Acknowledgements: Trial Guides, Aaron DeShaw, David Berardinelli

The Age of Computers

Since the mid-1990's, insurers have been using software to help determine the settlement value of their personal injury cases.

The most well know of these is **Colossus**.

However, there are 86 different programs that are used by insurers.

- Colossus – recently added impairment for pain
- *XM – developed by the writers of Colossus
- ICE
- MYND
- TEACH (State Farm)
- Mitchell Medical

Every PI attorney and doctor should read the book, "From Good Hands To Boxing Gloves" by David Berardinelli, Esq.

In his book, Berardinelli explains how the insurance companies went public in the mid-1990's that lead to them reaping billions in profits.

As a result, their fiduciary obligation changed from policy holder to the share-holder.

This has resulted in insurers making billions of dollars in profit.

Allstate:

1985 – 1995: $820 million in profit

1995 – 2006: $33 billion in profit

They achieved this by using a process called Claims Segmentation.

1. First Call
2. Special Investigations
3. MIST
4. Policy Limits
5. **Colossus**

Colossus and other software determines the settlement value of an injury claim using factors known as **value drivers**.

There are over 14,000 value drivers.

The top five (5) value drivers:

1. Diagnosis
2. Duties Under Duress
3. Loss of Enjoyment of Life, Hobbies, Sports, School and Work
4. Future Medical Care/Prognosis
5. Permanent Impairment Rating

Diagnosis

Every injury has one or multiple diagnosis.

*Update diagnosis – "jurors love it"

Formula: Each injured body part X # of diagnosis = claim value

Use ICD-10 codes

Concussion – mTBI

Fact Syndrome – Primary pain generator

The #1 soft tissue Value Driver is **ligament laxity**.

This yields the ICD-10 diagnosis of **S13.4**

Ligament laxity occurs in 35% - 45% of all whiplash patients.

The diagnosis is made using stress x-rays **and** physical examination.

Stress x-rays:

- Flexion – looking all the way down
- Extension – looking all the way up
- AP open mouth in lateral flexion – mouth open and bending L and R

The x-rays are analyzed utilizing Computerized Radiographic Mensuration Analysis (CRMA).

Research has found CRMA to be more reliable, repeatable and objective than measuring by hand.

Courts have ruled in favor of its use on **Daubert** and **Frye** challenges.

- In fact, one court ruled that a defense Motion *in limine* did not qualify for a Daubert challenge because CRMA is not a novel diagnostic test but rather a mere technological advancement of previously accepted methods of diagnosing ligament laxity found in the 4th, 5th and 6th editions of the AMA Guides to the Evaluation of Permanent Impairment.

NOTE: It is broadly considered medical malpractice if the doctor does not examine and x-ray a patient for this diagnosis.

Ligament laxity is both **diagnosable** and **impairable**.

Colossus only accepts impairments >2%.

- Cervical Spine: >3.5mm in flexion-extension
- Thoracic Spine: >2.5mm in flexion-extension
- Lumbar Spine: >4.5 mm in flexion-extension

This results in an impairment of **25-28% WP**.

A disc herniation with symptoms or a positive needle EMG results in **10-13% WP**.

If the ligament laxity is impairable, the patient can also be diagnosed with spinal subluxation - S13.1X0 (X being the level of subluxation)

Colossus will not assign a Value Driver for at least 90 days because this is considered permanent.

2. **Duties Under Duress** – These are activities of daily living that claimants cannot perform or can perform with pain. Each item has a value. Have the form completed at the beginning, monthly and at the end of the case.

3. **Loss of Enjoyment of Life, Hobbies, Sports, Work, School** – These are activities that a person cannot perform that has resulted in a loss of the quality of life of the claimant.

4. **Prognosis** – This is an opinion about future medical treatment and quality of life.

5. **Permanent Impairment Rating** – This is performed according to the 5th edition of the AMA Guides. This is what is in Colossus.

Impact On The Settlement Value

The impairment rating, duties under duress and loss of enjoyment of life comprise **65% of all non-economic damages** on a claim.

The bottom line: more money at settlement results in more money to pay doctors' bills and pay claimants.

FIVE FACTORS THAT DRAMATICALLY INFLUENCE THE SETTLEMENT VALUE OF A PERSONAL INJURY CLAIM

Acknowledgements: Trial Guides, Aaron DeShaw, David Berardinelli

The Age of Computers

Since the mid-1990's, insurers have been using software to help determine the settlement value of their personal injury cases.

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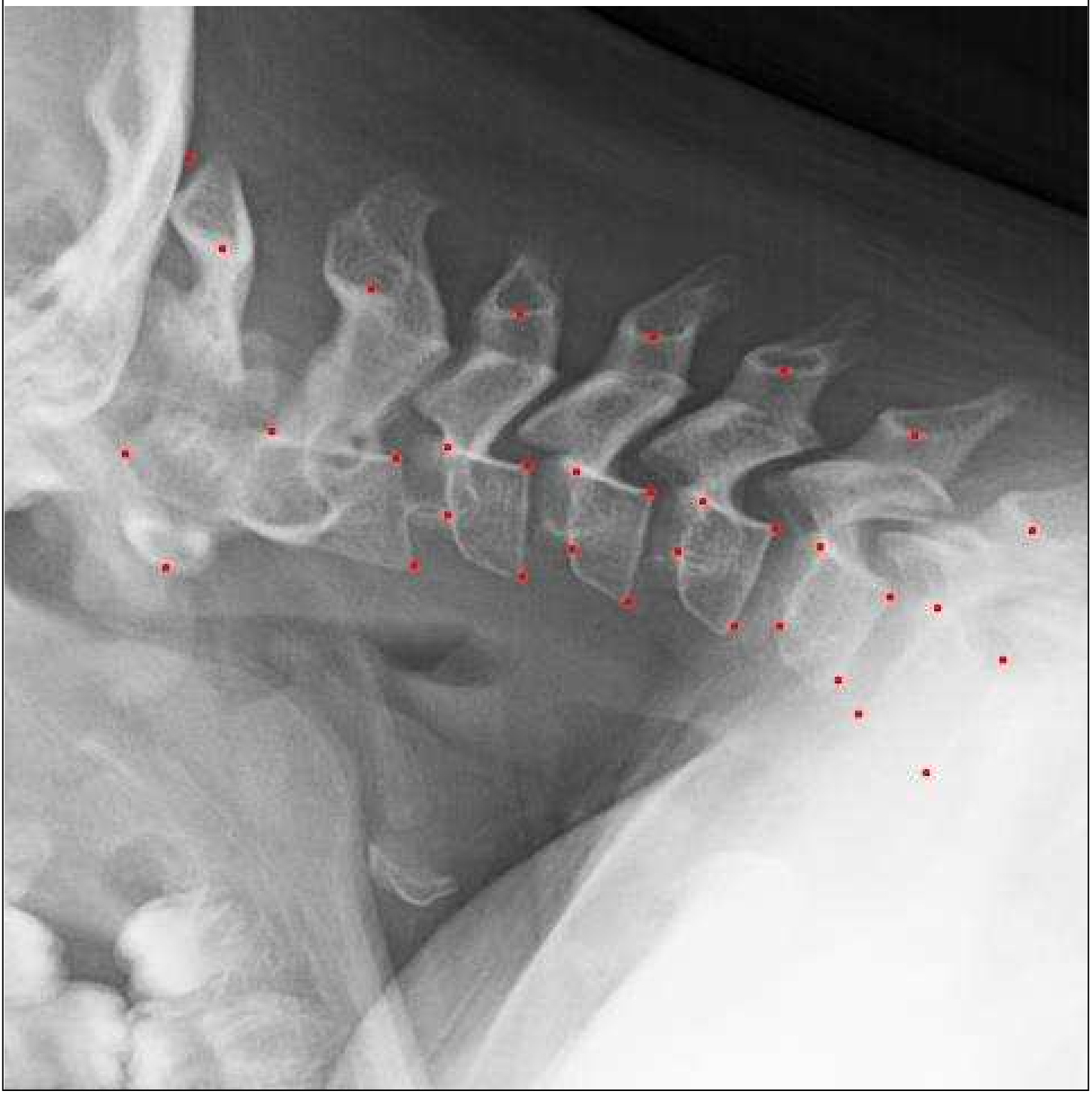
FLEXION LATERAL RADIOGRAPH

Patient Name : **S.I.D. : 40"**

Film Date : 06/05/2017

Analysis : 07/17/2017

Dr :



VERTEBRAL PLOTTING POINTS

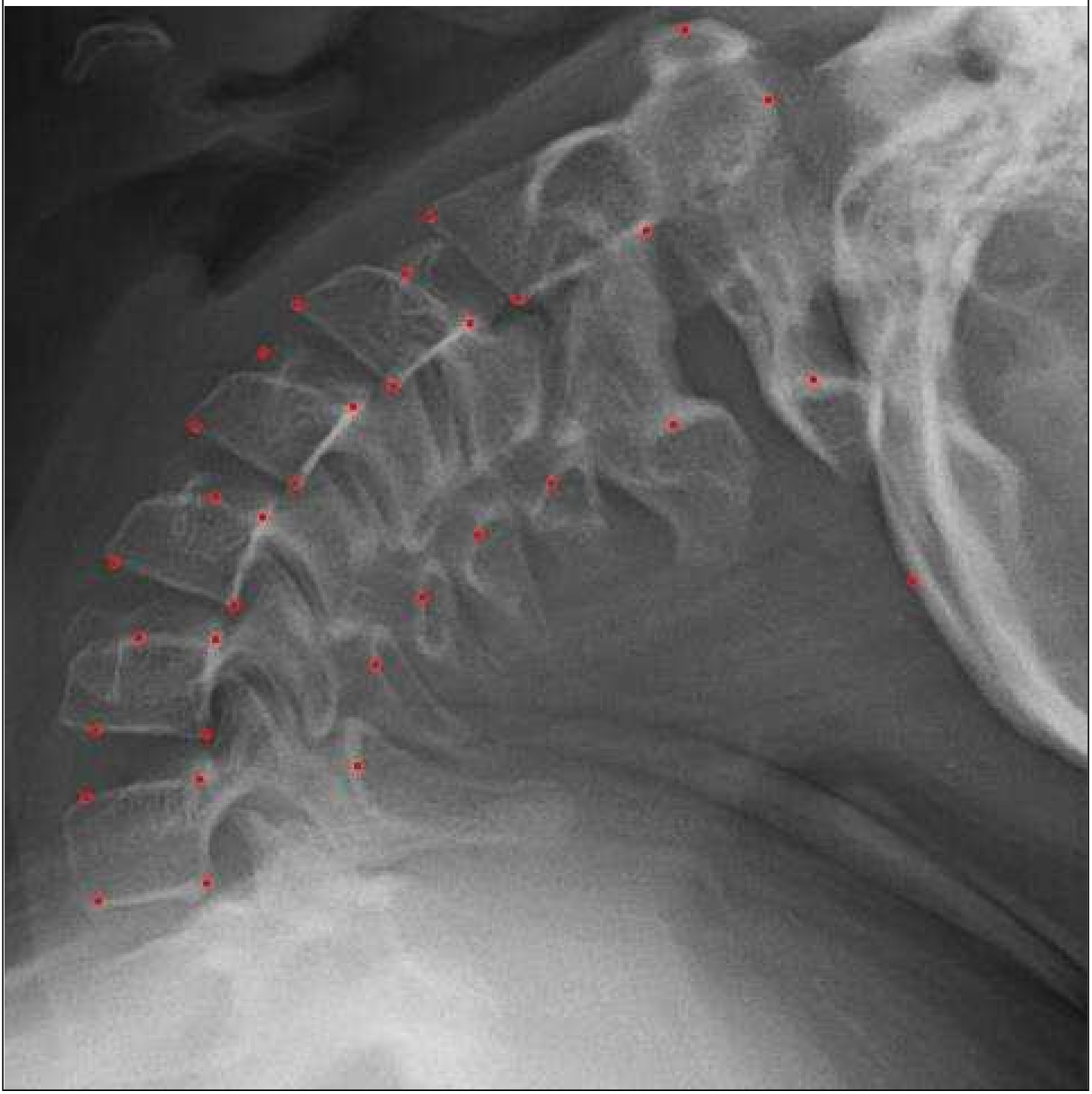
EXTENSION LATERAL RADIOGRAPH

Patient Name : **S.I.D. : 40"**

Film Date : 06/05/2017

Analysis : 07/17/2017

Dr :



VERTEBRAL PLOTTING POINTS

NEUTRAL LATERAL RADIOGRAPH

Patient Name : **S.I.D. : 40"**

Film Date : 06/05/2017

Analysis : 07/17/2017

Dr :

VERTEBRAL PLOTTING POINTS

Patient's Name : [redacted]
Referred By :
Examined By : [redacted]

DOB : 03/12/2007
Analysis : 07/17/2017
DOC : 05/15/2017

DXD CERVICAL RADIOGRAPHIC SPINAL ANALYSIS

This report is compiled upon evidence-based objective biomechanical analysis and protocols that have been established for Roentgenometric Digitization of the spine. This evaluation will not include a pathological report. The Digital Radiographic Images used were of acceptable quality and in compliance with normal protocols for X-ray digitization. This report follows the AMA Guides to The Evaluation of Permanent Impairment, 5th Edition, Errata.

+AOMSI qualifying the patient for 25% Impairment of Whole Person according to the AMA Guides to the Evaluation of Permanent Impairment, 5th Edition, page 392, Table 15-5.

The spinal measurements of translation and angulation are analyzed by a process called Computed Radiographic Mensuration Analysis (CRMA). DXD software is utilized to dynamically assess musculoskeletal structures by capturing articular motion during a dynamic range. This diagnostic tool enables motion analysis to quantify spinal pathologies and, above all, ligament laxity (M24.28) in specific spinal regions. The Mensuration Analysis is considered "Established" by the World Health Organization and can be found in the US National Guideline Clearinghouse.

Lateral Cervical Spine:

There is a spondylolisthesis at C2-3, C4-5 and C6-7. Interruptions of George's Line at C2-3, C3-4, C4-5, C5-6 and C6-7 during the lateral stress views (flexion/extension) are indicative of ligamentous instability. (Yochum & Rowe, Essentials of Skeletal Radiology, p.149, 2nd Edition)(3rd Edition, P.-207).

Cervical Study: ***ALTERATION OF MOTION SEGMENT INTEGRITY (AOMSI) QUANTIFICATION***

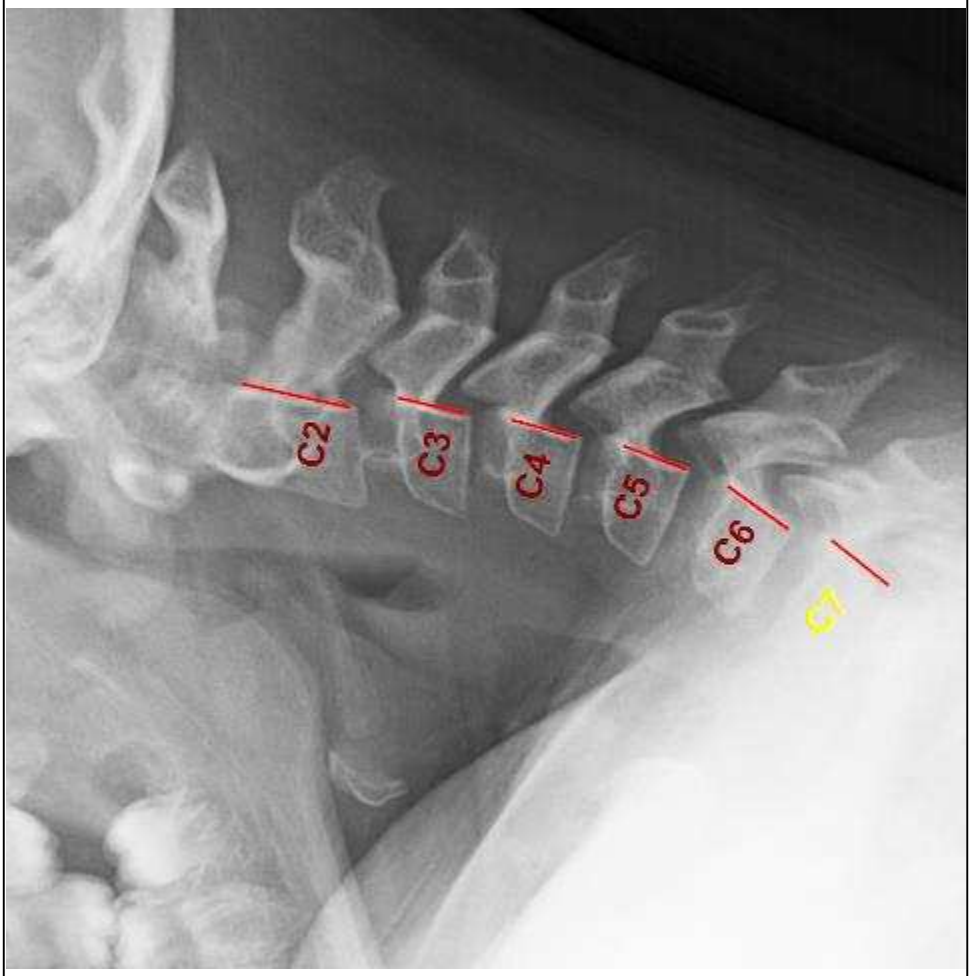
- The angular motion segment integrity is below ratable threshold.
- The translational motion segment integrity is compromised and ratable at C2-3, C4-5 and C6-7.

IMPRESSIONS:

1. Cervical motion study (C2-C7) indicates Translational Motion Segment Integrity change at C2-3, C4-5 and C6-7. The impairment of the Cervical region is due to ratable Loss of Motion Segment integrity and has permanent injuries.
2. Ligamentous instability is present in the Cervical spine.
3. Interruptions of George's Line at C2-3, C3-4, C4-5, C5-6 and C6-7 during the lateral stress views (flexion/extension) are indicative of ligamentous instability, sub-failure, or insufficiency from the evaluation of translational motion along with correlation of symptomatology and imaging studies.

FLEXION LATERAL RADIOGRAPH

Patient Name : [redacted]
Film Date : 06/05/2017 **S.I.D. : 40"**
Analysis : 07/17/2017
Dr : [redacted]

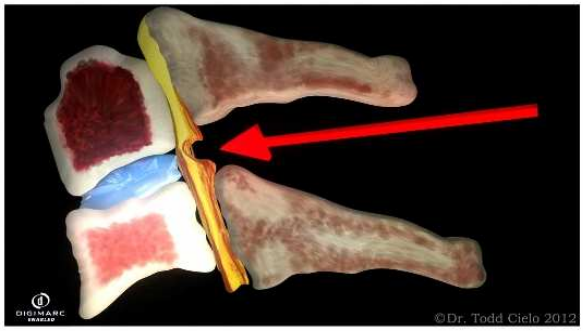


Abnormal / Ratable
Normal
Last Segment

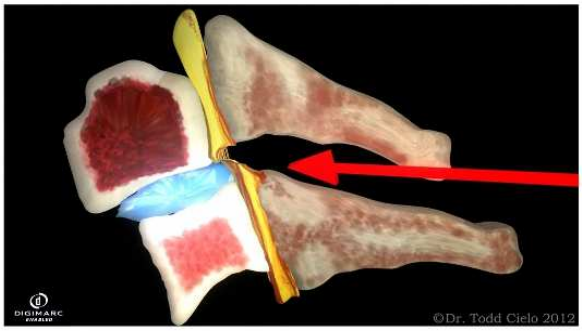
FLEXION LATERAL RADIOGRAPH
TRANSLATION (mm)

Posterior Longitudinal Ligament

The integrity of the posterior longitudinal ligament (PLL) is demonstrated by a forward (anterior) movement (translational motion) of one vertebra over the vertebra below or by the posterior widening of the intervertebral disc space (increased disc angle or angular motion). By measuring these discrepancies of George's Line (Yochum & Rowe, p. 149), AOMSI can be quantified and correlated with the AMA guides. (5th edition, p. 378-379).



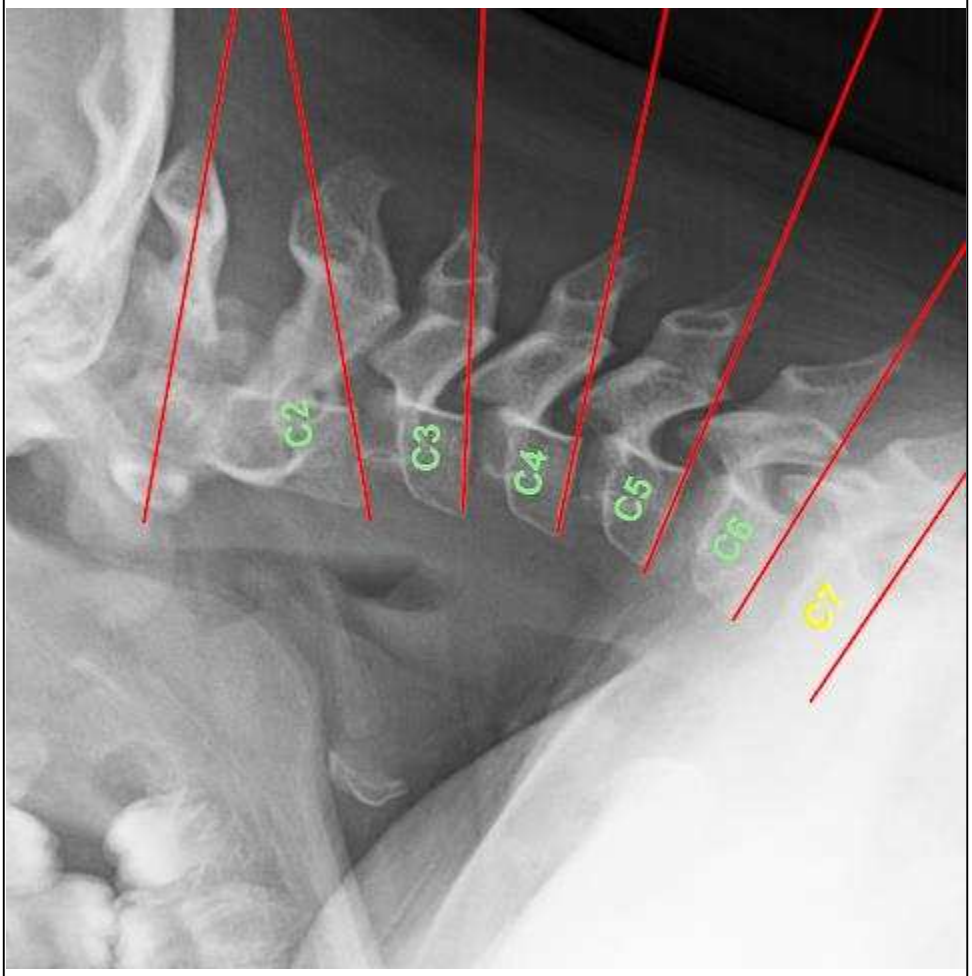
Widening of the posterior disc



Anterolisthesis

FLEXION LATERAL RADIOGRAPH

Patient Name : [redacted]
Film Date : 06/05/2017 **S.I.D. : 40"**
Analysis : 07/17/2017
Dr : [redacted]

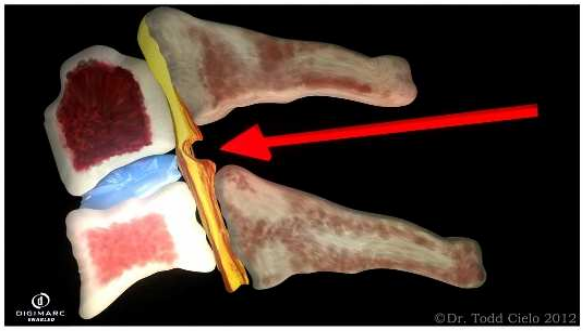


Abnormal / Ratable
Normal
Last Segment

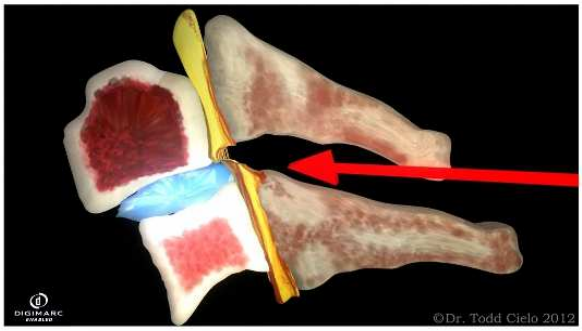
FLEXION LATERAL RADIOGRAPH
ANGULATION (Degrees)

Posterior Longitudinal Ligament

The integrity of the posterior longitudinal ligament (PLL) is demonstrated by a forward (anterior) movement (translational motion) of one vertebra over the vertebra below or by the posterior widening of the intervertebral disc space (increased disc angle or angular motion). By measuring these discrepancies of George's Line (Yochum & Rowe, p. 149), AOMSI can be quantified and correlated with the AMA guides. (5th edition, p. 378-379).



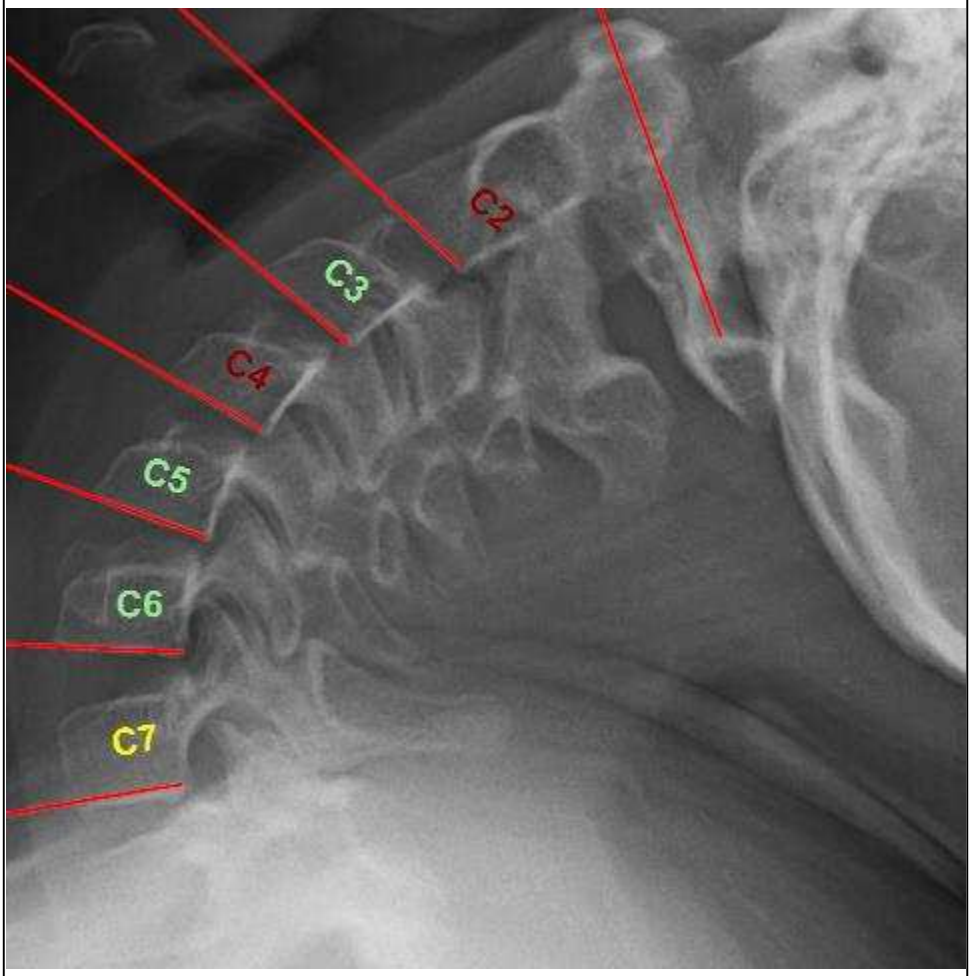
Widening of the posterior disc



Anterolisthesis

EXTENSION LATERAL RADIOGRAPH

Patient Name : [redacted]
Film Date : 06/05/2017 **S.I.D. : 40"**
Analysis : 07/17/2017
Dr : [redacted]

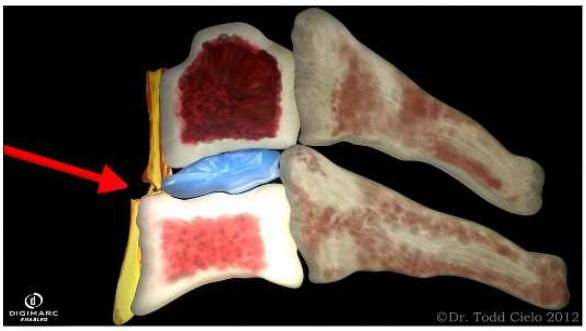


Abnormal / Ratable
Normal
Last Segment

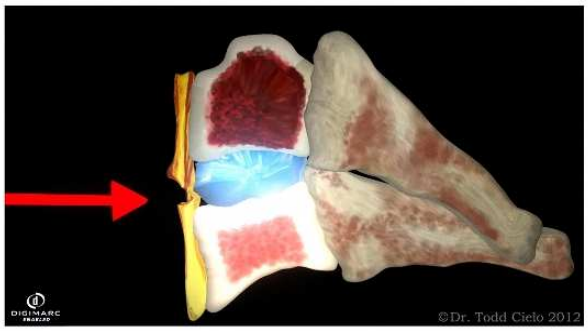
EXTENSION LATERAL RADIOGRAPH
ANGULATION (Degrees)

Anterior Longitudinal Ligament

The integrity of the anterior longitudinal ligament (ALL) is demonstrated by a backward (posterior) movement (translational motion) of one vertebra over the vertebra below or by the anterior widening of the intervertebral disc space (increased disc angle or angular motion). By measuring these discrepancies of George's Line (Yochum & Rowe, p. 149), AOMSI can be quantified and correlated with the AMA guides (5th edition, p. 378-379).



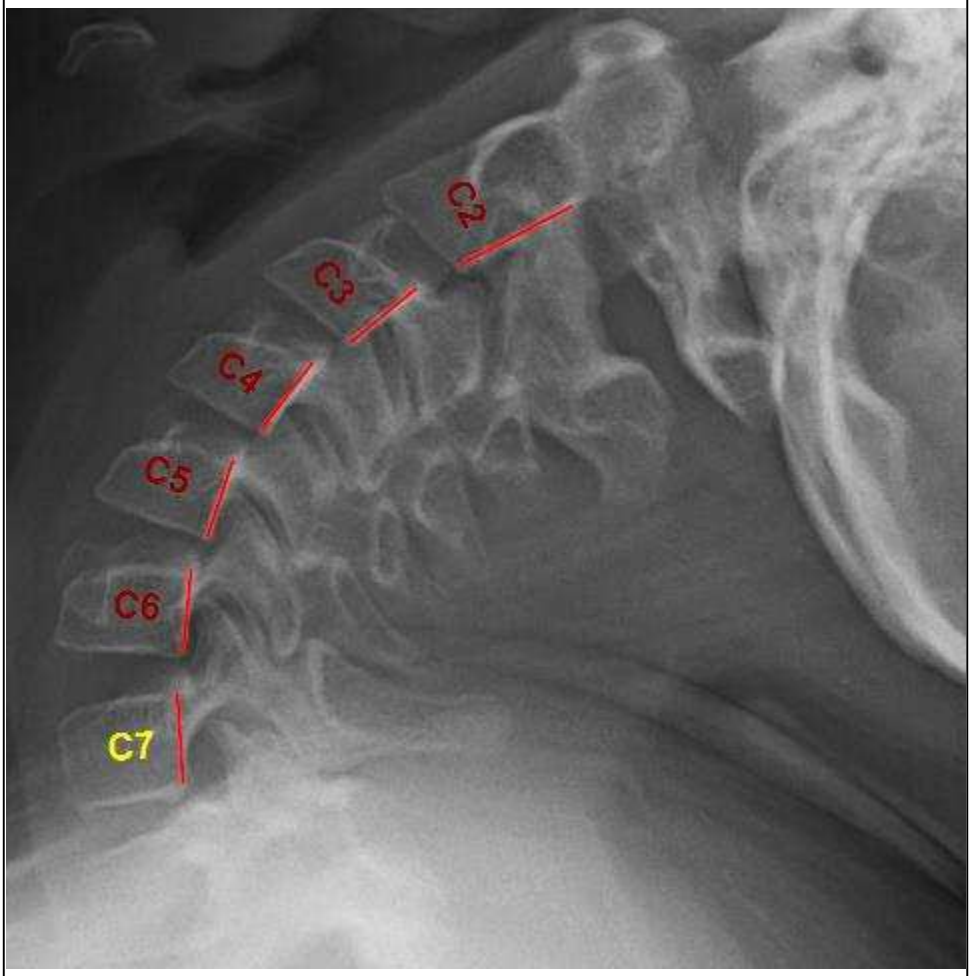
Retrolisthesis



Widening of the anterior disc

EXTENSION LATERAL RADIOGRAPH

Patient Name : [redacted]
Film Date : 06/05/2017 **S.I.D. : 40"**
Analysis : 07/17/2017
Dr : [redacted]

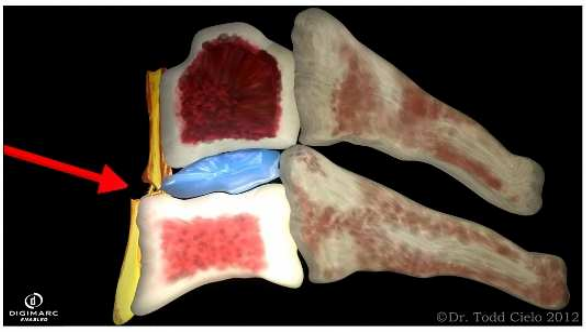


Abnormal / Ratable
Normal
Last Segment

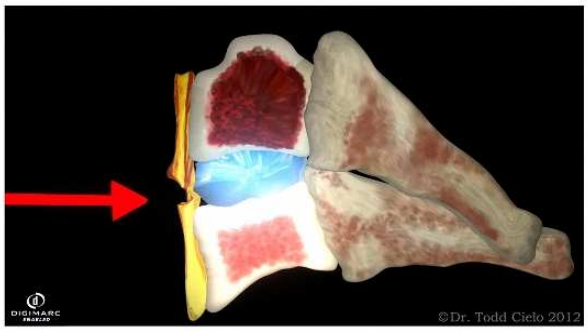
EXTENSION LATERAL RADIOGRAPH
TRANSLATION (mm)

Anterior Longitudinal Ligament

The integrity of the anterior longitudinal ligament (ALL) is demonstrated by a backward (posterior) movement (translational motion) of one vertebra over the vertebra below or by the anterior widening of the intervertebral disc space (increased disc angle or angular motion). By measuring these discrepancies of George's Line (Yochum & Rowe, p. 149), AOMSI can be quantified and correlated with the AMA guides (5th edition, p. 378-379).



Retrolisthesis



Widening of the anterior disc

Patient's Name : **DOB :**
Referred By : **Analysis : 07/17/2017**
Examined By : **DOC :**

ALTERATION OF MOTION SEGMENT INTEGRITY (AOMSI)

	Patient (mm)		Established Abnormal (mm)	Established Ratable (mm)	Total Translation (mm)	% Foraminal Encroachment
	A	P				
C2-3	2.83	1.33	0.60 - 3.50	3.50	**4.16**	15.96
C3-4	0.82	2.40	0.60 - 3.50	3.50	**3.22**	28.8
C4-5	1.23	2.32	0.60 - 3.50	3.50	**3.55**	27.84
C5-6	1.43	1.77	0.60 - 3.50	3.50	**3.20**	21.24
C6-7	2.58	1.17	0.60 - 3.50	3.50	**3.75**	14.04

Abnormal / Ratable Segment **Normal Segment**

Translational loss of motion segment integrity is defined as an anteroposterior motion of one vertebra over another that is greater than 3.5 mm.

Motion Segment Integrity, Translational
A - Anterior , P - Posterior

Translational motion is measured by determining the anteroposterior motion of one vertebra over another. Alteration of motion segment integrity (AOMSI) is defined by translational motion that is greater than 3.5 mm in the cervical spine, 2.5 mm in the thoracic spine and 4.5 in the lumbar spine. Using DRE Cervical Category IV, loss of motion segment integrity may be assessed as 25%-28% Impairment of the Whole Person. Using DRE Lumbar Category IV, loss of motion segment integrity may be assessed as 20%-23% Impairment of the Whole Person.

	Patient (°)		Established Abnormal (°)	Established Ratable (°)	Calculated Angulation (°)	
	I (Flex)	S (Ext)			I (Flex)	S (Ext)
C2-3	11.99	-2.59	7.00 - 11.00	11.00	**2.56**	**7.75**
C3-4	9.43	-10.34	7.00 - 11.00	11.00	**1.51**	**0.49**
C4-5	10.94	-9.85	7.00 - 11.00	11.00	**1.80**	**7.73**
C5-6	9.14	-17.58	7.00 - 11.00	11.00	**6.76**	**5.60**
C6-7	2.38	-11.98	7.00 - 11.00	11.00	---	---

Abnormal / Ratable Segment **Normal Segment**

Loss of motion segment integrity is defined as motion at the spinal level in question that is more than 11° greater than at either adjacent level. (Calculated difference, not raw angle)

Motion Segment Integrity, Angular
I - Inferior , S - Superior

A motion segment of the spine is defined as two adjacent vertebrae, an intervertebral disc and the vertebral facet joints. Loss of motion segment or structural integrity is defined as abnormal back-and-forth motion (translation) or abnormal angular motion of a motion segment with respect to an adjacent motion segment. The angular loss of integrity is defined as a difference in the angular motion of two adjacent motion segments greater than 11° at C2-3, C3-4, C4-5, C5-6, C6-7, greater than 15° at L1-2, L2-3, L3-4, and greater than 20° at L4-5 in response to flexion and extension. Loss of integrity of the lumbosacral joint is defined as an angular motion between L5-S1 that is 25° greater than motion at L4-5 level at 20° (Ref: AMA Guides to the Evaluation of Permanent Impairment, Fifth Edition) or an angular motion between L5-S1 that is 25°. Loss of integrity is defined as translational motion greater than 3.5 mm in the cervical spine or 5 mm in the thoracic and lumbar spine (Fourth Edition) and/or motion at the level in question that is more than 11° greater than at either adjacent level. (Calculated difference, not raw angle)

Pavlov's Ratio

Segment	Vertebral Width (mm) (B)	Cervical Sagittal Diameter (mm) (A)	Pavlov's Ratio (A/B)
C3	7.38	-18.73	-2.54
C4	5.99	18.47	3.08
C5	7.51	18.88	2.51
C6	9.36	17.67	1.89
C7	13.53	16.27	1.20

>1.0 is Optimal
0.85 is Borderline Stenotic
<0.80 is Stenotic and Pathological

Table 15-3 Criteria for Rating Impairment Due to Lumbar Spine Injury

DRE Lumbar Category I 0% Impairment of the Whole Person	DRE Lumbar Category II 5%-8% Impairment of the Whole Person	DRE Lumbar Category III 10%-13% Impairment of the Whole Person	DRE Lumbar Category IV 20%-23% Impairment of the Whole Person	DRE Lumbar Category V 25%-28% Impairment of the Whole Person
No significant clinical findings, no observed muscle guarding or spasm, no documentable neurologic impairment, no documented alteration in structural integrity, and no other indication of impairment related to injury or illness; no fractures	Clinical history and examination findings are compatible with a specific injury; findings may include significant muscle guarding or spasm observed at the time of the examination, asymmetric loss of range of motion, or nonverifiable radicular complaints, defined as complaints of radicular pain without objective findings; no alteration of the structural integrity and no significant radiculopathy ***or*** individual had a clinically significant radiculopathy and has an imaging study that demonstrates a herniated disk at the level and on the side that would be expected based on the previous radiculopathy, but no longer has the radiculopathy following conservative treatment ***or*** fractures: (1) less than 25% compression of one vertebral body; (2) posterior element fracture without dislocation (not developmental spondylolysis) that has healed without alteration of motion segment integrity; (3) a spinous or transverse process fracture with displacement without a vertebral body fracture, which does not disrupt the spinal canal	Significant signs of radiculopathy, such as dermatomal pain and/or in a dermatomal distribution, sensory loss, loss of relevant reflex(es), loss of muscle strength or measured unilateral atrophy above or below the knee compared to measurements on the contralateral side at the same location; impairment may be verified by electrodiagnostic findings ***or*** history of a herniated disk at the level and on the side that would be expected from objective clinical findings, associated with radiculopathy, or individuals who had surgery for radiculopathy but are now asymptomatic ***or*** fractures: (1) 25% to 50% compression of one vertebral body; (2) posterior element fracture with displacement disrupting the spinal canal; in both cases, the fracture has healed without alteration of structural integrity	Loss of motion segment integrity defined from flexion and extension radiographs as at least 4.5 mm of translation of one vertebra on another or angular motion greater than 15° at L1-2, L2-3, and L3-4, greater than 20° at L4-5, and greater than 25° at L5-S1 (Figure 15-3); may have complete or near complete loss of motion of a motion segment due to developmental fusion, or successful or unsuccessful attempt at surgical arthrodesis ***or*** fractures: (1) greater than 50% compression of one vertebral body without residual neurologic compromise	Meets the criteria of DRE lumbosacral categories III and IV; that is, both radiculopathy and alteration of motion segment integrity are present; significant lower extremity impairment is present as indicated by atrophy or loss of reflex(es), pain, and/or sensory changes within an anatomic distribution (dermatomal), or electromyographic findings as stated in lumbosacral category III and alteration of spine motion segment integrity as defined in lumbosacral category IV ***or*** fractures: (1) greater than 50% compression of one vertebral body with unilateral neurologic compromise

SAMPLE IMPAIRMENT RATING REPORT

Greenway Physical Medicine & Rehabilitation

John F. Schmidt, DC

6424 E Greenway Pkwy, Suite #112
Scottsdale, AZ 85254

Phone 480-995-0123
Fax 480-279-0214
johnschmidtdc@gmail.com

Permanent Whole Person Impairment Rating

Patient: Susan Rogers

History

Ms. Rogers injured her neck and lower back in an auto collision. She has completed her treatment and is deemed to be at maximum medical improvement, meaning that it is unlikely that she will receive further benefit from medical treatment at this time and that her injuries are permanent in nature.

Maximum Medical Improvement is defined in the American Medical Association's Guides to the Evaluation of Permanent Impairment 5th Edition (p. 601) as: "A condition or state that is well stabilized and unlikely to change substantially in the next year, with or without medical treatment. Over time, there may be some change; however, further recovery or deterioration is not anticipated."

Ms. Rogers has no prior history of cervical spine injury or impairment, therefore, the cervical spine will be rated using the Diagnosis Related Estimate (DRE) categories. There is multilevel disc involvement in the lumbar spine, therefore it is rated using the Range of Motion (ROM) method.

All percentages are whole person percentages and no apportionment has been assigned.

Treatment

The patient has been treated with a regimen of conservative treatment including manipulation, massage and therapeutic exercise for treatment of her neck and low back.

Exam

Cervical Spine: There is paraspinal muscle guarding in the lumbar spine bilaterally. The patient complains of right arm pain, however, there is normal muscle tone, size, strength and sensation over the C5/6 nerve distribution. The DRE method will be used in the cervical spine since this is the first reported injury to this area.

Lumbar Spine: The patient has limited range of motion in the lumbar spine. Please see actual measurements noted below. There is limited strength of in extension of the great toe bilaterally. There is also loss of sensation over the lateral leg bilaterally. There is no atrophy.

MRI revealed a 3mm central disc herniation at L4-L5 and L5-S1 with slight degeneration. The patient declined surgery at this time.

John Schmidt, D.C.		March 31, 2016
Evaluator		Date

Name: Susan L. Rogers
Address: 6965 75th Avenue
Daytime Phone: 602-652-8989
Patient ID: 2341
Gender: Female
Birth Date: 10/19/1950
Dominant Hand: Right

Primary Insurance

Policy: 895642343 **Claim:** 904a

Company: Quicksilver Insurance **Contact:** Bill Gateman
Address: 1100 St. George Blvd. / Saint George, Utah 84211
Phone: 435-894-1000 **Fax:** 435-894-1001 **Email:** claims@quickinsur.com

Secondary Insurance

Employer

Referral

Attorney

Company: Mark Smith **Contact:** Susan Jones
Address: 890 Mountainside Drive
Phone: 602 727-8900 **Fax:** 602 727-8413 **Email: msmith@greatlaw.com**

Care Providers

Company: Greenway PM&R **Contact:** John Schmidt, DC

Contact: Erin Wright

Impairment Summary

All impairment estimates are based on the 5th Edition of the Guides to the Evaluation of Permanent Impairment published by the American Medical Association.

Impairments have been calculated using a linear method of interpolation. In case of a broad range of impairment percentages for a given test, the impairment has been assigned proportionally in a manner consistent with the corresponding Table. See individual Table references for additional details.

The final whole person impairment is 27%
- Cervical spine DRE Method whole person impairment is 5%
- Lumbar spine ROM Method whole person impairment is 23%

Cervical Spine Impairment

The Diagnosis-Related Estimates (DRE) Method was used to calculate the cervical spine impairment. The assigned impairment and basis for the impairment are listed below.

Cervical DRE - Category II (Table 15-5, p. 392)

Contribution to Whole Person Impairment: 5%

Basis for Impairment:

Clinical history and examination findings are compatible with a specific injury, findings include:

- Muscle guarding or spasm observed at the time of the examination
- Nonverifiable radicular complaints, defined as complaints of radicular pain without objective findings

Lumbar Spine Impairment

The Range of Motion (ROM) Method was used to calculate the lumbar spine impairment. The assigned impairments and basis for the impairments are listed below.

Specific Spine Disorders (Table 15-7, p. 404)

Contribution to Whole Person Impairment: 8%

Section II. Intervertebral disk or other soft-tissue lesion

Unoperated on, stable, with medically documented injury, pain, and rigidity associated with moderate to severe degenerative changes on structural tests; includes herniated nucleus pulposus with or without radiculopathy.

- 2 levels involved (adds 1% WPI per level).

Lumbar Range of Motion Impairments (Table 15-8, p. 407; Table 15-9, p. 409)

Contribution to Whole Person Impairment: 10%

- Maximum true lumbar flexion angle is 60° with a sacral flexion angle of 20° contributing 5% to the whole person impairment
- Maximum true lumbar extension angle is 20° contributing 2% to the whole person impairment
- Maximum lumbar left lateral flexion angle is 20° contributing 1% to the whole person impairment
- Maximum lumbar right lateral flexion angle is 15° contributing 2% to the whole person impairment

According to the AMA Guides, an accessory validity test can be performed for lumbosacral flexion and extension. If the straight-leg-raising angle exceeds the sum of sacral flexion and extension angles by more than 15°, the lumbosacral flexion test is invalid. Normally, the straight-leg-raising angle is about the same as the sum of the sacral flexion-extension angle. If invalid, the examiner should either repeat the flexion-extension test or disallow impairment for lumbosacral spine flexion and extension.

Lumbar Spinal Nerve Root Impairment (Table 15-15, p. 424; Table 15-16, p. 424; Table 15-18, p. 424)l

Contribution to Whole Person Impairment: 7%

Left-side Combined Lumbar Nerve Root Impairment: 4% Whole Person (11% Lower Extremity)

- L5: Grade 3 (26%) motor deficit of extensor hallucis longus contributing 10% lower extremity impairment
- L5: Grade 4 (12%) sensory deficit contributing 1% lower extremity impairment

Right-side Combined Lumbar Nerve Root Impairment: 3% Whole Person (8% Lower Extremity)

- L5: Grade 4 (12%) motor deficit of extensor hallucis longus contributing 4% lower extremity impairment
- L5: Grade 2 (70%) sensory deficit contributing 4% lower extremity impairment

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