

Alex

Donaldson M, Petersen S, Cook C, Learman K. A Prescriptively Selected Nonthrust Manipulation Versus a Therapist-Selected Nonthrust Manipulation for Treatment of Individuals With Low Back Pain: A Randomized Clinical Trial. *J Orthop Sports Phys Ther.* 2016;46(4):243-50.

The purpose of this randomized controlled trial was to compare objective and subjective outcomes of prescriptively selected (PS) nonthrust manipulation and therapist-selected (TS) nonthrust manipulation in subjects with low back pain with short and long term follow-up periods. Similar studies have been performed previously, however, none of them included long-term outcomes. Subjects (n=63) with mechanically reproducible low back pain received treatments of either two 60 seconds bouts of grade III central posterior-anterior mobilizations (CPAs) to both L4 and L5 (PS), or a variable amount of unilateral posterior-anterior mobilizations (UPAs) and CPAs to the individuals' comparable spinal segment at grades ranging from I to IV, based on subject response. There was no time limit given for the TS treatment and the study does not specify how much time was spent and what was treated specifically in the TS group. Both groups were seen for 4 visits over a 2-week period. Additionally, both groups received a standardized home exercise program (HEP) consisting of standing hamstring stretches, quadruped cat and camel stretching, prone press-ups and supine Piriformis stretches. During the treatment sessions, these exercises were prescribed 3 times per day at 10 repetitions each. After the treatments, the subjects were urged to continue the HEP until the 1-month follow up, however, the article does not specify whether compliance with the HEP was recorded, or may have factored into the results.

The outcome measures for disability (ODI, NPRS) were collected at baseline, visit 4, 1 month and 6 months, while the PASS and GROC were collected only at visit 4 and the 1 and 6 months follow up. The subjects were all in chronic stages of low back pain and did not seek out treatment separately, but rather responded to the advertisement for this study. The majority of subjects ranged from low to moderate on disability outcome measures, was not irritable and had low fear of movement (measured with TSK).

The results indicate that there is no statistically significant difference between the groups in regards to short or long term outcomes, except in GROC scores. These results are similar to the findings in a study by Petersen et al. (JOSPT 3/16) investigating differences between general range of motion exercises and augmentative exercises in combination with manual intervention in subjects with neck pain. The GROC is used to determine the subjects' perceived improvement after treatment (health status, pain, disability, function, quality of life).

In the discussion section, the authors state that these results could stem from increased clinician-patient interaction in the TS group, due to the therapist seeking constant feedback in regards to the treatment. The authors suggest possible bias and assignment of greater value to treatment as a result.

There are several limitations to this study, including the lack of a control group and low number of visits, as listed by the authors. The lack of a control group raises the question whether the improvements by both groups should be attributed to the manual intervention, introduction to and performance of HEP, or simply decreases of symptoms over time. From a clinical/practical perspective, 4 visits in 2 weeks do not seem adequate and may be under the therapeutic levels. Furthermore, the inclusion/exclusion criteria were very focused on disability and outcome measures, however, did not specify aggravating or easing factors, or behavior of symptoms. Considering that the TS treatments still consisted of UPAs and CPAs, as compared to CPAs only the PS group, it is questionable how much difference there really was between the treatments received by either group. Although the TS group was not limited in regards to time and the comparable segments were treated, the authors do not specify what the treatments were and how much overlap there was between groups. Considering that CPAs and UPAs do not follow

specific mechanical coupling patterns of the facet joints like other techniques (attempt to do), it is often suggested that PAs provide more of a neurophysiological input into an area, rather than treating specific intervertebral joint restrictions. We know that PAs do not isolate a single segment, but rather move adjacent segments above and below, further suggesting that the treatment effects by the two groups may have been more similar than intended, or necessary for the purpose of this study. The lack of information in regards to compliance with HEP, both during treatments and after discharge, is another variable to be considered. It is possible that the majority of improvement made, could mostly be due to introduction of stretching and motor control exercises. As several studies have shown, manual therapy and exercise in combination tend to have the best outcomes, which could explain the steep decrease in ODI and NPRS, as well as plateau and increase respectively, after discharge. However, due to aforementioned lack of information, we are limited to speculation in this regard. Lastly, while decreased symptoms over time are less likely due to the chronicity of symptoms in these patients, it is still a possibility.

Considering the design and results, it seems that the study is more indicative of whether there is a significant difference in outcomes when comparing time and location specific bouts of grade III CPAs (PS) to varying grades of CPAs and/or UPAs to comparable segments and adjusted intensity and location as per patient response to intervention (TS).

Nick

Swanson B, Holst B, Infante J, Poenitzsch J, Ortiz A. **EMG activity of selected rotator cuff musculature during grade III distraction and posterior glide glenohumeral mobilization: results of a pilot trial comparing painful and non-painful shoulders.** *J Man Manip Ther.* 2016; 20(10):1-7

In the opening literature review, the authors cite cadaveric research showing that the posterior rotator cuff resists as much as 35% of the posterior translational force applied during GH posterior glide mobilizations. However, seeing that such research was performed on cadavers, active rotator cuff contraction that might also contribute as a restraint to translational movement unable to be determined. The authors note that no such research has been published examining rotator cuff contraction during glenohumeral mobilizations, and therefore such was the purpose of their study.

10 painful and 10 non-painful shoulders were examined in the study. Inclusion criteria for painful shoulders was very broad in that it simply had to be reproducible (active/passive ROM, MMT, special testing, etc..). Standardized electrode placement was performed over the infraspinatus, supraspinatus, and upper trapezius. Submaximal voluntary dynamic contractions (VDC) were used as the reference for all participants. This involved having the participant hold their arm in a standardized MMT position without weight or resistance. The participants then underwent grade III glenohumeral joint distraction and glenohumeral posterior glide.

Overall, both groups demonstrated what the authors deemed to be “considerable levels of rotator cuff activity,” during the mobilizations. Peak values for the %VDC ranged from 26% to as high as 67%, with painful shoulders consistently demonstrating higher values compared to non-painful shoulders.

The purpose of this article was merely to describe the effects of glenohumeral joint mobilization on rotator cuff activation. However, practical applications can be suggested (but not assumed) on the basis of its results. It is possible that if it is determined that there is limited glenohumeral accessory mobility upon testing, that this may be due not only (or even primarily) to capsular restriction, but to increased posterior cuff tension/activation. Also, if it is determined that only very low levels of cuff activation are appropriate for a given patient, than glenohumeral mobilizations, traditionally considered

a passive intervention, may be inappropriate, especially in the presence of pain. Conversely, if the goal is to facilitate rotator cuff activation, glenohumeral mobilizations may perhaps serve this purpose. It is well to remember that at present these applications are merely theorized based off the results of the present study and would require further validation to be firmly accepted.

Oksana

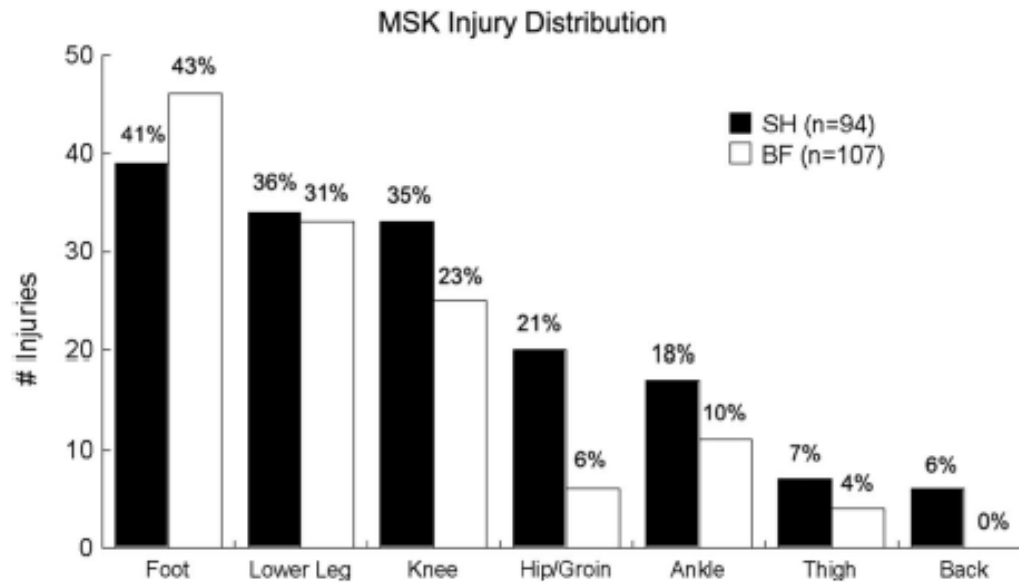
Prospective comparison of running injuries between shod and barefoot runners. Allison R Altman,1 Irene S Davis. Br J Sports Med 2016;50:476–480. doi:10.1136/bjsports-2014-094482

Several runners say that barefoot running minimizes injury rates while others say shoes are needed to adequately cushion the foot. It was found that barefoot runners had overall fewer injuries, however, injuries were not statistically different due to less mileage and a slower pace. Barefoot runners sustained more calf and plantar surface injuries while the shoe runners experienced more hip and knee injuries.

Barefoot runners sustain less hip and knee forces due to an increased forefoot striking pattern and increased cadence, while a majority of runners with shoes are heel strikers. One of the characteristics for heel strikers are increased ground reaction forces leading to musculoskeletal tissue loading and more injuries. However, barefoot running increases load to the calf and medial foot arch, which may increase the risk of plantar fasciitis.

A prospective survey was conducted over a year including 201 runners (107 barefoot and 94 shoes). Injuries and mileage was logged using a web-based database program. Methods: 18-50 year old runners, running >10 miles/ week, has been running > 6 months, barefoot runners had to run at least 50% barefoot and 50% in minimalist shoes. Participants entered their results in a web based database providing their running history, mileage and injury.

Limitations: small population, limited mileage on barefoot runners, the study was conducted with < 6 months experience could have increased injuries due to adaptation to a new running pattern.



SH: shoe runners
 BF: barefoot runners

Based on the running medicine conference, I would say how decreasing cadence when running has a huge impact on running. As well if you increase mileage you will have more wear and tear. I continue to preach cross training and increasing cadence patterns. I think this is an interesting article to share for those patients who ask questions about barefoot running verses shoes.

Sean

**Immediate effects of hip mobilization with movement in patients with hip osteoarthritis: A randomized controlled trial
 Manual Therapy 22 (2016) 80-85**

Hip OA is a common condition seen often in the outpatient setting and there is inconsistent evidence supporting manual therapy in the treatment for hip OA. The aim of this study was to examine physical performance and pain level following mobilization with movement (MWM) in patients with OA of the hip.

Forty participants that met the criteria for OA of the hip were included in this study and were randomized to either the experimental group (manual MWM) or a sham treatment group. The experimental group consisted of two mobilization techniques using a mobilization belt; 1) a lateral glide with hip flexion and 2) a lateral glide with hip IR. Three sets of 10 repetitions each were applied for each technique. The placebo group received a simulated MWM.

Outcomes were assessed immediately before treatment and 5 minutes after treatment and included a pain scale, hip flexion and IR ROM, Timed Up and Go test, the 30s Chair Stand Test and 40 m Self Paced Walk test. The authors found clinically important differences in physical performance with all functional tests performed and a significant decrease in pain level immediately following the intervention for the experimental group. Additionally, there was also a significant improvement in hip flexion ROM.

The results of this study are encouraging for the support of manual therapy as a treatment in this patient population. To have a significant improvement in one treatment session with a single

manual therapy technique is a valuable tool to have for the appropriate patient. I also appreciate the power of the functional testing performed in this study. It is easy to see how a patient could easily conceptualize the benefits of treatment when it is followed by a functional test (Assess/Reassess). The fact that there was a significant improvement with only 3 sets of 10 reps for each technique is also encouraging.

Laura

Recovery From a First-Time Lateral Ankle Sprain and the Predictors of Chronic Ankle Instability: A Prospective Cohort Analysis

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Doherty et al. have recently published a prospective cohort analysis in the American Journal of Sports Medicine on static and dynamic movement patterns and their predictive ability of chronic issues associated with lateral ankle instability. The definition of Chronic Ankle Instability (CAI) has evolved into a spectrum of motor control deficits and identifying risk factors for development can assist rehabilitation professionals identify appropriate candidates and treat them effectively. The authors of this study explore biomechanical descriptors during a number of functional movements and attempt to find a potential relationship between initial signs of kinematic fault patterns and final outcomes (Lateral Ankle Sprain copers or CAI).

Eighty-two participants were recruited after initial lateral ankle sprain from a hospital emergency department within two weeks of injury and followed for a period of 12 months without treatment. Outcome measures were collected at three time points: within 2 weeks of injury (time point 1), 6 months after injury (time point 2), and 12 months after injury (time point 3). The outcome measures included self-reported questionnaires (Chronic Ankle Instability Tool and the Foot and Ankle Ability Measure), dorsiflexion range of motion during static and dynamic closed chain tests, and five movement tasks including: single-limb stance (eyes open and eyes closed), the Star Excursion Balance Test (anterior, posterolateral, and posteromedial reach directions), single leg drop landing, drop vertical jump, and walking gait. Participants were evaluated at time points 1 and 2 and then classified as a LAS copers or CAI at time point 3.

There are several clinically significant points that the authors conclude with this study. First, hip joint stability with dynamic postural control tasks is directly correlated with development of CAI and the Star Excursion Balance Test (SEBT) was able to identify participants with sagittal plane deficits. The strength and activation of the hip musculature plays a crucial role in central motor control during functional tasks and there is increased reliance on hip joint movement strategies after loss at the ankle, both in global biomechanics and foot positioning. There was no clinical significance between ankle dorsiflexion ROM and outcomes, therefore the sagittal ROM deficits found during the SEBT did not associate with lack of dorsiflexion ROM but are more likely associated spinal and/or supraspinal alterations of motor control mechanisms after the initial injury. This includes both the “involved” and “uninvolved” limbs, stressing the importance of a bilateral focus of any rehabilitation program and need for proximal control.

The study unfortunately had a high amount of data “missingness” at time point 1 and did not find any early potential predictors in the study outcomes. The authors relate this time point similar to real-time clinical application, for we are most likely to encounter patients in an acute time point and could have used this information to potentially implement preventive measures to slow or stop the chronic sequelae. The authors performed an exploratory analysis on the relationship between the unwilling/unable participants and outcome of CAI vs. LAS copers. They found a 2-3 times higher odds of

developing CAI with when the participant did not perform the single leg drop landing and drop vertical jump tasks, although these findings were high in sensitivity and low in specificity, increasing the risk for false negatives.

Among other positive findings in this study are the strong clinical applicability of the FAAM and CAIT subjective outcome measures. The authors used the CAIT score to classify patients as either CAI or LAS coper, as well as patient report of return to previous level of play. Outcome measures are increasingly important in health-care for identifying appropriate people for intervention and the authors support the predictive value of these measures for CAI.

There were several limitations to this study including no additional information on the rehabilitation some participants sought, no additional information on injury severity, and limited external validity in participants who seek emergency care from injury (more likely indicating a high severity, although this is unknown). Despite this, physical therapists are more likely to encounter patients with a high severity of injury or of multiple history of injuries and therefore can relate to the limited assessment at time point 1. The strong association of the variables of SEBT is valuable to clinicians who seek predictive risk factors and this study contributes more evidence on the importance of addressing global and proximally-based movement tasks focusing on postural stability and motor control.