TEACHING INTRAMUSCULAR DRY NEEDLING IN ENTRY-LEVEL DPT EDUCATION: A MIXED METHODS EVALUATION OF STUDENT OUTCOMES AND PERCEPTIONS.

Chad Howland, PT, DSc, DPT, SMT, CMPT, Cert DN

Prentice Archuleta, B.S., SPT, Zachary Grant, B.S., SPT, Andrew Gumprecht, B.S., SPT, Max Lombardo, B.S., SPT, Katrina Maxsimic, B.S., SPT.

School of Physical Therapy, Husson University, Bangor, Maine

Introduction:

Intramuscular dry needling (IDN) is a directed intervention that involves inserting a fine, solid filiform needle into somatic tissue to address myofascial pain secondary to intramuscular trigger points and localized muscle hypertonus, including muscle tendon pathology. The primary aim of IDN is to elicit local muscle twitch responses that occur when the needle engages contractile tissue, creating an electrical depolarization to reduce pain and muscle tension, and improve function of the movement system[1].

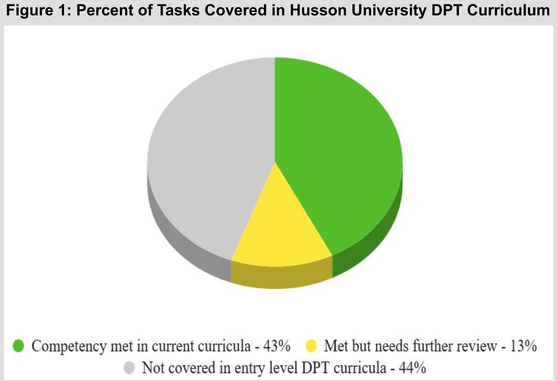
Presently in the United States, IDN is within the scope of physical therapist (PT) practice in thirty-nine states, including here in Maine, where jurisdictional scope of practice does not explicitly stipulate post entry-level training and/or certification[2].

The Commission of Accreditation in Physical Therapy Education (CAPTE) provides requirements ensuring appropriate and safe education across multiple domains, however; CAPTE does not mandate specific requirements regarding IDN instruction and competency in entry-level physical therapist education programs[3].

The Federation of State Boards of Physical Therapy (FSBPT) provided further guidance through the *Analysis of Competencies for Dry Needling By Physical Therapists*[3],which suggests about 86% of the required tasks and knowledge for IDN competency may be acquired through entry-level DPT education. A comparison between FSBPT analysis of competencies to the current DPT curriculum at Husson University is shown in ***Figure 1***. The aim of our teaching and learning experience was to address the required tasks and knowledge for IDN competency following entry-level DPT students' second programmatic year.

This study investigated student learning outcomes and beliefs following the design and implementation of a IDN education module.

Figure 1: Percent of Tasks Covered in Husson University DPT Curriculum



Methods:

This study utilized a mixed methods design. Participants were from a single cohort of entry-level DPT students enrolled at Husson University (n = 36). Inclusion criteria required successful completion of foundational musculoskeletal and neurology coursework, completion of the first full-time clinical education experience, good academic standing, and provision of written informed consent. The institutional review board at Husson University approved the study (Protocol #25PT03).

The course design and delivery consisted of 2.5 hours of asynchronous, online instruction, and 5 hours of in-person training focusing on experiential learning and immediate performance feedback. The course met CAPTE (2024) standards in the areas of 7A, 7B1, 7B3, 7C1, 7D2, 7D10, 7D11, 7D14, 7D15, and 7D23. The student participant-to-faculty ratio was 3:1.

Within-subject comparisons analyzed the difference between the readiness and summative knowledge assessments for safety, anatomy, technique, and professionalism/scope of practice domains.

Students' perspectives of the IDN course was collected through a post-course survey, developed in accordance with CHERRIES guidelines[4], and data summarized using median scores, interquartile range (IQR), and percentage of agreement to provide a consensus. Centered optimal-point items were interpreted using deviation-from-optimal analysis.

Two-cycle coding analyzed students' written responses to open questions from the survey, producing thematic abstraction, and subsequent development of a planned qualitative exploration through a focus group interview.

Results:

Table 1: Readiness vs Summative Knowledge Assessment by Domains

Domain	Readiness Median % (IQR)	Summative Median % (IQR)	Wilcoxon signed-rank test results
Safety	100.0% (94.0–100.0)	100.0% (99.0–100.0)	Z= 0.41, p = 1.0, r = 0.11
Anatomy	100.0% (100.0–100.0)	100.0% (89.4–100.0)	Z= 0.38, p = .850, r = 0.11
Technique	100.0% (98.7–100.0)	100.0% (91.5–100.0)	Z= -0.41, p = .783, r = -0.11
Professional	100.0% (100.0–100.0)	100.0% (100.0–100.0)	Z = -1.00, p = 1.00, r = 0.28

Table 2: Thematic Categories from post-course survey analysis

Theme	Description	Representative Quote	Frequency (n)
Experiential Skills Learning	Students valued hands-on practice and the opportunity to both perform and receive dry needling.	"The most valuable part was supervised hands-on practice performing dry needling techniques."	10
Guided Instructor Feedback	Students highlighted the importance of instructor demonstrations, real-time feedback, and a supportive learning environment that promoted safe skill development.	"I liked the demo of each technique before performing it and having instructors available to check our technique."	9
Course Structure and Learning Resources	Students suggested additional practice time, supplemental videos, and expanded learning resources to reinforce skill development and improve learning efficiency.	"More time learning and practicing techniques and having more videos to refer back to would be helpful."	10
Clinical Decision Making	Students expressed interest in greater integration of clinical reasoning, case studies, and patient selection considerations for dry needling.	"More clinical decision making with case studies for appropriate and not appropriate patients."	4
Professional Preparation and Identity	Some students emphasized the value of learning dry needling before clinical rotations and its potential role in professional skill development.	"Knowing basic techniques before clinicals was important."	3

Fifteen students consented to participate in the IDN educational module. A total of thirteen students completed the module, learning assessments, and post-course survey. The readiness and summative knowledge assessments achieved 100% median scores (IQR:100-100) across safety, anatomy, technique, and professional/scope of practice domains, with no statistically significant difference between the two assessments using the Wilcoxon signed-rank test (Z= -1.00 to 0.41, p = .783-1.00; r = -0.11 to 0.28). ***Table 1*** summarizes the results.

All students achieved competency in skills assessments across six separate muscles. No students reported adverse effects or adverse events during the learning module.

Survey results indicated elevated levels of student satisfaction (median score of 5/5, 92–to-100% agreement) across items related to course goals, content appropriateness, instructional balance, pacing, lab practice time, faculty facilitation, peer support, ethical/legal awareness, and overall learning experience. Survey results showed moderate levels of student confidence, clinical decision making, and likelihood of pursuing an IDN certification after graduation (median score of 4/5, 69-77% agreement). Students rated the learning experience a 4.5 out of 5 stars (***Figure 2***).

Qualitative analysis of the post-course survey showed themes specific to experiential learning, instructor feedback, course structure, and clinical reasoning (***Table 2***). The findings guided question development for the subsequent focus group interview (analysis in progress).

Figure 2: Overall course rating

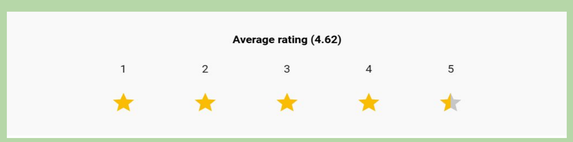


Figure 3: Anatomy of a intramuscular dry needle

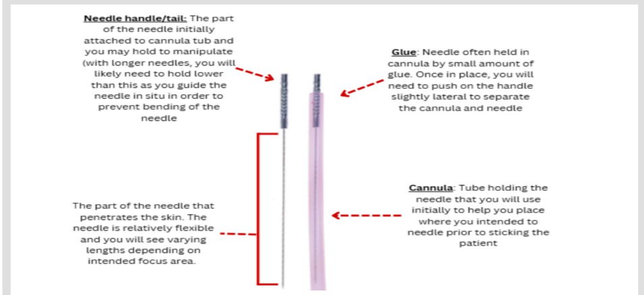
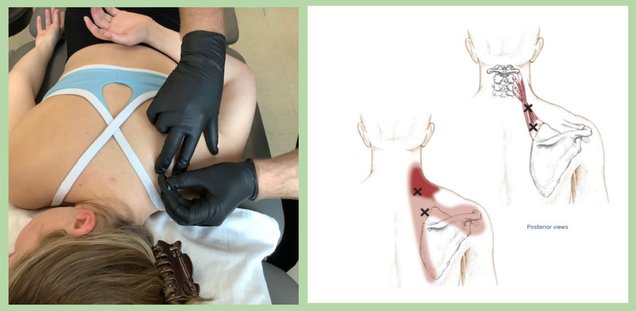


Figure 4: Intramuscular dry needling to the levator scapulae muscle



Discussion and Conclusion

By the end of the second programmatic year, entry-level DPT students appear to demonstrate strong foundational knowledge and ability to acquire the necessary skills to deliver IDN under direct supervision, as evidenced by the apparent ceiling effect observed on the readiness and summative knowledge assessments, along with achieving competent application under direct supervision, and no reported adverse effects or events.

Post-course survey responses indicated high satisfaction with the learning experience but revealed expected early-stage gaps in confidence and clinical reasoning.

Qualitative feedback from open-ended survey questions identified student preferences toward direct application with immediate instructor feedback, but suggested more instructional time, access to additional resources, and further integration of clinical reasoning.

The study findings support safe and effective integration of IDN education into an entry-level DPT program, through a course design emphasizing experiential learning, and small student-to-faculty ratios. Based on student perspectives, IDN course delivery should be greater than 7.5 contact hours to allow for more practice, feedback, and cultivate clinical decision-making skills prior to students' final clinical education experiences.

Further analysis is underway to examine students' perspectives about IDN education following their final clinical education experiences.

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Scan the QR code for link to list of FSBPT IDN safety requirements

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Scan the QR code for this study's references.

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