

**French H, Jong CC, Mccallan M. Do features of central sensitisation exist in Greater Trochanteric Pain Syndrome (GTPS)? A case control study. *Musculoskelet Sci Pract.* 2019;43:6-11.**

**Review Submitted by:** Anna Wilson

**Background/Objective:** Central nervous sensitization has been implicated in upper limb tendinopathy, but no studies have investigated if it plays a role in Greater Trochanteric Pain Syndrome (GTPS). The aim of this study was to investigate if features of central sensitization were present in people with GTPS through the use of quantitative sensory testing (QST).

**Methods:** Eighteen people with GTPS (recruited through musculoskeletal & rheumatology triage clinics and physiotherapy waiting lists of a large teaching hospital in Ireland) were matched with 18 healthy controls (staff & acquaintances of the hospital) in this cross-sectional study. The VISA-G (self-report questionnaire to determine disability associated with GTPS) and Central Sensitization Inventory (CSI) self-report questionnaires were completed and pressure pain detection thresholds (PPDTs) at local and remote sites were measured in all participants. Data were analyzed for between-group differences using Mann-Whitney U tests. Correlation between CSI and PPDTs were assessed using Pearson correlation coefficients.

**Results:** PPDT values were lower at local (symptomatic greater trochanter) and remote sites (tibialis anterior & lateral elbow) in the GTPS group, indicative of central sensitization, resulting in statistically significant between-group differences. 44.4% of the GTPS group were classified as having symptoms of central sensitization, based on the CSI (score < 40/100). Although not significant, the 'high CSI' group appeared to have lower PPDT compared to the 'low CSI' group. There was moderate to low correlation between PPDT values and CSI score.

**Conclusion:** This study provides preliminary evidence of central sensitization in people with GTPS. Results need to be validated using other objective quantitative sensory testing measures in larger samples.

**Commentary:** Overall the internal validity of the study was good and the statistical analysis was appropriate based on the type of data that they had. The biggest flaws of the study, in my opinion, are the very small sample size and that the assessors were not blinded to the groups. While blinding when performing a pain pressure threshold test might not be as important due to the objectivity of the measurement, I still feel like this would have been something feasible to do that would further improve the internal validity. Their inclusion criteria for GTPS was evidence based and in line with what might be used in the clinic- pain when lying on involved side, pain with weight bearing activities, pain with sitting, (+) external de-rotation test. In addition, their exclusion criteria were fairly comprehensive to ensure that those with multiple pathologies or other potential hip pain generators were not included.

The results demonstrate that there may be increased tissue sensitivity at local and remote sites and potentially up to about 40% of those with GTPS have some degree of central sensitization. While, clinically, the classification of central sensitization would be based off of more factors than just the patients CSI score and PPT (i.e. psychosocial factors, pain distribution, irritability & severity, etc.), the results of this study still identify that in patients with gluteal tendinopathy there may be more going on than just local tissue changes. The more patients I evaluate and treat the more I realize that it is rarely just one specific thing in isolation that is going on, which is what attracted me to diving deeper into this study. I think that the results of this study are in line with that clinical observation and warrant screening for these things in this patient population to ensure that the best treatment is provided.

**MEADOWS J, DENNINGER T, PETERSON S, MILLIGAN L, ZAPANTA J. Short-term Response to Treatment Targeting the Thoracolumbar Junction in Patients With Hip Pain: A Case Series. Journal of Orthopaedic & Sports Physical Therapy. 2019;49(8):611-619.**

**Review Submitted By:** Barrett Coleman

**Objective:** To describe the management of 3 patients with primary hip and groin pain who were treated with interventions targeting the Thoracolumbar Junction (TLJ).

**Methods:** Three cases were selected nonconsecutively where a clinician recollected a positive outcome when treatment to the TLJ was included to treat hip pain. A brief overview of the three cases' subjective asterisks:

	<b>Pt Profile:</b>	<b>Chief complaint:</b>	<b>Duration:</b>	<b>MOI:</b>	<b>Aggs:</b>
<b>Case 1</b>	69 yo Male	Variable deep ache in left hip	Three months	Insidious	Donning shoes and walking
<b>Case 2</b>	65 yo Male	Sharp, intense and deep pain in left lateral hip and groin	Two years	Insidious, but was worsened by bad golf swing 1.5 years ago.	Swinging a golf club, sitting for 45 minutes, lifting
<b>Case 3</b>	76 yo Female	Left upper lateral buttock pain that is	Nine months	Symptoms began after taking a group ex	Walking, lying on affected side, and sitting

		burning, aching and nagging.		class.	for prolonged hours
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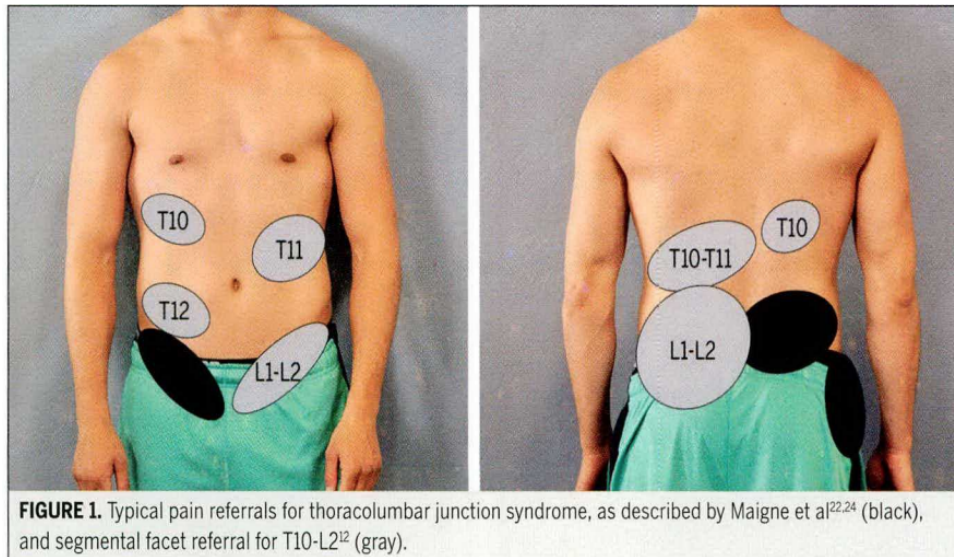
Patient’s thoracic, lumbar, and hip were screened for impairments. While treatment was at the discretion of the therapist, these three cases did not receive interventions focused at the hip but rather at the Thoracolumbar Junction. Thoracolumbar manual therapy treatment consisted of HVLAT while in rotation, sidelying rotation, and overpressure to thoracolumbar joint while in rotation. This was followed up with exercises including active seated trunk rotations, open books, and cat-cow stretches.

**Results:** The 3 patients in this case series responded favorably to interventions that address thoracolumbar junction dysfunction. This was demonstrated by subjective reports, decrease in pain to 0/10 at discharge, and improvement in functional outcome scores.

<b>TABLE 2</b>		<b>PATIENT-REPORTED OUTCOME MEASURES FOR THE 3 PATIENTS IN THIS CASE SERIES</b>		
<b>Outcome Measure</b>	<b>Case 1</b>	<b>Case 2</b>	<b>Case 3</b>	
Baseline pain*	6/10	7/10	5/10	
Discharge pain*	0/10	0/10	0/10	
Baseline disability	36/80 <sup>†</sup>	58/80 <sup>†</sup>	5.3/10 <sup>†</sup>	
Discharge disability	58/80 <sup>†</sup>	74/80 <sup>†</sup>	NA <sup>‡</sup>	
Global rating of change score	+7 <sup>†</sup>	+7 <sup>†</sup>	+6 <sup>†</sup>	
Total treatments, n	6	8	4	
Total weeks, n	4	4	3	

**Conclusion:** Treatment directed at the TLJ for patients with hip and groin pain may be an important consideration for clinicians. This may help guide physical therapists’ management of patients with hip and groin pain and the role of physical therapists in treating TLJ syndrome.

**Commentary:** Due to the nature of the study being a case series, we cannot generalize the results to the greater population. However, it is important to note the importance of casting a wide net when working in an area such as the lumbar spine and hip that has potential for many referred pain patterns. Thoracolumbar junction syndrome (sometimes referred to as Maigne’s syndrome) has the potential to refer to areas physical therapists commonly treat:



As part of ruling in and out differentials, it is important that we screen the lower thoracic and upper lumbar as part of our examination when evaluating these areas. For patients that have not responded to conventional treatment of lumbar and hip, it is possible that we have missed contributing impairments including dysfunction at the thoracolumbar junction.

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**Sean P. Riley, Brian T. Swanson & Elizabeth Dyer (2019) Are movement- based classification systems more effective than therapeutic exercise or guideline based care in improving outcomes for patients with chronic low back pain? A systematic review, *Journal of Manual & Manipulative Therapy*, 27:1, 5-14, DOI:**

**10.1080/10669817.2018.1532693**

**Review Submitted by:** Taylor Blattenberger PT, DPT

**Objective:** To determine if movement-based classification systems (MBC) resulted in better outcomes than guideline based care for patients with chronic low back pain.

**Methods:** The researchers searched five databases for randomized controlled trials comparing MBC systems with guideline based care. The search strategy was developed by a librarian and peer reviewed by a second librarian. Each RCT was required to score a PEDro score >6 and was assessed for bias using the Cochrane Collaboration's risk bias tool. Two blinded individual reviewers completed the risk assessment. Outcomes of interest included the numeric pain rating scale, the Oswestry Disability Index (ODI), and the Roland-Morris Low Back Pain and Disability Questionnaire (RM). Seven studies were included in this review.

**Results:** Of the seven studies, five were found to have low risk of bias, one was at a moderate risk of bias, and one study was high risk. The studies varied in methodology, outcome measures, and follow-up periods. Statistically significant findings were only

identified in short-term follow-ups of two studies. Fritz et al. found statistically significant differences in the ODI and Short Form-36 at 4 week follow up, but no difference in the long-term follow-ups. This study was found to have a high risk of bias. Saner et al. found a significant difference in RM between groups at 9-12 week follow up, but again, no differences at long term follow up.

**Conclusion:** The best available high to moderate quality evidence does not support the use of movement based classification systems over general exercise or guideline based care for patients with chronic low back pain.

**Commentary:** The authors of this review found that the best evidence available does not support the use of MBC systems for patients with chronic low back pain. No significant long-term differences were found when compared to guideline based care. The lack of evidence should serve as a caution when employing these systems when treating this patient population.

The recommendation to utilize MBC systems for patients with chronic low back pain has been based on low-level studies. The authors were only able to include seven studies that met their standards, which points to a gap in the literature on this topic. Even the studies that met the inclusion criteria were heterogeneous, utilizing a wide range of MBC systems and compare interventions. From a research perspective, this review should serve as a call for more high quality studies to assess the effectiveness of MBC systems. From a clinical perspective, this review should provide information showing that while MBC systems may be effective, they do not need to be prioritized over other exercise interventions for chronic lower back pain.

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**van de Graaf VA, Bloembergen CH, Willigenburg NW, et al. Can even experienced orthopaedic surgeons predict who will benefit from surgery when patients present with degenerative meniscal tears? A survey of 194 orthopaedic surgeons who made 3880 predictions. *British Journal of Sports Medicine* Published Online First: 01 August 2019. doi: 10.1136/bjsports-2019-100567**

**Review Submitted by:** Helen Shepard

**Objective:** To determine the ability of orthopaedic surgeons to predict successful outcomes in patients with meniscal tears who underwent arthroscopic partial meniscectomy (APM) compared to exercise treatment.

**Methods:** A survey of 20 patient cases was sent to orthopedic surgeons who predicted whether APM or exercise treatment would yield better outcomes for each patient and then estimated the expected change in knee function for both treatments. The cases were selected from a randomized clinical trial comparing the effect of surgical vs. exercise intervention in middle-aged patients with non-obstructive, symptomatic meniscus tears. Patients were classified as responders or non-responders based on IKDC scores at 24 months follow up with the top 5 best and worst outcomes per treatment group being

selected for the survey cases. Surgeons were also surveyed on what patient characteristics affected their decision and personal years of experience.

**Results:** The surgeons predicted the correct outcome in 50% of cases, and there was no significant difference between experienced knee surgeons and other surgeons. Surgeons were better at predicting outcomes for responders compared to non-responders. Approximately half of surgeons reported evidence-based medicine to be more important than personal experience, and 77% considered themselves to be up to date with the current literature on treatment of meniscus pathology. Though they were only correct half the time, surgeons reported they felt confident in their predictions 76% of the time. Patient characteristics that led surgeons to believe APM would be a more successful outcome were bucket handle tears, knee locking, failed non-operative treatment, traumatic etiology, and age <45 years. Characteristics that led them to choose exercise therapy were osteoarthritis, degenerative etiology, no obstructive complaints, age >45 years, and obesity.

**Conclusions:** Based on survey results, surgeons are unable to predict which patients would have more successful outcomes from APM surgery compared to exercise treatment. The percentage of correct predictions was no greater than due to chance alone, and expertise in the field of knee surgery did not affect this. Surgeons overestimated treatment response in the group of non-responders, with two thirds of the non-responders expected to respond well, indicating that surgeons tend to be over optimistic about treatment outcome. While most surgeons believe APM is not a good first treatment option, they still chose APM as the preferred treatment in 22% of cases.

**Commentary:** This study supports conservative treatment for meniscal tears first as compared to surgical intervention. Surgeons are unable to predict which patients will respond best to surgery, possibly due to the patient characteristics they used to make their decision which are not supported in the current literature, despite most surgeons reporting being up to date on the literature. The characteristics used did not include psychosocial factors, such as mental health, despite literature supporting this as a likely influence on outcomes. This also leads to the question of change in ability to predict outcomes if surgeons were to incorporate pain science knowledge into their decision. With a growing amount of literature pointing towards the importance of pain education, it would be interesting to see if this positively helps predict treatment outcomes. Additionally, it is interesting to note that the number of APM surgeries has not decreased despite surgeons recommending it as a treatment option less they previously did. The shift towards support of conservative options first is not mirrored by a decrease in the number of surgeries performed. The article also calls into question the ability of surgeons to predict positive outcomes from surgery vs. conservative treatment in other areas - if they are unable to predict outcomes for the meniscus, does this hold true for rotator cuffs and lumbar fusions as well? This article is important as we educate patients on the importance of trying conservative treatment first in the management of meniscal tears and other pathologies.

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**Sakata J, Nakamura E, Suzuki T, et al. Throwing Injuries in Youth Baseball Players: Can a Prevention Program Help? A Randomized Controlled Trial. *The American Journal of Sports Medicine*. 2019;47(11):2709-2716. doi:10.1177/0363546519861378.**

**Review Submitted by:** Brandon Reynolds

**Background:** Throwing injuries of the shoulder and elbow are common among youth baseball players.

**Hypothesis:** A prevention program will reduce the incidence of throwing injuries of the shoulder and elbow by 50% among youth baseball players.

**Study Design:** Randomized controlled trial; Level of evidence, 1.

**Methods:** The authors block randomized 16 youth baseball teams consisting of 237 players aged 9 to 11 years into an intervention group (8 teams, 117 players) and a control group (8 teams, 120 players). The intervention program consisted of 5 stretching, 2 dynamic mobility, and 2 balance training exercises performed during warm-up. Both groups were followed up for 12 months, during which the incidence of shoulder and elbow injuries was recorded. In addition, ball speed during pitching as a performance-related factor and variables of physical function (passive range of motion of the elbow, shoulder and hip, dynamic balance, and thoracic kyphosis angle) were assessed during the pre- and post-intervention periods.

**Results:** The incidence of shoulder and elbow injuries in the intervention group (1.7 per 1000 athlete-exposures) was significantly lower than that in the control group (3.1 per 1000 athlete-exposures) (hazard ratio, 1.940; 95% CI, 1.175-3.205;  $P = .010$ ). The factors related to pitching performance, as assessed by ball speed, tended to increase in the intervention group as compared with the control group ( $P = .010$ ). The program also improved shoulder horizontal adduction deficits on the dominant side, hip internal rotation on the nondominant side, and the thoracic kyphosis angle.

**Conclusion:** A prevention program decreases throwing injuries of the shoulder and elbow and enhances the parameter of pitching performance in youth baseball players.

**Commentary:** In this study, the authors created a modified prevention program for youth baseball players including five stretches, 2 dynamic mobility interventions, and 2 balance exercises to compare the differences in injury, ROM (Shoulder, elbow, and nondominant hip), kyphotic angle, performance (ball speed), and balance to a control group. One of the strengths of this study is that it is a randomized controlled trial with teams allocated by one of the authors who was blinded to their identity. Another strength of the study is the easy and short program provided to the subjects which if accurately reported, maintained a high compliance rate. One large weakness in the study is that the participants and physical therapists who trained them were not blinded to group allocation, which as the authors note could introduce the Hawthorne effect. Another weakness of this study was that the authors had the participants record the number of times they completed the program per

week and number of practices and games in a diary which is very subjective and could lead to false results. This study also only included subjects from the Yokohama City baseball league with majority of those subjects being male. Another note to bring up, which I believe may be a weakness is the program itself and the evidence behind the exercises and dosing. While I understand that a shorter program will improve adherence and compliance, I am interested in how effective the program actually was. The exercises and dosing are listed below:

- Stretching exercises
  - Massage of brachial muscles (grip brachial muscle and extend elbow x 10 times)
  - Stretch of pronator muscles (10 seconds x 1)
  - Posterior shoulder stretch (10 seconds x 1)
  - Anterior shoulder stretch (10 seconds x 1)
  - Posterior hip stretch (10 seconds x 1)
- Dynamic scapular mobility exercises
  - Cat-Camel (10 times)
- Dynamic thoracic mobility exercises
  - Quadruped trunk rotation (10 times)
- lower extremity balance
  - SLS Lateral slide (10 times)
  - Elbow to knee (10 times)

I believe that this study is clinically applicable due to the high incidence of injury in youth baseball players. While this study is based on a prevention program, I believe that we as physical therapists can play more of a role in preventative care as well as use this study as a guide during the rehab process of young baseball players on their return to sport. As the authors state that this is the first randomized control study focusing on a prevention program for young baseball players, I believe that future studies with a more comprehensive program would help strengthen their results and conclusions.

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**Kilgas MA, Lytle LLM, Drum SN, Elmer SJ. Exercise with Blood Flow Restriction to Improve Quadriceps Function Long After ACL Reconstruction. Int J Sports Med. 2019;40(10):650-656**

**Review Submitted by:** Lauren Carroll

**Abstract:** Quadriceps atrophy and weakness can persist for years after anterior cruciate ligament reconstruction (ACLR). We evaluated the effectiveness of a home-based blood flow restriction (BFR) exercise program to increase quadriceps size and strength several years after ACLR. Nine adults with ACLR (5±2 yrs post-surgery, ≤90% symmetry in quadriceps size and strength) and nine uninjured controls volunteered. ACLR participants exercised at home for 25 min, 5×/wk for 4 wks (single-leg knee extension, bodyweight half-squats, walking). Blood flow in only the involved leg was restricted using a thigh cuff inflated to 50% of limb occlusion pressure. Rectus femoris and vastus lateralis thickness and knee extensor strength were measured before and after training. Baseline and post-



training symmetry (involved leg/uninvolved leg) indices were compared to uninjured controls. Rectus femoris and vastus lateralis thickness and knee extensor strength in the involved leg increased by  $11\pm 5\%$ ,  $10\pm 6\%$ , and  $20\pm 14\%$ , respectively (all  $P < 0.01$ ). Compared to baseline, post-training knee extensor strength symmetry increased from  $88\pm 4$  to  $99\pm 5\%$  ( $P < 0.01$ ) and did not differ from uninjured controls ( $99\pm 5\%$ ,  $P = 0.95$ ). Implementation of BFR exercise at home was feasible, safe and effective. Results extend upon early post-operative application of BFR exercise for ACLR recovery and demonstrate that BFR can improve quadriceps function long after ACLR.

**Objective:** Evaluate effectiveness of blood flow restriction based HEP on quadriceps size and strength several years after ACL reconstruction procedure.

**Methods:** RCT that followed 9 patients ~ 5 years post ACLR and 9 non-injured patients in the control group that were prescribed a home-based BFR program. Individuals in the ACLR group were included based on the following criteria: unilateral ACLR > 2 years previously, completion of post-op rehab, cleared to return to activity by MD, exhibited >10% difference between involved/noninvolved leg. Participants were excluded if there were signs and symptoms of ligamentous laxity in the knee, meniscal pathology, and patellar dysfunction after ACLR. Individuals in the control group were included if there was no prior history of lower extremity joint surgeries.

**Results:** Vastus lateralis and rectus femoris thickness increased in involved leg more than the uninvolved leg in the ACLR group. In the control group, the vastus lateralis thickness in the non-dominant leg increased compared to the dominant leg, but the thickness of the rectus femoris did not change significantly. Knee extensor strength post-training was more symmetrical than at baseline in the ACLR group.

**Conclusions:** The patients in the ACLR group were able to achieve more symmetrical strength and mass in their involved leg after completing a BFR HEP for 4 weeks several years after their reconstruction procedure.

**Commentary:** I think this article did a great job of outlining the patient population and the exercises and equipment used for the BFR HEP to make it reproducible. I also liked that they stuck to very functional exercises for the program (single leg knee extension, body weight  $\frac{1}{2}$  squats, and walking) and made sure the participants were checking in with a provider at least once a week to make sure they were using the cuff correctly (and safely) and performing the exercises with good form. The BFR group was also educated on using the cuff, inflation parameters, and the proper location of the cuff for the exercises, which I think helped reduce the margin of error in the results from inconsistency regarding the actual BFR cuff.

As good as the results may have appeared, I think this article still fell short in a couple of areas. The number of subjects for this RCT is quite small and the results may not translate to a larger group. I also thought the included population was very narrow since the trial excluded participants that had meniscal pathology, other ligamentous knee laxity, and the others listed from above. I think a lot of the patients that we see post ACLR have these other involvements, so it makes it less applicable for us as clinicians. The biggest take

home I have from this article is that a BRF HEP for someone several years out from ACLR can help develop more side-to-side symmetry, especially if they feel like they aren't able to get into the prescribed 70-80% 1RM for muscle hypertrophy secondary to contraindications from the ACLR.

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**Premlata, Priyanka Rishi, & Gurpreet Singh. (2019). EFFECT OF POSITIONAL RELEASE TECHNIQUE VERSUS ISCHEMIC COMPRESSION ON PRESSURE PAIN THRESHOLD, RANGE OF MOTION, AND HEADACHE DISABILITY IN CERVICOGENIC HEADACHE PATIENTS AMONG COLLEGE GOING, STUDENTS. A RANDOMIZED CONTROLLED TRIAL. *International Journal of Physiotherapy*, 6(4), 140-148. <https://doi.org/10.15621/ijphy/2019/v6i4/185417>**

**Review Submitted by:** Steven J. Lagasse

**Objective:** To determine if positional release technique (PRT) is a beneficial and/or superior intervention for the management of cervicogenic headache when compared to ischemic compression, and conventional therapy (ultrasound coupled with hot pack).

**Methods:** 60 college-going subjects between the ages of 18 and 30 were categorized into 3 groups via block randomized sampling: PRT + conventional therapy, ischemic compression + conventional therapy, and conventional therapy. The objective measures were pressure pain threshold (PPT), range of motion (ROM) via goniometry, and headache disability measured via the neck disability index (NDI). These measures were taken at baseline, the day final day of week 2, and the final day of week 4. Each group received a 45-minute treatment session 3x/week for 4 weeks.

**Results:** Independent T-tests were used to assess the statistically significant difference between groups regarding the following measures: PPT of the Upper trapezius, Sternocleidomastoid, and Rectus capitis posterior minor (bilaterally), bilateral ROM (flexion, extension, lateral flexion, and rotation), and headache disability via the NDI.

At baseline, there were no differences between the three groups. When PRT was compared to the conventional therapy group at 4 weeks, PRT demonstrated a statistically significant difference in nearly all measures. Additionally, PRT demonstrated statistically significant difference when compared to the ischemic compression group. There were no significant measures that favored ischemic compression over PRT.

**Conclusions:** Based on this study, PRT was superior to ischemic compression, and conventional therapy. The PRT grouped received decrease NDI scores, decreased TTP, and demonstrated with increased ROM.

**Commentary:** Strengths of this article were the utilization of block randomization into groups. The article, however, does not mention any attempt to utilize blinding. The authors also fail to state if the sample size is sufficient for appropriate statistical power. An additional weakness may be that the authors state these findings can be generalized to

other age groups, including the geriatric population. However, there was selection bias with part of the exclusion criteria being spondylosis; 5 participants were excluded for this reason. A take away from this article could be that if a therapist uses ischemic compression for the treatment of cervicogenic headache, attempting PRT may be beneficial and possibly more effective.