

# Evaluation Models for Continuing Education Program Efficacy: How Does Athletic Training Continuing Education Measure Up?

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**Objective:** Although continuing education is required for athletic trainers (AT) to maintain their Board of Certification credential, little is known regarding its efficacy for advancing knowledge and improving patient care. Continuing professional education (CPE) is designed to provide professionals with important practical learning opportunities. The purpose of our literature review is to provide ATs with an understanding of the primary evaluation models for CPE programs and identify how athletic training compares to the current models. We then explicate how adult learning theories can influence both CPE program development and evaluation.

**Data Sources:** We conducted a review of pertinent literature from 2005-2008 using the Cumulative Index to Nursing and Allied Health Literature (CINAHL) with the following search terms in various combinations: *andragogy*, *adult education*, *continuing education*, *continuing professional education*, *lifelong learning*, and *evaluation*. This search resulted in approximately 190 hits.

**Data Synthesis:** We reviewed research studies that examined CPE effectiveness and the application of adult learning theories in program development. Our findings revealed that most CPE programs fail to assess acquisition or retention of knowledge in allied healthcare professions. To date, no studies in athletic training have investigated the extent to which CPE influences patient care.

**Conclusions/Recommendations:** We suggest conducting learning outcome studies to examine how ATs acquire and retain CPE program content and then apply it to their professional practice. Furthermore, we recommend incorporating adult learning theory into all CPE practices, including conference planning.

**Key Words:** continuing professional education, adult education, knowledge acquisition, knowledge retention, program evaluation, professional development, continuing education units

Continuing professional education (CPE) involves a commitment to lifelong learning. Entry-level education and continuing professional education in athletic training are fundamentally different with regard to education theory. Entry-level education in athletic training has strong foundations in the theory of pedagogy in which learning of new material occurs. The common teaching techniques utilized within the pedagogy model include factual lectures, assigned readings,

quizzes, rote memorization, and examinations. Continuing professional education, in contrast, is designed to address the theory of adult education, or andragogy, in which professionals engage in a lifelong process of inquiry, or continuing education, to obtain more practical knowledge that they deem important.<sup>1</sup> The teaching techniques of the pedagogical model that are used to transmit knowledge and skills to non-adult learners seem to be less than optimal for adult learners.

Healthcare professions, including athletic training, have developed, implemented, evaluated, and mandated CPE requirements to assure professional competence.<sup>2,3</sup> The completion of mandatory CPE units is one of the most common methods that healthcare professions use to keep their members abreast of current information, issues, and trends in healthcare. Advocates for continuing education state that CPE serves to sustain the effectiveness of healthcare professionals by ensuring clinical competence, thereby enhancing the quality of healthcare<sup>4, 5</sup> and reducing malpractice issues.<sup>6</sup> To advance the quality of healthcare, it is expected that participants of CPE programs acquire and retain information so that it may be transferred into professional practice.<sup>7</sup>

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The purpose of mandatory CPE requirements in athletic training is to hold athletic trainers (ATs) certified by the Board of Certification (BOC) accountable for engaging in professional development; for seeking new knowledge; for further developing professional judgment; for expanding the approaches to effective athletic training-related skills and techniques; for practicing athletic training in a professional, ethical, and appropriate manner; and for mastering athletic training-related skills and techniques beyond those expected of an entry-level AT.<sup>3</sup> This implies that as the role delineation and entry-level knowledge changes, a practitioner must keep pace with entry-level knowledge and skill. To date, there is no published evidence-based research to support the belief that completing CPE requirements will enhance or maintain the clinical competence of ATs. Therefore, the purpose of this article is to provide a review of the literature organized around four continuing education evaluation models common in the healthcare professions and relate these findings to adult learning theory. We then provide suggestions for improving the development, implementation, and evaluation of CPE programs in athletic training.

## Review of Literature

We conducted a review of pertinent literature using the Cumulative Index to Nursing and Allied Health Literature (CINAHL) and the following search terms in various combinations: andragogy, adult education, continuing education, continuing professional education, lifelong learning, and evaluation. We searched the years from 2005-2008. Literature published by various healthcare professions provides mixed evidence regarding the efficacy of CPE.<sup>7-33</sup> It is difficult to determine whether CPE is effective in the healthcare professions because there are various data collection methods utilized to observe the effectiveness of CPE including surveys, testing, observation, chart audits, and patient care outcome measures.<sup>34,35</sup> There are four outcome measure models upon which CPE programs are typically evaluated: (1) participant satisfaction; (2) acquisition and/or retention of knowledge and skills; (3) transfer of CPE to professional practice; and (4) impact of CPE on the patient.<sup>35</sup>

### Participant Satisfaction

Studies evaluating a CPE program based on the participants' level of satisfaction with the CPE program are evident in the literature.<sup>8,9,36,37</sup> Data collection is typically accomplished with surveys or questionnaires in which participants report whether the subject matter presented or instructional techniques utilized met their educational needs. Researchers in the allied health professions have reported that the hands-on method of teaching/learning real-life professional tasks or problems was the most preferred method of CPE participants,<sup>8,9,36</sup> whereas the self-paced method of teaching/learning that does not include enabling or reinforcing strategies was the least preferred method.<sup>37</sup> Davis et al<sup>9</sup> suggested that the criticism of traditional delivery methods of CPE programs, such as didactic lectures, appears justified and that more interactive instructional techniques aligned with adult learning theory should be incorporated into the development and implementation of CPE programs.

To date, there have been two satisfaction studies conducted in the athletic training profession and published in refereed

journals. Weidner<sup>38</sup> conducted a focus group study to ascertain ATs' satisfaction following a CPE program. The ATs participating in this study reported that the subject matter presented in the CPE program was important; however, overall participant satisfaction was low because the CPE did not present the subject matter in a satisfactory manner to address the participants' learning needs. The sample size of this study was small; therefore, reliability and validity of the comments obtained during the focus group interviews may be questioned.<sup>38</sup> Cuppett<sup>39</sup> conducted a study of the self-perceived CPE needs of ATs. Data collected in this study suggest that ATs deem all of the professional domains of the athletic training profession important subject matter for CPE programs. The participants in this study also indicated a preference for hands-on practice of clinical skills in CPE programs.

A participant's satisfaction related to a CPE program hinges on whether the program addressed his/her learning needs. Needs assessment survey research may have limited value because the data provides little or no additional knowledge with regard to the continuing education or competence of healthcare professionals.<sup>40,41</sup> Potential problems with needs assessment research include low response rates; utilization of survey tools requesting too much information thus eliminating potential responses; and failure to establish and/or report reliability and validity of the survey tool. Although needs assessment data may not offer a substantial contribution to the body of knowledge, information regarding participant learning needs and satisfaction with CPE programs may be useful for guiding the development and implementation of future CPE programs. Some considerations with developing CPE programs include learning style differences, life-long and self-directed learning, learners' individual needs, and attitudes and barriers toward education.<sup>42,43</sup> Individuals may utilize data from the examination of these areas to increase learning and participant satisfaction, which may also result in increased knowledge and competence of the healthcare professionals attending the CPE program.

### Acquisition and/or Retention of Knowledge and Skills

Educators may evaluate a CPE program based on the participants' acquisition and/or retention of knowledge and skills. This evaluation approach should assess via a questionnaire or multiple-choice exam participant knowledge in a content area prior to, immediately following, and one to six months following a CPE program.<sup>35</sup> Assessing knowledge prior to a CPE program establishes a baseline measure of knowledge. Assessing knowledge immediately following a CPE program determines the knowledge acquired, which reveals the short-term effects of a CPE program. Assessing knowledge one to six months following a CPE program gathers data relative to the knowledge retained, which reveals the long-term effects of a CPE program. To determine cognitive gain and retention, the primary data collection methods utilized are paper-and-pencil instruments. Recently, electronic data collection methods such as audience response systems and online evaluations have been employed by CPE providers to reduce lost or incomplete data. One study that investigated the utilization of the audience response system found that while learners' attention at the CPE program improved, there was no difference in knowledge scores as

compared to participants who did not utilize the response system.<sup>44</sup>

Many studies have indicated that CPE programs are effective for increasing participant knowledge;<sup>10-23,45</sup> however, there has been less research conducted to observe the long-term effects of CPE on knowledge retention.<sup>17,19,20</sup> The field of nursing has produced the most literature in this area. Flaskerud, Lewis, and Shin<sup>19</sup> examined knowledge acquisition and retention in nurses using a questionnaire. They reported an improvement of nurses' knowledge, which was retained over time. In contrast, Camp-Sorrell and O'Sullivan<sup>24</sup> collected data before attending a CPE program and at intervals of one week, one month, and two months following the program. They did not find any significant gains in knowledge acquisition or retention. One difference between these two studies was that Camp-Sorrell and O'Sullivan<sup>24</sup> reported data relative to knowledge acquisition and retention via chart audits rather than a questionnaire. This is considered a weaker data collection method due to the increased potential for bias when reviewing patient charts.<sup>35</sup>

Dunn et al<sup>20</sup> used a quasi-experimental research design that included a control group to evaluate knowledge acquisition and retention in 190 nurses after participating in a CPE program. These researchers assessed the nurses' knowledge prior to, immediately after, and six months following the CPE program. They reported a significant increase in knowledge and skills at six months for those nurses who participated in the experimental group. This finding suggests that the development and implementation of the CPE program addressed the learning needs of the participants.

Using a 20-item multiple-choice questionnaire, Koyama et al<sup>46</sup> conducted a quasi-experimental research study to observe the knowledge base of 24 nurses (experimental group) who participated in a CPE program compared to 27 nurses (control group) who did not participate in the CPE program. There was no statistically significant difference in knowledge between the experimental group and control group prior to, immediately following, or four months after the CPE program. Although the experimental design utilized in this study was an improvement compared to earlier research, the lack of power made it difficult to achieve statistical significance.<sup>46</sup>

Experimental procedures improved further as researchers began establishing and reporting validity and reliability measures of the instruments utilized to collect data. Kellerman-Langan et al<sup>17</sup> investigated knowledge retention in 27 nurses using a 38-item multiple-choice questionnaire administered prior to, immediately following, and 3 months after a CPE program. The knowledge assessment instrument was reviewed for content and face validity. The Cronbach  $\alpha$  for the instrument was .91, and the researchers reported a significant increase in knowledge following the CPE program. Also, participants retained this increase in knowledge for 3 months.<sup>17</sup>

Bell et al<sup>10</sup> developed a self-report questionnaire with a Likert-type scale that was administered in the following manner: (1) prior to a CPE program to assess pre-course knowledge, (2) immediately following a CPE program to assess knowledge acquisition, and (3) three-months following a CPE program to assess knowledge retention. They preceded this research study with a pilot study to establish clarity and readability of the questionnaire. Although the data indicated increased knowledge

acquisition and retention, the researchers acknowledged limitations with using self-reported data as well as other confounding factors that may have affected the results.<sup>10</sup>

There is no published research in the athletic training profession with regard to the acquisition and/or retention of knowledge following a CPE program. Recent CPE programs such as home-study courses and online modules have begun using objective measures (i.e., examinations) to ensure that participants achieve a minimal level of knowledge acquisition, but learning outcome data are yet to be reported. While home-study courses and online programs utilize objective measures to determine learning outcomes, large symposia and conferences rarely, if ever, employ these evaluations. One may speculate that large symposia and conferences do not utilize these measures because it is cost prohibitive to develop and implement valid assessment instruments for multiple sessions and workshops as well as to collect and evaluate the data from these instruments. Ultimately, one must view with caution the learning outcomes and knowledge retention acquired from a CPE program that fails to utilize an objective measurement of knowledge.

As suggested by the literature, participants in CPE programs acquire knowledge;<sup>10-20,45</sup> however, less is known about knowledge retention following a CPE program.<sup>17,19,20</sup> Further evaluation of the acquisition and/or retention of knowledge and skills following a CPE program may assist in the development and implementation of CPE programs. Developing and implementing various strategies for offering a CPE program may promote the acquisition of knowledge and the development of skills related to the profession.<sup>40,41</sup> Unless knowledge is acquired and retained, it is doubtful the knowledge can be transferred into practice. Transfer of knowledge into the practice setting, however, is a model of CPE assessment in and of itself.

### Transfer of CPE to Professional Practice

Another technique utilized to evaluate a CPE program questions if there is a transfer of the knowledge and skills gained by the participants to their professional practice. This type of CPE program evaluation is performed infrequently because of the difficulty in controlling confounding variables present in the work setting. In addition, collecting data that establishes a clear relationship between the knowledge and skills gained in a CPE program and professional practice is a daunting task.<sup>40,41</sup> The primary data collection methods utilized for this type of CPE program evaluation include: (1) evaluation procedures such as surveys, interviews, or self-reports to determine cognitive gain, retention, perceptions, and attitude or behavioral change; and (2) observational checklists, rating scales, or record audits to ascertain skill development or changes in performance.<sup>21,40,41,47,48</sup>

The literature is mixed in this area of research. Some studies have revealed improved skills, behaviors, or practice following CPE programs as identified through observations, chart audits, and/or self-reports.<sup>9,10,13,15,17,25-27</sup> For example, Davis<sup>8</sup> reported that 70% of the studies published in the literature indicate that physicians demonstrate a change in their clinical performance as a direct result of attending a CPE program. In a follow-up research study, Davis et al<sup>9</sup> reported that when interactive instructional techniques are utilized in a CPE program, 66% of the participants demonstrated a significant improvement in clinical performance. Moreover, when combinations of



interactive and didactic instructional techniques were utilized, 71% of the participants demonstrated a significant improvement in clinical performance.<sup>8</sup> However, other studies have identified no significant differences on skills, behaviors, or practice following CPE programs.<sup>7,21,24,25,28,29,45,48</sup>

Waddell<sup>49</sup> conducted a meta-analysis of the nursing literature on CPE, including published and unpublished studies, and concluded that it may have a positive effect on clinical nursing practice. Nurses participating in CPE were more motivated to change clinical practice techniques and apply new knowledge and skills to improve professional practice.<sup>49</sup> However, no significant differences on skills, behaviors, or practice following CPE programs have been identified in other studies.<sup>7,21,24,25,45</sup> Difficulty in controlling confounding variables such as staff size, interaction with colleagues, confidence, and changes in workplace procedures may result in positive or negative bias.<sup>26</sup> Thus, collecting data that establishes a clear relationship between the knowledge and skills gained in a CPE program and professional practice is problematic.<sup>40,41</sup>

Though direct assessment of knowledge transfer, such as the utilization of a patient care skill learned during a CPE, is of more value to determining the quality of a CPE program, indirect evidence offers an alternative avenue for study. One example of an indirect assessment of the transfer of knowledge into practice is a study conducted on physiotherapists. The purpose of this study was to determine the reasons for selecting treatment techniques.<sup>50</sup> Interestingly, most reasons for selecting a clinical treatment technique were related more to prior initial training and experience and less to CPE activity, such as reading current research and taking a specialized course. With this particular study, the value of CPE is not clear.

There is currently no published direct or indirect research in the athletic training profession with regard to the impact of CPE on professional practice. Studying the impact of CPE to determine its relationship with professional practice is difficult. However, improved research study designs that incorporate control groups and/or comparison groups while controlling for confounding variables should generate useful data for improving the development and implementation of CPE programs, thereby enhancing the knowledge and competence of healthcare professionals.

### Impact of CPE on Patient Care

A different CPE evaluation approach examines how the knowledge and skills the healthcare professional received from a CPE program has affected the patient. This type of evaluation does not focus on the healthcare professional but rather on the patient as a recipient of the healthcare professionals' services.<sup>40,41</sup> This type of CPE program evaluation evolved from the belief that the ultimate goal of CPE is to improve healthcare services provided by healthcare professionals to patients.<sup>41</sup> The assumption with this form of CPE evaluation is that if learning occurs and results in a change in behavior, skill, or knowledge, then patient care will change accordingly providing there is a transfer of learning to the workplace.

Although a limited number of studies have been done in this area, positive associations between CPE programs and the healthcare professionals' services have been reported.<sup>8,30-33,51</sup> Improvements in healthcare provided by CPE participants have

included increases in patient knowledge and compliance,<sup>32,33</sup> fewer medical complications,<sup>33</sup> decreased length of patient stay in the hospital,<sup>30</sup> and increased patient satisfaction with the healthcare provided.<sup>31,33</sup> Davis<sup>8</sup> reported that 48% of the studies in the literature demonstrated a positive change in healthcare outcomes. In contrast, Meservy and Monson<sup>26</sup> reported no significant change in patient outcomes following a CPE program. Unfortunately, the ability to draw firm conclusions from this CPE evaluation process is limited due to: (1) lack of comparison groups, (2) differences in evaluation techniques, (3) differences in educational strategies, and (4) differences in CPE program content.<sup>52</sup>

There has been no published study in athletic training investigating patient care outcomes. With improved research study designs that incorporate control groups and/or comparison groups while controlling for confounding variables, data would be available to improve the development and implementation of CPE programs to positively enhance patient care. As an example, it would be insightful to investigate whether participation in a CPE workshop on a neuromuscular training program to prevent ACL injuries results in the implementation of said program and thus reduced ACL ruptures. Interestingly, of the studies that have identified positive changes in professional practice because of continuing education activity, interactive educational methods (rounds, hands-on activities, engaged learning) were associated with the change in practitioner behavior.<sup>9</sup> Conversely, didactic sessions (lectures) were not effective.<sup>9</sup>

If indeed the ultimate goal of CPE is to affect patient care practices in a positive way, we must look to a CPE system that facilitates the acquisition and retention of new knowledge in a manner that allows for the transfer of learning in the workplace. Of importance, too, is delivering the educational program so that participants are satisfied with their learning activities. Interactive methods consistent with adult learning theory hold a level of promise to effect a positive change.

### Discussion

Based on the results obtained from the various CPE evaluation models outlined above, there are different educational formats that may enhance the acquisition and retention of knowledge ATs gain from the CPE programs they attend. ATs who acquire and retain CPE knowledge may then transfer it to their professional practice with the ultimate goal being the improvement of patient care. To maintain the certified AT credential, mandatory continuing education units (CEU) must be completed and documented.<sup>3</sup> The use of CEUs serves as a means to insure that the holder of a certified AT credential stays abreast of the latest knowledge and skills in the athletic training profession. Unfortunately, there exists little evidence to date indicating whether the accumulation of CEUs maintains a minimal level of professional competency. A CPE program with emphasis on andragogy and interactive methods, however, is intriguing.

### Andragogy and Continuing Education in Athletic Training

Andragogy is the art and science of helping adults learn.<sup>1</sup> There are five assumptions on which the model of andragogy is founded: (1) as one matures, his/her self-concept moves from one being a dependent personality toward one being a self-

directed individual; (2) as one matures, he/she accumulates a growing reservoir of experience that becomes a resource for learning; (3) as one matures, his/her readiness to learn becomes oriented toward the developmental tasks of his/her social roles; (4) as one matures, his/her time perspective changes from one of postponed application of knowledge to immediacy of application; therefore, orientation toward learning shifts from one of subject centeredness to one of performance centeredness, and (5) as one matures, the motivation to learn becomes internal.<sup>1,53</sup>

According to the andragogy model of adult education, adults develop a self-directed concept and orientation with regard to learning.<sup>1,53</sup> Self-directed learning involves “a process in which individuals take the initiative, with or without the help of others, in diagnosing their learning needs, formulating learning goals, identifying human and material resources for learning, choosing and implementing appropriate learning strategies, and evaluating learning outcomes.”<sup>54(p18)</sup> It has been reported that the typical adult spends 100 hours on each learning endeavor and conducts an average of five learning endeavors a year, totaling 500 learning hours per year.<sup>55</sup> Approximately three-quarters of adult learning projects are completely self-directed while only 20% are planned by a professional.<sup>56,57</sup> In addition, adults often avoid structured classes and investigate problems on their own because it is an important element of being a professional; where they “take control of the goals and purposes of learning and assuming ownership of learning.”<sup>58(p135)</sup>

Large traditional lecture-oriented programs provide the greatest opportunity for ATs to obtain CPE and accumulate CEUs.<sup>59</sup> The educational value of these programs is often measured by either attendance or participant satisfaction, which is not a valid measure of learning achievement.<sup>60</sup> To date there is no published research in the athletic training profession evaluating the efficacy of CPE programs beyond the evaluation of participant satisfaction. Knowles<sup>1</sup> argued that andragogical practice has a learner-centered approach and moves away from a teacher-centered approach. This is supported by Thompson<sup>60</sup> who suggested that large traditional lecture-oriented programs do not incorporate strategies in accordance with adult learning theory. Failure to incorporate adult learning theory in developing and delivering CPE programs may impair the ability of the participants to translate the knowledge and skills learned in a CPE program into improved athletic training healthcare.<sup>59,61</sup> Since CPE is required for ATs, a clear understanding and application of adult education theory in the development of CPE programs is paramount to maximizing knowledge acquisition and retention.

One method that the profession of athletic training can use to ensure excellent delivery of continuing education is through proper program planning at conventions and seminars. In other words, this planning should address adult learning issues. As an integral component of continuing education, program planning can have a far reaching impact not only on course content but also, and more importantly, on the delivery and retention of the course content. Since continuing education seminars can be quite diverse in content, these meetings “must therefore include a wide range of activities that give people the kinds of learning experiences they really want.”<sup>62(p214)</sup> Therefore, since each member comes to these seminars to learn about different topics,

program planning must be thought of as a key component on delivering the necessary information through multiple mediums.

The athletic training profession does provide CPE opportunities through multiple mediums, some of which are aligned with adult learning theories, such as peer workshops, research interest groups, on-line examinations, and interactive programs. These multiple mediums afford ATs the opportunity to practice self-directed learning in the selection of different learning resources. Moreover, the NATA has attempted to create programs to facilitate interaction with other practitioners. As outlined by Houle,<sup>62(p223)</sup> interactive learning can “provide for enhanced forms of experiential opportunity, learner initiative, evaluative mechanism, and supervisory authority.” With this notion, participants can exchange ideas with other professionals, get feedback on performance, and create a new knowledge base in an effort to improve patient outcomes. As aforementioned, Davis<sup>9</sup> found that more interactive learning environments resulted in better knowledge acquisition by CPE participants.

While developing CPE programs, providers could further utilize the experiences of the participants to foster knowledge acquisition and retention. In addition, providers could build practical application exercises into CPE programs that allow participants to plan and rehearse how they would apply the knowledge acquired to their day-to-day clinical practice.<sup>52</sup> Experiential learning techniques and practical application of knowledge (e.g., patient simulations, role playing, and consultative supervision) are aligned with andragogy theory and use the rich resource of learning that exists in adult learners.<sup>52</sup> Developing CPE programs that implement instructional techniques appropriate for adult learning may increase knowledge acquisition and retention, which may then be transferred to clinical practice resulting in improved patient outcomes.

To determine the effectiveness of CPE programs, perhaps CPE providers should work in greater collaboration with the National Athletic Trainers’ Association and the BOC to document the instructional techniques utilized and how they are aligned with an andragogical method of instruction. Continuing professional education providers approved by the BOC could be held more accountable for CPE efficacy by demonstrating participants’ knowledge acquisition and improved performance through pre- and post-tests, peer-reviewed performance, or self-reflection on differences in professional practice. Reflection on learning is a critical aspect to integrating new knowledge and skill into practice and identifying the extent to which it has utility in one’s practice setting.

With a minimal amount of research conducted on the effectiveness of CPE in athletic training, we recommend conducting more research on how CPE can better serve the participants and the profession. Greater emphasis in research should be placed on how individuals select CPE programs, how the content is delivered to credential holders, how it is transferred to professional practice, and finally, how it affects patient care. Without understanding these factors, determining the effectiveness of CPE in athletic training is limited.

## Conclusions

In the effort to examine the evaluation of CPE, we raised several key points concerning its use, implementation, and

effectiveness as it relates to andragogy. Though its intention is seldom questioned, the effectiveness of CPE is often times called into question. In the examination of previous research in CPE for the healthcare professions and for ATs, there is insufficient evidence to unequivocally conclude that CPE significantly enhances a practitioner's competence or improves a patient's outcome. Therefore, more research is necessary to support the claims of continuing education advocates who believe that CPE ensures sustained clinical competence, thereby improving the quality of healthcare<sup>4,5</sup> and reducing malpractice issues.<sup>6</sup> However, it has been suggested from previous findings that with improved research design and development, the possibility exists for greater retention of gained knowledge, which would be necessary for the transference of CPE to professional practice and improved healthcare.

Further, adult learning theory<sup>1,54,55,63</sup> and research<sup>8,9,53,58,62</sup> suggest that effective CPE programs should progress from the traditional lecture-based approach and seek new avenues of effective presentation for the adult learner. Such concepts might include the creation of more online seminars/examinations,<sup>23,63</sup> hands-on learning opportunities, peer-based study groups, and small group breakout sessions during large lecture-based presentations, as well as increasing the variety of educational topics at national symposiums. We are beginning to see a great deal more of these CPE modes and perhaps examining the resultant learning and skill acquisition, transfer of knowledge, and patient care outcomes is a necessary step as well. As a fundamental characteristic of adult learning in CPE, the delivery of the learning content must be with meaning and purpose to a practitioner's internal desire to learn and be immediately applicable to their respective work setting.

ATs have a commitment to provide the best patient care possible to those they serve. Continuing education is both valuable and necessary to advance athletic training knowledge and improve the delivery of care. Thus, to conclude, we provide the following recommendations to positively impact the CPE process in athletic training:

1. The NATA and BOC should make CPE research a priority and encourage individuals to investigate the effects of CPE on knowledge acquisition and retention, transfer of knowledge and skills to the workplace, and impact of CPE on patient care practice.
2. Not only accumulate a minimum number of hours of attendance at a CPE event, but also address knowledge acquisition and knowledge retention to ensure learning occurs.
3. Along with participant satisfaction of CPE programs, require approved providers of CPE to document improved knowledge, knowledge retention, or positive impact on patient care as requisite for awarding CEUs.
4. Require approved CPE providers to move toward the use of adult learning strategies that are learner-centered for their educational programs.
5. Consistent with adult learning theory, involve ATs in the diagnosing of learning needs, planning, and assessment of CPE programs so that a positive impact is made on AT practice.

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