# COMMENTARY

# Evidence-Based Chiropractic Education
## *Are We Equipping Graduates for Clinical Practice with Improved Patient Outcomes?*

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Evidence-based practice has emerged as a driving factor in current curriculum development in chiropractic education. This commentary discusses educational strategies incorporating evidence-based practices in the doctor of chiropractic curriculum and explores whether all five steps of the evidence-based process and patient outcomes from evidence-based practice are being assessed.

**Key Indexing Terms:** Chiropractic; Evidence-Based Medicine; Evidence-Based Practice; Health Care Education; Patient Choice

## INTRODUCTION

Evidence-based medicine (EBM) was introduced at McMaster University in the 1980s to incorporate the cutting edge of medical science into a practitioner's decisions regarding patient care.[1,2] According to Sackett et al, "Evidence based medicine is the conscientious, explicit, and judicious use of current best evidence in making decisions about the care of individual patients."[3]

Fernandez and Delaney discuss the several variations in the terminology, which include evidence-based health care, evidence-based practice (EBP), and EBM.[4] Haneline discusses evidence-based chiropractic (EBC) as an offshoot of the movement toward EBP.[5] Regardless of the term used, the central idea is the need to incorporate the physician's clinical experience and expertise with the best available published evidence along with the patient's preference to determine the method and course of care for each patient.[6]

The five steps in the practice of EBM/EBC include[5,7]

1. asking a clinical question;
2. searching the literature for the best available evidence to answer the question;
3. appraising the evidence for validity and applicability to the clinical case being presented;
4. using the critical appraisal along with clinical expertise and the patient's needs and circumstances to apply the integration to the case; and
5. evaluating the effectiveness of the clinical decision and exploring methods of improvement.

These steps might be viewed as a cycle beginning with step 1 and continuing through step 5, with the goal of improved patient outcomes through the proper application of EBP in the clinical setting.[8] The 5th step of the evidence-based process identifies areas of improvement for the clinician in applying steps 1 through 4.[9]

Chiropractic colleges are incorporating EBP in curricula. The purpose of this commentary is to explore the steps of EBP being addressed in curricula for doctor of chiropractic degrees granted by chiropractic colleges.

## DISCUSSION

A 2004 literature review by Fernandez and Delaney discusses evidence-based educational strategies and resulting patient outcomes in both medical and chiropractic education institutions.[4] Their review summarized medical education studies documenting improved educational outcomes and the early evidence of improved patient outcomes demonstrated in randomized clinical trials (RCTs) after an evidence-based medical education intervention. The medical education studies employed a defined study methodology with clearly defined objectives regarding EBP in medical education. In a 5-year period, medical education published a controlled educational trial and 6 RCTs of patient outcomes from an EBP intervention. In

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contrast, according to the literature review by Fernandez and Delaney, chiropractic education published 4 studies documenting educational outcomes from an EBP instructional intervention. Three of these were qualitative survey designs assessing improved educational outcomes and 1 was a survey of chiropractic colleges' clinic administration about the extent of EBP methods in outpatient clinics. There were no studies of patient outcomes resulting from an EBP chiropractic education intervention.

Four chiropractic colleges have been awarded R25 funding through the National Center for Complementary and Alternative Medicine (NCCAM) of the National Institutes of Health (NIH) grant program to stimulate research in curriculum programs incorporating EPB.[10,11] With this availability of grant funding, one might expect that evidence-based educational strategies for the doctor of chiropractic degree program might advance to include defined study methodologies with clearly defined objectives regarding EBP in chiropractic education and further to include controlled educational trials or RCTs of patient outcomes from an EBP intervention. To ascertain new chiropractic education studies assessing educational or patient outcomes from an EBP intervention since the 2004 literature review by Fernandez and Delaney, several databases were searched for peer-reviewed articles published between January 2003 and May 2011. Databases included PubMed, the Manual Alternative and Natural Therapy Index System (MANTIS), CINAHL®, and the Index to Chiropractic Literature (ICL). For the purposes of this commentary, articles resulting from this literature search were reviewed to select those that discussed specific EBP educational interventions assessing student cohorts in the doctor of chiropractic program and excluded articles that were solely surveys of student attitudes or that only described EBP educational programs that did not contain any measured outcomes of defined study objectives. Based on this inclusion and exclusion criteria, 3 fully developed studies discussed EBP educational strategies assessing student cohorts in the doctor of chiropractic program. One was a case study by Smith et al of 6 cohorts of first-year chiropractic students.[12] Two were single studies of 3rd-year chiropractic students (1 study by Good and the other by Jamison).[13,14]

The case study by Smith et al describes an intervention designed to impart evidence-based skills through a team-teaching methodology that included didactic, experiential learning, and Socratic teaching methods.[12] The study methodology and outcome measures appeared to focus on steps 1, 2, and 3 of the evidence-based process.

Both of the single study articles[13,14] discuss an instructional strategy that includes a component of applying EBP to a patient. Good used a case report project requiring a literature search for which students created a fictional patient to diagnose and determine a management and treatment plan.[13] Using a fictional patient may limit the ability to fully develop all steps of the evidence-based process. Jamison describes a multifaceted project including a literature appraisal and critique, with development of a client personal wellness contract as a project deliverable.[14] To simulate actual clinical practice, Jamison's project instructed students to use a "relative" stranger to appraise his or her lifestyle and prepare and monitor a wellness program. Both of these studies appear to address steps 1, 2, 3, and 4 of evidence-based process.

A survey of student attitudes about EBP by Banzai et al. indicates that while students have positive attitudes about EBP and feel it is important in clinical practice (96.7%), they did not demonstrate good knowledge of fundamental literature critical appraisal skills, even though 66.6% of the respondents had received EBP instruction.[10] Several studies underscore the importance of continuing to weave evidence-based instruction throughout the entire curriculum, with the culmination of higher-level critical thinking skills and application of EBP within the patient encounter during a student's clinical internship.[12,15–17]

In the clinical setting, Fernandez and Delaney conducted a study that encouraged the use of an actual patient vs a fictional patient.[4] The study summarized self-assessed skills and attitudes of chiropractic interns, and the outcomes assessed appeared to focus on steps 1, 2, and 3 of the evidence-based process.

From the published literature, it appears that the primary focus of EBP education in chiropractic colleges continues to focus on the first 3 steps of the evidence-based process.[18,19] One chiropractic university has undertaken a project to redesign the 4-year curriculum of the doctor of chiropractic program.[20] Their document on standards and competencies indicates plans to address all steps of the evidence-based process. As yet, there have been no published studies to assess educational outcomes or patient outcomes from this redesigned curriculum.

A key component in evidence-based practice is incorporating clinical expertise with the best available published evidence and patient preferences to determine a method and course of care.[6] Today's patients have easy access to a multitude of information sources, enabling them to better participate in decisions about personal health care choices.[21] Patient preferences involve personal values, concerns, and expectations of care that determine acceptance, rejection, or modification of the suggested course of care.[5] Patient preference leads to shared decision making between the doctor and the patient.[6,22] An informed patient's decision to follow a clinician's treatment plan might be influenced by the extent to which patient preferences are being appropriately addressed and assessed. The clinician may have a predetermined assumption about patient preferences; however, it is the patient who makes the ultimate choice about his or her health care goals. Incorporating patient preference involves not only knowledge of the clinical condition and relevant research, but also involves interpersonal communication skills. During

a clinical encounter, the doctor should be able to explore the patient's preferences through appropriate inquiry, provide an understandable explanation of risks and benefits, and determine appropriate outcomes assessment.[23]

Davidson et al discuss an EBP-structured clinical examination of a simulated patient encounter, during which medical students must form a clinical question, search for and appraise the literature, and explain the clinical rationale to a standardized patient in response to a patient inquiry.[24] Chiropractic student interns need to be able to integrate the research evidence with clinical expertise and patient preferences during the clinical encounter. There is early evidence in chiropractic education of using the research evidence along with patient involvement to arrive at a clinical decision and plan of care.[14] There is a paucity of studies in chiropractic education assessing student intern skills in communicating relevant research or involving the patient in shared decision making during the clinical encounter. The assessment of a student intern's ability to apply research evidence in clinical decision making to an individual patient and to incorporate patient preferences remains an area to be more fully developed in EBP assessment.[25]

The author suggests the next step in EBP chiropractic curriculum efforts might be to incorporate strategies aimed at moving beyond instruction and assessment of educational outcomes associated with performing steps 1, 2, and 3 of EBP. Chiropractic education needs to develop and assess student intern skills in performing step 4 of EBP incorporating patient preferences in the clinical decision during the patient encounter. As the EBP chiropractic curriculum is developed in the future, we might ask the questions "Are we incorporating all 5 steps of EBP in our curriculum?" and "Are we appropriately and adequately measuring the educational and patient outcomes resulting from an EBP curriculum in both the academic and clinical educational environments?" By evaluating an instructional design using these questions, it may enable us to equip the next generation of chiropractors with the evidence-based clinical expertise needed for improved patient outcomes and ultimate practice success.

## CONCLUSION

A growing body of literature describes EBP instruction and curricular modification in the doctor of chiropractic program. Chiropractic education continues to use primarily surveys of student self-reported skills and attitudes to assess EBP instructional strategies. The educational outcomes being assessed appear to continue a focus on literature search, retrieval, and critical analysis skills. Since the first published study of chiropractic educational outcomes resulting from EBP instruction in 1999 by Green and Johnson,[26] there appear to be no published studies assessing patient outcomes attributable to EBP in chiropractic education. Research documenting patient outcomes from an evidence-based initiative in chiropractic college clinical settings remains an area to be developed.[4]

## CONFLICTS OF INTEREST

There are no conflicts of interest or funding sources associated with this commentary.

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