Quadrivium: A Journal of Multidisciplinary Scholarship

Volume 4
Issue 1 *Issue 4, Spring 2012*

Article 3

4-27-2012

Building the Foundation: Educational Soundness in Teaching Evidence-Based Practice

Megan Colas
Nova Southeastern University, mr1251@nova.edu

Pradeep Vanguri
Nova Southeastern University, pv101@nova.edu

QUADRIVIUM
A JOURNAL OF MULTIDISCIPLINARY SCHOLARSHIP

About the Authors

Originally from Baltimore, Megan Colas, Ph.D., assistant professor at the college, earned her Bachelor of Science in Athletic Training from Salisbury University in Maryland. She then attended Virginia Tech, earning a master's degree in health promotions and sports performance. Also at Virginia Tech, she completed her Ph.D. in Curriculum and Instruction while serving as an assistant athletic trainer for the university's women's basketball team. Her current research interests are clinical instruction, evidence-based medicine, and therapeutic interventions.

Pradeep Vanguri, Ph.D., associate professor at the college, serves as clinical coordinator for the college's Athletic Training Education Program. He earned his Bachelor of Science in Exercise Science from East Carolina University in Greenville, North Carolina, and his Master of Science in Education from North Carolina State University in Raleigh. Upon completing his graduate work, he served as assistant professor and assistant athletic trainer in the Athletic Training Education Program at Barton College in Wilson, North Carolina. He completed his Ph.D. at The University of Alabama in Tuscaloosa, where he also served as graduate assistant in the undergraduate Athletic Training Education Program. His current research interests include faculty development, pedagogy, and clinical instruction.

Building the Foundation: Educational Soundness in Teaching Evidence-Based Practice

by Megan Colas and Pradeep Vanguri

Athletic training education has begun preparing students to enter clinical practice using evidence-based practice procedures. These procedures have been extensively studied and evaluated throughout various medical professions. Athletic training lends itself readily to the development of this skill set with the incorporation of clinical experience courses incorporated into curricula. The incorporation of evidence-based medicine skill development with clinical experience provides a foundation for successful skill acquisition. With the recent addition of evidence-based practice guidelines as a content area for athletic training education proficiency assessment, educators and clinical educators are burdened with fostering this multi-faceted skill in novice learners. Considering the importance of the multiple steps incorporated in sound evidence-based practice, novice learners lacking clinical experience must learn to foster this skill under careful direction. Educators must provide a clear progressive introduction that will allow students to develop these skills over time and foster long term practice standards. The appropriate introduction of evidence-based concepts encourages an appreciation for self-directed inquiry and establishes evidence-based practice as a standard of clinical practice. This challenges

educators to develop a curriculum from a sound theoretical and practical basis. Similar methods of pedagogy can be applied to other areas of higher education as we attempt to foster the critical thinking and analytical skills required by are students upon graduation as they enter the workforce. We strive to cultivate students who have a clear understanding of critical thinking and the importance of research through a clear and well-planned process similar to the evidence-based practice procedures introduced in the medical education community.

According to constructivist theory, a learner acquires knowledge through a progressive process of building experiences (Fosnot, 1996). With this framework, students must construct their own understanding of clinical techniques through active learning procedures. In a similar fashion, evidence-based approaches to medical education also require students to have an active role in the learning process (Wyer & Silva, 2009; Silva & Wyer, 2009). Early models of evidence-based medicine (EBM) outline clinical expertise, researching evidence and patient preferences to guide evidence-based practice (Wyer & Silva, 2009). According to this standard, students learning this technique are required to critically analyze available information and compare that to their own clinical expertise. The missing link in this scenario is the progressive development of their clinical expertise while building the knowledge base that will create a foundation for higher-level analytical skills. In order to build these skills in students, we are required as educators to introduce practical experiences that support teachable criteria to fit into a hierarchy of increasing responsibility and clinical experiences. The importance of the clinical expertise in evidence-based practice should not be overlooked. This aspect of EBM is a critical piece in fostering sound inquiry as a professional (Misak, 2010). Students must learn to develop critical analysis through careful guidance as a novice learner with progressively self-guided requirements in order to effectively adopt this behavior (Armstrong, 2010). Incorporating skill-appropriate problem-based learning and progressive exposure to self-guided inquiry appropriately allows students to master evidence-based practice procedures and build confidence in their own clinical appraisal (Hadley J. D., 2007).

An important first step in developing sound curriculum is ensuring the faculty introducing a new concept of evidence-based medicine is well trained and clearly knowledgeable in the concepts of information management and health literacy (Ismach, 2004). This step requires a plan to integrate qualified individuals capable of encouraging progressively more complex processing skills among students. The inclusion of clinical experience in the development of a sound evidence-based curriculum has been clearly linked to stronger skill development in evidence-based techniques and changing behaviors (Coomarasamy & Khan, 2004). Including evidence-based practice through progressive exposure and incorporation of clinical experience closes the gap between educational requirements and EBM skill development.

A sound curriculum based on EBM requires the learner to have a strong understanding of judicious inquiry, information acquisition and critical appraisal. Often students over-emphasize information acquisition more heavily than the inquiry or appraisal in an effort to meet the standards of projects focused on answering questions provided for them. This lacks the critical step of asking clinical questions and critically appraising current evidence to determine the need for clinical application (Manspeaker & Lunen, 2010). Equal focus leads the educator to consider the importance of first, developing knowledge, second, supporting information acquirement, and, lastly, analyzing the information attained for clinical application in order to learn evidence-based

skills (Courey, Benson-Sonos, Deemor, & Zeller, 2006). Progressive inclusion of analytical processing fosters skill mastery directed toward supporting the continued development of evidence-based practice skills as a professional practice standard. Asking students to focus initially on clinical questions requires students to acquire appropriate information and determine relevance. The common concept in current literature related to this pedagogical technique is the importance of knowledge discovery prior to the evaluation of evidence in literature. Requiring students to acquire information prior to understanding how to develop their own clinical inquiry de-emphasizes the critical steps in evidence-based practice which negatively impacts the likelihood of long-term adoption in their professional practice.

Athletic training strongly endorses “learning over time” through evaluation of competency and proficiency over the course of a full curriculum (Carr D, 2010). This concept of learning over time assumes a progression from knowledge building to skill application to problem-solving skills. This aligns itself recognizably with the most successful application of evidence-based medicine standards to students in a curriculum format. This hierarchy of skill development assumes that the learner’s cognitive processing leads to learning and to the ability to develop clinical questions identifying the most effective and useful methods of delivering clinical practice procedures.

Preparing students for professional practice that incorporates sound techniques of clinical inquiry and evidence-based methods ensures that future patients will be given the most effective and appropriate care possible. Effective timing and planning of EBM curriculum should not be applied without careful consideration of training and knowledge of educators and clinical educators. The development of curricula designed for fostering EBM skill acquisition must be applied with careful consideration of the quality of instruction. Part of building a foundation of evidence-based medicine is constructing a framework to be applied with proficient instruction which will foster student mastery of subject matter. Proper planning and guidance in curriculum development will lead to the most successful outcomes in student professional behaviors.

As students progress through undergraduate education, they are required to conceptualize information of increasing complexity. In much the same way that athletic training education encourages students to learn how to incorporate “evidence” into their clinical practice, students in other disciplines can benefit from educators taking an approach to education that encourages clinical inquiry, information acquisition, and critical appraisal of information through the students’ exposure to practical situations. The more exposure students have to “real-life” problems and the more we encourage those students to dig deeper into why they are performing procedures in a specific way, the more we’ll encourage them to develop these same skills in their professional skill set.

In the classroom some procedures that help foster these skills effectively include teaching skills early in the curriculum centered on how to appropriately ask clinically relevant questions based on experience. When we support the initial development of skills based on justifying actions taken in the field, we encourage the student to clearly conceptualize their decision making by answering the question “why?” After students have mastered this inquiry skill, they can then focus on more complex reasoning by acquiring appropriate support from research.

Incorporating critical appraisal of information requires educators to lay the groundwork for analysis of research by progressively exposing students to more complex analysis situations. Ways to accomplish this range from guided analysis of research articles to guided experiences in information acquisition. Identifying appropriate procedures for answering the clinical queries they have developed is a skill that must be mastered before more complex decisions on relevance and impact of information acquired can be cultivated.

Once effective questions have been asked and information is acquired, the appraisal of information can be conducted. This is a step that will encourage long-term learning and is a skill that is most efficiently developed again through progressive and repeated exposure to practical experiences requiring decisions in the field to be justified by research. When students are exposed to sound research methods in this gradual and ongoing framework they are more likely to continue these methods of inquiry and appraisal in their careers in the similar fashion to the concept of evidence-based medicine.

References

Armstrong, K. (2010). Self-directed learning in athletic training education. *Athletic Therapy Today, 15*(1), 19–22.

Carr D, V. J. (2010). Development of athletic training learning over time instruments. *Athletic Therapy Today, 15*(1), 12–18.

Clark R, M. R. (2008, October). Learning by viewing versus learning by doing: evidence-based guidelines for principled learning environments. *Performance Improvement, 47*(9), 5–13.

Coomarasamy, A., & Khan, K. (2004, October). What is the evidence that postgraduate teaching in evidence-based medicine changes anything? A systematic review. *BMJ, 329*, 1–5.

Courey, T., Benson-Sonos, J., Deemor, K., & Zeller, R. (2006). The missing link: information literacy and evidence-based practice as a new challenge for nursing educators. *Nursing Education Perspectives, 27*(6), 320–323.

Fosnot, C. T. (1996). *Constructivism: Theory, perspectives, and practice.* New York, New York: Teachers College Press.

Hadley, J., Davis, J., & Khan, K. (2007). Teaching and learning evidence-based medicine in complementary, allied, and alternative health care: An integrated tailor-made course. *The Journal of Alternative and Complementary Medicine, 13*(10), 1151–1155.

Heye, M., & Stevens, K. (2009). Using new resources to teach evidence-based practice. *Nursing Education, 48*(6), 334–339.

Ismach, R. B. (2004). Teaching evidence-based medicine to medical students. *ACAD EMERG MED, 11*(12), 1283e6–1283e10.

Jutte, L., & Walker, S. (2010). Incorporating foundational evidence-based practice concepts and skills across an athletic training education program. *Athletic Training Education Journal, 5*(3), 119–125.

Khan, K., & Coomarasamy, A. (2006). A hierarchy of effective teaching and learning to acquire competence in evidenced-based medicine. *BMC medical Education, 6*(59), 1–9.

Misak, C. (2010). Narrative evidence and evidence-based medicine. *Journal of Evaluation in Clinical Practice, 16*, 392–397.

Petrisor, B., & Bhandari, M. (2006). Principles of teaching evidence-based medicine. *Injury, 37*, 335–339.

Romanello M, M. M. (2006, May). Information literacy in athletic training: a problem based approach. *Athletic Therapy Today*, *11*(3), 40–43.

Silva, S., & Wyer, P. (2009). Where is the wisdom? II—Evidence-based medicine and the epistemological crisis in clinical medicine. *Journal of Evaluation in Clinical Practice, 15*, 899–906.

Slawson, D., & Shaughnessy, A. (2005). Teaching evidence-based medicine: Should we be teaching information management instead? *Academic Medicine, 80*(7), 685–689.

Welch, C., Van Lunen, B., Walker, S., Manspeaker, S., Hankemeier, D., Brown, S., et al. (2011). Athletic training educators' knowledge, comfort, and perceived importance of evidence-based practice. *Athletic Training Education Journal, 6*(1), 5–14.

Wyer, P., Keitz, S., Hatala, R., Hayward, R., Barratt, A., & Montori, V. (2004). Tips for learning and teaching evidence-based medicine: Introduction to the series. *CMAJ, 171*(4), 347–8.

Wyer, P., & Silva, S. (2009). Where is the wisdom? I—A conceptual history of evidence-based medicine. *Journal of Evaluation in Clinical Practice, 15*, 891–898.