 | 15 |
| Body Center | 46 | 239 | 15 |
| C2 | 16 | 271 | 13 |
| Lower Angle | 21 | 258 | 18 |
| Plane Line | 55 | 239 | 6 |
| Atlas / Odontoid | 193 | 106 | 1 |
| Angles (4th) | 128 | 165 | 6 |
| C1 Rotation | 16 | 272 | 12 |

These findings require further study to understand why some measures showed no change or worsened.

## Discussion

- Notable changes in patient assessment measured variables have been clinically observed in the pre- and post-data measurements, interpreted as a successful patient intervention.
- Relationships regarding reduction of upper cervical misalignments with return to postural alignment with the vertical axis were examined.
- Identified were a descriptive analysis of the chiropractic realignment data of this patient sample.
- The presence of significant change in alignment pre- to post-treatment was observed.
- Pre- to post-intervention assessments were analyzed to detect decreases or increases or no change in misalignment variables.

**Pre- adjustment**

**Post-Adjustment**

## Conclusion

- More study needed to resolve clinically apparent observations of assessments and relationships ,
- Studies to resolve reliability & validity of the assessment measures are needed.
- Comparison of significant assessment changes to Quality of Life measures may reveal clinical significance of changes.