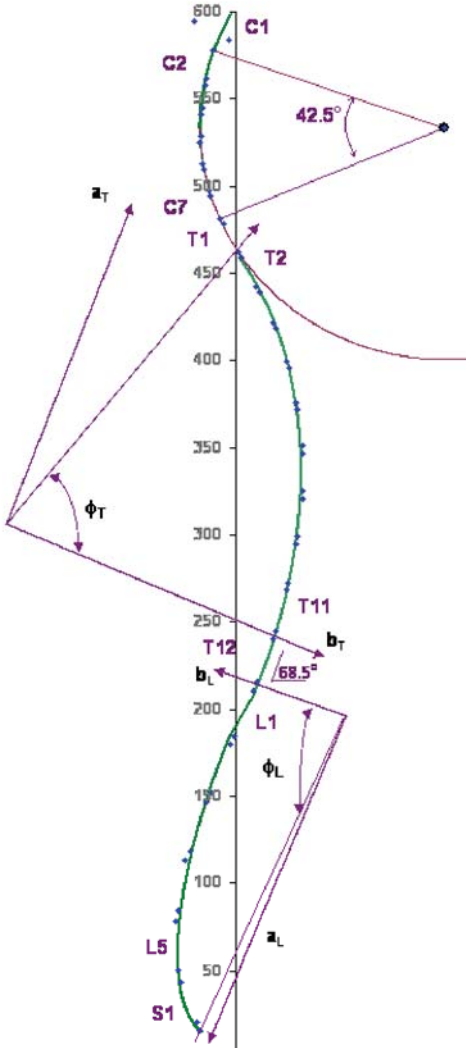
PostureRay™

The Ultimate in Precision X-Ray Evaluation



X-RAY Report of Findings

Prepared for : Johnny TestPatient

Evaluation Date : 9/2/2007

Date X-Ray Taken: Sunday, August 19, 2007

Prepared by:
Advanced Chiropractic Associates
8406 Massachusetts Ave., Suite A 2
New Port Richey
Florida, United States
34653

X-RAY Report of Findings

Welcome

You have chosen to be a patient at an office that utilizes posture and x-ray to evaluate your spinal alignment. While a postural analysis can provide a knowledge of gross postural/spinal abnormalities (your outside alignment), only a radiographic evaluation can provide the details of your spine's alignment and condition (your inside alignment). Your spinal alignment, any possible spinal arthritis, and disc disease (S.A.D.D.) are both conditions of interest to your doctor. With the knowledge from analyzing your spinal x-rays, your health care provider can determine a beginning clinical impression (diagnosis from any abnormalities found on your x-rays) and determine an initial program of corrective care.

What is Normal for the Spine?

Your doctor performs several levels of analyses on your spinal x-rays. First, an overall evaluation of your alignment in front-to-back radiographic views and your side radiographic views is performed. In the Front view, your spine should be straight or vertically aligned with gravity. In the Side view, your spine should have four natural curves. These four curves should be a convex forward curve in the neck (termed lordosis), a concave curve in the rib cage area (termed thoracic kyphosis), another convex forward curve in the low back (termed lumbar lordosis), and a concave curve in your sacrum-tailbone area. Figure 1 illustrates this alignment.

Figure 1.

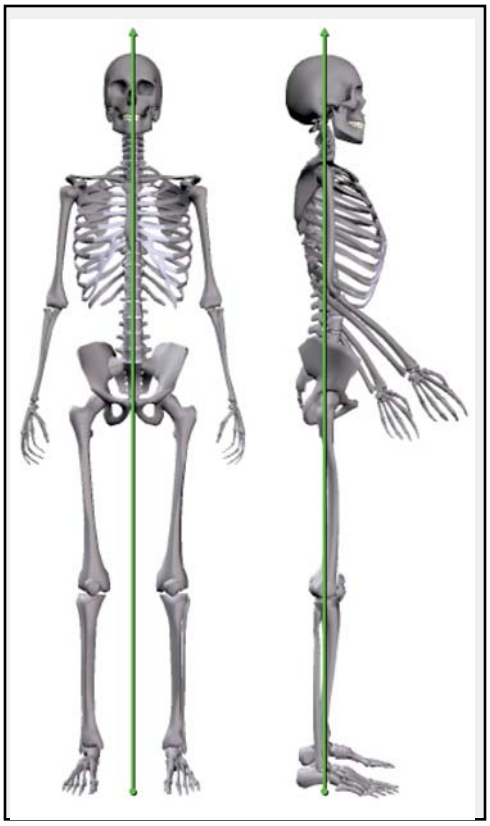


Figure 1.

Normal spinal alignment is depicted in both the front and Side views. In the front view, the center of mass of the skull, thorax, and pelvis are in a vertical line which falls between mid-stance. The spinal column is vertically aligned with respect to gravity. In the side view, the center of mass of the skull, thorax, and pelvis are in vertical alignment over the ankle. The cervical spine is lordotic, the thoracic spine is kyphotic, and the lumbar spine is lordotic.

X-RAY Report of Findings

For a second evaluation, your doctor looks for any obvious spinal ligament damage by observing individual spinal vertebra for any left or right misalignments in the front view and any forward or backward misalignments in the side view. Figure 2 illustrates cases of spinal ligament damage.

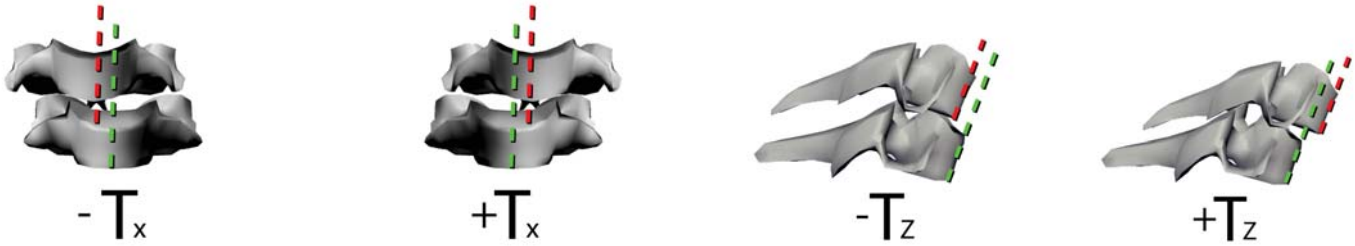
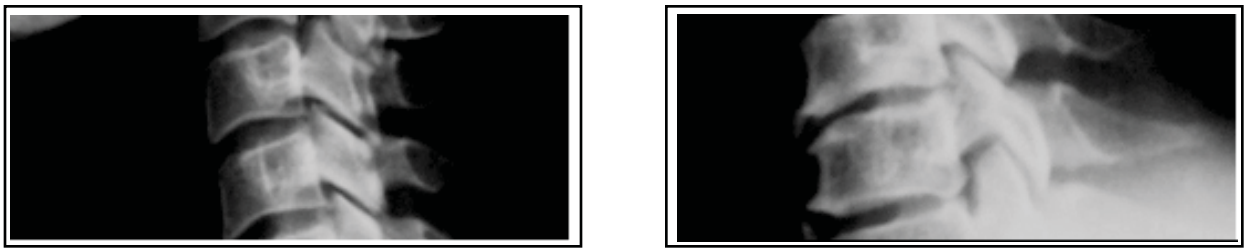


Figure 2. Ligament damage is present when a spinal vertebra does not align properly with either the vertebra immediately above it or immediately below it. In the 1st and 2nd picture, abnormal alignment of a vertebra translating left and right, signifying spinal ligament damage, is illustrated for the front view. In the 3rd picture, in the side view, forward slippage of the top vertebra is depicted. In the 4th picture, in the side view, backward slippage is shown.

For a third evaluation of your spinal x-rays, your doctor checks each vertebra for normal contour and density. This evaluation determines the state of any possible spinal arthritis and disc disease (S.A.D.D.) that you may have. Figure 3 provides an example of this analysis.



For a fourth evaluation of your spinal x-rays, your doctor checks the spacing between each pair of vertebrae. This spacing is where the spinal discs lie. Any narrowing of the normal spacing indicates disc injury and disc disease. Figure 4 presents an example of disc narrowing and disease.

Figure 4. Between the top and middle vertebrae, a normal disc spacing is seen. However, between the middle and lower vertebrae, the disc space is narrowed. This indicates that the disc has been injured and is losing its water content. While disc disease can have several causes, generally, it is a result of abnormal stress (pressures) applied to the disc from abnormal spinal alignment.

X-RAY Report of Findings

For a fifth evaluation of your spinal x-rays, your doctor determines the alignment of each spinal region (neck, rib cage, and low back) compared to the region immediately below by comparing each region to a vertical line in both the front view and side view. The following vertebrae should be vertically aligned with each other: C1 (first neck vertebra), T1 (first rib cage vertebra), T12 (last rib cage vertebra at the level of your kidneys), and S1 (first vertebra in your sacrum). Figure 5 illustrates this alignment for the three separate spinal regions, neck, rib cage, and low back.

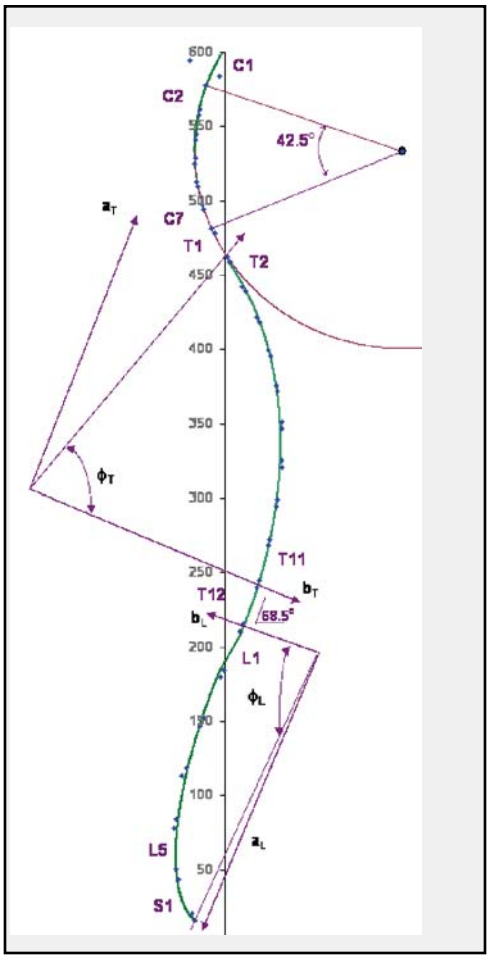


Figure 5. Normal spinal balance from the side is when a vertical line will pass through C1, T1, T12, and S1. This can be observed all at once on a full-spine side view x-ray or for individual regions on smaller x-ray views, termed sectional x-rays. The figure to the left shows only the posterior points of each vertebra. If we look at the side view cervical (neck), C1 is aligned with T1 (thick vertical black line), with a forward convex curve termed cervical lordosis. If we just look at the side view of rib cage (thoracic), T1 is aligned with T12 and there is the presence of a concave curvature (termed thoracic kyphosis). If we look at the side view lumbar (low back), T12 is aligned with S1, with a forward convex curve termed lumbar lordosis.

For a sixth evaluation, your doctor measures any displacements of the individual spinal vertebra and/or spinal regions. These measurements are in degrees for any angular or turning (rotational) displacements and in millimeters for any sliding or shifting (translational) displacements. Figures 6 and 7 illustrate these measurements.

X-RAY Report of Findings

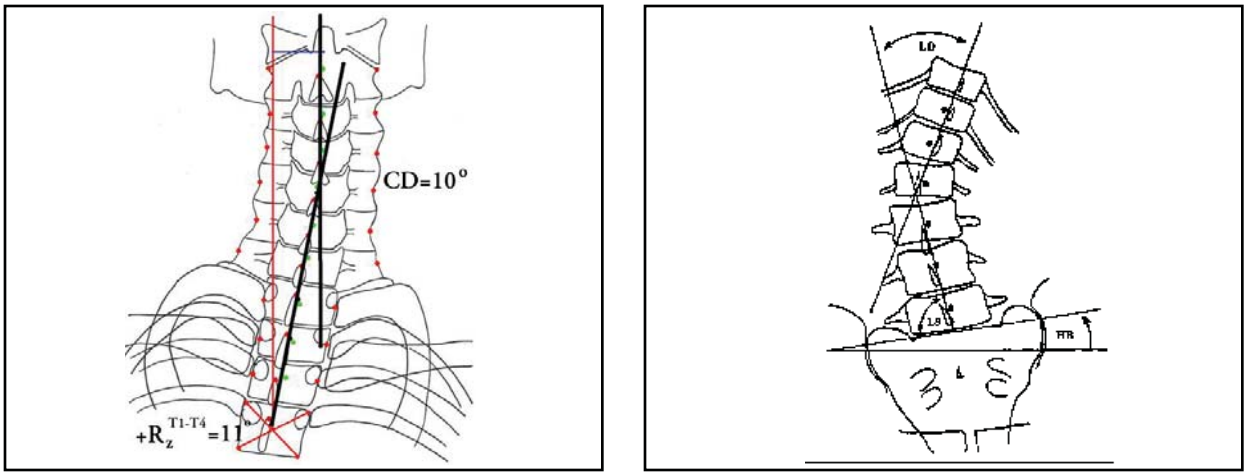


Figure 6.

In the front x-ray views, lines are drawn through the centers of mass of each spinal vertebra to measure your abnormal spinal alignment. In A, an example of an analysis of abnormal spinal alignment of the neck in the front view is provided, and in B, an example of an analysis of abnormal spinal alignment of the low back is shown.

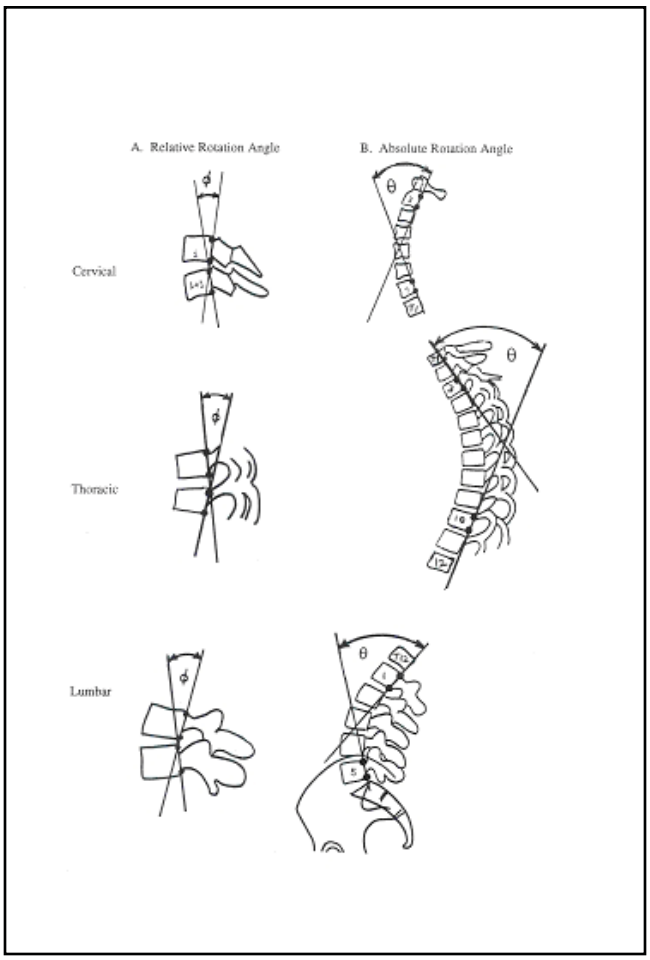


Figure 7.

In the side view, lines are drawn on the back part of each spinal vertebra. These lines are termed "Posterior Tangents". When measuring angles between adjacent posterior tangents, the angles are termed Relative Rotation Angles (RRA). When angles are formed by posterior tangents on the top and bottom vertebrae in any spinal region, these angles are termed Absolute Rotation Angles (ARA). There are precise normal values published in the scientific literature for each spinal RRA and each spinal ARA. Your alignment will be compared to these published normal values.

X-RAY Report of Findings

What Are the Risks of X-ray Exposure?

While we must constantly work towards the reduction of health risks in all endeavors, we may be led to accept a minimal level as normal. While there is no data indicating diagnostic radiology has a present risk, any radiation dose must be compared to the benefits of useful information gained. The necessity for appropriate treatment selection is indeed an acceptable trade-off when put into perspective. The need for x-ray imaging is especially clear when one considers that radiographic (x-ray) imaging is the only valid method for determining abnormal spinal alignment and the presence of any spinal degeneration. However, since 1990, there has been a growing knowledge base that suggests medical x-rays may have health benefits. While an actual benefit from radiation exposure may seem outrageous, there is much scientific evidence for this phenomenon. This phenomenon/field of study is termed Radiation Hormesis.12-27,29-48

Radiation Hormesis is the stimulatory or beneficial effect of low doses of ionizing radiation. This topic is in direct conflict with the "Linear No-Threshold Hypothesis" (LNT), which has been assumed to be true for more than 50 years. This LNT model comes from estimating the risks at lower doses of radiation, in the absence of data, by extrapolating in a linear model from the extremely large doses of radiation from atomic bombs dropped on Japan in the 1940s.

This LNT model has been used to set limits of radiation exposure by all official and governmental associations around the world.17 Recently in 2003, Kauffman12 reiterated that authors critical of exposure from diagnostic radiation always use the LNT model. This use of the LNT model includes the recent 2005 report by the USA National Research Council.28 This report stated, "there will be some risk, even at low doses (100 mSv or less), although the risk is small" and "there is no direct evidence of increased risk of non-cancer diseases at low doses."28 This 2005 report ignored and contradicted an earlier 2003 review by Kant et al.29

For a comparison of exposures, USA citizens are exposed to an average annual natural background radiation level of 3 mSv, while exposure from a chest x-ray is approximately 0.1 mSv and exposure from a whole body computerized tomography (CT) scan is approximately 10 mSv.28 Also it is noted that 10mSv = 1,000mrem, which equates to about 46 cervical series or 8 lumbar series. Thus, the x-ray views taken to evaluate your spine in this office constitute a very small exposure compared to a CT scan or even annual background radiation from your natural environment.

Thus, it is obvious that the extremely small health risks (and maybe even some health benefits), associated with the x-ray exposure, needed to determine the state of health of your spine in this Report, are small indeed compared to the knowledge gained from this information.

From your radiographic examination at our office, we have determined the state of degeneration of your spine, and have determined the exact displacements of your spine. This knowledge not only gives us a working Clinical Impression/diagnosis of your spinal condition, but also determines the type of treatment that is needed to improve your spinal health condition.

We hope that you appreciate our thoroughness in examining and diagnosing your spinal health problems. In the next few pages, for each x-ray view obtained, we will present a normal view on the left hand side to compare to your x-ray on the right hand side. A table of values of normal measurements and your abnormal alignment will be provided on a Summary page after the x-ray photographs.

X-RAY Report of Findings

This Analysis Has Been Researched

We are proud to state that the normal spinal alignment presented in this report is the result of many research projects on spinal alignment in normal subjects.1-6 Normal values for all spinal angles and distances, utilized in this report, have been reported in the most prestigious journals in the Index Medicus literature.1-6 Your abnormal spinal displacements (subluxations) will be compared to these normals.

These measurements of spinal displacements, utilized here, are mathematical utilizing geometric methods. This geometric line drawing analysis has been shown to be very reliable (repeatable) and valid (accurate).7-11

Clinical Impression/Diagnosis

A Clinical Impression (Diagnosis) of your condition is derived from a variety of sources, including the consultation and discussion of your health history with your doctor, any orthopedic and/or neurological examinations, range of motion examination, postural examination, and the radiographic examination.

For recordkeeping purposes, the Clinical Impression is reduced to numerical codes, which have been agreed upon world wide. These International Classification of Diseases codes are termed “ICD” codes, are given to healthcare providers in code books, and are lists of specific agreed upon numbers followed by brief descriptions. These numbered ICD codes make for easy communication of your health problems, when given to any third party payers or state government entities, i.e., insurance companies, Workers Compensation, lawyers, courts, State Boards, etc.

Generally, a patient can trace his/her present condition back to a past injury, which is termed mode of onset. Using ICD codes, your doctor has reduced your condition to 5 different categories: (1) mode of onset of condition (accidents, falls, etc), (2) global postural displacements, (3) regional and/or segmental spinal displacements, (4) unchangeable complicating factors (ligament damage, spinal fractures, osteoarthritis, etc), and (5) disease syndromes (headaches, neck pain, arm pain, mid back pain, low back pain, leg pain, sciatica, etc.).

X-RAY Report of Findings

PostureRay™ The Ultimate in Precision X-Ray Evaluation

Your Doctor's Clinical Impression of your condition is:

1) Mode Of Onset Conditions

Motor Vehicle Accidents

E812.0 Driver in a Motor Vehicle collision with another vehicle

2) Spinal Subluxation

Sagittal Curve Subluxation

839.08 Loss of the Cervical lordotic curve

3) Permanent Injuries

Cervical

728.4 Ligament laxity

Lumbar

722.52 Lumbar disc degeneration, Specify level at:
L5-S1
756.12 Anterolisthesis

4) Pain or Disease Syndromes

Cervical

723.1 Cervicalgia
847.0 Cervical sprain/strain, Specify:
Sub acute (3- 6 weeks)

Thoracic

724.1 Thoacicalgia (pain)

Lumbar

724.2 Lumbalgia
728.85 Muscle spasms
782.0 Abnormal skin sensation
846.0 Lumbo-sacral sprain/strain, Specify:
Sub acute (3- 6 weeks)
847.2 Lumbar strain/sprain, Specify:
Sub acute (3- 6 weeks)

Abnormal Posture: Yes Segmental Instabilities: Yes

Special description

X-RAY Report of Findings

PostureRay™
The Ultimate in Precision X-Ray Evaluation

Side View of Your Neck (Lateral Cervical View)

The normal healthy curvature of a neck from the side.

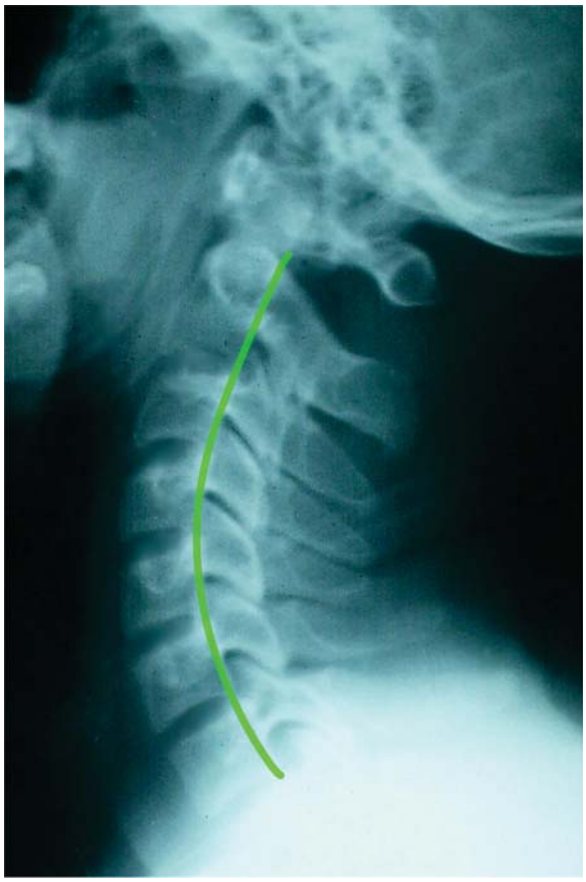
The green curved line represents the normal, healthy position for your neck.

No spinal arthritis is apparent and healthy disc spaces are visualized.

Your neck position from the side

This colored curved line represents the normal, healthy position for your neck.

This dotted line represents where your neck is currently positioned.



Notes about your condition:

Your head is positioned **27.8 mm forward**, and you have lost **122.9%** of your normal neck curve.

John, this reversal of your neck curve is a major reason why you are suffering from the headaches and neck/ the patient has a reversal of theexpected normal lordosis. No otherfindings are noted. upper back pain following you crash.

X-RAY Report of Findings

PostureRay™
The Ultimate in Precision X-Ray Evaluation

Front View of Your Neck (AP Cervical View)

The normal, healthy position of a neck from the back/front

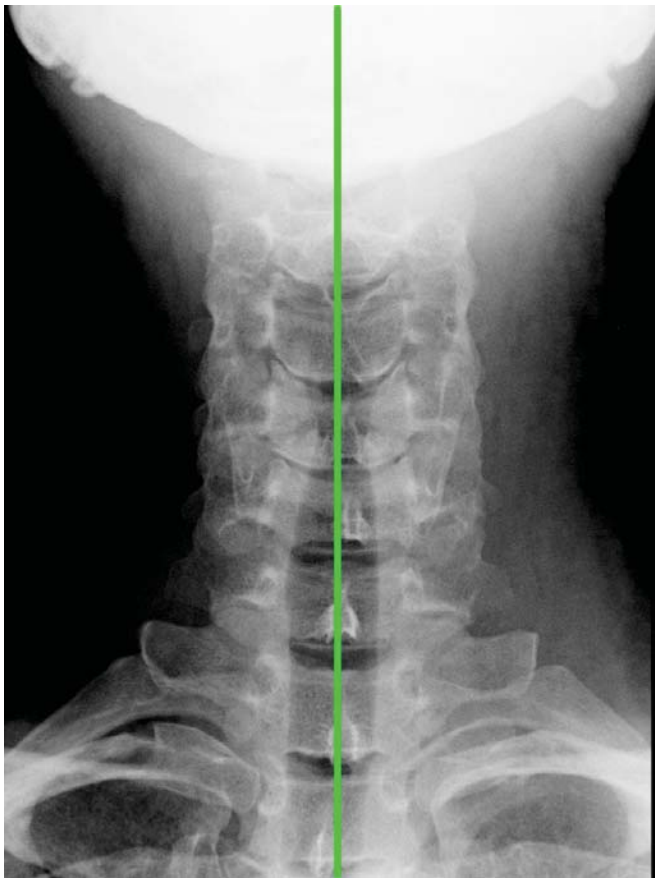
The green line represents the normal, healthy position for your neck

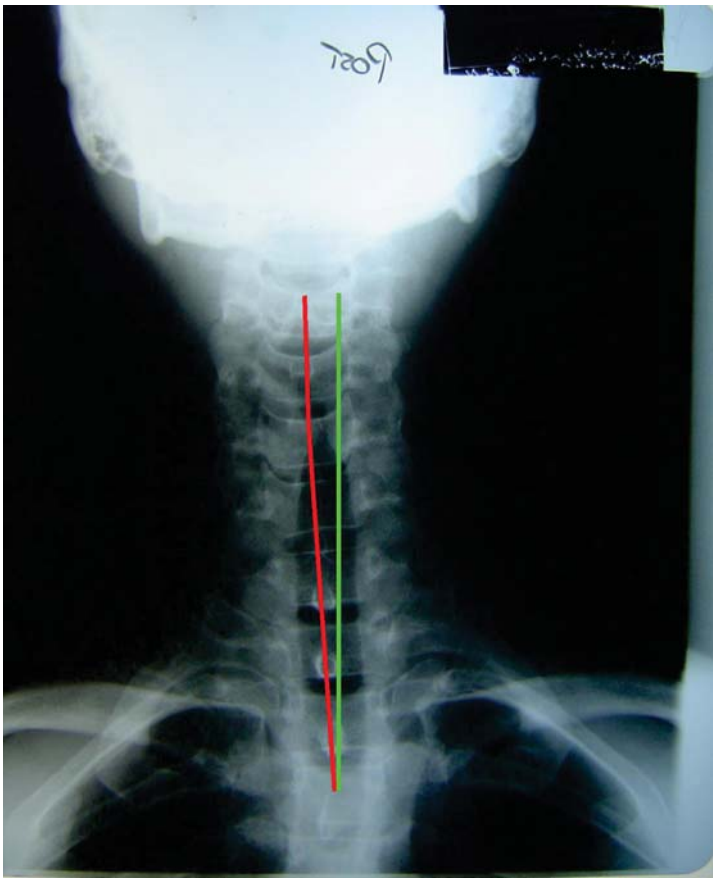
No arthritis and healthy joint spaces are visualized

Your neck position from the back

This colored line represents the normal, healthy position for your neck.

This colored line represents where your neck is currently positioned.





Notes about your condition:

Your head is shifted **11.7 mm right**, you have a mid neck scoliosis of **4.0°** and a lower neck tilt of **2.1°**

John, can you see how shifted your neck is from normal? If you follow our rehab methods, I believe we can improve your spinal structure towards a more normal alignment.

X-RAY Report of Findings

Side View of Your Low Back (Lateral Lumbar View)

The normal healthy curvature of a low back curve from the side.

The green curved line represents the normal, healthy position for low back curve.
No spinal arthritis is apparent and healthy disc spaces are visualized.

Your low back curve position from the side

This colored curved line represents the normal, healthy position for your low back curve .

This dotted red line represents where your low back curve is currently positioned.

Notes about your condition:

Your rib cage is positioned **21.4 mm forward** relative to your pelvis, and you have lost **27.8 %** of your normal low back curve.
John, notice that your L5 is shifted forward? This is the cause of your low back pain. Unfortunately, I can not fix this problem. However, I believe we can manage your pain and improve the balance of your spine above this point of injury.

X-RAY Report of Findings

Front View of Your Low Back (AP Lumbar View)

The normal, healthy position of a low back from the front/back

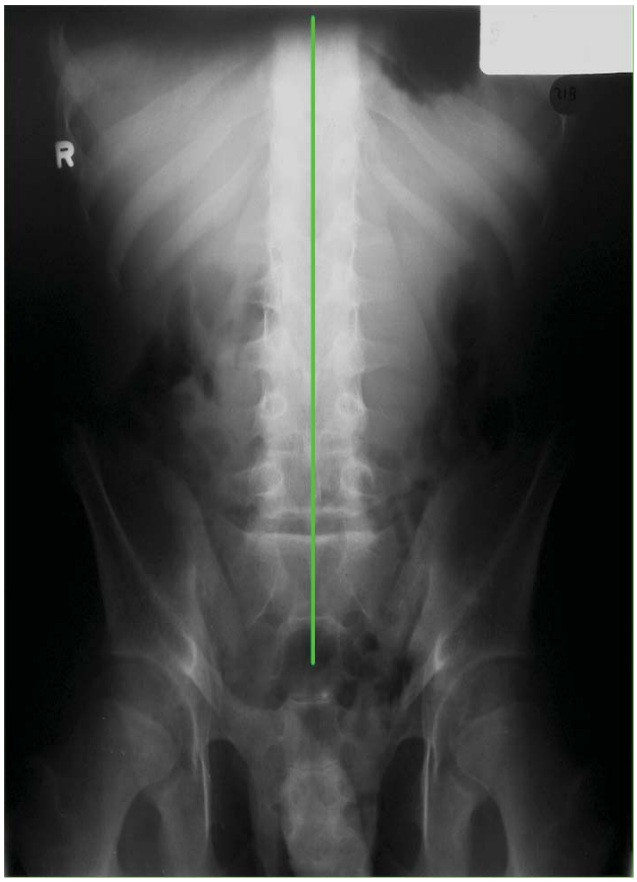
The green line represents the normal, healthy position for your low back.

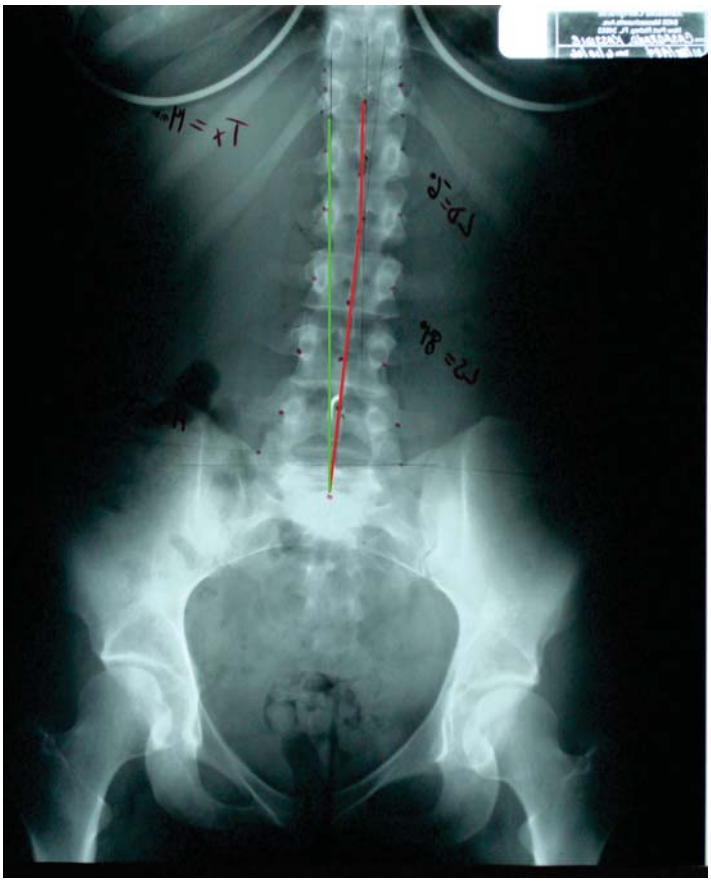
No arthritis and healthy joint spaces are visualized.

Your low back position from the front

This colored line represents the normal, healthy position for your low back.

This colored line represents where your low back is currently positioned.





Notes about your condition:

Your low back is shifted **15.2 mm to the left**, you have a mid low back scoliosis of **5.6°** and a lower tilt of **4.7°**

This abnormal position of your low back puts increased pressure on your spinal discs, muscles, bones, and nerves. This condition may lead to premature spinal arthritis and disc disease (S.A.D.D.).

X-RAY Report of Findings

Summary

By looking at your x-ray views compared to the normal views in the preceding photographs, you get a visual idea of what is wrong with your spinal alignment, which Chiropractors term vertebral subluxations.

However, a visual image does not provide the details of your misalignments. Therefore, we have provided the following Table, which has normal values for the lateral x-ray views for segmental and global alignment compared to your segmental and global alignment. These sagittal (lateral view) values were determined using a geometric analysis of the positions of your vertebrae on each x-ray view.

Cervical Spinal Level

Segments Analyzed	RRA Normal Values	RRA Patient Values	Difference From Normal	Segmental Translations *
C1 to Horizontal	29º	1.5º	94.7%	
C2-C3	-10º	0.2º	101.8%	-2.2 mm
C3-C4	-8º	15.2º	290.2%	-1.1 mm
C4-C5	-8º	4.5º	156.4%	-1.8 mm
C5-C6	-8º	-4.9º	39.3%	-1.7 mm
C6-C7	-8º	-5.4º	31.9%	-1.8 mm
C7-T1	-8º	-11.2º	40.4%	0.5 mm

Global Analysis	Normal Values	Patient Values	Difference From Normal
ARA C2-C7	-42º	9.6º	32.4º
Translation C2-C7	0 mm	27.8 mm	27.8 mm

RRA = Relative Rotational Angle of Measurement

ARA = Absolute Rotational Angle of Measurement

* Values in Red Exceed Established Normal

Anterior/Posterior Cervical Level

Global Analysis	Normal Values	Patient Values	Difference From Normal
RZA T3	0º	4.0º	4.0º
CDA C3-T3	0º	2.1º	2.1º
Translation C3-T3	0 mm	-11.7 mm	11.7 mm

X-RAY Report of Findings

PostureRay™ The Ultimate in Precision X-Ray Evaluation

Lumbar Spinal Level

Segments Analyzed	RRA Normal Values	RRA Patient Values	Difference From Normal	Segmental Translations *
L1-L2	-5º	-5.3º	6.2%	-0.3 mm
L2-L3	-6º	-17.2º	186.0%	**-7.3 mm**
L3-L4	-9º	-9.3º	3.1%	**-4.9 mm**
L4-L5	-19º	-19.4º	1.9%	-3.8 mm
L5-S1	-33º	-22.8º	31.0%	**14.4 mm**
Sacral Base Angle	40º	45.8º	14.6%	

Global Analysis	Normal Values	Patient Values	Difference From Normal
ARA L1-L5	-40º	-51.1º	11.1º
Translation L1 - S1	0 mm	21.4 mm	21.4 mm
Pelvic Tilt	50º	58.6º	8.6º
Pelvic Incidence	56º	58.3º	2.3º WNL
CBP PTPIA	67º	65.9º	1.1º WNL

RRA = Relative Rotational Angle of Measurement

ARA = Absolute Rotational Angle of Measurement

* Values in Red Exceed Established Normal

Anterior/Posterior Lumbar Summary

Global Analysis	Normal Values	Patient Values	Difference From Normal
HB Angle	0º	-4.7º	4.7º
LS Angle	90º	-88.1º	1.9º
LD Angle T12-L5	0º	5.6º	5.6º
Translation T12-S1	0 mm	15.2 mm	15.2 mm

X-RAY Report of Findings

Important Information

Disclaimer:

THE CONTENTS OF THIS POSTURERAY® REPORT ARE NOT A SUBSTITUTE FOR YOUR HEALTH CARE PROVIDER'S INDEPENDENT AND THOROUGH DIAGNOSIS. The findings of this PostureRay® Report are determined by analyzing points on a digitized radiograph which were chosen by your health care provider. The accuracy and quality of the results produced by this PostureRay® Report are entirely dependent upon your health care provider's ability to see and choose the correct landmarks on the digitized radiograph. THEREFORE, WE CANNOT AND DO NOT WARRANT OR GUARANTEE THE ACCURACY, COMPLETENESS OR RELEVANCY OF ANY INFORMATION OR RESULTS PROVIDED IN THIS POSTURERAY® REPORT. As with any clinical information, the information contained in the PostureRay® Report must be read, reviewed and approved by a health care provider. Your health care provider's signature below demonstrates that your health care provider read, reviewed and approved the findings in this PostureRay® Report before making it available to you. PostureCo, who owns PostureRay, is not responsible for the examinations, analysis, diagnosis, and treatment provided by your health care provider.

Joe Ferrantelli
Advanced Chiropractic Associates
8406 Massachusetts Ave., Suite A 2
New Port Richey
Florida, United States
34653

X-RAY Report of Findings

References

[1] Harrison DD, Janik TJ, Troyanovich SJ, Holland B. Comparisons of Lordotic Cervical Spine Curvatures to a Theoretical Ideal Model of the Static Sagittal Cervical Spine. Spine 1996;21(6):667-675.

[2] Harrison DD, Harrison DE, Janik TJ, Cailliet R, Haas JW, Ferrantelli J, Holland B. Modeling of the Sagittal Cervical Spine as a Method to Discriminate Hypo-Lordosis:Results of Elliptical and Circular Modeling in 72 Asymptomatic Subjects, 52 Acute Neck Pain Subjects, and 70 Chronic Neck Pain Subjects. Spine 2004; 29(22):2485-2492.

[3] Harrison DE, Janik TJ, Harrison DD, Cailliet R, Harmon S. Can the Thoracic Kyphosis be Modeled with a Simple Geometric Shape? The Results of Circular and Elliptical Modeling in 80 Asymptomatic Subjects. J Spinal Disord Tech 2002; 15(3): 213-220.

[4] Harrison DD, Harrison DE, Janik TJ, Cailliet R, Haas JW. Do Alterations in Vertebral and Disc Dimensions Affect an Elliptical Model of the Thoracic Kyphosis? Spine 2003; 28(5): 463-469.

[5] Janik TJ, Harrison DD, Cailliet R, Troyanovich SJ, Harrison DE. Can the Sagittal Lumbar Curvature be Closely Approximated by an Ellipse? J Orthop Res 1998; 16(6):766-70.

[6] Harrison DD, Cailliet R, Janik TJ, Troyanovich SJ, Harrison DE, Holland B. Elliptical Modeling of the Sagittal Lumbar Lordosis and Segmental Rotation Angles as a Method to Discriminate Between Normal and Low Back Pain Subjects. J Spinal Disord 1998; 11(5): 430-439.

[7] Harrison DE, Harrison DD, Cailliet R, Troyanovich SJ, Janik TJ. Cobb Method or Harrison Posterior Tangent Method: Which is Better for Lateral Cervical Analysis? Spine 2000; 25: 2072-78.

[8] Harrison DE, Cailliet R, Harrison DD, Janik TJ, Holland B. Centroid, Cobb or Harrison Posterior Tangents: Which to Choose for Analysis of Thoracic Kyphosis? Spine 2001; 26(11): E227-E234.

[9] Harrison DE, Harrison DD, Janik TJ, Harrison SO, Holland B. Determination of Lumbar Lordosis: Cobb Method, Centroidal Method, TRALL or Harrison Posterior Tangents? Spine 2001; 26(11): E236-E242.

[10] Harrison DE, Holland B, Harrison DD, Janik TJ. Further Reliability Analysis of the Harrison Radiographic Line Drawing Methods: Crossed ICCs for Lateral Posterior Tangents and AP Modified Risser-Ferguson. J Manipulative Physiol Ther 2002; 25: 93-8.

[11] Harrison DE, Harrison DD, Colloca CJ, Betz J, Janik TJ, Holland B. Repeatability of Posture Overtime, X-ray Positioning, and X-ray Line Drawing: An Analysis of Six Control Groups. J Manipulative Physiol Ther 2003; 26(2): 87-98.

[12] Kauffman JM. Diagnostic Radiation: Are the risks exaggerated? J Amer Phys Surg 2003; 8(2): 54-55.

[13] Cohen BL. Test of the linear-no threshold theory of radiation carcinogenesis for inhaled radon decay products. Health Physics 1995:68(2):157-174.

[14] Cohen BL. The cancer risk from low level radiation: a review of recent evidence. Med Sent 2000;5:128-131.

[15] Cohen BL. Cancer risk from low-level radiation. AJR 2002;179(5):1137-43.

[16] Cohen BL. Catalog of risks extended and updated. Health Physics 1991; 61(3):317-335.

[17] Walker JS. Permissible dose: A history of radiation protection in the 20th century. Berkeley, Calif: University of California Press, Berkeley, 2000.

[18] Harrison DE, Harrison DD, Hass JW. Structural rehabilitation of the cervical spine. Evanston, WY: Harrison CBP? Seminars, Inc., 2002.

[19] Harrison DE, Harrison DD, Haas JW, Betz J, Oakley PA. CBP? Structural rehabilitation of the lumbar spine. Evanston, WY: Harrison CBP? Seminars, Inc., 2005.

[20] Regano LJ, Sutton RA. Radiation dose reduction in diagnostic X-ray procedures. Phys Med Biol 1992;37(9):1773-1788.

[21] Luckey TD. Radiation Hormesis. Boca Raton: CRC Press, 1991;5:228-230.

[22] Luckey TD. Nurture with ionizing radiation: a provocative hypothesis. Nutrition Cancer 1999; 34(1):1-11.

[23] Sherwood T. 100 years' observation of risks from radiation for British male radiologists. Lancet 2001; 358:604.

[24] Stokes IAF, Bevins TM, Lunn RA. Back surface curvature and measurement of lumbar spinal motion. Spine 1987;12:355-361.

[25] Johnson GM. The correlation between surface measurement of head and neck posture and the anatomic position of the upper cervical vertebrae. Spine 1998;23:921-927.

[26] Refshauge KM, Goodsell M, Lee M. The relationship between surface contour and vertebral body measures of upper spine curvature. Spine 1994;19:2180-2185.

[27] Mosner EA, Bryan JM, Stull MA, Shippee R. A comparison of actual and apparent lumbar lordosis in black and white adult females. Spine 1989;14:310-331.

[28] Committee to Assess Heath Risks from Exposure to Low Levels of Ionizing Radiation. Health risks from exposure to low levels of ionizing radiation: BEIR VII Phase 2. National Research Council. Washington DC: National Academies Press, 2005.

[29] Kant K, Chauhan RP, Sharma GS, Chakarvarti SK. Hormesis in animals exposed to low-level ionizing radiation. Inter J Low Rad 2003; 1(1):76-87.

[30] Feinendegen LE. Evidence for beneficial low level radiation effects and radiation hormesis. Br J Radiol 2005;78:3-7.

[31] Parsons PA. Hormesis: an adaptive expectation with emphasis on ionizing radiation. J Appl Tox 2000;20:103-112.

[32] Pollycove M. The issue of the decade: hormesis. Eur J Nucl Med 1995;22:399-401.

[33] Pollycove M. Nonlinearity of radiation health effects. Env Health Persp 1998;106:363-368.

[34] Luckey TD. Hormesis with Ionizing Radiation. CRC Press, Boca Raton, FL, 1980:

[35] Cohen BL. Problems in the radon vs. lung cancer test of the linear no-threshold theory and a procedure for resolving them. Health Phys 1997;72:623-628.

X-RAY Report of Findings

References

[36] Cohen BL. Updates and extensions to tests of the linear no-threshold theory. Technology 2000;7:657-672.

[37] Frigerio NA, Eckerman KF, Stowe RS. Carcinogenic hazard from low-level, low-rate radiation, Part I. Rep.ANL/ES-26.Argonne Nat.Lab 1973.

[38] Jagger J. Natural background radiation and cancer death rate in Rocky Mountain and Gulf Coast States. Health Phys 1998;75:428-434.

[39] Kostyuchenko VA, Krestina L. Long-term irradiation effects in the population evacuated from the east-Urals radioactive trace area. Sci Total Environ 1994;142:119-125.

[40] Matanoski, G. M. Health effect of low level radiation in shipyard workers: final report. Report no. DOE DE-AC02-79 EV10095. 1991. Washington, DC, US Dept of Energy.

[41] Hickey RJ, Bowers EJ, Clelland RC. Radiation hormesis, public health, and public policy: a commentary. Health Phys 1983;44:207-219.

[42] Tubiana M. The carcinogenic effect of low doses: the validity of the linear no-threshold relationship. Int J Low Rad 2003;1:1-33.

[43] Cameron JR. Moderate doae rate ionizing radiation increases longevity. Br J Radiol 2005;78:11-13.

[44] Cameron JR. Radiation increased the longevity of British radiologists. Br J Radiol 2002;75:637-640.

[45] Cameron JR. Longevity is the most appropriate measure of health effects of radiation. Radiol 2003;229:14-15.

[46] Cameron JR. Is radiation an essential trace energy? Physics and Society 2001;Oct:http://www.aps.org/units/fps/newsletters/2001/october/a5oct01.html

[47] Parsons PA. Radiation hormesis: an ecological and energetic perspective. Med Hypoth 2000;57:277-279.

[48] Luckey TD. Radiation hormesis in cancer mortality. Chi Med J 1994;107:627-630.