

# Editorial: Hyposkillia & Critical Thinking: What's the Connection?

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Over the summer I read an essay and a book, which continue to press themselves upon my mind and occupy my thoughts: *How Doctors Think* by Groopman,<sup>1</sup> and *Hyposkillia – Deficiency of Clinical Skills* by Fred<sup>2</sup> both contend that physicians' clinical skills suffer because, in the preparation, they are not purposively taught to think critically.

*How Doctors Think* is about what goes on in a doctors's mind while treating patients.<sup>2;see forward</sup> The idea for it came to Groopman,<sup>1</sup> a physician-educator, while on rounds with students, interns, and residents. In the process of discussing patients, Groopman was disturbed by the lack of depth of his student's questions and thinking. This glaring deficiency lead him to question "Who teaches doctors to think?" Pondering this question lead to discussions with many colleagues, and eventually to a New York Times best selling book. In reflection of his own time as a medical student, Groopman, realized that only "rarely did attending physicians actually explain the mental steps that lead him to his decisions."<sup>1</sup>

One popular approach to help physicians diagnose problems was clinical decision trees — preset algorithms or clinical guidelines that lead from major symptoms through a series of branching questions and eventually to a diagnosis and treatment plan. These, Groopman argued, are fine for "run of the mill diagnosis and treatment," but inadequate when symptoms or tests are vague, conflicting, or inaccurate. Algorithms have their place, he stated, but they also "discourage physicians from thinking independently and creatively. Instead of expanding a doctor's thinking, they can constrain it."<sup>1</sup>

Similarly, Groopman cautions against rigid reliance on the current rage—evidence-based medicine (basing all treatment decisions strictly on statistically proven data). This rigidity suggests rejection of treatment that is not backed by statistical data. Such an approach "risks having the doctor choose care passively, solely by the numbers. Statistics cannot substitute for the human being before you; statistics embody averages, not individuals."<sup>1</sup>

The 10 chapters of *How Doctors Think* are individual case studies of various difficult cases shared with Groopman<sup>1</sup> by various physicians. Recurring themes in these chapters are that physicians often are too quick to make a diagnosis; they do not consider all the possibilities when framing differential diagnosis.

Fred's<sup>2</sup> essay, and his suggestions for medical educators, was so impressive that I sought permission to reprint it in this issue (see p 82). In it, Fred expressed concern at the increasing numbers of

"hyposkilliacs" being graduated from medical schools. Hyposkilliacs, he stated are "physicians who cannot take an adequate medical history, cannot perform a reliable physical examination, cannot critically assess the information they gather, cannot create a sound management plan, have little reasoning power, and communicate poorly...They learn to order all kinds of tests and procedures but don't always know when to order [them] or how to interpret them."<sup>2</sup>

Sound familiar? Comments from many athletic trainers over the past few years convince me that newly graduated athletic trainers suffer from a similar malady. Recent graduates possess great knowledge and skills, but suffer from an inability to apply their knowledge and skills when dealing with actual patients.

Part of the problem, Fred asserted, is due to mental laziness caused by habitual reliance on technology, which "prevents physicians from using the most sophisticated, intricate machine they'll ever and always have—the brain."<sup>2</sup> As I pondered his words I asked myself a series of questions: Are athletic training students mentally lazy or is there more to it than that? Are we helping them develop critical thinking skills in order to apply the appropriate tests or treatment in each situation? Can they correctly analyze their patients' responses to that intervention? If so, how is it happening? If not, what can be done about it?

## Critical Thinking

A common theme between Groopman's<sup>1</sup> and Fred's<sup>2</sup> works is the need for greater critical thinking. This is not just a problem for physicians, however. Other health professions also cry out for the need to develop critical thinking clinicians as well.<sup>3,4</sup>

Despite a good deal having been written about critical thinking (just try googling "critical thinking"), and how to develop it,<sup>5,6</sup> it is a complex issue and not easy to teach. While developing critical thinking is an objective of most institutions of higher learning, few seem effective in teaching it across the curriculum. It appears to have become yet another in a long list of educational buzz-words. Gabennesch<sup>7</sup> argues that what most educators teach is at best quasi-critical thinking and that critical thinking has become a "pedagogical fashion that everyone applauds but few conceptualize very deeply."<sup>7</sup>

There are many definitions of critical thinking, ranging from simple statements such as "complex, thoughtful, purposeful process of forming judgments using reasons and evidence,"<sup>8</sup> to the

comprehensive consensus statement by the American Philosophical Association, who stated:

“We understand critical thinking to be purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual, methodological, criteriological, or contextual considerations upon which that judgment is based. CT is essential as a tool of inquiry. As such, CT is a liberating force in education and a powerful resource in one's personal and civic life. While not synonymous with good thinking, CT is a pervasive and self-rectifying human phenomenon. The ideal critical thinker is habitually inquisitive, well-informed, trustful of reason, open-minded, flexible, fair minded in evaluation, honest in facing personal biases, prudent in making judgments, willing to reconsider, clear about issues, orderly in complex matters, diligent in seeking relevant information, reasonable in the selection of criteria, focused in inquiry, and persistent in seeking results which are as precise as the subject and the circumstances of inquiry permit. Thus, educating good critical thinkers means working toward this ideal. It combines developing CT skills with nurturing those dispositions which consistently yield useful insights and which are the basis of a rational and democratic society.”<sup>9</sup>

Unfortunately, these definitional statements provide little insight to the specifics of the pedagogical implications or practices specific to teaching critical thinking skills in medical education. The prospect of teaching critical thinking has been overwhelming, but the thoughts of two authors (Bacon and Brookings) have guided me in my attempts to engage students in critical thinking. Sir Francis Bacon's<sup>10</sup> advice to readers was:

“Read not to contradict and confute,  
Nor to believe and take for granted...  
But to weigh and consider.”<sup>10</sup>

Thus critical thinkers are neither cynical (sarcastic, sneering, disbelieving) nor gullible (receive willingly or without question), but rather they are skeptical (thoughtful, inquiring).

Brookings<sup>11</sup> identified two characteristics of critical thinkers. People act as critical thinkers, he said, when they:

1. Identify and challenge the assumptions underlying their own or another's beliefs and behavior, and
2. Explore and imagine alternatives to current ways of thinking and acting.

Despite the fact that everything we do is based on assumptions, most people fail to acknowledge the assumptions that form the origins of their perspective. Assumptions, (mine, yours, theirs) are always in play; whether recognized or not. They are a part of each person's unique experiential background and affect how each views, processes, and interprets experiences. The following theoretical account (based on actual data) will serve to illustrate this point.

Authors of a study of stretching methods to increase hamstring

flexibility conclude that both methods resulted in increased flexibility, but one of the methods is more effective than the other. Authors of a replication of the study conclude that only one of the methods significantly increases flexibility. What was the difference? The second study included 3 groups, a control group in addition to the two experimental groups. Both the control group and one experimental group increased in flexibility, but there was no difference between the two. The act of measuring flexibility was enough of a stimulus to significantly increase flexibility. The supposed increases in flexibility in the lesser of the two experimental groups was the result of measurement rather than the stretching technique. In the first case the authors' conclusion was faulty because they were based on an unrecognized, and faulty assumption that the mere act of measurement would not affect the outcome. The wisdom in actively seeking out assumptions upon which beliefs are based will bring greater clarity and credence to research findings.

But the value of identifying assumptions goes far beyond clarifying research findings. It should become part of everyday life. Educators should help students develop the habit of digging out assumptions upon which their own and others ideas and beliefs are based.

Brookings'<sup>11</sup> second point, that critical thinking involves looking for alternative explanations or conclusions for any given set of findings, is indeed, the essence of differential diagnosis. The inability to view problems from varying perspectives and to consider all possible solutions is not limited only to physicians who, as Groopman<sup>1</sup> suggests, are too quick to render a diagnosis, but is common to much of our society, in all walks of life. When faced with decisions, most make snap judgments without weighing all the evidence, from all sources, and considering all possible alternatives. Conversely, critical thinkers actively seek out alternative explanations, and in comparison, decide which explanation is most likely.

To a large extent, our educational system does not facilitate critical thinking. Much of our education is founded on the lowest level of thinking—rote memorization. Hence students are constrained by a common experiential background that is devoid of the types of experiences that cultivate critical thinking. Such a system allows for maximum exposure but little time for in-depth explorative exercises. Providing early and frequent experiences in which diagnostic thought processes and strategies are overtly discussed would broaden student experiential backgrounds. Once broadened, a student then processes the next experience based upon greater understanding. Then that experience becomes part of his or her personal experiential background, and so on.

Critical thinking involves “processing information, rather than simply absorbing it: analyzing, synthesizing, interpreting, explaining, evaluating, generalizing, abstracting, illustrating, applying, comparing, recognizing logical fallacies.”<sup>7</sup> This is not to say that absorbing information by rote memorization is unimportant, rather students must be provided opportunities and encouraged to

go beyond memorization to process the information they absorb. Information has to be absorbed before it can be processed.

The same is true with critical thinking. Absorbing, or acquiring critical thinking skills is, of course, only the first step. Follow-up application and practice is necessary to convert this inert skill set into a viable, performative knowledge. Practitioners must *willingly* apply critical thinking skills in order to fully align declarative classroom critical thinking knowledge with real world situations. Educators can greatly facilitate this alignment by modeling such practices both in the classroom and clinical settings.

### Clinical Experience and Critical Thinking

Another suggestion from Fred<sup>2</sup> is particularly important to athletic training education. It is that “much of clinical experience should take place in real-world setting, supervised by experienced, compassionate, common sense, real-world practitioners.”<sup>2</sup> Real experiences with real patients guided by seasoned, perceptive instructors would convey deeper understanding than the all too often inert classroom knowledge which students have “absorbed.”

Many will say, “we do that; an integral part of AT education is clinical experience.” Yes we do, but how effective is it? How much clinical thinking does it involve? Four major impediments to critical thinking during clinical experience are: 1) clinical skills courses substitute for too much of students’ clinical experience with patients;<sup>13</sup> 2) clinical experience becomes “work” rather than “education;” where students learn by osmosis, i.e. picking up tips and tricks haphazardly; 3) clinical instructors hover too much over students, inadvertently stifling student’s autonomous decisions;<sup>13</sup> 4) many clinical instructors do not engage students in critical thinking about their patients. (See Radtke,<sup>14</sup> Table 1 for suggestions). Let’s strive to do better.

In summary, I encourage athletic training educators to adopt four specific strategies to purposefully teach and practice critical thinking skills with their students: 1) develop a habit of being skeptical (being neither cynical nor gullible); 2) identify and acknowledge underlying assumptions; 3) consider any and all alternative explanations for a given set of facts, statistics, or circumstances; and 4) create early, and frequent mentored clinical experiences involving autonomous critical thinking and decisions. The goal must be to bridge the gap of classroom knowledge and practical application and thereby help students become knowledgeable, confident, critical thinking professionals.

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