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INVITED COMMENTARY

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Because the topic at hand is of personal interest, and also I believe of educational and professional necessity in order to develop effective practice outcomes, it was with great interest and excitement that I read “A Three-Question Framework to Facilitate Clinical Decision Making” in this issue of the *Athletic Training Education Journal*. Because “thinking” is at the heart of what athletic trainers do every day in their collective quest to provide safe and effective services to their patient populations, and because teaching the ability to think well is perhaps one of the most difficult endeavors for educators to master, the focus of this article is indeed timely and pertinent. The author is commended for addressing something as nuanced and complex as “clinical decision making,” but this invited commentary provides a welcome opportunity to further develop an important conversation surrounding clinical reasoning by pointing out a few limitations.

To be sure, effective clinical decision-making is essential for competent care and thus for the development of the able clinician; and yes, students must be able to hear and “see” how more experienced clinicians think when making diagnostic decisions and setting up subsequent plans of care for the management and rehabilitation of injury and illness. By extension then, supervising clinicians must be comfortable teaching students how they themselves think if they are going to then teach students how to think better during their clinical experiences. A flexible yet tangible cognitive scaffolding is needed, one that allows both student and instructor to go both forwards and backwards in reviewing their collective thinking experiences for flaws and accuracies of content, analysis and application. The author of the Three Question Framework points out this complex interplay between student and preceptor, and the need for continual reflection on the thinking needed to solve clinical problems by reviewing some of the literature on clinical reasoning and diagnostic problem solving. The author also provides a brief review of some of the typical barriers to developing student thinking in the real clinical context that makes up so much of their education. To this end, the article potentially provides a firm and portable “method” for less experienced clinical educators seeking a means of creating a dialogue with their students, particularly as it regards the use of

therapeutic modalities. However, there are a few interconnected issues that merit further discussion.

First, most of the research conducted on clinical decision-making and/or clinical reasoning has focused on the complex challenges associated with diagnostic decision-making—the ability to readily recognize key features that make up distinct data points of a case presentation in order to formulate, and then narrow a list of workable differential diagnoses into one plausible hypothesis. To do this, the evaluating clinician must be able to discern the relevant from the irrelevant by performing an intricate history and physical examination that is streamlined, organized and eventually, accurate. Amongst other things, the evaluating clinician must be able to properly identify the various internal and external factors that may be contributing to the pathology under investigation, properly select, execute and interpret various special tests and other diagnostic measures, and most notably, accurately connect all the various dots that comprise the patient presentation. For example, when evaluating a female runner with patellofemoral joint pain syndrome the student clinician must (among other variables) be able to discern whether weak hip musculature, or excessive pes planus is the primary cause of her dynamic femoral valgus and internal rotation that’s causing altered patellofemoral tracking. Doing so is critical to then developing an appropriate plan of care for the patient (strengthen the hip, fabricate orthotics, or both), as it is clear at this point that the involved tissue has been identified, and the contributing factors that can be addressed have been discerned.

In the end, the well thinking clinician must completely contextualize both the severity and nature of the pathology involved by being able to zero in on both the nature and magnitude of injury or illness before constructing or implementing a plan of care. In short, the attending clinician cannot set up an effective treatment plan of care until the bulk of the clinical reasoning process has already been completed—that being during the differential diagnosis process. The author does indeed make reference to that reality in citing prior literature on the subject, but in my view it fails to then adequately connect the steps from evaluation to therapeutic modality choice and application using clinical decision-making as

the bridge the author presents it to be. In effect, the presentation of the Three Question Framework may put the proverbial “cart before the horse” by using literature from clinical reasoning (for diagnosis formulation) as the table setter for clinical decision-making for therapeutic modalities. As I have highlighted with the patellofemoral case above, the clinical reasoning needed to diagnose the nature and level of pathology supersedes the thinking needed to choose the appropriate modality application.

The second concern is deeply interconnected to the first, but on a more basic level that traces back to cognitive psychology. Although requesting clinical instructors to ask athletic training students to first correctly identify the treatment goal and target tissues before choosing the most apropos modality for treatment appears to be a concise and portable framework for questioning and understanding, it doesn't really represent the higher-level thinking that's central to the fabric of critical thinking. In reality, the proposed 3 Question Framework represents lower level thinking that's based primarily on accurate recall of learned, technical information. More to the point, all clinical thinking is predicated upon the accurate acquisition of stored and organized biomedical knowledge—chiefly, the didactic elements of a comprehensive athletic training curriculum. For it goes without saying that one cannot think well with faulty information.

With regard to electrical modality usage, the indications, contraindications, and parameters of all modality devices are well stated (although not all are validated with high quality outcomes research) and should be clearly and definitively learned as requirements of all athletic training curricula. To point is the ultrasound example provided in this article—the hypotheticals provided do not represent in-depth critical thinking, but rather more factual recall of standard indications, contraindications and parameters for ultrasound use. And as I've stated, both the target tissue and treatment goal should have been properly identified during the initial evaluation process prior to the selection process. This is not meant to imply that no thinking is involved in choosing modality parameters, nor that rote memorization is all that is required, but rather that as presented, the 3 Question model does not represent clinical decision making as it's situated by the author, or the bulk of the literature on medical learning. Students should be able to answer each of the 3 questions posed in the framework, but not because a preceptor uses it as the basis for promoting clinical decision-making. Rather, once students pass their therapeutic modalities class, they should be well aware of the scientific theory and application details for modality usage for the variety of conditions they'll confront in the clinical setting.

The 3 Step Approach is indeed a short and simple framework for clinical instructors to gauge student understanding of choosing and applying therapeutic modalities for treatment. In this light, it may prove useful for less experienced clinical educators looking for a “tool” that will help gauge and promote student learning. And yes, it does address a certain level of thinking on the students' part in that it forces them to connect the diagnosis to the plan of care. As the author points out, the best evidence available for treatment outcomes for each modality application should also be central to any conversation between preceptors and students, and thus

part of any clinical decision-making process. Granted, we do not yet have the volume of evidence we need for all that we do at this point in time, but earnest efforts must be made to ensure that both student and preceptor are attempting to incorporate best practices when setting up treatment and rehabilitation programs. For these reasons, the author's efforts are to be commended.

But for those educators looking for more tangible ways to promote clinical reasoning that will advance their novice clinician's thinking abilities, be forewarned. Because the bulk of the clinical decision-making is actually done during the evaluation process, the 3 Step Approach will likely not be capable of promoting expert clinical reasoning by itself. The target tissue should be identified as a result of a thorough evaluation and gleaning of the differential diagnosis, and the treatment goal should then be predicated upon the results of the evaluation in which the stage or severity of the injured tissue has also been determined. From this, the modality choice should then be made on prior base knowledge gained from the students' didactic coursework in therapeutic modalities. The thinking required to do a comprehensive and effective evaluation in effect, sets up the thinking required to choose the proper modalities and plan of care; not the other way around.

AUTHOR REPLY

I read with great interest the comments of Dr. Geisler regarding the manuscript “A Three Question Framework to Facilitate Clinical Decision Making.” In them, Dr. Geisler suggests that this framework is not sufficient to replace other paradigms of clinical reasoning and diagnostic decision making. I agree. However, in no place do I suggest that this portable 3 question framework does so. In fact, the title of this paper clearly states that this framework is simply being held up as a potential tool to help facilitate (ie, assist) this process, not replace it.

Dr. Geisler goes on to say that a clinician must “completely contextualize...the pathology...before constructing or implementing a plan of care” and that the clinician “cannot set up an effective treatment plan of care until the bulk of the clinical reasoning process has already been completed.” Again, as a similarly seasoned clinician, I could not agree more. However, to imply that this 3 question framework suggests otherwise is not appropriate. Throughout the manuscript the framework is articulated as a tool that novice clinicians may use to assist in the development of a treatment plan, in concert with other pertinent data obtained in the evaluation process. In fact, considering the basic hypothetical clinical examples in the text, it is clear that this tool is being suggested for use after the diagnostics and high level of clinical reasoning has been completed. I would certainly hope that one would not consider the application of therapeutic modalities until after the initial clinical decision making process had been thoroughly vetted!

Next, Dr. Geisler makes another astute observation (via a similar hypothetical patellofemoral case vignette) that “the clinical reasoning needed to diagnose the nature and level of pathology supersedes the thinking needed to choose the appropriate modality application.” I agree again. However, this is not a

diagnostic tool, nor paper related to diagnostic reasoning. He goes on to say that the 3 question framework discussed in this manuscript “represents lower level thinking.” Never in this paper was it suggested that the framework be considered as a new clinical reasoning paradigm, or one to be employed independent of other data and information in the clinical case. And with regard to “lower level thinking,” this paper suggests a tool that is designed for novice clinicians who are, by default, at developmentally lower levels of thinking. As such, the framework is very appropriate.

In fact, in Dr. Geisler’s own work he has made the call for athletic training educators to strive to connect didactic, classroom learning with clinical educational experiences that are experienced in an “organized, progressive, and reflective manner in order to promote mental and physical competence, and subsequent clinical expertise.”^{1(p.54)} The 3-question model presented in this paper is proposed as just such a framework, and is actually designed in support of Dr. Geisler’s statement. It is a simple framework that connects didactic information (eg, modality theory and guidelines) with clinical educational experiences (eg, deciding which modality and what parameters to use) so that students feel more organized in their thoughts and decision making process. Furthermore, it is clearly stated in the manuscript

that this tool is a potentially useful one for novice clinicians who are just entering the clinical arena and being exposed to the seminal clinical decision making experiences of their training and career. This model will allow the student to think in a “reflective manner” while they are cultivating their own competence and confidence and linking theory with practice.

In all, while I respect and agree with Dr. Geisler’s broader philosophical discourse regarding clinical decision making as a whole, I stand by this method as a valuable and well-received tool for developing clinicians in the clinical arena, just as it was proposed. When used in concert with other pieces of relevant clinical data, it can help the student reflect on the clinical context as a whole and hopefully lead to increased confidence on the part of the clinical student.

REFERENCE

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