ATHLETIC TRAINING EDUCATION JOURNAL

www.nataej.org
DOI: 10.5608/070111

PERSPECTIVES

A Three-Question Framework to Facilitate Clinical Decision Making

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Context: Highly developed critical thinking and the ability to discriminate among many possible therapeutic interventions is a core behavior for the practicing athletic trainer. However, while athletic training students receive a great deal of clinically applicable information, many are not explicitly trained in efficient methods for channeling this great volume of data into sound clinical decisions.

Objective: To propose a simple, three-question framework for prudent clinical decision making in therapeutic modalities and rehabilitation contexts.

Background: Athletic training education occurs in various settings, where students are immersed in basic cognitive and psychomotor proficiencies germane to the prevention, evaluation, treatment, and rehabilitation of injury and illness in the physically active. In clinical practice, the knowledge and demonstration of these proficiencies are vital to the development of sound clinical decision making.

Description: I propose a simple and repeatable three-question decision making scheme that includes questions related to clinical goal(s), target tissue(s), and modality choice(s), as a potential mechanism to improve athletic training students' decision making in the clinical arena.

Clinical Advantage(s): This simple framework is adaptable to many clinical settings and can help cultivate decision making abilities and confidence, especially in the less experienced clinician.

Conclusions: The ability to make sound clinical decisions is fundamental to athletic training. With simple cognitive frameworks, clinical educators can empower students to make sensible decisions in the clinical arena leading to improved student self-confidence and patient outcomes.

Key Words: critical thinking, instructional techniques, clinical education

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Full Citation:
Sibold J. A three-question framework to facilitate clinical decision making. *Athl Train Educ J*. 2012. 7(1):11-17.

A Three-Question Framework to Facilitate Clinical Decision Making

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Athletic training education occurs in didactic, laboratory, and clinical settings.[1] After completion of the curriculum, it is common to hear reports of entry level athletic trainers who, despite great content knowledge, lack the ability to make prudent clinical decisions.[2] Highly developed critical thinking and the ability to "sort through a cluster of features presented by a patient and accurately assign a diagnostic label, with the development of an appropriate treatment strategy…" [3(P. 98)] is the ultimate goal of clinical education of entry-level athletic trainers.

However, when one leaves the controlled classroom/ laboratory environment for a clinical education site, there is often a disconnect between the junior clinician and the clinical preceptor.[4] Geisler & Lazenby[4] make 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."[4(p. 54)] The three-question model I present in this paper is proposed as such a framework. My purpose is to offer a three-question framework that clinicians and clinical educators may use to hone students' ability to arrive at sound clinical decisions with regard to therapeutic modalities and rehabilitation.

In the less formal clinical practicum site, many clinical mentors may assume that the rationale for their actions is obvious to the student. In this scenario, demonstration of clinical skills can become paramount to development of clinical decision-making.[2] In other words, the student may learn what to do or how to do it, but not how to arrive at the decision to do it. The ability to think critically is vital as it is an amalgamation of cognitive, psychomotor, and affective domains of clinical knowledge. This disconnect between the seasoned and novice clinician has been similarly identified in the literature,[5] and the ability to "critically pull apart ideas and put them back together cognitively" has been recognized as a fundamental variable that helps connect theory and application.[6(p. 383)]

Critical Thinking In Athletic Training

Critical thinking can be defined simplistically as the ability to make purposeful, self-regulatory judgments.[7] Rudd and colleagues[8] further define this concept as an "approach to solving problems or addressing questions with incomplete evidence and information and for which an incontrovertible solution is unlikely."[8(p. 5)] Thelatter's definition is an excellent description of what the athletic trainer is asked to do on a regular basis. Athletic training educators are encouraged to employ techniques that specifically target athletic training students' acquisition of critical thinking,[9] and problem solving skills.[10]

Despite the obvious need for the astute clinician to be able to think critically in the evaluation and treatment of patients, several barriers to critical thinking have been identified within the athletic training educational environment. In his call to action for us to strive to do better, Knight[2] suggests that we are not teaching young clinicians to think.[4] He cites several potential reasons for this. First, he suggests that the substitution of clinical courses for real clinical experiences may result in simulated clinical scenarios that take away from students' experiences with real patients. Second, he highlights the perversion of clinical learning experiences into clinical "work," where students may sometimes be considered as substitutes for athletic medicine staff and not as part of a learning environment. Finally, Knight acknowledges the potential lack of autonomy for students that may result from clinical situations where clinical instructors micromanage students or fail to engage them in clinical settings.[2] Scriber[11] paralleled this concern when he astutely noted that direct supervision of athletic training students, while important, does have the potential to limit the development of decision-making and critical thinking when supervision is overborn.

In response to this potential failure of clinical education in athletic training, repeatable and adaptable frameworks for clinical decision-making are needed. In proposing such tools (See Table 1), we do not suggest the use of global, general, "cookie cutter" algorithms, but instead the use of widely applicable, stepwise frameworks that students can use across diverse clinical situations to sort through symptoms and/or treatment options and match possible interventions to the patient-specific demands of the situation. In doing so, seasoned clinicians can provide students the framework for clinical decision-making that is portable and efficient so that in the frequently chaotic clinical setting the student is empowered by a system of thinking that may lead to more prudent decisions, and subsequently, clinical confidence.[4]

Experts vs. Novices

When one observes the clinical education environment, the difference between novice and expert clinical reasoning becomes readily apparent.[4] Experts are efficient at integrating pertinent observational cues and patterns of information. They are able to systematically retrieve information from their training and experience and apply it in a pragmatic fashion that takes into account the individualized needs of the particular context at hand.[12]

Novice clinicians are often unable to arrive at a timely decision due to interference of irrelevant variables and the lack of an ability to systematically filter through clinical findings and compare them to broad clinical experience.[4] Moreover, they may miss obvious and telling signs, and in doing so may fail to organize the information, jumping to a conclusion that is neither justified nor accurate.[4] This, coupled with the anxiety that many students report in the clinical setting, has the potential to lead to mistakes and poor patient outcomes, which can invariably threaten a student's self-confidence in the clinical arena.

As clinical preceptors, we must not assume that by observing our actions the student understands or learns the process by which we arrived at a particular clinical decision. By offering an explicit understanding of our clinical decision-making schema, we can

serve to make connections between didactic knowledge and clinical competencies. Students benefit from simple tools with which they can organize their clinical observations and integrate them in the context of their broad theoretical knowledge. By using these tools, we are teaching novice clinicians a skill that is portable and adaptable to many clinical situations; one that, with time, may greatly improve their ability to make sound clinical decisions.

Instructional Technique

The proposed framework has arisen from my 15 years of professional experiences in various clinical educational settings. The framework is based on a common observation that many students arrive in the clinical setting with a great deal of knowledge coupled with a lack of confidence in their ability to apply it. Although many students are able to integrate theoretical knowledge into clinical decision-making, some students continue to default to answering the question "Why did you choose that intervention?" with "Because that is what my ACI does" or "I don't know." The 3 questions in my proposed framework (See Table 1) are:

1) What is the treatment goal?

2) What is the target tissue?

3) What is the modality that meets the need?

What Is the Goal?

The development of short and long term goals is fundamental to the complete treatment plan. At its core, a therapeutic goal refers to the planned consequence of interventions undertaken by the clinician.[13] By having students identify, communicate, and record a well-developed treatment goal, the clinical educator is forcing the student to prioritize the clinical necessities of the case and establish the desired clinical outcomes for and with the patient. In doing so, the novice clinician can cultivate his or her ability to identify and integrate only the most relevant evaluative findings into the treatment plan, a fundamental skill for advanced clinical decision-making.

By requiring students to set a goal, and reflect upon it prior to initiating an intervention, clinical instructors can not only reinforce goal setting as a critical step in the treatment algorithm, but also force the student to critically examine the bevy of clinical options available to them and discriminate amongst them for best practice based on a desired outcome. Setting goals in the rehabilitation setting also ensures that critical variables are not overlooked, while giving clinicians a criterion against which they can measure the efficacy of their chosen intervention(s).[13]

What Is the Target Tissue?

Identification of the target tissue may appear initially as an elementary and assumed step in clinical interventions. However, this piece of the framework does not refer solely to the correct identification of a geographical landmark. Frequently, students are very well-versed in landmark identification for practical exams, sometimes with little or no understanding of the clinical significance of the underlying anatomical tissues. In addition to the obvious characteristics like tissue depth and functional status, one should also consider the structural, neurologic and vascular integrity, the stage of healing, histological properties, pathological co-morbidities and contraindicative properties of any tissue that is the target of a clinical intervention.

Consider the example of ultrasound. Identifying the target tissue may be as simple as determining the frequency of ultrasound necessary for a given anatomical depth (ie, 1 vs 3 MHz). However, there are other target tissue factors one must consider for the safe and appropriate deployment of ultrasound in the clinical setting. For example, is the tissue acutely inflamed? Is my goal acute inflammatory control or vigorous heating of the tissue for

Table 1. Three-Question Framework

Primary Questions	Examples of Sub-Questions
What is my goal?	What is the best sequence for today's intervention(s)? How does the goal fit within the overall plan/stage of healing? How will I measure treatment efficacy?
What is the target tissue?	What depth is the target, and what is overlying it? In what stage of healing and in what condition is the tissue? Are there contraindications specific to the tissue?
What is the modality that meets the need?	Does this modality specifically target the tissue? Is this modality synergistic with others in the plan? Does this intervention match the unique needs of this tissue?

elongation? Is the neurologic status of the tissue such that the patient can self-protect in the event of burn? These are just a few examples of the many target tissue considerations a clinician must attend to for the safe and efficacious utilization of just one modality. For each modality there are many possible tissue considerations that become paramount in the derivation of a clinical plan.

Not only does this step in the process ensure appropriate use of the modality that is ultimately chosen, but it also assists the student in discriminating among many possible modalities for the stated goal. Consider that based on a goal of tissue elongation, heat becomes a primary choice. However, in the absence of the consideration of tissue location and properties, the novice clinician is potentially unable to decide between a moist heat pack and 1MHz ultrasound. In this case, the intervention may miss the target altogether.

What is the Modality that Meets the Need?

Assuming that a clear goal has been established and appropriate consideration has been given to target tissues, the emerging clinician can then narrow down the possible tools available for a given goal. For example, an unrelated analogy that may help the student with this particular piece of the framework is that you don't necessarily need a fire hose to water your plants. Yes, it will get the job done, but not without significant and presumably negative side effects. Similarly, many modalities may share global effects (eg, pain control, strengthening); but tissue characteristics, the stage of healing, and patient specific variables often require certain modalities as opposed to others, or the adaptation of a modality to meet the unique needs of the patient and situation. Consider the hypothetical example of patellofemoral dysfunction in which the general goal (strengthening) and target tissue (VMO), have been established. There are many exercises that strengthen the quadriceps group. However, when the novice clinician is not systematic in his or her decision-making schema, the result may be that open chain, high resistance exercises are chosen, exacerbating the pain and leading to further atrophy and debilitation.

By explicitly considering one modality versus another, the clinician is, by default, forced to a) reflect back on the goal, b) systematically consider the merits of each possible modality, and c) consider the unique needs of the patient and condition being treated. Furthermore, this step allows a thoughtful consideration of the "fit" of a particular intervention in the overall treatment plan. For example, does this modality choice compliment or take away from others in the intervention? Does the order of these modalities make sense, and do they work synergistically toward the treatment goal? Clearly, therapeutic modalities are not the end all treatment goal. This framework should serve only as a way of arriving at sound clinical intervention decisions, all of which should be aimed at restoration of function.

These are often considerations that seasoned professionals make almost in the sub-conscious. Their experience has honed a fantastic ability to complete this entire three-step process seemingly in an instant. As clinical educators, we are failing the athletic training student when we fail to offer them insight as to how we arrived at our decision. It is our obligation to assist the student in developing simple and repeatable mechanisms that not only result in prudent clinical decisions, but also contribute to the self-confidence and self-efficacy of the developing clinician.

In fact, one could make a compelling argument that we are paralyzing the student when we simply answer the question they ask. We are telling them the what, not the how or the why. In agreement with prior calls,[4] it is my recommendation that when faced with a clinical question similar to the previous examples, the educator should respond with the simple framework of "What is your goal? What is your target tissue? What is the modality that meets your needs?" With time, students will begin to employ this system on their own, before relying on the senior clinician for help, thus arriving at sound clinical decisions independently.

Conclusion

A clinical educator should consider the following from Geisler & Lazenby:[4(p. 53)]

> *In many, if not most, curricula there often exists a gap between teacher and student, between message sent and message learned; a distance best signified as the immeasurable difference between perceived teaching, and actual student learning. The 'how' of knowledge construction and acquisition often remains hidden or unappreciated to both the learner and teacher in mis-educative environments.*

In other words, clinicians should engage students in a dialogue related to how the decision was made, and not simply make the decision and assume its justification is obvious.

Based on this principle, I have offered a potential three-question system that can be repeated across many clinical scenarios, particularly those related to the use of therapeutic modalities and/or rehabilitative interventions. I recommend that clinical educators employ it (and develop others like it) in the education of athletic training and other allied health students. By forcing the habitual use of frameworks such as the one proposed, clinicians and students alike may find power in their simplicity, and in doing so develop confidence in their ability to make prudent decisions in the continually challenging clinical arena. Future research should rigorously examine whether the proposed technique leads to improved critical thinking in the clinical arena described, as well as in other aspects of clinical practice.

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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