

## *The Future of Medicine is Behind Us: The Case for a 1912 Case-Based Curricula*

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In his best-selling 1989 book *The Seven Habits of Highly Effective People*, Stephen Covey had it right that we should “begin with the end in mind.” While Covey was referring to a desired direction and destination for the individual, there is convincing evidence that this principle is apt for medical education, specifically when employed pedagogically in the form of case-based learning. While the perspective on what the “end” really is for a practicing clinician and a medical student may differ, a middle ground is certainly accessible.

While the likely “end” for a practicing clinician is teaching medical students the skillset necessary for effective patient-physician interaction, the “end” for medical students is often much shorter-ranged, passing the next test. While the classroom tests initially take the first focus, at some point during the first 2 years of medical school, a second “end” begins to impose itself irritatingly into the consciousness of the medical student, their first national board exam. This exam is typically taken after their second year of study, which includes the United States Medical Licensing Exam (USMLE) for allopathic students and the Comprehensive Osteopathic Medical Licensure

Examination (COMLEX) +/- the USMLE for osteopathic students. At many medical schools, passage of these exams is high-stakes since students are often not allowed to matriculate into their clinical rotations until they have passed.

So, why even bring up the argument for a case-based curriculum unless the system is potentially broken? Case-based learning has been utilized in medicine since 1912<sup>1</sup> and is generally recognized as a method of teaching in which “the goal... is to prepare students for clinical practice, through the use of authentic clinical cases. It links theory to practice, through the application of knowledge to the cases, using inquiry-based learning methods.”<sup>2</sup> However, this goal of successful preparation for patient care continues to be unmet. USA Today published an article on July 18, 2023, entitled, “795,000 Americans a year die or are permanently disabled after being misdiagnosed.” This article was based on an article published the day before in *BMJ Quality and Safety*, which concluded, “[patients] become permanently disabled or die annually across care settings because dangerous diseases are misdiagnosed. Just 15 diseases account for about half of all serious harms, so the problem



may be more tractable than previously imagined.”<sup>3</sup> This report continues to confirm the findings of other reports, such as Lancet’s 2018 report on a “systematic analysis of amenable deaths in 137 countries,”<sup>4</sup> Daniel Makary’s 2016 article entitled “Medical error—the third leading cause of death in the US,”<sup>5</sup> and JT James “A New, Evidence-based Estimate of Patient Harms Associated with Hospital Care.”<sup>6</sup> However, most of us do not need to have an article summarize these findings for us —nearly all of us have experienced this firsthand or have a family member or friend who has. Suppose you believe the most recent numbers of patients impacted by misdiagnosis and assume that for every person affected, there is a modest direct or indirect emotional, mental, or psychological impact on a conservative 25 other people who are a meaningful part of their lives. In this case we have now affected 20 million people. This leaves out the social media impressions that are also in the multimillions when such adverse events become posted online for all to see and become a part of, whether they want to or not. Suffice it to say that despite the immensity of medical knowledge at our learner’s fingertips, we continue to struggle with patient outcomes.

The solution to meet the diverse “ends” of both practicing physicians and medical students and to address patient outcomes is the widespread robust employment of case-based learning. Susan F. McLean’s 2016 article entitled “Case-Based Learning and its Application in Medical and Health-Care Fields: A Review of Worldwide Literature,” in which 70 articles were reviewed, concluded that 2 main outcomes for student learners were “gaining knowledge” and “changing patient care outcomes.”<sup>7</sup> This approach certainly seems to fit the bill for addressing the students’ short-term “ends” and the practicing clinician’s long-term ones. Case-based learning (CBL) is not new in medical education and is employed in some fashion by medical schools worldwide with excellent effect. However, this form of pedagogy needs to take center stage for the entirety of medical education.

Let us imagine a 4-year curriculum built entirely around patient presentations, perhaps several thousand of them. Year 1, day 1 would begin with a 5-year-old with a knee scrape. Students would be tasked with attending to learning modules on the

skin and its role as a protective barrier. They would answer questions about the skin layers and their purposes. They would then delve into understanding the benefits of soap and water and antibiotic cream. There would be introductory information on inflammation and wound healing. At the conclusion of all the basic science and clinical supporting modules for “A 5-year-old with a Scraped Knee,” these medical students, by the end of day 1, would know how to manage a basic abrasion. This would begin the methodical presentation of 1 patient after another, each with slightly more complex conditions, building upon previously learned material. All basic science would slowly be incorporated and integrated horizontally and vertically across all 4 years, covering hundreds of the most common scenarios clinicians see daily in outpatient and inpatient settings.

The beauty of this model is that all other components required of a curriculum and other pedagogy variants (e.g., problem-based learning, patient-oriented evidence that matters) can be seamlessly integrated, conceptual or skill-based. You name it; there is a place to integrate it within the patient case: professionalism, ethics, diversity, equity, inclusion, systems-based practice, health disparities, health literacy, medical economics, history taking, physical exam, suturing, intubation, and so forth. Imagine how competent you could make the skillsets of fourth-year students heading into residency with this model. By the fourth year, the students would have covered all of the common cases and have moved from “A 10-year-old with Strep Throat” to challenging modules involving published case studies such as “Advanced Ovarian Cancer Detected Due to an Inguinal Metastasis in the Canal of Nuck.”<sup>8</sup> And perhaps the pièce de résistance of this model at this stage in the educational continuum is that the modules students would be tasked with critically thinking through would continue to review basic science modules, thus enhancing their lifelong learning and teaching skills. Imagine how vastly prepared these students would be for residency, especially if the last 6 months of their fourth-year curriculum were explicitly designed to incorporate such advanced patient cases related to their upcoming residency.

When everything revolves around the patient cases, the days of students asking, “Will this be on the



test?" and "Why are they teaching us this?" and "Is this tested on the boards?" will be long gone. The days of residency directors asking, "Why are these students not prepared?" will also fade away. The case-based model shows students the immediate necessity for acquiring knowledge and skills and presents a serious, professional approach to their medical education. Students would be preparing for success in their curriculum, success for their vignette-drive boards, and, most importantly, success in caring for patients. In order to advance patient care, we need to start with an improved medical education model, and where to begin is to start at the end.

## BIOGRAPHY

Aaron McGuffin, MD is the founder of Universal Notes, an online case-based educational tool for USMLE and COMLEX board preparation.

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