PASIG MONTHLY CITATION BLAST: No.27 **January 2008**

Dear PASIG members:

We look forward to seeing you at Combined Sections Meeting in Nashville next month. We hope our members will attend all of our PASIG programming and business meeting, as well as support our members presenting their research. Below is a summary of PASIG activities and performing arts-related presentations at CSM. Stop by the Orthopaedic Section table for a handout of these PA-relevant topics or print this out. (Please check locations in onsite programming updates.)

We'd like to announce the PASIG election results: President, Leigh Roberts, Treasurer, Amy Humphrey, and Nominating Committee Member, Jason Grandeo. Thanks to all for your willingness to run and congratulations to our newly elected Board members.

Our special interest topic this month, to get us primed for our CSM PASIG programming, is *Cervical-thoracic Dysfunction*, contributed by PASIG outgoing president, Susan Clinton PT, MHS, OCS. The format is an annotated bibliography of articles on the selected topic from 1998 – 2008. Anyone interested in overseeing a special topic citation blast, please volunteer. As always, your comments and entry contributions to these Citation BLASTs are welcome. Please drop me an e-mail anytime.

Shaw

Shaw Bronner PT, PhD, OCS
Chair, PASIG Research Committee
sbronner@liu.edu

* * * * * * * * * * * * *

Combined Sections Meeting, Nashville, 2008

Friday, February 8th

7:00 – 8:00 AM **PASIG Business Meeting**

8:00 – 11:00 AM **PASIG PROGRAMMING**

Evaluation and Treatment of Cervicothoracic Pain and Dysfunction - Freeing the Performing Artist to Reach New Heights

8:00 – 8:45	Evidence based evaluation and treatment of neck pain in the performing artist. J Cleland PhD, PT, FAAOMPT
8:45 – 9:00	Case Example.
9:00 – 9:45	Evidence based evaluation of cervical radiculopathy. S Piva PhD, PT
9:45 – 10:00	Case Example: Dancer with serratus anterior insufficiency. K Hollman PT
10:00 – 10:15	T3/T4 syndrome in performing artists. S Stralka MS PT
10:15 – 10:35	Medical interventions for cervical/thoracic pain (meds, imaging, interventional pain management, etc). BA Mukherji MD
10:35–11:00	Panel Discussion. All Speakers

5:00 – 7:00 PM **Orthopaedic Section Business Meeting & Reception**

****

PLATFORMS

Friday, February 8th

Sports Physical Therapy Section

Platform Session I - ACL/Knee: 1:00 PM - 4:00 PM

1:20 - 1:40: Effect of Routine Physical Therapy Care, Status Post Anterior Cruciate Ligament Reconstruction, Using the Knee Outcome Survey and Numeric Pain Score In the Early Post-Operative Period. DF Bardugon

1:40 - 2:00: Side-to-side Comparisons of Postural Stability Following Anterior Cruciate Ligament Reconstruction. MV Paterno

2:00 - 2:20: Functional Testing to Discontinue Brace Use for Sport After ACL Reconstruction. NM Goodstadt

2:20 - 2:40: Quadriceps Femoris Strength Influences Knee Motion in Non-copers Who Receive Perturbation Training. EH Hartigan

2:40 - 3:00: Practice Guidelines Using an Accelerated Criterion Based Rehabilitation Progression for a College Athlete After an Infrapatellar Tendon Repair. A Hunter-Giordano

3:00 - 3:20: Lateral Landing Strategies: Potential Risk for ACL Injury? LC Schmitt

2:40 - 3:00: Femoro-Acetabular Impingement: A Case Study. MJ Spevak

3:00 - 3:20: Establishing Unilateral Ratios of Scapulothoracic Musculature Using Hand Held Dynamometry. N Turner

Saturday, February 9th

Orthopaedic Section

Platform Session I – Spine I: 1:00 PM – 3:00 PM

1:00 – 1:15: Systematic Review of Tests to Identify the Disc, SIJ or Facet Joint as the Source of Low Back Pain. J Latimer

1:15 – 1:30: Treatment Effects of Spinal Manipulation on Trunk Proprioception in Subjects with Chronic Low Back Pain during Symptom Remission. K Learman

2:30 – 2:45: The Effect of Subject Expectation on Spinal Manipulation Induced Hypoalgesia. J Bialosky

2:45 – 3:00: Immediate Effects of Spinal Manipulative Therapy in Subjects With Low Back Pain:

A Pilot Study. J Bialosky

Platform Session II – Hip/Knee II: 1:00 – 3:00 PM

1:15 – 1:30: Development of a Clinical Prediction Rule for Diagnosing Hip Osteoarthritis in Patients with Unilateral Hip Pain. T Sutlive

2:15 – 2:30: Comparison of Hip Kinematics, Hip Muscle Strength and Hip Muscle Activation between Females with Patellofemoral Pain and Healthy Controls. R Souza

2:45 – 3:00: Frontal and Transverse Plane Hip Kinematics during Level Walking, Stair Ascent and Descent in Individuals with Patellofemoral Pain Compared to Pain-free Control Subjects. G Salsich

Platform Session IV - Performing Arts/Occ. Med/Other: 1:00 – 3:00 PM

1:00 – 1:15: Reliability and Validity of Functional Ankle Range of Motion Measurements in Dancers. K Hollman & D Dickson. (PASIG Student Scholarship award.)

1:15 – 1:30: Reliability, Validity, and Interpretation of a New Way to Measure Ankle Dorsiflexion. D Dickson

1:30 – 1:45: Core and Shoulder Girdle Muscle Activation during Plank and Hundred Exercises on the Pilates Reformer and Mat. C Ruby

1:45 – 2:00: A Comparison of Pelvic and Shoulder Girdle Activation between Experienced and Novice Pilates Participants during Plank and Hundred Exercises on the Pilates Reformer and Mat. C Ruby

2:00 – 2:15: A Measurement System for Lumbar Extension Strength. J Simpson

2:15 – 2:30: Treatment of an Individual with Piriformis Syndrome Focusing on Hip Muscle Strengthening and Movement Reeducation: A Case Report. S Yun

2:30 – 2:45: Management of a Patient with Bilateral Knee Multiligament Involvement. L Schmitt

2:45 – 3:00: Force Myography: A Novel Means to Characterize Muscle Activity during Functional Tasks. JB Barr

Platform Session VI – Hip/Knee II: 3:00 – 5:00 PM

4:00 – 4:15: Identification of Abnormal Hip Motion Associated with Acetabular Labral Pathology: A Case Report. A Brennglass

4:15 – 4:30: The Response of Diagnostic Intraarticular Hip Injection for Individuals with an Acetabular Labral Tear. RRL Martin

4:30 – 4:45: Diagnostic Accuracy of Symptoms and Exam Findings in Determining Response to Anesthetic Intraarticular Injection in Individuals with Acetabular Labral Tears. RRL Martin

Platform Session VII – Other/Spine II: 3:00 – 5:00 PM

4:30 – 4:45: Lateral Abdominal Muscle Behavior in Subjects with Lumbopelvic Pain during the Active Straight Leg Raise Test. D Smyth Teyhen

4:45 – 5:00: Lateral Abdominal Muscle Behavior in Subjects with Lumbopelvic Pain during the Abdominal Drawing-in Maneuver. D Smyth Teyhen

Platform Session VIII – Foot & Ankle: 3:00 – 5:00 PM

3:15 – 3:30: Effects of a 4 Week, Unilateral Neuromuscular Control Training Program on Bilateral Lower Extremity Postural Control and Function in Subjects with Chronic Ankle Instability. T Helton

3:30 – 3:45: Exam Factors Identifying Patients Status-Post Inversion Ankle Sprain Who are Likely to Benefit from Manual Physical Therapy Interventions and Exercise. JM Whitman

POSTERS *[Please notes, times of Poster presentations were not available at the time of this Blast.]*

OPO135: THE EFFECTS OF THE FIVE BALLET FOOT POSITIONS ON POSTURE OF THE

LUMBAR SPINE, PELVIS, AND HIP. D Levine, D Ingram, R Walker, MW Whittle, C Solly, T Squires, R Walsh

OPO136: HEART RATE VARIABILITY (HRV) AND PERFORMANCE ANXIETY IN COLLEGE MUSIC STUDENTS. NF Quarrier, H Stephenson

OPO137: PREDISPOSING FACTORS TO FOOT AND ANKLE INJURIES IN ADOLESCENT PREPROFESSIONAL BALLET DANCERS. R Wong, A Beasley, K Hessleton, A Maier, J Gamboa, L Roberts

CERVICAL-THORACIC DYSFUNCTION

The annotated bibliography this month is focused on examination and intervention of the cervico-thoracic region. While problems in this region may be most applicable to musicians, dancers, skaters, and gymnasts must lift others overhead, support their body weight with their upper extremities, or simply perform portebras. I chose this topic to reflect the PASIG programming for CSM 2008 in Nashville. I hope this will provide advance information on the latest evidence regarding this region. I have chosen articles from 2004 - present that discuss mobilization, exercise, manipulation, clinical prediction rules and validity of examination. I look forward to seeing all of you in Nashville.

Susan C. Clinton PT, MHS, OCS
PASIG President

Allison GT, Nagy BM, Hall T (2002). A randomized clinical trial of manual therapy for cervico-brachial pain syndrome -- a pilot study. Man Ther 7(2):95-102.

Cervico-brachial pain syndrome is an upper quarter pain condition in which mechano-sensitive neural tissue is considered a primary feature. A single-blind randomized controlled trial was conducted to determine the clinical effect of two manual therapy interventions. Thirty subjects (20 females and 10 males) were randomly allocated to one of three groups - one of two manual therapy intervention groups or a control group. One manual therapy intervention group consisted of passive techniques aimed at mobilizing neural tissue structures and the cervical spine. The other involved indirect manual therapy techniques with a focus on articular components of the gleno-humeral joint and thoracic spine. The treatment period lasted 8 weeks in total and was combined with a home exercise program. Following the 8-week baseline period the control group were crossed over into the specific neural tissue manual therapy group. Pain visual analogue scale (VAS), the short-form McGill pain and Northwick Park neck pain questionnaires were completed before, midway and after the treatment period. The findings suggest that both manual physiotherapy interventions combined with home exercises are effective in improving pain intensity, pain quality scores and functional disability levels. A group difference was observed for the VAS scores at 8 weeks with the neural manual therapy technique having a significantly lower score.

Browder DA, Erhard RE, Piva SR (2004). Intermittent cervical traction and thoracic manipulation for management of mild cervical compressive myelopathy attributed to cervical herniated disc: a case series. J Orthop Sports Phys Ther 34(11):701-12.

Case series to describe the management of 7 patients with grade 1 cervical compressive

myelopathy attributed to herniated disc using intermittent cervical traction and manipulation of the thoracic spine. Intermittent cervical traction has been indicated for the treatment of patients with herniated disc and has been suggested to be helpful for patients with cervical compressive myelopathy. Manipulation of the thoracic spine has been utilized to safely improve active range of motion and decrease pain in patients with neck pain. Dizziness was eliminated in 3 out of 4 patients and chronic headache symptoms were improved in 3 out of 3 patients. There were no adverse events or outcomes. Intermittent cervical traction and manipulation of the thoracic spine seem useful for the reduction of pain scores and level of disability in patients with mild cervical compressive myelopathy attributed to herniated disc. A thorough neurological screening exam is recommended prior to mechanical treatment of the cervical spine.

Cleland JA, Childs JD, Fritz JM, Whitman JM, Eberhart SL (2007). Development of a clinical prediction rule for guiding treatment of a subgroup of patients with neck pain: use of thoracic spine manipulation, exercise, and patient education. Phys Ther 87(1):9-23.

To date, no studies have investigated the predictive validity of variables from the initial examination to identify patients with neck pain who are likely to benefit from thoracic spine thrust manipulation. The purpose of this study was to develop a clinical prediction rule (CPR) to identify patients with neck pain who are likely to experience early success from thoracic spine thrust manipulation. Data for 78 subjects were included in the data analysis, of which 42 had a successful outcome. A CPR with 6 variables was identified. If 3 of the 6 variables (positive likelihood ratio=5.5) were present, the chance of experiencing a successful outcome improved from 54% to 86%. The CPR provides the ability to a priori identify patients with neck pain who are likely to experience early success with thoracic spine thrust manipulation. However, future studies are necessary to validate the rule.

Cleland JA, Childs JD, McRae M, Palmer JA, Stowell T (2005). Immediate effects of thoracic manipulation in patients with neck pain: a randomized clinical trial. Man Ther 10(2): 127-35.

Mechanical neck pain is a common occurrence in the general population resulting in a considerable economic burden. Often physical therapists will incorporate manual therapies directed at the cervical spine including joint mobilization and manipulation into the management of patients with cervical pain. Although the effectiveness of mobilization and manipulation of the cervical spine has been well documented, the small inherent risks associated with these techniques has led clinicians to frequently utilize manipulation directed at the thoracic spine in this patient population. It is hypothesized that thoracic spine manipulation may elicit similar therapeutic benefits as cervical spine manipulation while minimizing the magnitude of risk associated with the cervical technique. The purpose of this randomized clinical trial was to investigate the immediate effects of thoracic spine manipulation on perceived pain levels in patients presenting with neck pain. The results suggest that thoracic spine manipulation results in immediate analgesic effects in patients with mechanical neck pain. Further studies are needed to determine the effects of thoracic spine manipulation in patients with neck pain on long-term outcomes including function and disability.

Cleland JA, Glynn P, Whitman JM, Eberhart SL, MacDonald C, Childs JD (2007). Short-term effects of thrust versus nonthrust mobilization/manipulation directed at the thoracic spine in patients with neck pain: a randomized clinical trial. Phys Ther 87(4):431-40.

Evidence supports the use of manual physical therapy interventions directed at the thoracic spine in patients with neck pain. The purpose of this study was to compare the effectiveness of thoracic spine thrust mobilization/manipulation with that of nonthrust mobilization/ manipulation in patients with a primary complaint of mechanical neck pain. The authors also sought to compare the frequencies, durations, and types of side effects between the groups. The results suggest that thoracic spine thrust mobilization/manipulation results in

significantly greater short-term reductions in pain and disability than does thoracic nonthrust mobilization/manipulation in people with neck pain.

Fernández-de-las-Peñas C, Palomeque-del-Cerro L, Rodríguez-Blanco C, Gómez-Conesa A, Miangolarra-Page JC (2007). Changes in neck pain and active range of motion after a single thoracic spine manipulation in subjects presenting with mechanical neck pain: a case series. J Manipulative Physiol Ther 30(4):312-20.

The aim was to report changes in neck pain at rest, active cervical range of motion, and neck pain at end-range of cervical motion after a single thoracic spine manipulation in a case series of patients with mechanical neck pain. METHODS: Seven patients with mechanical neck pain (2 men, 5 women), 20 to 33 years old, were included. All patients received a single thoracic manipulation by an experienced manipulative therapist. The outcome measures of these cases series were neck pain at rest, as measured by a numerical pain rating scale; active cervical range of motion; and neck pain at the end of each neck motion (eg, flexion or extension). These outcomes were assessed pre-treatment, 5 minutes post manipulation, and 48 hours after the intervention. A repeated-measures analysis was made with parametric tests. Within-group effect sizes were calculated using Cohen d coefficients. RESULTS: A significant ($P < .001$) decrease, with large within-group effect sizes ($d > 1$), in neck pain at rest were found after the thoracic spinal manipulation. A trend toward an increase in all cervical motions (flexion, extension, right or left lateral flexion, and right or left rotation) and a trend toward a decrease in neck pain at the end of each cervical motion were also found, although differences did not reach the significance ($P > .05$). Nevertheless, medium to large within-group effect sizes ($0.5 < d < 1$) were found between pre-intervention data and both post-intervention assessments in both active range of motion and neck pain at the end of each neck motion. CONCLUSIONS: The present results demonstrated a clinically significant reduction in pain at rest in subjects with mechanical neck pain immediately and 48 hours following a thoracic manipulation. Although increases in all tested ranges of motion were obtained, none of them reached statistical significance at either post-treatment point. The same was found for pain at the end of range of motion for all tested ranges, with the exception of pain at the end of forward flexion at 48 hours. More than one mechanism likely explains the effects of thoracic spinal manipulation. Future controlled studies comparing spinal manipulation v. spinal mobilization of the thoracic spine are required.

Gross AR, Kay TM, Kennedy C, Gasner D, Hurley L, Yardley K, Hendry L, McLaughlin L (2002). Clinical practice guideline on the use of manipulation or mobilization in the treatment of adults with mechanical neck disorders. Man Ther 7(4):193-205.

An evidence-based clinical practice guideline was developed to ascertain the risks and benefits for manipulation or mobilization in treating mechanical neck disorders with or without radicular findings or cerviogenic headache. Pain, function, patient satisfaction and adverse events were appraised. Manipulation and mobilization alone showed similar effects as placebo, wait period, or control group, and appeared similar in benefit for pain relief. While high-technology exercises were superior to manipulation alone for improving long-term pain scores, manipulation plus low-technology exercise had the same effect. Patient satisfaction scores favoured manipulation plus low-technology exercise over manipulation alone, and high-technology exercise alone. Multi-modal care including some combination of manipulation or mobilizations and exercise was superior to control, other physical medicine methods, and rest. Based on weak evidence, estimates for serious complication for manipulation ranged from one in 20,000 to five in 10,000,000. Stronger evidence suggests a multi-modal management strategy using mobilization or manipulation plus exercise is beneficial for relief of mechanical neck pain. Weaker evidence suggest less benefit to either manipulation/mobilization done alone than when used with exercise. The risk rate is uncertain.

Hurwitz EL, Morgenstern H, Vassilaki M, Chiang LM (2005). Frequency and clinical predictors of adverse reactions to chiropractic care in the UCLA neck pain study. Spine 1;30(13):1477-84.

Randomized clinical trial designed to document the types and frequencies of adverse reactions associated with the most common chiropractic treatments for neck pain, and to identify possible clinical predictors of adverse reactions to chiropractic treatment. Our results suggest that adverse reactions to chiropractic care for neck pain are common and that despite somewhat imprecise estimation, adverse reactions appear more likely to follow cervical spine manipulation than mobilization. Given the possible higher risk of adverse reactions and lack of demonstrated effectiveness of manipulation over mobilization, chiropractors should consider a conservative approach for applying manipulation to their patients, especially those with severe neck pain.

Kay TM, Gross A, Goldsmith C, Santaguida PL, Hoving J, Bronfort G; Cervical Overview Group (2005). Exercises for mechanical neck disorders. Cochrane Database Syst Rev. 20(3):CD004250.

Neck disorders are common, limit function, and are costly to individuals and society. Exercise therapy is a commonly used treatment for neck pain. The effectiveness of exercise therapy remains unclear. The purpose of this study was to assess the effectiveness of exercise therapy to relieve pain, or improve function, disability, patient satisfaction, and global perceived effect in adults with mechanical neck disorders (MND). The evidence summarized in this systematic review indicates that specific exercises may be effective for the treatment of acute and chronic MND, with or without headache. To be of benefit, a stretching and strengthening exercise program should concentrate on the musculature of the cervical, shoulder-thoracic area, or both. A multimodal care approach of exercise, combined with mobilization or manipulation for subacute and chronic MND with or without headache, reduced pain, improved function, and global perceived effect in the short and long term. The relative benefit of other treatments (such as physical modalities) compared with exercise or between different exercise programs needs to be explored. The quality of future trials should improve through more effective 'blinding' procedures and better control of compliance and co-intervention. Phase II trials would help identify the most effective treatment characteristics and dosages.

Kessler TJ, Brunner F, Künzer S, Crippa M, Kissling R (2005). Effects of Maitland's manual mobilization on the thoracic spine. Rehabilitation 44(6):361-6.

The goal of manual therapy is to decrease pain and to increase function of the spine and peripheral joints. The method introduced by Maitland is widely used in manual medicine. However, no objective changes in the mobility of the thoracic spine after performing manual mobilization have been published in the literature. The aim of this study is to reveal possible changes in the segmental mobility of the thoracic spine after posterior-anterior manipulations without thrust in comparison with a control group. In addition, significant changes within the treatment group were examined. Thirty-six volunteers were randomized into an intervention (16) and a control group (20). The intervention group was treated two times a week for three weeks. The control group received no treatment. The mobility was objectively measured by using Medimouse. No significant difference in the mobility of the thoracic spine could be shown within the intervention group and in comparison with the control group.

King W, Lau P, Lees R, Bogduk N (2007). The validity of manual examination in assessing patients with neck pain. Spine J 7(1):22-6.

Although manual therapists believe that they can diagnose symptomatic joints in the neck by manual examination, that conviction is based on only one study. That study claimed that manual examination of the neck had 100% sensitivity and 100% specificity for diagnosing painful zygapophyseal joints. However, the study indicated that its results should be reproduced before they could be generalized. The present study was undertaken to answer

the call for replication studies. The objective was to determine the sensitivity, specificity, and likelihood ratio of manual examination for the diagnosis of cervical zygapophyseal joint pain. Manual examination had a high sensitivity for cervical zygapophyseal joint pain, at the segmental levels commonly symptomatic, but its specificity was poor. Likelihood ratios barely greater than 1.0 indicated that manual examination lacked validity. Although the results obtained were less favorable than those of the previous study, paradoxically they were statistically not different. The present study found manual examination of the cervical spine to lack validity for the diagnosis of cervical zygapophyseal joint pain. It refutes the conclusion of the one previous study. The paradoxical lack of statistical difference between the two studies is accounted for by the small sample size of the previous study.

Martínez-Segura R, Fernández-de-las-Peñas C, Ruiz-Sáez M, López-Jiménez C, Rodríguez Blanco C (2006). Immediate effects on neck pain and active range of motion after a single cervical high-velocity low-amplitude manipulation in subjects presenting with mechanical neck pain: a randomized controlled trial. J Manipulative Physiol Ther 29(7):511-7.

The objective of this study is to analyze the immediate effects on neck pain and active cervical range of motion after a single cervical high-velocity low-amplitude (HVLA) manipulation or a control mobilization procedure in mechanical neck pain subjects. In addition, we assessed the possible correlation between neck pain and neck mobility. Our results suggest that a single cervical HVLA manipulation was more effective in reducing neck pain at rest and in increasing active cervical range of motion than a control mobilization procedure in subjects suffering from mechanical neck pain.

Palmgren PJ, Sandström PJ, Lundqvist FJ, Heikkilä H (2006). Improvement after chiropractic care in cervicocephalic kinesthetic sensibility and subjective pain intensity in patients with nontraumatic chronic neck pain. J Manipulative Physiol Ther 29(2):100-6.

The objective of this study was to examine alteration in head repositioning accuracy (HRA), range of motion, and pain intensity in patients with chronic cervical pain syndrome without a history of cervical trauma. There was no difference between the treatment patients and the control subjects at the beginning with regard to age, sex, subjective pain intensity, range of motion, and HRA. At the 5-week follow-up, the treatment patients showed significant reductions in pain and improvement of all HRA aspects measured whereas the control subjects did not show any reduction in pain and improvement in only one HRA aspect. No significant difference was detected in CROM. The results of this study suggest that chiropractic care can be effective in influencing the complex process of proprioceptive sensibility and pain of cervical origin. Short, specific chiropractic treatment programs with proper patient information may alter the course of chronic cervical pain.

Pho C, Godges J. Management of whiplash-associated disorder addressing thoracic and cervical spine impairments: a case report (2004). J Orthop Sports Phys Ther 34(9):511-9; discussion 520-3.

Clinical case report to describe a physical therapy program addressing impairments of the upper thoracic and cervical spine region for an individual with a whiplash-associated disorder. A 32-year-old female with complaint of diffuse posterior cervical and upper thoracic region pain was evaluated 2 weeks following a motor vehicle accident. The patient reported that she was unable to sit for longer than 10 minutes or perform household duties for longer than 1 hour. In addition, she was unable to perform her tasks as a postal worker or participate in her customary running and aerobic exercise activities because of pain in the cervical and upper thoracic region. Interventions addressing the impairments of the upper thoracic and cervical spine region were associated with reducing pain, increasing cervical range of motion, and facilitating return to work and physical activities in a patient with a whiplash-associated disorder. There is a need for continued research investigating the efficacy of providing interventions to the thoracic spine for patients with whiplash-related injuries.

Ruiz-Sáez M, Fernández-de-las-Peñas C, Blanco CR, Martínez-Segura R, García-León R (2007). Changes in pressure pain sensitivity in latent myofascial trigger points in the upper trapezius muscle after a cervical spine manipulation in pain-free subjects. J Manipulative Physiol Ther 30(8):578-83.

This study analyzed the immediate effects on pressure pain threshold (PPT) in latent myofascial trigger points (MTrPs) in the upper trapezius muscle of a single cervical spine manipulation directed at the C3 through C4 level. Our results suggest that a cervical spine manipulation directed at the C3 through C4 segment induced changes in pressure pain sensitivity in latent MTrPs in the upper trapezius muscle. Different therapeutic mechanisms, either segmental or central, may be involved at the same time.

Tseng YL, Wang WT, Chen WY, Hou TJ, Chen TC, Lieu FK (2006). Predictors for the immediate responders to cervical manipulation in patients with neck pain. Man Ther 11(4):306-15.

Cervical manipulation has been considered an effective treatment for managing neck pain. However, clinical observation showed that cervical manipulation was not effective for every patient. Development of clinical prediction rules for identifying patients with neck pain who are likely to respond to cervical manipulation may improve clinical decision-making and the treatment success rate. The purpose of the study was to identify predictors for the immediate responders to cervical manipulation treatment in patients with neck pain. Six predictors including "initial scores on Neck Disability Index < 11.50", "having bilateral involvement pattern", "not performing sedentary work > 5 h/day", "feeling better while moving the neck", "without feeling worse while extending the neck", and "the diagnosis of spondylosis without radiculopathy" were identified to significantly predict the immediate responders. The presence of four or more of these predictors increased the probability of success with manipulation to 89%. We concluded that using favourable predictors to identify treatment responders before administering cervical manipulations could significantly increase the probabilities of a successful treatment. This study finding may enhance the efficacy of clinical decision-making in using cervical manipulation intervention.

Wiater JM, Flatow EL (1999). Long thoracic nerve injury. Clin Orthop Relat Res (368):17-27.

Injury to the long thoracic nerve causing paralysis or weakness of the serratus anterior muscle can be disabling. Patients with serratus palsy may present with pain, weakness, limitation of shoulder elevation, and scapular winging with medial translation of the scapula, rotation of the inferior angle toward the midline, and prominence of the vertebral border. Long thoracic nerve dysfunction may result from trauma or may occur without injury. Fortunately, most patients experience a return of serratus anterior function with conservative treatment, but recovery may take as many as 2 years. Bracing often is tolerated poorly. Patients with severe symptoms in whom 12 months of conservative treatment has failed may benefit from surgical reconstruction. Although many surgical procedures have been described, the current preferred treatment is transfer of the sternal head of the pectoralis major tendon to the inferior angle of the scapula reinforced with fascia or tendon autograft. Many series have shown good to excellent results, with consistent improvement in function, elimination of winging, and reduction of pain.