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Preparing Students for EBP

Pamela Levangie, PT, DSc

As I have been sitting here through the past day and a half, I have been quite amazed at how closely what we are doing at Sacred Heart University jibes with what I am hearing from other people. Certainly, I come from the framework that evidence-based practice is all about reading the literature, but we do not use it to the exclusion of other components of EBP. I also want to acknowledge up front that I don't think that we at Sacred Heart are the only ones who are using the following approach to EBP, or that our way is the only way it should be done. Rather, I simply want to describe the particular approach we have implemented.

At Sacred Heart University, which is where I am currently located, students begin course work that is foundational to preparing them for evidence-based practice. In the first semester of study, they take a *Concepts in Measurement* unit. During the second semester, I teach a semester-long *Clinical Research* course that focuses on understanding concepts of clinical research and on critical review of physical therapy literature. During the third and fourth semesters of study, when they are doing their clinical coursework, the emphasis is on the concepts of validity and reliability of the tools they use. The students also have an additional opportunity to do some limited critical review of the literature. Then, in the fifth semester of study - their fifth and final academic semester - the students take a course called *Research in Evidence-Based Practice*. This course is the so-called capstone experience in the state of Connecticut. The capstone experience is required for any graduate degree and can take many forms, and this course is our capstone. It would be considered to be our thesis or the equivalent to whatever else you might be doing or have done in your own programs that is similar. It is a three-credit course, offered in the last academic semester. The work is done in working groups of three or four students each, and it begins with a planning meeting in the spring semester, before the start of their third year. I serve as the course coordinator for this course.

During their planning meeting, we present the students with two or three complex patient cases. Then, as a group, they work through those cases to identify what they believe the key issues of examination and intervention for that patient are, across the spectrum, without

necessarily prioritizing them. We keep the topics purposefully broad, so things like strength assessment, pain control, and wound healing are the topics generated in the process. Each group then chooses one of those topics for a particular case. A group could choose an examination topic or an intervention topic for any one of the two or three patients. The group task then becomes to review the research literature on the case-related management issue and case. Of course, we have already talked about the fact that these may not necessarily be the same things. That is, they may not find a union in the literature between the case they have and the management issue they have chosen. Because of this, they first need to narrow their topic, because the topic is broad. We want to give them some wiggle room within it to choose a particular path within their topic. They do that through their literature review.

Next, they assess the value of the case or issue-related research as it relates to clinical decision-making. That is certainly a key component in terms of critical review. Then, and here is the biggest issue, they have to choose one article that best informs the case and the issue. They go into this process absolutely convinced that the article they want is out there. What is stunning about this is that although the word-of-mouth has gone down from previous classes that this does not always happen, they are still sure that they will find it. Every presentation begins with, "And, of course, we thought we would find the perfect article..." They have to make their own compromises as to what they believe best suits that patient.

We also give them the opportunity to choose a supportive secondary article that they can use in any way they see fit. They then have to write a précis of the two selected articles. As an aside here, we took this step initially because students could not get articles photocopied on short notice because of the copyright laws; this was a way of circumventing that. I do it now, however, because writing a précis of an article, which is really like a multi-page summary, is an amazing experience. It helps the students decide what is important in that article - what they can let go of and what they need to keep. Anyway, the group writes the précis, and then the rest of the class is only responsible for reading the pré-

cis, which keeps the work load down as they go through the course. The students in a group have to critique the research article, with a particular emphasis on its value to the clinical decision-making process, given its strengths and weaknesses. They then make a recommendation for the patient that is in the case, using the specific management topic. This becomes particularly important, and, in a minute, we will come back to that topic a little bit.

The patient recommendation is key to the experience. They have to justify that patient recommendation, using the reviewed article, the background literature, and the patient issues. They may go through all this and say, "And, therefore, we're not going to use TENS, and here is why." The reason may be that the literature does not support the use of TENS because it is inappropriate for the patient or for some other reason. They then have to propose a research study that will address one or more of the deficits in the current body of relevant research literature. Their particular goal is to propose a study, anticipating that the study findings will facilitate further clinical decision-making. Typically, they might say, "We cannot recommend TENS for this patient because we're missing some key element of data that we need. Here is the study that we think would give us that key element of data." Probably the most common approach, however, is to try to fix their primary article if they feel that it did not quite suit their needs or lacked rigor. The groups work by a continual process of consensus and compromise that are key elements in preparing them for the formulation of research wherever and with whomever they may be doing it.

Each member of that group is responsible for knowing the answers to questions about any aspect of the project. The culmination of that project is a formal presentation to their classmates. Increasingly, what the students have chosen to do is to invite friends, family, and significant others to that presentation. It actually becomes quite an important event to the student. The presentations begin about the sixth week of the semester. During the first six weeks, everybody is working on the project. In the spring, they all claim they are going to start during the summer, but one of the big questions is, "Did you really?" There is always one group that actually announces, "Yes, we did!"

The presentation must have a professional format - PowerPoint or some similar type of approach. The students do an extremely professional presentation. They must give a chronology of the literature review and their rationale, including the following: how they began their literature search; what path they followed; what decisions they made as they went through the process; and, how they got to the primary article. They then present

the primary article critique and their patient recommendation, followed by their proposed study. They complete all of that in about 45 minutes. The proposed study components require that they go through and address each of the following issues: Objective/ Hypothesis; Sample (inclusion/exclusion); Design and Variables (including levels); Methods of Measurement (outcome tools); Proposed Data Analyses (including rationale); and, Clinical Relevance of Potential Findings. I am sure there is more, and I know these are not particularly new ones to any of you. Up until now, I have not required that the students write an IRB or an informed consent for their proposed study. I do not think I will ever do this formally. What I will do instead is require that they present the proposed risks and benefits to the patient that one would include in an IRB because the risk-benefits is one of the most critical components of it.

At the end of the presentation, there is a 20-minute, open discussion period. This is entirely student-driven. Unlike what happens in many environments, faculty members have trouble getting a word in edgewise, which is an amazing thing, when you think about it. The presenters respond to questions on the choices made, their path through the literature, and any decisions that they made all the way through the process. They field questions and suggestions on their proposed study, which is where a lot of the emphasis tends to be in the questioning. The emphasis is on constructive or formative criticism. The students know that they are accountable for their work from day one. There are some very interesting components to this evaluation. This portion makes the students take the process very seriously. Two weeks after their presentation, they turn in a revision of their critique, their patient recommendations, and their proposed study, based on presentation feedback. They have the opportunity to use what they have heard from their classmates, in addition to any other input, in order to amend what they have done. They also turn in a complete bibliography, including annotations of key literature.

Table 1 provides an example of one of the complex patients used for this assignment. As you can see, we try to tackle as many different system dysfunctions as we can. The case as it is seen here focuses on the key elements that are going to stimulate evidence-based practice issues, but it is a much-abbreviated version of what the students get. *Case 1* gives samples of the various types of things that we might pull from one specific case. *Case 2* is a synopsis of another case.

Patient Case: Randall Wiley

- 70 yo African-American male elective CABG x 3 w/ intra-aortic balloon pump (7 days post-op)
- Intraoperative CVA → L hemiplegia (R inf. MCA)
- R lower lobe atelectasis post-vent (resolved)
- PMH: failed angioplasty
- PMH: Type I Diabetic
- Examination findings at day 7 given
- Signs of L unilateral neglect
- Pt. Goal: return home and resume some level of community volunteer work

Table 1

**Sample Patient Management Topics
Patient Case: Randall Wiley**

- Cardiac Rehab
- Respiratory tests [or intervention]
- Tone tests [or intervention]
- Balance tests [or intervention]
- Perceptual tests [or intervention]
- Gait tests [or intervention]
- Functional assessment [or intervention]
- Discharge planning (return to home)

Case 1

Table 2 illustrates sample issues for Case 2. You will see that many of the management issues overlap. That is where the students may say, “Well, I am interested in evaluating strengthening, but I am more interested in doing it in Case 1 than in Case 2.” The issues may be different in each case; one patient may have spasticity, the other may not. We do not discourage students from choosing strength twice, even when they might be in the context of two very different patients and their path through the literature could be quite different.

Patient Case: Marian Conway

- 28 yo female 4 mos. post-Guillian-Barre’
- Onset in 6th month of 3rd pregnancy
- Full paralysis (including CNs) for 6 weeks
- C-section at term
- Vent-weaned at 10 wks
- Full bulbar function returned
- TCU → Rehab
- ARDS residual
- Orthostatic hypotension problems
- Stress incontinence
- Plateaued ms. function
- Short-term Goal: w/c and transfer independence for return to home and childcare

Table 2

**Sample Patient Management Topics
Patient Case: Marian Conway**

- Respiratory tests [or intervention]
- Mobility tests [or interventions]
- Gait tests [or intervention]
- Strength tests [or interventions]
- Endurance tests [or interventions]
- Pelvic floor tests [or interventions]
- Adaptive/assistive device interventions

Case 2

Through this experience, the students are demonstrating their ability to search for and obtain relevant foundational literature. They are critically reviewing and independently assessing that relevance. Relevance is a key element in terms of what this experience means and what we hold our students accountable for. We are not interested in what the author’s conclusions are; we are interested in the student’s ability to draw independent conclusions.

The students learn through their course work, and ultimately through this experience, that the meat of any article is in the figures and in the tables. They must recognize and state the inherent assumptions and limitations in that literature. They must make recommendations based on their own conclusions drawn from that literature. They must explicate the assumptions made by the clinician when patient-management recommendations are put forth. Whether the student says that what they found is either good or not so good, he or she needs to say why and tag it, in particular, to a patient. They must propose appropriate clinical research questions and present the outcome of the group’s investigation using appropriate professional style. They must offer and accept constructive criticism and suggestions, and they must participate in peer review.

Those are the key elements of the experience. It is important to understand that this work was done in the context of a problem-based learning curriculum. This means that the students already have experience in self-directed learning, substantial experience with group work, and experience with routine peer evaluation. It also means that they have done previous presentations, and they have had previous experience with study formulation and with literature critique. In spite of all that previous experience, I would like to go quickly through some of the comments that we hear from the students.

These are very typical comments from the course evaluation:

"I liked the intellectual interaction, both within the group and during presentation."

Intellectual interaction – there is a term that does not always come up in our course evaluations!

"Gave me a deeper understanding and respect for research."

For those of you who might be having students do projects, this is a key element because you can get to the same goal or end without many of the frustrations.

"Creating a study proposal is a huge learning experience. I really liked it. Knowing in-depth each aspect of your presentation was a real learning experience."

"The literature search sharpened my ability to push through articles, decide their importance, and how or how not they would benefit our cause. My organizational skills greatly improved, given the insane amount of information we were generating."

"I now understand how different thought processes can affect the final outcome, and how working as a group, although extremely painful at times, helped to lead a more comprehensive understanding of the subject."

This could not be a more important outcome if you want to foster research in your clinicians later and if you want to foster evidence-based practice.

"I developed professionally through Capstone, by commitment, dedication, determination and desire, especially to get it done while learning and still having friends."

They just call it Capstone; it never gets a course name.

"Most of all, I learned to do educational work with people. I have worked with people all my life through sports and jobs, but nothing like this."

As with all the other comments, this student was simply responding to the question about what you would like us to know about this experience.

And lastly, *"I felt it truly tested my organizational, collaborative, research, presentation and statistical knowledge and skills."*

We feel that this process provides a consistent sense of pride and accomplishment, it fosters an evidence-based practitioner, and it promotes the idea that collaborative, clinic-based research is feasible and do-able. Can it be generalized beyond a PBL curriculum? Well, the idea for this actually evolved with my colleagues at Boston University; it started in 1993. When I left Boston University and began to work at Sacred Heart in 1996, we modified the experience to suit our needs there. Frankly, I do not know what BU is doing now, but they have a class size of a hundred students. This approach can be extrapolated outside of problem-based learning. The challenges are group size and numbers of groups (depending on your curriculum format) and the students' willingness to participate in open dialogue. If you have not set the stage for open dialogue as a precedent in your program, then you might find it will not be as successful. Frankly, the discussions that we used to have with a hundred students at BU were almost exclusively faculty-driven because the model for discussion had not been set.

It takes a tremendous commitment on the part of the faculty to be successful with this experience. You must work individually with the students and with the groups to facilitate their process. You have to do this in a way that is going to make it clear that they are making the decisions, that they are making the choices, and that, in the end, it is their product. That takes a lot of work.