Abstract
The osteopathic pedal pump is a lymphatic technique that is both gentle and passive. Although widely taught in osteopathic medical schools as a method to enhance lymphatic flow, there have been few studies to support this claim until now. We recruited 20 geriatric patients with lower extremity edema from the New Jersey Institute for Successful Aging (NJISA). On those patients we performed the pedal pump treatment protocol described in the methods. Then, using a two tailed T-test, we determined that the significance of displacement between pre-treatment and post-treatment limb volumes was highly significant with a p-value of p = 0.001 for change in limb volume following the combined thoracic inlet/outlet and five-minute pedal pump treatment. We therefore recommend consideration of the osteopathic pedal pump for treatment of lower extremity edema for patients who are willing.

Methods
Twenty geriatric patients were recruited from the NJISA if they had lower limb edema. Patients were excluded from the study if they had any of the following conditions: acute asthma, COPD, metastatic cancer, active infections, or lower extremity fractures. A within-subjects study design with pre- and post-treatment measurement of lower limb volume was used. Pretreatment lower limb volume measurements were obtained using a volumetric water gauge (Fig. 1) prior to myofascial thoracic inlet release (Fig. 2) and the 5-minute pedal pump protocol treatment (Fig. 3). Posttreatment lower limb measurements were then taken immediately following the pedal pump protocol treatment. A telephone interview was conducted 2-3 days later to assess participants’ experience of the treatment and whether they would consider receiving the treatment in the future.

Results
The average change in lower limb volume of our patients was 76.90 mL with a standard deviation of 65.89 mL. There was statistically significant change (p = 0.001) between pre- and post-treatment limb volumes. The minimum displacement was -12 mL and the maximum displacement was -242 mL. In a post hoc analysis, patients who saw the most appreciable change are those who also have diabetes (p < .001; M = 113.75 mL; SD = 88.399 mL), history of DVT (p = .038; M = 120.50 mL; SD = 105.5 mL), or obesity (p = .004; M = 94.3 mL; SD = 86.82 mL).

Conclusions
The osteopathic pedal pump is a potentially highly-efficacious adjunctive treatment in elderly patients with pedal edema. There are some limitations to our study, namely the small sample size and the lack of a control group. Further, larger double blinded controlled clinical trials are needed to support the effect of the treatment in a more generalizable population.

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