
Letter to the Editor

I would appreciate the opportunity to discuss your response to Dr. Nagwa S. Shenouda's comments that appeared in *The Journal of Chiropractic Education*, Vol. 14(2), 2000. I am presently a third-trimester student at the National University of Health Sciences (formerly, The National College of Chiropractic) and I was taught biochemistry by Dr. Shenouda. I completely concur with her position that biochemistry (more specifically, the Krebs cycle) is a significant part of chiropractic education. This letter attempts to address certain aspects of your argument that I consider faulty. Although unintentional, your position reinforces anti-intellectualism in chiropractic, a problem that has hindered the growth of this profession in the past, and continues to do so.

Prior to entering chiropractic school, I was an instructor of microbiology at the College of Staten Island of the City University of New York. As an educator whose responsibility was to teach nursing and physical therapy students, I strived to incorporate traditional microbiology concepts with my clinical experience as a hospital microbiologist. I hoped that as a result of my efforts, my students would understand the importance of the basic science they were learning as it related to clinical practice. In contrast, as a graduate student I was required to take one year of biochemistry, and my professor made it clear from the outset that the courses would be taught from a mechanistic point of view without clinical applications. As I worked in the hospital, it became very apparent that I would not use all of my biochemical knowledge because many of the biochemical tests used today to identify microorganisms are automated. I agree with the viewpoint that one can do an effective job in this setting without knowing the intricacies of metabolic pathways, but what happens if the machine breaks down and the tests have to be performed manually? Moreover, what happens when a physician comes into the lab asking about how a certain biochemical test was performed with respect to the diagnosis? A sound knowledge of biochemistry is essential in order to do the job and avoid a potentially embarrassing situation.

Despite the fact that most chiropractic students will never find themselves in the aforementioned situations, I still argue that a sound knowledge of metabolic pathways is necessary. On a conceptual level, I could not imagine calling myself a "doctor" of a healing art without knowing the details of energy metabolism. I realize that my clinical judgment will be based on a basic science foundation that includes such disciplines as biochemistry, anatomy, and histology, among others. However, unlike anatomy and histology, recent scientific discoveries in biochemistry have increased our understanding of the discipline exponentially. Certainly educators should not expect students to be abreast of all these new discoveries, but how can these future physicians understand the implications of future discoveries if they do not have a solid understanding of biochemical fundamentals such as the Krebs cycle (1)? It is my opinion that minimizing these areas of study (and the basic

sciences, in general) will put current chiropractic students at a disadvantage in their future practices when they are competing for patients in an aggressive health care market.

You wrote that “the first two points Dr. Shenouda raised with regard to the Krebs cycle are a fair approximation of what I believe that our students should know.” These two concepts are so basic that a high school student in an advanced placement biology course could understand them. I thought that I was in professional school. Is this what my “professional” education will be relegated to—that of high school subject matter? I sincerely hope not. Recall that one year of organic chemistry (with labs) is a prerequisite for entrance into chiropractic school. I suggest that if you intend to teach juvenile biochemistry, then abolish this prerequisite. Doing so would be a step towards anti-intellectualism.

It is understood that a fair portion of what chiropractic, allopathic, and osteopathic students retain during school will be forgotten when in practice (2). This is especially true of miniscule information that is not clinically significant. However, as a former educator I suggest that instructors at chiropractic institutions be very careful not to fall into what I call the “clinically significant” trap that many chiropractic students gripe about. That is, “Just teach us what is clinically significant.” I am in school to become a chiropractic physician and, although my approach to disease may be different than others, I am not exempt from knowing the intricacies of the basic sciences.

I have argued previously (3) that chiropractic education is analogous to the pouring of a concrete foundation. The more solid the concrete (the basic sciences), the better chance that the house (the clinical sciences) will maintain itself. The success that this profession now enjoys will be further propagated by the discoveries made in chiropractic research. Consequently, one of the responsibilities of chiropractic institutions should be to produce chiropractic scientist-practitioners (4). Unfortunately, chiropractic physicians are still not permitted to apply for many postdoctoral fellowship positions in research laboratories like other doctoral-level professionals such as Ph.D.s, M.D.s, D.O.s, D.P.M.s, and D.V.M.s. Although there are many reasons for this discrepancy, one of them is that the scientific community is still not convinced that a chiropractic education provides students with enough basic sciences for him or her to excel in the laboratory. Can you think of a better reason to have a sound foundation in biochemistry?

Perhaps the most disturbing statement in your response is when you wrote, “There is absolutely no need for chiropractic students, or students of any other health profession, to be aware of the technical minutia associated with the Krebs cycle or other chemical pathways.” How is an allopathic or osteopathic physician supposed to know what drug is appropriate to prescribe for a patient if he or she does not have a strong biochemistry background? Since many pharmaceuticals inhibit enzymes integral to specific metabolic pathways, it makes good sense that these physicians understand biochemistry. In fact, today there are herbal medicines utilized by many chiropractic physicians that have been found to affect metabolic pathways. Is this not another reason to know biochemistry?

Chiropractic institutions must forge ahead with their curricula to develop more scholarly chiropractic physicians. They must not regress by eliminating basic science courses that are essential to a chiropractic physician’s understanding of the human body. I am reminded of a statement that Albert Einstein made in an essay on education: “I want to oppose the idea that the school has to teach directly that special knowledge and those accomplishments which one has to use later directly in life. The demands of life are much too manifold to let such a specialized training in school appear possible.” Although Einstein may not have had

chiropractic education in mind when he wrote this, it seems that his position is appropriate to the current discussion. Although some of the material learned in the basic sciences is not clinically relevant, it must be mastered by chiropractic students, so that they may continue to facilitate the evolution of this profession and, more importantly, earn the respect that we all rightfully deserve.

I applaud my professors at the National University of Health Sciences for instilling in students the concept that the clinical sciences are an extension of the basic sciences. This is one concept that all chiropractic students should understand.

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REFERENCES

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In Reply

I appreciate the fact that Mr. D'Antoni, and Dr. Shenouda previously, have taken the effort and interest to engage in dialogue and express their viewpoints on these issues. I am equally disappointed by the apparent silence of other chiropractic educators, and of all institutions other than National College of Chiropractic. Hopefully, this is due to readers of *The Journal of Chiropractic Education* skipping the letters and editorials, rather than a reflection of apathy with regard to the composition of the evolving chiropractic curriculum.

I must say that I concur with several of Mr. D'Antoni's contentions. I fully support "the concept that the clinical sciences are an extension of the basic sciences", in the sense that without a good grasp of the basic sciences, there is little hope of going beyond a mechanistic approach to clinical practice, much less contributing to the advancement of the art. I also agree with the notion that education should not be strictly limited to the presentation of that which is "clinically significant". However, the question at hand is how much is enough? Surely, somewhere between the realms of "anti-intellectualism" and a vain attempt to master all the nuances of all basic science subjects, there must be an acceptable middle ground that provides students with the knowledge and skills necessary to become chiropractic physicians and to give them the starting points to become explorers at the frontiers of the profession should they so choose.

Mr. D'Antoni's letter quite clearly demonstrates one of the problems I see hindering the development of a "rational" chiropractic curriculum. As is proper, experts in various areas of subject content are brought to chiropractic colleges in an effort to insure that the education is of the highest quality. Unfortunately, some of the faculty with expertise in basic sciences or medical sciences (such as microbiology, pathology, pharmacotoxicology, etc.) have little or no understanding of the scope or nature of chiropractic practice. Lacking this background, they often default to their own professional or educational experience in setting curriculum priorities, sometimes with less than optimal results. These same faculty then contribute to the

NBCE examinations, compounding and perpetuating this situation. Mr. D'Antonio's application of his experience in the diagnostic laboratory setting to the chiropractic curriculum is a fairly clear example of this phenomenon. So is his making the case for the importance of a detailed biochemistry curriculum based on the prescriptive privileges of allopaths and osteopaths.

Mr. D'Antoni also makes the assertion that the integration of chiropractic into mainstream healthcare and academia are partially a result of a less than thorough basic science education. This view is not supported by history. Many states previously had basic science examinations required for licensure of all health care providers, and in some states these examinations were created with the assumption that they would provide an effective barrier to chiropractors. These examinations no longer exist, in large measure because they failed to provide that barrier. On average, chiropractic candidates performed better than their allopathic counterparts. We have long since demonstrably achieved educational parity in this arena, with no noticeable effect on professional integration.

It would be marvelous if every new chiropractor possessed an in depth understanding of the basic sciences, a high level of clinical skill and acumen, extremely detailed knowledge of methods utilized by other health professions, top-notch business skills and legal knowledge, political skills, and the skills required for producing high-quality research. This, however, is impossible. Attempts to achieve this by cramming more and more content into a limited time rob students the opportunity for synthesis and integration of materials that are essential to the chiropractic physician of the future. Many students adapt to information overload by defaulting to a learning strategy that involves the rote memorization of facts for each successive examination, often resulting in chiropractic graduates with little or no conceptual understanding of the material they have "learned", and no idea of how to use the information. I believe that a rational and consensual assessment and revision of the core chiropractic curriculum will improve both the educational experience and outcomes. I also believe that to succeed, we must collectively recognize that our primary objective is the education of highly skilled *chiropractors*, with the ability to engage in critical reasoning and to continue their own education after graduation. No chiropractic college can legitimately claim to have achieved this with all of their graduates, and none of us should be comfortable with our curricula until we do.

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