Comparing the Effect of Osteopathic Manipulative Medicine versus Concussion Education in the Treatment of Concussion
A Pilot Study

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HYPOTHESIS
We hypothesize that osteopathic manipulative medicine (OMM) will lead to improvement in symptoms as measured through the 3rd edition of the Sport Concussion Assessment Tool (SCAT-3) and Immediate Post-Concussion Assessment and Cognitive Testing (ImPACT) assessment tools in post-concussion subjects as compared to a control group, who will receive concussion education.

INTRODUCTION
Concussions are a form of mild traumatic brain injury, which are caused by trauma to the head or body (Figure 1). Concussions are diagnosed by history and physical examination reported by the patient and/or witnesses.1–4 One retrospective chart review showed improvement of symptoms utilizing Sport Concussion Assessment Tool (SCAT-2) surveys post-OMM on sports-related effects of OMM on post-concussion patients. One retrospective chart review showed improvement of symptoms utilizing Sport Concussion Assessment Tool (SCAT-2) surveys post-OMM on sports-related concussions.

MATERIALS AND METHODS

DESIGN
• This is a randomized treatment control experimental trial comparing OMM to concussion education

HYPOTHESIS
- SCAT-3 and ImPACT are two tools that monitor concussion severity.
- SCAT-3 is a subjective questionnaire, assessing twenty-two different symptoms on a numerical scale from zero to six, in a self-reported manner (Figure 2). ImPACT is a computer-based neurocognitive test battery that evaluates a patient’s cognitive function after concussion and compares it to their baseline score (Figure 3).

IMPUTATION
OMM can potentially address musculoskeletal restrictions that may occur due to trauma and treat somatic dysfunctions, which can improve symptoms from concussion. Prior studies have found that OMM has a positive effect on concussion-like symptoms, such as vertigo and imbalance, but there is limited evidence documenting the effects of OMM on post-concussion patients. One retrospective chart review showed improvement of symptoms utilizing Sport Concussion Assessment Tool (SCAT-2) surveys post-OMM on sports-related concussion patients. To date, there have been no randomized control trials published examining the effects of OMM on post-concussion patients.

INTERVENTIONS/OBSERVATIONS
• The enrolled subjects (n=8) were randomized into two groups: OMM as the intervention (n=4), and the controls, receiving concussion education (n=4). All investigators delivering the 30-minute interventions were certified in American Academy of Family Physicians (AAFP) “Concussion” and compares it to their baseline score (Figure 3).

RESULTS
Statistical significance was set at p = 0.05. Long term evaluation using the pre-intervention scores for SCAT-3 and ImPACT did not reach statistical significance. For the acute change, the OMM group showed statistically significant improvements in symptom number and severity in Visit 1 when analyzed with the Mann-Whitney U test (p=0.029, p=0.029), as compared to the control group. The between-subject effects for change in symptom number (p=0.022) and change in symptom severity (p=0.010) were also statistically significant.

CONCLUSION
While the assessment tool scores did not exhibit a statistically significant difference for the long-term analysis, it did show significance when analyzed for acute change. The data obtained from this pilot study demonstrates that there is an improvement after OMM treatment acutely as compared to concussion education. A limitation to the current project includes the small sample size with only four subjects in each group. The subjects were randomized, but the control group exhibited more severe manifestations of post-concussion symptoms as shown through the mean pre-intervention SCAT-3 and ImPACT scores on Visit 1. As this is a pilot study, further studies should be considered to investigate the application of OMM in improving symptoms in post-concussion subjects.

REFERENCES