Using Real-Time Ultrasound Imaging to Enhance Learning and Clinical Application of Joint Traction in Physical Therapy Education

Todd Burnett PT/s; Michael Ling PT/s; Melissa Ho PT/s  Mentors: Alycia Markowski, PT, DPT; Maureen Watkins PT, DPT

**Introduction**

- Physical therapy students struggle with confidence and execution when learning manual techniques.
- Current teaching methods lack objective feedback.
- Real-time ultrasound imaging (RTUI) provides objective knowledge of performance and results.
- We proposed that the use of RTUI when learning manual techniques would result in enhanced skill acquisition and increased student confidence when compared to traditional teaching methods.

**Methods**

- 84 third professional year physical therapy students self-selected into control and intervention groups.
- All students received baseline written and video instruction.
- The control group received traditional lab based instruction that includes instructor demonstration and observational feedback.
- The intervention group received RTUI in addition to traditional instruction.
- Pre and post data collection included confidence surveys and measured students ability to separate two joint surfaces. Post intervention qualitative feedback was collected.

**Results**

- Overall, there was significant improvement in students confidence in performing knee traction. p<.0001
- There was no statistical difference between control and intervention group. p=.14
- No significant difference in joint space changes was found between control and intervention groups joint space but a positive trend was noted. p=.78
- Analysis of qualitative data identified 3 themes. 100% of the Students exposed to RTUI reported RTUI was helpful for objective and visual feedback. 24% believed it helped them learn and 26% stated more time with the USI would have been beneficial.

**Clinical Relevance**

- The use of RTUI provides students with objective feedback and instant knowledge of results.
- Students are able to see that their technique is effectively separating a joint space.
- RTUI may enhance the associative stage of motor learning.
- The image provides feedback to the student on the proper amount of force to apply when performing the technique.

**Discussion**

- Overall we saw improvements in learning with trends toward students showing more confidence in their skills when exposed to RTUI.
- Our study may have been limited by inadequate exposure to viewing and understanding ultrasound images an limited amount of practice time with the RTUI unit.
- More research is currently needed to determine if increased exposure to RTUI throughout the DPT curriculum would be beneficial for student learning.

---

This study was supported by Provost Grants for Advancing Undergraduate Teaching and Learning at Northeastern