

# Collegiate Athletic Trainers' Perceived and Actual Knowledge of Therapeutic Ultrasound Concepts

Kristen Couper Schellhase, EdD, LAT, ATC, CSCS, Jennifer L. Plant, MEd, LAT, ATC, CSCS, and Carey E. Rothschild, PT, DPT, OCS, CSCS • University of Central Florida

**Context:** Therapeutic ultrasound is a widely used modality, however, little is known about the knowledge level of athletic trainers regarding therapeutic ultrasound. **Objective:** To examine athletic trainers' perceived and actual knowledge of therapeutic ultrasound concepts. **Design:** Cross-sectional. **Setting:** Web-based. **Patients or Other Participants:** Randomly selected collegiate athletic trainers ( $35.55 \pm 8.86$  years). **Intervention:** The questionnaire included: Likert scale questions regarding perceived knowledge of the educational competencies related to therapeutic ultrasound; actual knowledge questions regarding theory/textbook validated knowledge; frequency of use questions; and demographics. **Main Outcome Measures:** Correlations. **Results:** Athletic trainers in collegiate settings reported fairly high confidence in their knowledge of the application-related therapeutic ultrasound competencies. Athletic trainers reported less confidence in their knowledge of the theory-related competencies. The actual knowledge mean score was  $15.50 \pm 2.88$  out of 22 possible points. The 13 questions that were answered correctly by less than 75% of the participants related to insufficient parameters, safety concerns, and theory/book knowledge. Weak to moderate positive relationships were found between actual knowledge scores and perceived knowledge scores, age group, and number of therapeutic modalities courses taken. Weak to moderate positive relationships were found between perceived knowledge scores and both age group and number of courses taken. **Conclusions:** Athletic trainers were more confident with application-based questions than they were with theory-based questions. Though overall confidence in their knowledge of therapeutic ultrasound concepts was high, actual knowledge scores were relatively poor. Actual knowledge scores were higher in older age groups and in those who had taken more therapeutic modalities courses. The use of inadequate intensities and inadequate treatment durations, as outlined by Draper in 1998, were still seen. While a self-assessment tool may be helpful for some, this study suggests that more research is needed regarding whether athletic trainers have an accurate understanding of their need for continuing education in this area.

Ultrasound is a popular therapeutic modality that has been used to treat orthopedic conditions since the 1950s.<sup>1-4</sup> The clinical application of therapeutic ultrasound has evolved over the past several decades, from being used exclusively as a thermal modality to being employed for its nonthermal effects, particularly in tissue repair and wound healing.<sup>5,6</sup> Correct application of therapeutic ultrasound can aid in the treatment of

musculoskeletal injuries, whereas incorrect application may reduce the desired physiological effects or even cause harm to the patient.<sup>7</sup> Despite its widespread use, little is known about the perceived and actual knowledge level of athletic trainers regarding therapeutic ultrasound. Armijo-Olivo et al. investigated the beliefs and sources of knowledge of therapeutic ultrasound of Canadian physical therapists, but no such study has

## KEY POINTS

▶ Collegiate athletic trainers were confident in their knowledge regarding therapeutic ultrasound concepts.

▶ Higher confidence was reported for application questions versus theory questions.

▶ Though perceived confidence was high, actual knowledge scores were fairly low.

▶ Respondents in an older age group and respondents who had taken more therapeutic modalities courses tended to have higher actual knowledge scores.

▶ The use of inadequate intensities and inadequate treatment durations were seen.

literature search uncovered no studies that analyzed athletic trainers' retention of knowledge postcertification. However, a review of literature in other health care professions found that knowledge and skill related to emergency care begins to decline within six months to one year after training.<sup>8</sup> Furthermore, early athletic training curricula relied less on a set coursework and more on a demanding clinical component for the attainment of knowledge and skills.<sup>9</sup> While the fifth edition of *Athletic Training Educational Competencies*<sup>10</sup> contains nine competencies/proficiencies that directly apply to the theory, application, and intended outcomes of therapeutic ultrasound, these requirements have not always been in place, and many athletic trainers graduated and passed their certification examination before the current understanding of modern therapeutic ultrasound principles. While the Board of Certification (BOC) requires athletic trainers to participate in continuing education, it does not currently require athletic trainers to provide evidence that they have current knowledge in any specific subject other than emergency cardiac care.<sup>11</sup> Therefore, it is important to understand the level of knowledge regarding therapeutic ultrasound concepts among athletic trainers.

## Procedures and Findings

We recruited participants by requesting the e-mail contact information for a random sample of 1,000 athletic trainers through the National Athletic Trainers'

been performed to date regarding athletic trainers.<sup>5</sup>

Athletic trainers have met a minimum standard of therapeutic modalities knowledge by graduating with a degree in athletic training and passing a certification examination; however, the retention of knowledge by athletic trainers once they become certified is unclear. A

Association (NATA) research survey service. Selected individuals were required to be employed athletic trainers (any setting), certified, not retired, and from the United States. The research proposal was evaluated and approved as exempt from regulation by the researchers' university institutional review board (IRB). Participants were informed of the study's purpose and their completion of the questionnaire served as their consent to participate.

An electronic mail message was sent that invited participants to complete a questionnaire via a hyperlink to SurveyMonkey/Audience (<http://www.surveymonkey.com/mp/audience/>). The recruitment message contained information about the researchers, purpose of the study, selection process, nature of the questionnaire, and IRB information. We sent two follow-up emails, one month and two months after the original request.

The perceived knowledge items included all of the therapeutic intervention (TI) competencies related to therapeutic ultrasound that were contained in the fifth edition of *Athletic Training Educational Competencies*.<sup>10</sup> The competencies are required elements of any current athletic training professional degree program curriculum, and the intent was to determine how confident currently practicing athletic trainers felt with those same competencies. Participants were given the stem of "I feel confident in my knowledge and understanding of, and am able to..." and then asked to choose from "strongly agree" (4), "agree" (3), "disagree" (2), "strongly disagree" (1), or "cannot determine" (2.5).

The actual knowledge section was created using the results from a review of literature that revealed common misconceptions regarding therapeutic ultrasound.<sup>7</sup> This section was designed by an instructor who had been teaching the therapeutic modalities course within a professional athletic training program for 10 years. Questions were designed to mimic an examination given to students in an athletic training program. Twenty-four preceptors and faculty at the researchers' institution were asked to complete the questionnaire and their feedback was used to increase the clarity of questions and response choices. Once this was complete, all test questions and answers were validated by using three therapeutic modalities textbooks.<sup>12-14</sup> If the question phrasing and answer could not be validated through all three textbooks, it was not included in the final questionnaire. The final questionnaire consisted of the following: nine Likert scale items that evaluated participants' perceived knowledge; a knowledge test