Medical Evaluation of Factual Evidence in Narrative Format

Regarding

Mr. Casey Strand

To: Bentz Law Firm

From: albert XXX

albert XXX
D.C.

Kennebec, Inc.
3237 Kennebec Road
Suite 101
Pittsburgh, PA 15241
Phone: (412) 278-2040

Bentz Law Firm
100 Washington Road
Pittsburgh, PA 15228

INITIAL EXAMINATION

3/1/2010

Patient:	Casey Strand
Date of Loss/Onset:	3/1/2010
Claim Number:	
Date of Exam:	3/1/2010

Dear Ms. Bentz:

This is an initial narrative report regarding my evaluation and treatment of the above-named patient. This report is based upon scientific peer-reviewed literature and gold standard functional/structural outcome assessments. The examination procedures and report are in compliance with The Guidelines for Evaluation and Management Services published by the Health Care Financing Administration (HCFA) of the United States Federal Government (May 1997).

MECHANISM OF INJURY

Mr. Strand stated that before the impact, the headrest in his automobile was set so that the top third of the head rest struck the bottom of his head. According to Warner et al, when an automobile is struck from behind, a ramping effect is created, thereby causing the occupants of the automobile to move upward. This causes the headrest to now strike the head at a lower angle, creating a fulcrum for increased hyperextension of the neck. (Warner CY, Stother CE, James MB, Decker RI, Occupant protection in rear-end collisions:II. The role of the seat back deformation in injury reduction. 35th Stapp Car Crash Conference, 1991; SAE 912914)

Mr. Strand stated that he was surprised by the impact. According to Mertz and Patrick, the unaware occupant is at greater risk of injury. (Mertz HJ, Patrick LM. Investigation of the kinetics of whiplash. 1967; SAE 670919)

Mr. Strand stated that at the moment of impact, his head was turned to the left. Randanov and Sturzenegger found that patients who had rotated or inclined head position were much more likely to have symptoms at 2 years post-injury then those with a straight-on head position. (Radanov BP, Sturzenegger M. The effect of accident mechanisms and initial findings on the long-term outcome of whiplash injury. Journal of Musculoskeletal Pain 1996; 4(4):47-59.)

Mr. Strand stated that the vehicle he was driving was a Pinto. According to Luo and Goldsmith, a small car can experience much bigger accelerations in a minor impact and therefore increase the injury. (Luo Z., Goldsmith W. Reaction of a human head/neck/torso system to shock. Journal of Biomechanics 1991; 24;7;499-510)

Mr. Strand stated that the vehicle that struck his automobile was a BMW 750. According to Luo and Goldsmith, the faster and heavier the rear car is moving, the more severe the forces placed on the occupant in the front car. (Luo Z., Goldsmith W. Reaction of a human head/neck/torso system to shock. Journal of Biomechanics 1991; 24;7;499-510)

Mr. Strand stated that he was wearing his safety belts (lap and shoulder harness) at the time of the accident. According to Allen, Barnes and Bodiwala, shoulder belts are very effective at saving lives in auto accidents, but there is some evidence that they can actually cause more damage in a rear collision. Because the body is held in place, the

neck suffers worse hyperflexion. The cervical spine may also undergo a twisting motion from the head restraint, causing a more complex injury. (Allen MJ, Barnes MR, Bodiwala GG, The effect of seat belt legislation on injuries sustained by car occupants. Injury: The British Journal of Accident Surgery 1985; 16; 471-476)

Mr. Strand reported that he felt pain immediately after the accident. A study by Radanov found that patients who reported pain immediately after their accidents were more likely to have pain two years post-injury. It is generally recognized that patients with immediate symptoms are at a higher risk of long-term pain from whiplash. (Radanov BP, Sturzenegger M, De Stefano G. Long-term outcome after whiplash injury. A two-year follow-up considering the features of injury mechanisms and somatic, radiologic and psychosocial findings. Medicine 1995; 74(5): 281-296)

PRESENT SYMPTOMATOLOGY

SYMPTOM	SITE	INTENSITY (0-10 WITH 10 BEING THE WORST)	FREQUENCY OF AWAKE TIME
Headaches	left	10	8%

Self-Reporting outcome questionnaires were completed by the patient to assess the extent to which the impairment affects his activities of daily living and the ways the patient copes with these circumstances. The index score for each questionnaire is noted below.

	OPTIMAL	3/1/2010	
Headache Disability Index			
- Emotional	0/52	52	
- Functional	0/48	48	
Total:		**100**	**severe**

NEUROLOGICAL EXAMINATION

The patient is alert and oriented to time, place and person. Reflexes are equal and reactive bilaterally in both upper and lower extremities and are +2. Dermatomal sensation was evaluated with a Whartenburg pinwheel and revealed hyperesthesia (increased sensation) at C6 on the left side.

ORTHOPEDIC SECTION

The Maximum Cervical Compression Test was negative on the left side.
In this test, the patient, sitting upright, attempts to laterally flex the neck and head toward the affected shoulder. Then the examiner directs the patient to bring the chin as close as possible to the shoulder. The test may be repeated passively if there is no response when the patient does the action actively. The test is positive if the action causes radicular pain on the side of the flexion and rotation, in this case the right side. A positive test reveals cervical nerve root compression.

O'Donahue Maneuver was negative on the left side.
This test can be done with the patient sitting or standing. The patient actively rotates the trunk against the examiner's counter pressure. Then the examiner passively rotates the shoulder. If either of these actions causes pain, the test is considered positive. Pain caused from the active test indicates a strain and pain from the passive test indicates a sprain.

A Cervical Compression Test was negative left side of the spine.
This test was performed on this patient in order to localize the cervical pain. Downward pressure was applied to the top of the head.

The Soto-Hall Test was negative reflecting pain in the cervical spine.
With the patient supine and the examiner exerting pressure on the sternum to prevent either lumbar or thoracic flexion, the examiner places the other hand under the patient's occiput and flexes the head and neck slowly and forcibly upon the sternum. This causes more and more of a pull on the posterior spinous ligaments, starting at the Ligamentum Nuchae, moving downward until it reaches the spinous process of the involved vertebra. There the pull acts as a lever compressing the vertebral body, thus causing localized pain. This test is mainly used to diagnose and localize vertebral bony disease and injuries, particularly of the compression type.

The Shoulder Depression Test was negative on the left side.
With the patient lying supine, the examiner, standing on the affected side, pushes the shoulder caudadward while laterally flexing the cervical spine to the opposite shoulder. With the shoulder still stabilized, rotation of the cervical spine to the opposite side follows the lateral flexion. Radicular pain, produced or aggravated by the first maneuver and confirmed by the second reveals a positive test. The significance of this test demonstrates adhesions of the dural sleeves, the spinal nerve roots or the adjacent structures of the joint capsule on the side opposite lateral flexion.

Bragard's Sign (a.k.a. Braggard's Sign) was negative on the left side.
A positive result is indicated with an increase in radicular pain when the lower limb is held in the "LaSegue's Position" with each foot being strongly dorsiflexed, indicating peripheral or nerve root irritation of the sciatic nerve.

Palpation of the Sciatic Nerve Test was negative on the left side.
In this test, the patient stands on one foot, using a wall or chair for support. While lifting the opposite knee about waist high, the examiner palpates the greater trochanter and

ischial tuberosity. This test is positive when the palpation causes pain, which indicates disc herniation or a space-occupying lesion.

Sicard's Sign was negative on the left side.
With the patient supine and legs fully extended, the examiner lifts the leg to a point that is just short of producing pain. Then the great toe is dorsiflexed. A positive sign is indicated when this action results in sciatic pain, indicating sciatic radiculopathy.

The Lasegue (Straight Leg Raise) Test was negative on the left side. at degrees.
This test is done with the patient supine and with the knee in extension. The examiner actively flexes each thigh slowly while holding the other hand on the knee to prevent its flexion. The leg is lifted 90 degrees or until pain prevents further motion. The final angle of flexion at which pain occurs, as well as the location and intensity of the pain is noted by the examiner. This test is considered positive when the straight leg cannot be raised to 90 degrees without pain.

Ely's Heel to Buttock Test was negative on the left side.
This test is a two stage test done with the patient in a prone position. First the knee is flexed to the opposite buttock. Then the thigh is hyperextended. A positive test is indicative of one of the following: a hip lesion; irritation of the iliopsoas muscle or its sheath; inflammation of the lumbar nerve roots; or the presence of lumbar nerve root adhesions.

Patrick's Test was negative on the left side.
Performed with the patient supine, the examiner places the external malleolus over the patella of the opposite limb. Then downward pressure is applied to the thigh. When pain results from this action, particularly in the hip flexor area, the test is positive. A positive test suggests hip joint disease, because the action antagonizes hip flexor spasm brought on by an inflammatory lesion. This test is also known as the FabER or FABERE Sign from the acronym of the maneuver: Flexion, Abduction, External Rotation and Extension.

Gaenslen's Test was negative on the left side.
On this test, the examiner has the patient lie supine with the affected side lying close to the edge of the table. The hip and knee on the unaffected side are flexed, while the patient clasps the flexed knee to his chest. The examiner then applies pressure against the clasped knee and the knee of the extended hip. If this action results in an exacerbation of pain from the pelvis, then the test is positive. A positive test tends to indicate a sacroiliac joint lesion.

The Nachlas' Test was negative on the left side.
This is when the patient lies prone and relaxed with the lower limbs side by side on a flat, non-yielding examining table. The foot is passively raised from the table and the knee is maximally flexed by the examiner with one hand while the other hand is exerting downward pressure over the pelvis to keep the patient from buckling at the hips. The test is positive when the patient experiences pain in the sacroiliac or lumbosacral regions and, at times, along the nerves that run in front of these joints. Radiating pain follows either that of the sciatic nerve or the external cutaneous nerve. If the patient has no skeletal abnormality in the lower part of the back, the above symptoms will not be elicited, only a feeling of tension in the anterior thigh. If, however, upper lumbar pain and/or femoral radicular pain is elicited, the maneuver then becomes diagnostic for femoral neuropathy. This test is performed to find a lesion in the lumbosacral and/or sacroiliac joints.

Yeoman's Test was negative on the left side.
This test is done with the patient in a prone position. The examiner exerts downward pressure over the suspected sacroiliac joint, while maximally flexing the ipsilateral knee. Then the thigh is hyperextended while holding down the pelvis. Deep pain in both sacroiliac joints from the above action indicates a strain of the anterior sacroiliac ligaments.

The Hibb's Test was negative on the left side.
With the patient prone, the examiner stabilizes the pelvis on the side nearest to him by placing one hand firmly on the dorsum of the iliac bone; with the other hand around the patient's ankle, he flexes the opposite knee to a right angle. From this position the examiner slowly pushes the leg laterally causing strong internal rotation of the femoral head. This test is done bilaterally and the production of the pelvic pain reveals a positive test.

Goldthwait's Sign was negative in the lumbar area on the left side.
This test is designed to differentiate between sacroiliac and lumbosacral involvement. It is performed with the patient supine. The examiner palpates the lumbosacral joint while slowly straight leg raising the limb on the affected side. The test is then repeated on the other unaffected side. When pain is brought on before the lumbosacral joint is opened and it's possible to raise the leg on the unaffected side to a greater level than the limb on the affected side, without pain, then a lesion of the sacroiliac joint or ligaments is presumed. When no pain is experienced until the lumbosacral movement occurs and pain is felt when either leg is raised to approximately the same height, then a

lumbosacral lesion is more likely, which was the case with this patient.

SPINAL EXAMINATION

A thorough spinal examination was performed on Mr. Strand . Spinal examination consisted of static and motion palpation of the cervical, thoracic, lumbar spine and pelvis. It included intervertebral joint play analysis, comparative leg length analysis and range of motion evaluation. The examination revealed dysfunctions/vertebral subluxations at the following levels: C5, C6

These articular dysfunctions are associated and accompanied by joint edema, joint capsulitis and deep and superficial myospasms. There is muscle splinting and tenderness upon digital palpation at the levels of the articular dysfunctions. There is pain on percussion of the spinous processes at these levels as well. There are myofascial trigger points located in the following musculature: bilateral trapezius muscles

FUNCTIONAL AND STRUCTURAL ASSESSMENTS

Individual physical test measurements and their calculated values are listed below. The first examination serves as a starting point or baseline for comparison, with subsequent test measurements documenting change over time. In this manner, test scores and functional assessments are used as outcome measures.

RANGE OF MOTION (ROM) Testing - Restriction and/or asymmetry in spinal motion was noted in the physical examination. Active range of motion testing was performed to document the extent of those spinal restrictions and asymmetries using the ZERO-NEUTRAL, GRAVITY-BASED SFTR (Sagittal Frontal Transverse Rotation) METHOD developed by John J. Gerhardt, M.D. Range of motion was tested using dual inclinometers, as recommended on page 400 of the AMA Guides to the Evaluation of Permanent Impairment, 5th Edition. In order to help ensure that the patient was giving an optimum effort, the reproducibility criteria was followed. According to page 399 of the AMA Guides to the Evaluation of Permanent Impairment, 5th Edition, “When measuring range of motion, the examiner should obtain at least three consecutive measurements and calculate the mean (average) of the three. Measurements should not change substantially with repeated efforts. If the average is less than 50°, three consecutive measurements must fall within 5° of the mean; if the average is greater than 50°, three consecutive measurements must fall within 10% of the mean. Motion

testing may be repeated up to six times to obtain three consecutive measurements that meet these criteria. If after six measurements inconsistency persists, the spinal motions are considered invalid. The measurements and accompanying impairment estimates may then be disallowed, in part or in their entirety."

According to page 558 of the AMA Guides to the Evaluation of Permanent Impairment, 6th Edition, 'range of motion may be used to monitor clinical progress in individuals.'

	Normal	**3/1/2010**	**%LIMITATION**
Cervical Flexion	50	47	6%
Cervical Extension	60	42	30%

Mr. Strand satisfied the AMA reproducibility criteria.

Notes: The patient reported increased discomfort in the following planes of motion:

- Cervical Left Lateral Flexion
- Cervical Right Lateral Flexion

A COMPUTERIZED COMPARATIVE MUSCLE STRENGTH TEST (CCMT) procedure was performed in order to determine asymmetry in muscle strength and/or to quantify muscle strength loss as noted on the subjective muscle strength test. These muscle strength losses of the upper and/or lower extremities indicate neurological facilitation resulting from trauma to the cervical and/or lumbar spine. According to Bohannon et al [Bohannon, RW and Andrews, AW; Perpetual and Motor Skills, 1999, 89, 878-880], the difference in strength between sides is typically less than 6%.

Isometric Muscle Strength (lbs)	**Spinal Nerve Levels**	**Left**	**Right**	**Difference**
Stemocleidoma/Scaleni/Erector Spinae	C3	17	31	45 %
Flexor Carpi Ulnaris		22	22	0 %
Extensor Carpi Radialis/Ulnaris	C6	19	24	21 %
Abductor Pollicis Brevis		19	12	37 %
1st Dorsal Interosseus- Index	C5	28	27	4 %

Finger				

TREATMENT GUIDELINES

In order to determine a guideline for number and duration of treatment of Mr. Strand for the injuries he suffered as a result of the automobile accident of 3/1/2010, the Croft Guidelines for the Treatment of CAD Injuries was utilized.

In 1993, Arthur Croft, D.C., M.S., M.P.H., F.A.C.O., F.A.C.F.E., published a set of management guidelines in the ACA Journal. These guidelines have also been published in Whiplash Injuries: the Cervical Acceleration/Deceleration Syndrome (second edition in 1995 and third edition in 2002) and in a recent Canadian practitioner's guide to whiplash injuries, sanctioned by the Canadian Chiropractic Association.

The Croft Guidelines have been a part of our literature now for more than ten years. No competing guidelines relative to CAD treatment have been published during that time, with the exception of the Quebec Task Force Guidelines on WAD, but these are only applicable for patients who remain on disability. The International Chiropractors Association, several American state chiropractic organizations and associations and at least one Canadian province have now adopted the Croft Guidelines.

The following is a summary of the Croft Guidelines for the Treatment of CAD Injuries.

Grades of Severity of Injury

Grade 1 - Minimal; No limitation of motion; No ligamentous injury; No neurological findings

Grade 2 - Slight; Limitation of motion; No ligamentous injury; No neurological findings

Grade 3 - Moderate; Limitation of motion; Some ligamentous injury; Neurological findings may be present

Grade 4 - Moderate to Severe; Limitation of Motion; Ligamentous instability; Neurological findings present; Fracture or disc derangement

Grade 5 - Severe; Requires surgical management/stabilization

Guidelines for Frequency and Duration of Care in Cervical Acceleration/Deceleration Trauma

	Daily	**3x/wk**	**2x/wk**	**1x/wk**	**1x/mo**	**TD**	**TN**
Grade I	1 wk	1-2 wk	2-3 wk	<4 wk	*	<11 wk	<21
Grade II	1 wk	<4 wk	<4 wk	<4 wk	<4 mo	<29 wk	<33
Grade III	1-2 wk	<10 wk	<10 wk	<10 wk	<6 mo	<56 wk	<76
Grade IV	2-3 wk	<16 wk	<12 wk	<20 wk	**	**	**
Grade V				**Surgical stabilization necessary - chiropractic care is post-surgical**			

TD = treatment duration; TN = treatment number
** = possible follow-up at 1 month*
*** = may require permanent monthly or p.r.n. treatment*

Common Factors Potentially Complicating CAD Trauma Management

- Advanced age
- Metabolic disorders
- Congenital anomalies of the spine
- Developmental anomalies of the spine
- Degenerative disc disease
- Disc protrusion (HNP)
- Spondylosis
- Facet arthrosis
- Rheumatoid arthritis or other arthridigites affecting the spine
- Ankylosing spondylitis or other spondylarthropathy
- Scoliosis
- Prior cervical spinal surgery
- Prior lumbar spinal surgery
- Prior vertebral fracture
- Osteoporosis
- Paget's disease or other disease of bone

- Spinal stenosis or foraminal stenosis
- Paraplegia or quadriplegia
- Prior spinal injury

Mr. Strand has a history of the following complicating factors: Degenerative disc disease, disc protrusion (hnp).

At the initial examination of Mr. Strand , the patient was found to have loss of cervical range of motion. According to the Croft Guidelines described above, Mr. Strand 's injuries would fall into Grade II, or slight injury. Treatment guidelines for Grade II are for up to 33 visits within a 29 week period of time and may require monthly treatment in the future.

PROGNOSIS

Stephen M. Foreman, DC, DABCO, compiled a system of rating the prognosis or degrees of injury with regards to future pain and suffering as a result of the Cervical Acceleration/Deceleration (C.A.D.) injury.

Foreman developed a number system, in the form of a scale, which is used to objectively quantify and classify mechanisms of the whiplash trauma resulting in the injuries. The examiner utilizes his findings to ascertain the information which allows the patients to be classified into these categories.

The explanation of a rating system based on “Scales” (Scales of Objective Data), or “Prognosis Scales”, utilizes a numerical point value classification system, along with modifiers from objective data based on: radiographic findings, patient history and examination findings. The purpose is to accurately assess the probability of long term residuals and the need for medication or surgery.

The reference of the Norris and Watt study from 1983 can be found on pages 608 through 611 in the British Journal of Bone and Joint Surgery (1983), copies of which may be obtained at the Rutgers or Harvard Medical Schools, Med-line Computer Systems, local libraries or Universities Medical Libraries.

Cervical acceleration/deceleration injuries are classified by these authors as belonging to one of three initial groups. These groups are termed “Major Injury Categories” or

MIC's.

MIC 1 Major Injury Category 1:
Patients sustain only subjective symptoms. No objective findings found upon physical examination. (10 points)

MIC 2 Major Injury Category 2:
Patients experience subjective signs and present a loss in range of motion (cervical). (50 points)

MIC 3 Major Injury Category 3:
Patients bear subjective signs and symptoms, a loss in the range of motion and objective neurological deficit seen as sensory or motor impairment. (90 points)

These Major Injury Categories are modified by the following conditions which present a statistically poorer prognosis:

Canal size 10-12 mm:
Narrowed spinal canals have been shown to heighten neurological involvement. Larger canal size offers the spinal cord component of the Central Nervous System more protection, in light of its increased diameter. (20 points)

Canal size 13-15 mm:
These parameters offer more space; however, degenerative changes may lead to future stenosis and additional problems. (15 points)

Straight Cervical Spine:
Whether a result of spasm, muscular or ligamentous damage, or both, researchers Norris and Watt found this to be aligned with a poorer prognosis. (10 points)

Kyphotic Cervical Curve:
Affiliated with residual pain, increased degenerative changes, a poor prognosis often accompanies this. (15 points)

Fixated Segments:
Whether a corollary affect due to congenital blocks or degenerative changes, these consequences impart a poorer clinical recovery and a significantly higher incidence of

degenerative changes after the accident. (15 points)

Pre-existing degenerative changes:
As visualized upon inspection of radiographic views. Due to eminent arthropathy of the joints and associated laxity of ligaments, this pre-existing condition may amplify the consequences of the injury. It has been shown that "no matter how slight," these changes adversely affect the prognosis. (10 points)

Loss of Consciousness:
As an aftermath of head injury, this represents a separate additional form of injury. Patients who suffer this state statistically yield a far greater incidence of future degenerative changes. (15 points)

In their study published on the Journal of Bone and Joint Surgery Surgery, pages 608 through 611, researchers Norris and Watt found a significant relationship between the Major Injury Category (MIC) and the presence of residual pain. They further related:

MIC #1 = 56% of injured patients
MIC #2 = 81% of injured patients
MIC #3 = 90% of injured patients

The typical residual pain presented primarily as neck pain, headache and paresthesia. The following is the point calculation for Mr. Strand :

MIC 1 Major Injury Category 1:	**10**
Canal size 10-12 mm:	**20**
TOTAL POINTS	**30**

Prognosis Group 1 (10 - 30 points):
This is an excellent prognosis. This means that there is little or no chance of a need for long term medication or surgery. However, there is a 50/50 chance of long term residuals such as mild muscle pain, neck stiffness, headaches and paresthesia.

Prognosis Group 2 (35 - 70 points):
The prognosis is considered to be GOOD. This means that there is a slight chance of need for long term medication or surgery. However, there is a 50 to 80% chance of long term residuals such as mild to moderate muscle pain, neck stiffness, headaches

and paresthesia.

Prognosis Group 3 (75 - 100 points):
The prognosis is considered to be FAIR. This means that there is a moderate chance of a need for long term medication or surgery. However, there is 50-80% chance of long term residuals such as moderate muscle pain, neck stiffness, headaches and paresthesia.

Prognosis Group 4 (105 - 125 points):
The prognosis is considered to be POOR. This means that there is a marked chance of a need for long term medication or surgery. However, there is an 80-90% chance of long term residuals such as persistent muscle pain, neck stiffness, headaches and paresthesia.

Prognosis Group 5 (130 - 165 points):
The prognosis is considered to be clinically unstable. This means that there is a marked chance of a need for long term medication or surgery. However, there is an 80-90% chance of long term residuals such as persistent muscle pain, neck stiffness, headaches and paresthesia.

Mr. Strand 's prognosis falls within Prognosis Group 1.
This is an excellent prognosis. This means that there is little or no chance of a need for long term medication or surgery. However, there is a 50/50 chance of long term residuals such as mild muscle pain, neck stiffness, headaches and paresthesia.

(Foreman, SM, Croft, AC: Whiplash Injuries-The Cervical Acceleration/Deceleration Syndrome, 3rd Edition. Lippincott, Williams & Wilkins, pages 508-514, 2002.)

ASSESSMENT / DIAGNOSIS

The patient was in the office today with the above described complaints. His present chiropractic, orthopedic and neurological examination is as described above. The following is the initial diagnosis:

E812.0 driver of an automobile involved in a motor vehicle collision

In my opinion, the above diagnoses are a direct result of the automobile accident

described in this report.

PLAN / RECOMMENDATION

Mr. Strand will be treated two times per week.

Treatment will consist of chiropractic adjustments to the cervical spine.

Treatment goals for this stage of care are to reduce pain and restore range of motion.

He will be re-evaluated in 4 week(s) with outcome questionnaires, computerized range of motion and muscle tests.

If you have any questions regarding this patient, please contact this office at (412) 278-2040.

Sincerely,

albert XXX