Clinical Case Report Competition

West Coast College of Massage Therapy, Victoria Campus

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Third Place Winner

Tracy Crawford

Decreasing symptoms occurring from cervical spine dysfunction with massage therapy
Acknowledgements

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Conflict of Interest and Consent Notification

To the author’s knowledge, no conflict of interest exists. Informed consent was received from the patient prior to treatment. No personal information was revealed in the production of this paper.
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Abstract

Objective: Massage Therapies effectiveness in decreasing symptoms occurring from a cervical spine dysfunction.

Clinical Features: A twenty one year old female who suffers from: chronic tension headaches on a daily basis; decreased rib expansion with respiration; restricted fascia and hyper toned cervical spine musculature. This patient also experiences high stress levels and poor sleeping habits.

Methods: The majority of the seven treatments ranged from sixty to seventy minutes in length and included ten minutes of initial assessment, forty to fifty minutes of treatment and ten minutes of re-assessment. Techniques which were introduced into the treatments were general swedish massage (GSM), passive range of motion (PROM), myofacial release (MFR), trigger points (TP) and positional release therapy (PRT), and muscle energy techniques (MET).

Results: Through the comparative analysis of the eight treatment sessions, a decrease in muscle hyper tonicity in the cervical spine, a decreased in tension headaches and an increase in rib movement with respiration were all obtained. The patients stress levels were also slightly decreased during the treatments sessions.

Conclusion: Massage therapy is effective in decreasing symptoms occurring from a cervical spine dysfunction.

Key Words: cervical spine dysfunction, hyperventilation, effects from stress, tension headaches
Cervical spine dysfunction can affect any or all of the cervical spine vertebrae and the structures attaching to and around them including but not limited to muscle, fascia, ligaments, vertebral discs and nerves. The signs and symptoms will vary and depend on the dysfunction as well as the structures affected.

A dysfunction resulting from a musculoskeletal origin has a direct link with a normal response to stress." Some of the stress factors which negatively influence musculoskeletal soft tissue structure or function, produce irritation, increased muscle tension and pain” (Chaitow, Muscle Energy Techniques 3rd edition, 2006). “The normal response of muscle to any form of stress is increased tone (Barlow 1959, Seley 1976)” (Chaitow, Muscle Energy Techniques 3rd edition, 2006). Emotional stress is a contributing factor to musculoskeletal dysfunction as emotional stress increases the bodies sympathetic nervous system, putting the body into a fight or flight response (Lugwig, 2000). This effects the musculature as muscle tone is increased during the fight or flight response and “muscular hypertonicity and the subsequent development of trigger points in these muscle commonly lead to neck stiffness low back pain and headaches.” (Lugwig, 2000).

“Tension headaches and headaches with muscular origin are associated with trigger points and other myofascial pain syndromes (travel, Simons, 1983)” (Lugwig, 2000). As well, sleep disturbances and aggravating factors including stress, fatigue and poor posture may also play a role in tension headaches. A cervicogenic headache is one that arises from structures in the cervical spine. They are usually felt unilateral and felt into the frontal region of the head.
Trigger points from cervical spine musculature can refer into the head at various locations following the referral area of certain muscles and can be commonly misdiagnosed as tension headaches (Vizniak N. A., 2008). “Spinal dysfunction can affect the sympathetic nervous system and lead to headaches” (Lugwig, 2000).

During the stress response, other systems will also be elevated and an increase in heart rate, blood pressure and an increase is respiratory rate may also occur (Lugwig, 2000). “Under stress, breathing becomes more shallow and atypical as the body attempts to increase oxygen intake.” (Lugwig, 2000). Atypical breathing contributes to an increase in hypertonicity of the cervical spine muscles involved with respiration (Chaitow, Muscle Energy Techniques 3rd edition, 2006). Hyperventilation (over breathing) refers to an excessive drop in CO2 levels producing a rise in blood pH, i.e. respiratory alkalosis. This interference of blood pH causes a chain of systemic reactions that have adverse effects on musculoskeletal heath such as increased muscle tension, muscle spasm, increased response to catecholamines and muscle ischemia and hypoxia. (J.Paul, Pain and Stress Class notes, 2011) (Schleifer LM, 2002) Therefore diaphragmatic breathing is indicated to help reduce stress levels and pain (Lugwig, 2000).

“Massage was found to reduce the levels of cortisol in the body and to decrease a person’s perceived stress and anxiety levels (Field et al. 1995d). It increases the person’s awareness of the tense areas in the body which enables the person to develop more relaxed posture and better breathing” (Lugwig, 2000). This case presentations primary goal is to treat the underlying dysfunction of the cervical spine by increasing muscle length and range of motion as well as decreasing any present myofascial trigger points and adhesions in the cervical spine (Lugwig, 2000). The secondary goal is to have an effect on decreasing the sympathetic nervous
system, decreasing tension headaches and establishing typical breathing patterns (Lugwig, 2000) (Chaitow, Muscle Energy Techniques 3rd edition, 2006).

**Patient History**

The patient is a twenty one year old, ectomorph build female; who at the time of this case report, suffers from a cervical spine dysfunction due to hyper toned cervical musculature. The patient’s symptoms due to this dysfunction are tension headaches, short breaths by using primarily the thoracic and cervical musculature to breathe, heaviness in her chest and a “popping” sound heard at the posterior left side of the cervical spine following deep inhalation. The patient suffers from a high level of emotional stress.

The patient receives tension headache symptoms approximately 5X a week and has since the age of fifteen. She is not aware of any triggers which may be linked to these headaches other than increased stress levels. The headaches are felt at different locations at different times. The areas in which she feels headache sensations are in the sub occipital area, the temporal area, along the side of the head behind the ear and into the forehead. The headaches are also only felt unilaterally and between the morning and early afternoon. On average these intensity of the pain due to the headaches are 5 out of 10 on the pain scale and can be somewhat relieved with Advil most of the time.

The patient has a high stress level due to school, work and relationships and feels pressure from deadlines. On average her stress levels are at a 6-9.5 out of 10 with 10 being the highest level of stress imaginable. The patient finds relief from high stress levels by taking hot
baths or applying a heat pack to the posterior cervical spine, as well as exercising at the gym 2-3 times per week.

The patient has previously received treatment from a Chiropractor and a Registered Massage Therapist and is not currently receiving any treatment outside of this case study. The patient feels that she gets adequate amounts of sleep and generally her quality of sleep is good but does suffer from restlessness periodically. The patient sleeps on her back most of the time.

The patient has never suffered from trauma to the cervical spine. This patient is currently taking Advil 1-2 tablets with the presence of a headache.
Investigation and Physical Examination

Initial assessment before commencing treatments:

<table>
<thead>
<tr>
<th></th>
<th>Before Treatments</th>
<th>Chest Expansion Measurement:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cervical Spine</td>
<td>Active Range of Motion</td>
<td>Axilla</td>
</tr>
<tr>
<td>Flexion</td>
<td>50</td>
<td>Zyphoid process</td>
</tr>
<tr>
<td>Extension</td>
<td>80</td>
<td>12th Rib</td>
</tr>
<tr>
<td>Right Rotation</td>
<td>80</td>
<td>1 ½ inch</td>
</tr>
<tr>
<td>Left Rotation</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Right side bend</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Left side bend</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>Adson</td>
<td>(-)</td>
<td>(+)</td>
</tr>
<tr>
<td>Allen</td>
<td>(-)</td>
<td>(+)</td>
</tr>
<tr>
<td>Wright</td>
<td>(+) pulse returns @170</td>
<td>(+) pulse returns @160</td>
</tr>
<tr>
<td>Spurling’s</td>
<td>(-) discomfort at end range with compression</td>
<td>(+) discomfort at end range without compression</td>
</tr>
</tbody>
</table>
The patient has indicated that before commencing treatments her current stress level is a 9.5/10, with 10 being the highest amount of stress. She is feeling shortness of breath and “heaviness” in her chest. Plum line photos were taken to assess the patient’s initial posture.
Treatment Outline

Subject was treated eight times, with treatments consisting of one hour to an hour and fifteen minutes, over a five week period. Myofascial release (MFR) techniques were used as well as techniques including general swedish massage (GSM), muscle energy techniques (MET), trigger points (TP) and positional release therapy (PRT), passive range of motion (PROM), traction and occipital condyle releases were all incorporated into each treatment session.

Each treatment session shared the same goals to increase muscle length, range of motion of the cervical spine and decrease and apparent trigger points and adhesions in the area. Home care was also consistent throughout the treatment sessions as it was important to keep the demand put on the patient at a minimum in order to not stimulate their stress level. It was also important to have continuation with the home care of diaphragmatic breathing each day, in order to have a desired effect of establishing a typical breathing pattern and aid in decreasing the subjects stress levels daily. An increase in water intake was added to the homecare during the second half of the treatment sessions as it was indicated that the patient was not consuming nearly enough water daily to meet the suggested amount of six to eight glasses per day.

The use of a hydroculator at the beginning of each treatment for 5 minutes as well as the positioning of the subject in a supine position was used consistently throughout the treatment sessions.
Methods

Muscle Energy Technique (MET) was incorporated in each treatment session. The idea behind using MET was to target the deep musculature of the cervical spine such as the multifidus, intertransversarii and interspinalis muscles. MET are a class of soft tissue manipulation that is a directed and controlled patient initiated movement with incorporating isometric and isotonic muscle contractions. This technique is designed to improve musculoskeletal function and reduce pain. MET confines forces to the musculature or level of dysfunction involved and has the ability to relax an overactive muscle and enhances stretch of shortened muscles or their associated fascia. (Chaitow, Muscle Energy Techniques 3rd edition, 2006)

Myofascial Release techniques (MFR) were incorporated in the beginning and the end of every treatment. MFR shearing was used along the Chest and Cervical spine areas to have a releasing effect of any adhesions in these areas prior to any muscle work being done. Shearing is a deep technique which is used to have an effect on the Pretracheal and Prevertebral Fascia which is the deeper layers; it will as well have an effect on the most superficial layer the Investing Fascia of the cervical spine. All these layers a fascia are important for the cervical spine as well as the thorax of the body as they all have connections in to various areas and levels of the thorax. The Occipital Condyle Release (Suboccipital release) was used at the end of every treatment after all of the muscle work. The sub occipital release has a direct effect on fascial connections and is indicated for use with cervical spine disorders, decreasing the sympathetic nervous system and reducing tension headaches. A release from this technique can reduce intracranial fluid congestion which will contribute to better functioning craniosacral system
mobility, and may release any restrictions on the glossopharyngeal, vagus and the accessory cranial nerves which pass through this area. (Brotsky, 2011) (S.Langer, 2010)

General Swedish Massage (GSM) was the main component to the treatments and was applied following the MFR techniques. GSM has an effect on the musculoskeletal system, circulatory system as well as the nervous system. GSM was used to treat hypertoned musculature, improve functional range of motion in the cervical spine, and decrease the sympathetic nervous system. GSM was used to warm up the musculature in the chest and cervical spine. Following warm up, muscle stroking, kneading and muscle stripping was performed on Sternoclediomastoid (SCM), Scalenes (posterior, middle and anterior), trapezium, longus colli, sub occipitals, levator scapula and the erector spinae muscles. Slower rates of these techniques were used to help calm the nervous system (S.Griffiths, 2009). Passive Range of motion was used in increasing joint health and decreasing the sympathetic nervous system.

Trigger Point Release (TPR) and Positional Release Techniques (PRT) were used throughout the treatment at specific locations as indicated by the patient. “Trigger points originate in hyperirritable localized myofascial tissue which may lead to sustained muscle contraction and weakness. This syndrome is characterized by localized point tenderness, characteristic referred pain and occasionally with autonomic phenomena, all resulting in motion restriction and pain.” (G.Robertson, 2010) PRT is a variation of treating trigger points. While compressing a trigger point or point of tenderness the tissues involved (muscles, joints and whole cervical region) are moved into the patients comfort zone; the ‘position of ease’ or ‘position of least resistance’ (J.Paul, Pain and Stress class notes Term 6, 2011). “Pain, which is being monitored by compression of a painful ‘tender’ point, reduces by at least 70% when the ease position is reached” (J.Paul, Pain and Stress class notes Term 6, 2011)
**Homecare:** Diaphragmatic breathing was given to the patient to do before bed for five minutes. This home care was given throughout the treatments with no change as it was important to not over prescribe homecare to this patient due to their current stress levels. To have the desired effect from the Diaphragmatic breathing, it was necessary for the patient to continue with it daily throughout the treatments. The Diaphragmatic breathing was given to assist the patient with distressing daily before bed, to assist in a restful sleeping pattern and to take the time to restore typical breathing patterns. Near the end of the treatment sessions, home care was adjusted slightly to increase an additional glass of water consumption to their daily intake as it was revealed that the patient was not consuming more than one to two glasses of water per day (J.Paul, Pain and Stress class notes Term 6, 2011) (Lugwig, 2000).

**Review of Treatment Outcomes**

Comparison chart between Treatment #1 and Treatment #8:

<table>
<thead>
<tr>
<th></th>
<th>Nov 2, 2011</th>
<th>Nov 30, 2011</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Cervical Spine</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Flexion</td>
<td>50</td>
<td>50</td>
<td></td>
</tr>
<tr>
<td>Extension</td>
<td>80</td>
<td>80</td>
<td></td>
</tr>
<tr>
<td>Right Rotation</td>
<td>80</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Left Rotation</td>
<td>80</td>
<td>90</td>
<td></td>
</tr>
<tr>
<td>Right side bend</td>
<td>20</td>
<td>40</td>
<td></td>
</tr>
<tr>
<td>Left side bend</td>
<td>20</td>
<td>40</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>Nov 2: Left</th>
<th>Nov 2: Right</th>
<th>Nov 30: Left</th>
<th>Nov30: Right</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adson</td>
<td>(-)</td>
<td>(+)</td>
<td>(-)</td>
<td>(+)</td>
</tr>
<tr>
<td>Allen</td>
<td>(+)</td>
<td>(+)</td>
<td>(-)</td>
<td>(-)</td>
</tr>
<tr>
<td>Wright</td>
<td>(+) pulse back @ 170 degrees Abduction</td>
<td>(+) pulse back @ 160 degrees Abduction</td>
<td>(+) pulse back @160 degrees</td>
<td>(+) pulse back @ 170 degrees</td>
</tr>
</tbody>
</table>
Within eight treatments, the patient’s cervical spine range of motion was greatly increased. A noticeable increase in lateral flexion from 20 degrees pre treatments to 40 degrees post treatments. Rotation was also slightly increased by 10 degrees. Adson, Allen, Wright and
Spurling’s tests were all done every treatment. Adson’s and Allen Maneuver were negative by the end of the treatment sessions. While Spurling’s and Wright tests have little to no significant changes throughout the eight treatments.

Rib expansion was measured at the beginning, middle and end of the treatment sessions. The measurements taken on November the 15th at treatment number six had the most improvement. The measurements taken at the end of these treatments had digressed slightly compared to the measurements taken in the middle, but overall the results are impressive.

The patient had a decrease in the frequency of tension headache occurrences in between treatments as these sessions progressed onward and it is noted that there seemed to be a direct correlation to the patients stress level (seen in the Subjective Findings Graph). The patient also noted on treatment eight that the “popping” in the cervical spine had decreased and was not as bothersome by the end of the eight treatments. The patients stress level had fluctuated up and down during the sessions but were not significantly reduced and the neck disability index score went from a 13 scored to a 10 scored by the end of the eighth treatment.

There was no noticeable change in the patient’s posture from the beginning and the end treatment.
Discussion and Conclusion

The therapist notes that by the end of the eight treatments sessions there was an increase in range of motion in the cervical spine, a decrease in the frequency and intensity of headaches and an improvement in typical rib expansion with inhalation, were all achieved. It is also noted although the ribs and diaphragm muscles were not directly treated throughout the treatments sessions, that the scalene, pectoralis and SCM muscles were and this may have also contributed to the increase of typical rib movement with inhalation in conjunction with the patients recommended homecare.

The therapist believe that the treatments were able to help the patient maintain a constant stress level and keep her sympathetic nervous system from firing high even though her stressors continued to be present. The diaphragmatic breathing as home care had greatly influenced the normal function and strengthening if the diaphragm muscle, therefore increasing rib expansion and decreasing the patients “heaviness” in chest.

The therapist notes that it is imperative for the patient to continue with their daily homecare in order to maintain typical rib movement, easiness of breath and to help alleviate and manage a healthier stress level. The combination of this with regular treatments should help keep the patients tension headache frequencies and intensity to a lower or nil occurrence.
References


Appendix 1

Oxford Range of Motion Chart

Normal Ranges of Motion

<table>
<thead>
<tr>
<th>Cranial Cervical (cranium to C7) Movement</th>
<th>Degrees of Motion</th>
</tr>
</thead>
<tbody>
<tr>
<td>Flexion</td>
<td>45-50</td>
</tr>
<tr>
<td>Extension</td>
<td>85</td>
</tr>
<tr>
<td>Lateral Flexion</td>
<td>40</td>
</tr>
<tr>
<td>Axial Rotation</td>
<td>90</td>
</tr>
</tbody>
</table>

(Magee D. J., Orthopedic Physical Assessment fifth addition, 2008)

Foraminal Compression (Spurling’s) Test

This test is designed to recreate symptoms indicative of a nerve root issue. This test is done in three stages and if any symptoms are produced, the therapist does not proceed to the next stage. A positive test result would be classified if the client feels pain radiating into the arm in which the head is side flexed during compression. Neck pain without radiation into the arm is not considered a positive test. The tests positions narrow the intervertebral foramen so that the following conditions may lead to symptoms: stenosis; cervical spondylosis; osteophytes; trophic, arthritic or inflamed facet joints; herniated disc; or vertebral fractures. If the pain is felt in the opposite side from which it is taken into during the testing, this is called reverse Spurling’s sign and is indicative of muscle spasm.

In the first stage, the therapist gently applied a compressive force on the client’s head in a neutral position.

In the second stage, the therapist gently applied a compressive force on the client’s head in an extended position.

In the final stage, the therapist applies a gentle compressive force on the client’s head while they are in an extended and rotational position to the unaffected side, then to the side of complaint.

(Magee D. J., Orthopedic Physical Assessment fifth addition, 2008)
Appendix 2

Wright (Hyper abduction) Test

This test is done with the patient lying down (in order to eliminate gravity) or sitting (working against gravity). The therapist takes the patients radial pulse and passively brings the patients arm into 180 degrees of abduction at the shoulder. If the pulse has diminished, that is indicative to pectoralis minor syndrome which indicates a hypertoned pectoralis minor muscle which is impinging the axillary artery. When patients pulse has diminished, it is a good idea to see at what level the pulse returns at therefore while still monitoring the pulse the therapist can slowly lower the arm down until they feel the return of the patients pulse. This degree will give a more specific marking point as what degree the patients pulse is lost and a better record to compare a patient’s progress with. (Magee D. J., 2008) (Coy, Reginal Orthopedics Class Notes, 2011)

Allen Maneuver

While seated the patients arm is passively moved by the therapist to 90 degrees of Abduction and flex the elbow to 90 degrees on the same side. The therapist monitors the patient’s radial pulse and has the patient turn their head to the opposite side of testing, slightly extend their head and take a deep breath in and hold. At this time the therapist should determine if the patients pulse has diminished or is still present. A diminished pulse is positive for compression of the subclavian artery and/or the neurovascular bundle between middle and anterior scalene. (Magee D. J., 2008) (Coy, Reginal Orthopedics Class Notes, 2011)

Adson Maneuver

For this test the patient is seated. Their arm is passively moved into extension and external rotation at the shoulder, the patient then actively rotates their head towards the side being tested. The therapist is monitoring the patient’s radial pulse and has the patient take a breath in and hold it for a second. A diminished pulse is indicative of Thoracic outlet syndrome (TOS). (Magee D. J., 2008) (Coy, Reginal Orthopedics Class Notes, 2011)

Halstead Maneuver

This is a variation of Adson’s Test. The test is done the same way except the patient rotates their head away from the side being tested. A diminished pulse is also indicative of thoracic outlet syndrome (TOS). (Magee D. J., 2008) (Coy, Reginal Orthopedics Class Notes, 2011)
### Appendix 3

**Muscles of the Cervical Spine and their Actions**

<table>
<thead>
<tr>
<th>Action</th>
<th>Muscles Acting</th>
</tr>
</thead>
<tbody>
<tr>
<td>Rotation of head (Muscles of one side contract)</td>
<td>1. Levator scapula (face moves to same side) &lt;br&gt;2. Splenius cervicis (Face moves to same side) &lt;br&gt;3. Longissimus cervicis (Face moves to same side) &lt;br&gt;4. Semispinalis cervicis (Face moves to same side) &lt;br&gt;5. Iliocostalis cervicis (Face moves to same side) &lt;br&gt;6. Multifidus (face moves to opposite side) &lt;br&gt;7. Intertransversarii (face moves to same side) &lt;br&gt;8. Scalene (face moves to opposite side) &lt;br&gt;9. Sternocleidomastoid (SCM)  &lt;br&gt;   (Face moves to opposite side) &lt;br&gt;10. Obliquis capitus inferior  &lt;br&gt;   (face moves to opposite side) &lt;br&gt;11. Rotatores brevis (face moves to same side) &lt;br&gt;12. Rotatores longi (face moves to same side)</td>
</tr>
</tbody>
</table>
7. Scalene  
8. Sternocleidomastoid (SCM)  
9. Obliquus capitis inferior  
10. Iliocostalis cervicis  
11. Rotatores brevis  
12. Rotatores longi  
13. Longus colli

(Magee D. J., Orthopedic Physical Assessment fifth edition, 2008)
## Appendix 4

### Neck Disability Index

This questionnaire has been designed to give the doctor information as to how your neck pain has affected your ability to manage in everyday life. Please answer every section and mark in each section only the ONE box which applies to you. We realize you may consider that two of the statements in any one section relate to you, but please just mark the box which most closely describes your problem.

#### Section 1 — Pain Intensity
- [ ] I have no pain at the moment. (0)
- [ ] The pain is very mild at the moment. (1)
- [ ] The pain is moderate at the moment. (2)
- [ ] The pain is fairly severe at the moment. (3)
- [ ] The pain is very severe at the moment. (4)
- [ ] The pain is the worst imaginable at the moment. (5)

#### Section 2 — Personal Care (Washing, Dressing, etc.)
- [ ] I can look after myself normally without causing extra pain. (0)
- [ ] I can look after myself normally but it causes extra pain. (1)
- [ ] It is painful to look after myself and I am slow and careful. (2)
- [ ] I need some help but manage most of my personal care. (3)
- [ ] I need help in all aspects of self care. (4)
- [ ] I can't get dressed, I wash with difficulty and stay in bed. (5)

#### Section 3 — Lifting
- [ ] I can lift heavy weights without extra pain. (0)
- [ ] I can lift heavy weights but it gives extra pain. (1)
- [ ] Pain prevents me from lifting heavy weights off the floor, but I can manage if they are conveniently positioned, for example on a table. (2)
- [ ] Pain prevents me from lifting heavy weights, but I can manage light to medium weights if they are conveniently positioned. (3)
- [ ] I can lift very light weights. (4)
- [ ] I cannot lift or carry anything at all. (5)

#### Section 4 — Reading
- [ ] I can read as much as I want to with no pain in my neck. (0)
- [ ] I can read as much as I want to with slight pain in my neck. (1)
- [ ] I can read as much as I want to with moderate pain in my neck. (2)
- [ ] I cannot read as much as I want because of moderate pain in my neck. (3)
- [ ] I can hardly read at all because of severe pain in my neck. (4)
- [ ] I cannot read at all. (5)

#### Section 5 — Headaches
- [ ] I have no headaches at all. (0)
- [ ] I have slight headaches that come infrequently. (1)
- [ ] I have moderate headaches which come occasionally. (2)
- [ ] I have moderate headaches which come frequently. (3)
- [ ] I have severe headaches which come frequently. (4)
- [ ] I have headaches almost all the time. (5)

#### Section 6 — Concentration
- [ ] I can concentrate fully when I want to with no difficulty. (0)
- [ ] I can concentrate fully when I want to with slight difficulty. (1)
- [ ] I have a fair degree of difficulty in concentrating when I want to. (2)
- [ ] I have a lot of difficulty in concentrating when I want to. (3)
- [ ] I have a great deal of difficulty in concentrating when I want to. (4)
- [ ] I cannot concentrate at all. (5)

#### Section 7 — Work
- [ ] I can do as much work as I want to. (0)
- [ ] I can do my usual work, but not more. (1)
- [ ] I can do most of my usual work, but not more. (2)
- [ ] I cannot do my usual work. (3)
- [ ] I can hardly do any work at all. (4)
- [ ] I cannot do any work at all. (5)

#### Section 8 — Driving
- [ ] I can drive my car without any neck pain. (0)
- [ ] I can drive my car as long as I want with slight pain in my neck. (1)
- [ ] I can drive my car as long as I want with moderate pain in my neck. (2)
- [ ] I cannot drive my car as long as I want because of moderate pain in my neck. (3)
- [ ] I can hardly drive at all because of severe pain in my neck. (4)
- [ ] I cannot drive my car at all. (5)

#### Section 9 — Sleeping
- [ ] I have no trouble sleeping. (0)
- [ ] My sleep is slightly disturbed (less than 1 hr. sleepless). (1)
- [ ] My sleep is mildly disturbed (1–2 hrs. sleepless). (2)
- [ ] My sleep is moderately disturbed (2–3 hrs. sleepless). (3)
- [ ] My sleep is greatly disturbed (3–5 hrs. sleepless). (4)
- [ ] My sleep is completely disturbed (5–7 hrs. sleepless). (5)

#### Section 10 — Recreation
- [ ] I am able to engage in all my recreation activities with no neck pain at all. (0)
- [ ] I am able to engage in all my recreation activities, with some pain in my neck. (1)
- [ ] I am able to engage in most, but not all, of my usual recreation activities because of pain in my neck. (2)
- [ ] I am able to engage in a few of my usual recreation activities because of pain in my neck. (3)
- [ ] I can hardly do any recreation activities because of pain in my neck. (4)
- [ ] I cannot do any recreation activities at all. (5)

Scores (out of 50): 0–4 No disability 5–14 Mild disability 15–24 Moderate disability 25–34 Severe disability >35 Complete disability

Figure 3-30


(Magee D. J., Orthopedic Physical Assessment fifth addition, 2008)