

# Manual Therapy Research Review



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## Welcome

Welcome to the 19th issue of the Manual Therapy Research Review. In this issue reviews of four somewhat linked papers are presented. Firstly a paper is presented by McCarthy et al (2019) that challenges the need for specificity in lumbar manipulation, one by Kawchuk et al (2019) that looks at physiotherapists' ability to palpate stiff spinal segments, a paper by Geri et al (2019) exploring the concepts of touch in manual therapy, and finally, a paper by Stathopoulos et al (2019) that provides a systematic review and meta-analysis of Mulligan MWM's on improving joint range of motion.



Thanks to all those physiotherapists that have contributed to the Manual Therapy Research Review in 2019. Enjoy this and a Merry Christmas and a prosperous New Year to you all. Duncan

## Paper One

**McCarthy CJ, Potter L, Oldham JA. Comparing Targeted Thrust Manipulation with General Thrust Manipulation in Patients with Low Back Pain. A General Approach is as Effective as a Specific One. A randomised Controlled Trial. BMJ Open Sport & Exercise Medicine 2019;5:e000514. doi:10.1136/bmjsem-2019-000514**

**Background:** Spinal manipulation is commonly used to treat back pain. The application of spinal manipulation has traditionally involved an element of targeting the technique to a level of the spine where the proposed movement dysfunction is sited. We evaluated the effects of a targeted manipulative thrust versus a thrust applied generally to the lumbar region.

**Methods:** A randomised controlled clinical trial in patients with low back pain following CONSORT (Consolidated Standards of Reporting Trials) guidelines. Sixty subjects were randomly allocated to two groups: one group received a targeted manipulative thrust (n=29) and the other a general manipulation thrust (GT) (n=31) to the lumbar spine. Thrust was either localised to a clinician defined symptomatic spinal level or an equal force was applied through the whole lumbosacral region. We measured pressure-pain thresholds (PPTs) using algometry and muscle activity (magnitude of stretch reflex) via surface electromyography. Numerical ratings of pain and Oswestry Disability Index scores were collected.

**Results:** Repeated measures of analysis of covariance revealed no between-group differences in self-reported pain or PPT for any of the muscles studied.

**Summary:** A GT procedure - applied without any specific targeting- was as effective in reducing participants' pain scores as targeted approaches. Trial registration number ISRCTN11994230.

### Commentary

This is a fascinating paper and challenges some of the teaching methods with respect to the specificity of lumbar spine manipulation. I think we can all think of courses we have been on where the instruction has been very specific to the level and location of the high velocity thrust.

This paper has demonstrated through a robust study design that this level of specificity is not required as the results are the same whether you are specific or not. One must not lose sight of the premise sitting above this that the patient was appropriate for manual therapy. We have seen that the positive outcomes for spinal HVT can be enhanced via the use of clinical prediction rules (Flynn et al, 2002) and that we also do not need a cavitation with the HVT to ensure a positive outcome (Flynn et al, 2006). We have also seen that in other areas such as the cervical spine, we can manipulate the thoracic spine and get a good result in changes in cervical range of motion and pain reduction (González-Iglesias J, et al, 2009). So while this study challenges the specificity, the judicious application of manual therapy is still key.

### References

1. Flynn T, Fritz J, Whitman J, et al. (2002). A clinical prediction rule for classifying patients with low back pain who demonstrate short-term improvement with spinal manipulation. *Spine*,27:2835–43.
2. Flynn, T., Childs, J., and Fritz, J. (2006). The audible pop from high-velocity thrust manipulation and outcome in individuals with low back pain. *Journal of Manipulative and Physiological Therapeutics*, Volume 29, Issue 1, January, Pages 40-45
3. González-Iglesias J, Fernández-de-las-Peñas C, Cleland JA, et al. Thoracic spine manipulation for the management of patients with neck pain: a randomized clinical trial. *Journal of Orthopaedic Sports Physical Therapy*, 2009;39:20–7.

### Paper Two

**Kawchuk, G Miazga, S Pagé, I Swain, M Carvalho, D Funabashi, M Breen, A Wong, A. Clinicians' Ability to Detect a Palpable Difference in Spinal Stiffness Compared With a Mechanical Device. *Journal Manipulative Physical Therapy* 2019;42:89-95**

**Objective:** The purpose of this study was to quantify the threshold at which clinicians can detect a difference in spinal stiffness of the thoracic and lumbar spine via palpation and then determine if this detection threshold would affect a clinician's ability to identify changes in spinal stiffness as measured by an objective instrument.

**Methods:** In this study, the threshold at which a change in spinal stiffness was detected was quantified in 12 experienced clinicians (physical therapists and doctors of chiropractic) by changing the differential stiffness in 2 inflatable targets until the clinician could no longer identify which was stiffer. In the second part of the study, clinicians then were asked to palpate pre-identified pairs of vertebrae in an asymptomatic volunteer and to identify the stiffer of the pair (T7 and L3, T7 and L4, L3 and L4), and the biomechanical stiffness of each vertebral pair was quantified objectively by a validated instrument.

**Results:** The mean stiffness detection threshold for the clinicians was 8%. Objective measurement of the stiffness differential between vertebral pairs was 30% for T7\* and L3, 20% for T7\* and L4, and 10% for L3\* and L4 (\*denotes the stiffer of the pair). Ten of 12 clinicians correctly identified T7 as stiffer when compared with L3 and T7 as stiffer than L4. Alternatively, when the differential vertebral pair stiffness was similar to the stiffness detection threshold (~8%), clinicians were less successful in identifying the stiffer vertebra of the pair; 4 of 12 clinicians correctly identified L3 as being stiffer compared with L4.

**Conclusion:** These results suggest that the physiological limits of human palpation may limit the ability of clinicians to identify small alterations in spine stiffness.

### Commentary

This is a very useful study that in a lot of ways adds further debate about the specificity of manual therapy assessment and potential treatment choices. For many interventions, the assessment findings determine the choice of that intervention. If there is a loss of intervertebral accessory glide, the choice of manual therapy is often mobilisation, if there is an increase in intervertebral accessory glide, then a possible muscle activation programme may be given. Therefore, the ability to detect these movement changes is key to the treatment selection. This study challenges the precision with which we think we can do this. The results of this study indicate that, if the differences in stiffness factors between vertebral pairs are large, then the accuracy is good, but where there are small changes in stiffness factors between vertebral pairs we are not so good!! The next obvious step using the nice methodology of this study, is to have a patient population and do the comparison between the spinal indenter and the therapist's perception of stiffness (and pain too!).

### Paper Three

Tommaso Geri, et al. Exploiting the Role of Human Touch Musculoskeletal Science and Practice. <https://doi.org/10.1016/j.msksp.2019.07.008> in press

**Introduction:** The physiotherapy approach to musculoskeletal pain is currently pointing more towards a hands-off management of patients by education and exercise therapy. However, hands-on techniques still represent a core element of musculoskeletal physiotherapy practice appreciated by patients and widely taught in educational programme and clinical professional development training.

**Purpose:** This professional issue explains why hands-on techniques may be considered a specific form of touch and outlines the importance of having a deep and wider understanding of their action mechanisms. Three aspects of the human touch, namely analgesic, affective and somato-perceptual are considered in light of the current literature.

**Implications:** The view of hands-on techniques as a specific form of human touch implies a change of perspective. Primarily, manual therapy techniques are based on the physical properties of the delivered stimulus (requiring knowledge of anatomy, biomechanics and neurophysiology) as well as on the emotional properties that emerge from the sympathetic contact established with the patient. Secondly, the manual therapists should develop relationship and communicative skills allowing this kind of touch to emerge. Thirdly, accordingly with this new perspective, the study of the multifaceted mechanisms of action of hands-on techniques requires a multidisciplinary team of researchers including specialists apparently far from the clinical field. Finally, the recognition of the therapeutic value of touch as one of the most qualifying professional acts of physiotherapists is needed and guarantees patients of its best evidence-based delivering.

#### Commentary

Continuing this theme of challenging and reflecting on some of our key manual therapy tenants, this paper is a nice expose' of the role of "hands on". The authors draw our attention to other aspects of touch that are inherently part of manual therapy such as the physical stimulus but also the emotional and communicative role of hands on. The paper also positions manual hands-on approaches within a multi professional research field and in keeping with evidence. A great read.

### Paper Four

Stathopoulos, N., Dimitriadis, Z., and Koumantakis, G. (2019). Effectiveness of Mulligan's Mobilisation With Movement Techniques on Range of Motion in Peripheral Joint Pathologies: A Systematic Review With Meta-analysis Between 2008 and 2018. *Journal of Manipulative Physiological Therapy*, 42:439-449.

#### Abstract

**Objectives:** The purpose of this study was to provide an updated systematic review and meta-analysis regarding the effectiveness of mobilization with movement (MWM) techniques on range of motion (ROM).

**Methods:** An electronic search strategy of the Physiotherapy Evidence Database, PubMed, Cochrane Library, Embase, Google Scholar, and CINAHL was performed between August 2008 and January 2018. Two independent reviewers selected the studies. Only randomized controlled trials were included. The methodology was independently assessed by 2 reviewers using the Physiotherapy Evidence Database scale. The Z indicator was considered for the assessment of statistical significance of ROM change, whereas for each meta-analysis referring to a specific joint pathology, the total mean difference (95% confidence interval) was compared against minimum detectable change values from relevant studies conducted in similar populations to assess clinical significance.

**Results:** Included were 18 studies with 753 participants in 10 separate meta-analyses for ROM. All studies were classified as high quality or medium quality. Peripheral joint MWM seems to produce better therapeutic results in comparison to sham, passive, other active, or no therapeutic approach, regarding improvement of joint ROM in specific peripheral joint pathologies, consistently in all movement directions for shoulder adhesive capsulitis (mean improvement 12.30-26.09 degrees,  $P < .02$ ) and hip pain (mean improvement 4.50-14.80 degrees,  $P < .0001$ ).

**Conclusion:** Mobilisation with movement produced a statistically and clinically significant ROM increase consistently in all movement directions for shoulder adhesive capsulitis and hip pain. However, for shoulder impingement, shoulder pain/dysfunction, hamstring tightness, knee osteoarthritis, and chronic ankle instability pathologies, a therapeutic benefit regarding ROM could not be clearly established. Owing to the small number of individual studies included within the separate groups of pathologies examined in our systematic review, methodologically rigorous studies with longer follow-up periods are warranted to better inform the evidence base on the effects of MWM on ROM.

### Commentary

This final paper is a very robust systematic review that builds on a previous systematic review by Hing et al (2009). The addition of the meta-analysis provides further weight to the strength of the findings. In this case it is clear that MWM's work well for conditions where joint stiffness is the key issue (e.g. Adhesive Capsulitis and hip dysfunction) but less well for things like shoulder impingement. This would seem a useful and pragmatic finding. It is also good to see the ever-growing number of studies using the MWM approach. Even though the quality of these studies in the review is still low, hopefully more robust studies will be delivered in the future to strengthen the use of MWM's.

### References

Hing W, Bigelow R, Bremner T. (2009). Mulligan's mobilization with movement: a systematic review. *Journal of Manipulative and Physiological Therapeutics*, 17(2):39-66.

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