Does the Manual Therapy Technique Matter?

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Decision-making related to manual therapy interventions has traditionally been based on biomechanical theoretical constructs. Most approaches generally advocate that the practitioner should accurately identify a segmental dysfunction based on the assessment of intersegmental motion or alignment, towards which a specific manual therapy intervention is then directed to ameliorate the underlying dysfunction. Presumably, these dysfunctions are associated with the patient’s experience of pain and disability, hence a failure to adequately address them are thought to interfere with recovery.

While the evidence for the effectiveness of manual therapy techniques continues to expand, mounting evidence has emerged challenging the usefulness of the biomechanical model. First, the physical examinations procedures commonly used to identify biomechanical dysfunctions presumably amenable to manual therapy interventions have almost universally been shown in multiple studies to be unreliable and lack validity for their use. Even presuming biomechanical dysfunctions can be identified, recent evidence has emerged suggesting that manual therapy practitioners are unable to accurately localize manipulative techniques to a specific segment. The purpose of this brief commentary is to review recent evidence related to the specificity of manual therapy interventions.

Recent in vivo dynamic MRIs studies have investigated spinal kinematics during posteroanterior (PA) mobilization in both the lumbar and cervical spine. Kulig et al demonstrated that when a PA Grade IV force was directed at any
segment in the lumbar spine rotation in the sagittal plane occurs at all lumbar vertebrae, suggesting that the technique is not specific to any one segment. Lee and colleagues\textsuperscript{10} investigated the effects of a Grade III\textsuperscript{13} mobilization directed at the C5 spinous process, the maximum intervertebral rotation occurred in the direction of extension at the C2/C3 segment (approximately 3.8 degrees) while the C7/T1 segment actually rotated into flexion (approximately 2 degrees). This suggests that not only is a PA mobilization directed at C5 not specific but also that the 2-3 segments above and below the target vertebrae experienced the greatest amount of rotation in the sagittal plane.

Recent studies\textsuperscript{11,12} have investigated the accuracy and precision of spinal manipulation techniques as determined by the location of cavitations. Beffa and Mathews\textsuperscript{11} investigated the location of cavitations performed with a technique directed at L5 and another technique directed at the sacroiliac joint. There was no correlation between the technique used and the joint that cavitated. In fact each of the techniques resulted in cavitations throughout the lumbosacral region (Figure 1). Furthermore, Ross et al\textsuperscript{12} investigated the accuracy of manipulation directed at the thoracic and lumbar spine. The results demonstrated that thoracic spine manipulation was accurate 53\% of the time while lumbar spine manipulation was only accurate 46\% of the time. In addition, the majority of the manipulations resulted in multiple cavitations from which the authors concluded that manipulation is not segment specific.

While the aforementioned studies suggest that manual therapy interventions are not specific to an individual segment, the logical question becomes, “does it matter”? A number of studies\textsuperscript{14-16} have investigated the effects of different manual therapy techniques on patient-centered outcomes in patients with neck and low back pain. Chiradejnant et al\textsuperscript{14} investigated the effects of a therapist selected mobilization technique versus a randomly selected technique (central PA, unilateral PA, transverse PA) on outcomes. The results demonstrated that a significant reduction in pain occurred in both groups; however, no difference was
observed between the groups, lending credibility to the idea that perhaps the particular technique utilized may not be overly important.

Haas and colleagues\textsuperscript{15} investigated the effectiveness of manipulating a cervical segment identified as being impaired based on endplay assessment versus a randomly selected segment on pain and stiffness in a group of patients with neck pain. Immediate and evening follow-up demonstrated that both the groups exhibited statistically significant reductions in pain and stiffness, but there were no differences between the groups. Another study demonstrated no difference in outcome among 30 patients with neck pain who were randomly assigned to receive either a cervical rotatory or a cervical lateral break manipulation for 10 treatments.\textsuperscript{16} The collective conclusions from these studies question whether the choice of technique is necessary to optimize the clinical outcome and provide evidence that the effects of manual therapy interventions may not be as precise as previously thought.\textsuperscript{15} Future randomized clinical trials should be performed to investigate the long-term effects of different manipulation techniques on patient-centered outcomes.

Recently a clinical prediction rule was developed\textsuperscript{17} and validated\textsuperscript{18} that used a manipulation technique purported to target the sacroiliac joint as the treatment of choice for identifying patients with low back pain likely to benefit rapidly and dramatically (based on patient reported levels of disability) from spinal manipulation. Interestingly, the presence of sacroiliac provocation tests, motion tests and symmetry tests were not identified as predictor variables for patients who would respond positively to this particular manipulation technique. In fact the results of these two studies suggest that the manipulation technique used (Figure 2) will result in significant reductions in disability, despite the absence of a well understood rationale as to the mechanism responsible for the favorable effects on clinical outcomes.
Recent evidence refuting the specificity of mobilization and manipulation techniques, combined with data suggesting that one particular technique might not be superior to another, questions the necessity to practice based on a strict biomechanical model when treating patients with low back and neck pain. Future work should continue to examine whether there are preferential effects for different manual therapy techniques, and whether efforts to be specific are worthwhile. Future research should also continue to elucidate the mechanisms underlying the favorable effects of manual therapy on clinical outcomes in patients with low back and neck pain.

Reference List


Figures

Figure 1. Location of cavitations associated with manipulation techniques directed at L5 and the sacroiliac joint\textsuperscript{11}
Figure 2. Manipulation technique used in the Flynn et al\textsuperscript{17} and Childs et al\textsuperscript{18} studies.