

GUEST EDITORIAL

Do EHRs Affect Students' Abilities to Develop Critical-Thinking Skills?

Since their inception, electronic health records (EHRs) have had a major impact on the health care and policy environments. Although patient privacy and implementation challenges have received broad attention, the effects of EHRs on teaching and learning are less well known.

The changes are far-reaching and involve more than simply a technological alternative to paper charts. With their ability to access data historically and via other health systems, EHRs can more closely integrate medical and dental services to provide patient-centered care. With their potential to reduce provider input errors and flag concerning values and contraindications, EHRs can improve patient safety and quality of care. And through the use of an intelligent decision support system (IDSS) to prompt and guide providers through the information-gathering process, EHRs can aid in patient diagnosis and treatment planning.

Despite these heartening possibilities, there is uncertainty regarding the impact of EHRs on students' abilities to develop critical-thinking skills and instructors' capacities to assess student competencies. The American Dental Education Association (ADEA) defines critical thinking as "purposeful, self-regulatory judgment which results in interpretation, analysis, evaluation, and inference, as well as explanation of the evidential, conceptual,



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methodological, criteriological or contextual considerations upon which judgment is based.”(1)

As NYUCD clinical faculty, developing and assessing students' critical thinking in practice environments is at the heart of what we do every day. Before the introduction of our EHR system, we observed the process of information gathering by students from patients, and evaluated the type and quality of

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the questions asked and students' subsequent analyses. We believed that students' abilities to generate appropriate questions followed by their interpretations of the findings were valid means for assessing their critical-thinking skills related to the dental management of a range of medical conditions.

Our third- and fourth-year dental students are tasked with applying the didactic training gained during their first two years of dental school to caring for their patients in clinical

settings. As their supervisors and mentors, we have gained familiarity with those sections of the EHR related to patient diagnosis and medical management. As our first year of implementation draws to a close, vital questions have surfaced. Most central of these is, “What will be the effect of EHRs on students' abilities to develop critical-thinking skills?” Further, “How does using an IDSS affect the development of student judgment in diagnosis and treatment?” And finally, “Will the set structure and guided approach affect students' abilities to practice dentistry independently, for instance, in practices with alternative EHRs in operation or in settings such as schools without EHR systems in place?”

Previously, we depended upon the unscripted nature of the patient interview process to assess student competency. Because these encounters no longer exist, we are searching for replacement options. The real-world attributes of service learning create challenges, including the tension between assessing student progress and competency while assuring patient safety and quality of care. Ultimately, it is our responsibility as clinical faculty to create environments that foster critical thinking and place students on the path to lifelong learning. Our overarching pedagogical goal is

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to foster the development of oral health professionals who use the best available evidence along with their clinical judgment and patient preferences to inform their decision making in caring for their patients.

In our view, continued evolution of EHR systems would do well to include both guidance from clinical faculty who use the EHR as a teaching tool and feedback from their students. Successful EHRs ought to enhance students' abilities to gather key patient data—

both self-reported dental and medical history information and clinical examination results. Students need to ask the relevant questions that lead to appropriate indicators for

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developing and analyzing medical management plans. The challenge for developers of EHRs is to proceed iteratively, ensuring that all essential aspects of their implementation are considered in order to maximize student learning and patient care.

To achieve their highest standards, EHRs should also allow for the assessment of competency in all aspects of dental care in order for students to become oral health professionals who deliver quality care to their patients. At present, it is unclear whether EHRs will abet the development of dental students into healthcare providers who can confidently practice as independent, self-assessing practitioners. Instead, students often report being

overwhelmed with the mechanics of completing the EHR forms and obtaining the requisite approvals, rather than focusing on the relevance of the patient information received and interpreting it properly to arrive at proper diagnoses and management plans.

As with any innovation of this magnitude and complexity, EHRs stand to benefit from the experiences and expertise of many stakeholders, including clinical faculty. In particular, we recommend assessing critical thinking and competency via a *Competency Chart*, where development and progression of each case depends on the questions students pose and the decisions they make. Appropriate answers then lead to the correct diagnosis and

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ADEA considers critical thinking to be the process of assimilating and analyzing information. This encompasses:

- an interest in finding new solutions,
- a curiosity with an ability to admit to a lack of understanding,
- a willingness to examine beliefs and assumptions and to search for evidence to support these beliefs and assumptions, and
- the ability to distinguish between fact and opinion.

Resources available at:

http://www.adea.org/about_adea/governance/Pages/Competencies-for-the-New-General-Dentist.aspx

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management plan. On the other hand, inappropriate answers lead students down the wrong path and signal that they are not yet competent, providing opportunities for faculty, abetted by EHRs, to expound on how best to enhance their skills. We also believe clinical faculty who oversee competency development ought to be involved in refining EHRs to ensure that they meet pedagogical needs and competency criteria.

It is our intent in this guest editorial to open the debate to make certain that all relevant perspectives are heard, including those of the authors featured in this issue of *JADE*. In this way, we can best ensure that the promise of EHRs to enhance student learning and patient care is achieved, without the peril of diminished critical thinking of future generations of oral health professionals.

Reference

1. American Dental Education Association. Overview of critical thinking skills: what is critical thinking? [Internet]. Available from: <http://www.adea.org/adeacc/~/Resources/Critical-Thinking-Skills-Toolkit/Pages/Overview-of-Critical-Thinking-Skills.aspx>



In August 2010, the American Dental Association (ADA) adopted a resolution stating that dental school graduates must be competent in the use of critical thinking. In the accreditation standards, critical thinking is one of the principles and also part of Standard 2, Educational Program. The intent is for educational programs to use teaching and learning methods that support the development of **critical-thinking and problem-solving skills**.

Resources available at:
<http://www.ada.org/~media/CODA/Files/predoc.aspx>