

HOD ACTION: Council on Medical Education Report 8 adopted as amended and the remainder of the report filed.

REPORT 8 OF THE COUNCIL ON MEDICAL EDUCATION (A-15)

Meaningful Access to Electronic Health Records (EHR) for Undergraduate Medical Education Students

(Resolutions 907-I-14 and 914-I-14)

(Reference Committee C)

EXECUTIVE SUMMARY

In 2011, the American Medical Association (AMA) began to assess medical student access to electronic health records (EHRs). CME Report 1-I-11, Medical Student Access to Electronic Health Records, described the barriers and limitations that, in many cases, have resulted in students assuming a mainly passive role as observers of the record. The report also analyzed the concerns that had been expressed about the effects of EHR use on student learning. This report provides an update on the current level of student involvement with EHRs in undergraduate medical education (UME) and explores best practices and opportunities to assure that students have ample opportunities to have access to and meaningful experiential clinical learning with EHRs.

This report also addresses Resolution 907-I-14, which calls for our AMA to support efforts to incorporate electronic health records training into UME, and Resolution 914-I-14, which asks that our AMA work with the Liaison Committee on Medical Education and the Accreditation Council for Graduate Medical Education to encourage the nation's medical schools and residency and fellowship training programs to teach trainees in those programs effective methods of utilizing electronic devices in the exam room and at the bedside, so that they enhance rather than impede the physician-patient relationship, so as to have a positive impact on said relationship and health care for the patient.

The movement to EHRs provides opportunities to improve patient care as well as increase the accuracy of communications. The implementation of EHRs, however, presents significant challenges regarding patient communication, safety and privacy, controls for authorship and authentication, compliance and liability. As a first step toward residency and beyond, medical students need to acquire the necessary hands-on experience to enter and discuss orders and prescriptions and document a clinical encounter in the medical record without direct supervision, without compromising patient care or safety. Learning to use the EHR in a way to enhance patient interviewing is also critical.

Some academic institutions are developing innovative teaching EHR systems, but software innovation and standardization is limited, since most academic EHR (AEHR) systems are custom built and information on AEHR selection and resources to identify EHR systems for educational settings are not readily available. As a result, integrating an AEHR into the curriculum can be complex, expensive and time consuming.

The AMA's Accelerating Change in Medical Education (ACE) Consortium, comprising 11 medical schools nationwide, is developing innovative models that can be adapted at other US medical schools (www.changemed.org). The Consortium's recent work includes investigating the tools necessary to create a robust virtual health care learning system, including teaching EHRs. Currently, each of the Consortium schools has an EHR system in place at the students' primary clinical sites with some ability for students to write notes. Examples of some of the innovative teaching EHR models are described in this report.

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REPORT OF THE COUNCIL ON MEDICAL EDUCATION

CME Report 8-A-15

Subject: Meaningful Access to Electronic Health Records (EHR) for Undergraduate Medical Education Students
(Resolutions 907-I-14 and 914-I-14)

Presented by: William A. McDade, MD, Chair

Referred to: Reference Committee C
(Daniel B. Kimball, Jr., MD, Chair)

1 Resolution 907-I-14, Promoting Education of Electronic Health Records in Undergraduate Medical
2 Education, introduced by the Medical Student Section and referred by the House of Delegates
3 (HOD), asked that our American Medical Association (AMA) support efforts to incorporate
4 electronic health records (EHR) training into undergraduate medical education (UME).
5

6 Resolution 914-I-14, Excessive Computer Time for Medical Students, Residents and Fellows,
7 introduced by the Wisconsin Delegation and referred by the HOD, asked that our AMA work with
8 the Liaison Committee on Medical Education (LCME) and Accreditation Council for Graduate
9 Medical Education (ACGME) to encourage the nation's medical schools and residency and
10 fellowship training programs to teach trainees in those programs effective methods of utilizing
11 electronic devices in the exam room and at the bedside, so that they enhance rather than impede the
12 physician-patient relationship so as to have a positive impact on said relationship and health care
13 for the patient.
14

15 In 2011, the AMA Council on Medical Education began to assess medical student access to EHRs.
16 With the transition from paper records to EHRs, students in many institutions are no longer able to
17 write notes and orders (under supervision) in the actual patient chart. This change is a step
18 backwards in the education of medical students. Council on Medical Education Report 1-I-11,
19 Medical Student Access to Electronic Health Records, described the barriers and limitations that, in
20 many cases, have resulted in students assuming a mainly passive role as observers of the record.
21 The report also analyzed the concerns that had been expressed about the effects of EHR use on
22 student learning. This report provides an update on the current level of student involvement with
23 EHRs in UME and explores best practices and opportunities to assure that students have ample
24 opportunities to have access to and meaningful experiential clinical learning with EHRs. This
25 report will also address Resolutions 907-I-14 and 914-I-14.
26

27 STUDENT ACCESS TO THE EHR
28

29 EHRs have become important tools in patient care; many medical schools have incorporated the
30 use of EHRs into their curricula. A survey by the LCME during the 2013-2014 academic year
31 showed that almost all (98 percent) of LCME-accredited medical schools allowed student access to
32 EHRs, although access to the EHR varied across institutions and hospital types (school- or
33 university-owned hospitals, affiliated hospitals, non-hospital ambulatory training sites, and VA
34 hospitals).¹

1 A 2012 survey of clerkship directors showed that permitted levels of use varied. The survey
2 indicated that 32 percent allowed students to only view the record; 41 percent allowed them to
3 view and write notes; and 27 percent allowed them to view the record, write notes, and enter orders
4 to be cosigned.²

5 6 BARRIERS AND LIMITATIONS

7 8 *Legal and Regulatory Requirements*

9
10 Students are denied full access to EHRs or have significantly restricted access due to hospital
11 and/or medical staff requirements, the structure of the EHR system (e.g., no place for student
12 notes), liability concerns, legal requirements, and payer requirements/regulations.¹ Guidelines
13 issued by the Centers for Medicare & Medicaid Services (CMS) for documenting evaluation and
14 management services under Medicare explicitly state that “students may document services in the
15 medical record in certain circumstances.” Services provided by medical students are not
16 reimbursable, and CMS has strict rules about which student documentation can be used to support
17 billable service.³

18
19 In a 2014 Compliance Advisory, the Association of American Medical Colleges (AAMC)
20 recommended that “the EHR should allow for real-time identification of the author of a note
21 (medical student, resident, non-physician provider or teaching physician) so that the author/history
22 of authorship and review is readily apparent to all users in the final note.”⁴ Although CMS does not
23 address documentation in the EHR, the AAMC also notes that meeting this requirement will mean
24 that teaching physicians cannot copy and paste or refer to students’ documentation of physical
25 examination findings or medical decision making in their personal notes.⁴ Inappropriate use of
26 medical student documentation to support a bill to Medicare may be considered fraudulent by the
27 federal government and may lead to allegations of violating the False Claims Act.⁴

28
29 Other factors impeding medical students’ use of EHRs are concerns about security, patient privacy,
30 and confidentiality. Access to health information, including data in the EHR systems at hospitals,
31 ambulatory care centers, and other health care institutions, is highly regulated by laws, including
32 the Health Insurance Portability and Accountability Act (HIPAA). These laws carry civil and, for
33 some forms of violation, criminal penalties for individuals who break them, as well as sanctions
34 and penalties for institutions that fail to protect health and personal information.⁵

35
36 Institutions also tend to restrict medical student access to EHRs because of issues related to
37 potential legal liability. The risk of medical errors due to the ability to copy and paste notes, input
38 incorrect information, and misuse clinical decision support systems can present wide-ranging
39 consequences for medical student education.⁶

40 41 *Educational Issues*

42
43 Some medical educators have expressed concern that students’ overreliance on clinical decision
44 support systems, which allow for easy access to relevant and up-to-date medical literature for
45 developing diagnosis and management plans, may lead to complacency in evaluating their own
46 decisions. For example, if trainees rely on the EHR system to alert them of potential serious side
47 effects or drug interactions, they may be less likely to research these possibilities before ordering a
48 medication.⁷ EHRs may also affect the development of oral presentation and communication skills
49 and impair the ability to translate and synthesize clinical information before and during rounds.^{7,8}

1 Further, some have argued that the EHR can hinder patient-physician communication^{9,10,11} and
2 might be a barrier for relationship building tasks (talking to, looking at, and building rapport with
3 patients) during clinical encounters.¹² A study by Margalit et al. showed that physicians spent an
4 average of 24 percent to 55 percent of the patient visit time gazing at the screen, and this time was
5 inversely related to the physician's direct engagement with the patient through asking questions
6 and listening to the patient.¹³ It can be challenging for the clinician to effectively communicate
7 while accessing the EHR with the patient present; minimize diversion of attention from a patient,
8 which can alter the patient's narrative; and avoid the diminishment of dialogue, particularly in the
9 psychosocial and emotion realm.¹⁴

10
11 Training and experience with the EHR system are important components for getting faculty
12 adjusted to teaching health IT. However, the steep learning curve for faculty may be a barrier.²

13 *Copying and Editing Student Notes for Educational Purposes*

14
15
16 EHRs have the potential either to enhance or impair the development of effective written
17 communication skills, which medical students are expected to begin exhibiting during UME.⁷
18 Medical students have reported that their documentation was better or more complete with the
19 EHR.^{12,15} In a national survey of clerkship directors, however, more than half of respondents (57
20 percent) stated that they use the student note to help document a resident or attending note, and
21 some (24 percent) indicated that there have been issues with an individual copying a provider's
22 note and using it as their own without the proper attribution.² The survey respondents also felt that
23 the "copy and paste" ability stifled a student's thinking, especially in obtaining and synthesizing
24 information, because students could and did "document" information that they didn't obtain
25 themselves.² Although a limited educational framework exists for teaching students proper EHR
26 documentation, the Alliance for Clinical Education has recommended that medical schools develop
27 competencies in EHR documentation for all students and that medical education leaders must
28 ensure that their students become skillful and ethical users of EHRs.^{15,16}

29 *Logistical and Structural Issues*

30
31
32 In a recent study of medical student use of EHRs, more than 80 different EHR systems were
33 reported as used by various institutions.² Thus, it is likely that medical students will not be using
34 the same EHR software systems at each of their assigned hospitals or practices. Furthermore,
35 although the use of clinical simulation EHR curricula are increasing,¹⁷ not all training sites have
36 teaching EHR systems in place. It can also be costly and time consuming for institutions to
37 establish licenses/permissions and log-in IDs as well as provide appropriate training for students
38 rotating through clinical clerkships.¹⁸

39 40 EHR CHARACTERISTICS THAT WOULD MITIGATE COMPLIANCE AND OTHER 41 CONCERNS

42 *The Advantages and Disadvantages of Scribing Notes for Educational Purposes*

43
44
45 Scribing by medical students is an activity that is distinct from allowing medical students to write
46 notes as part of their educational experience. If possible, the EHR should allow for clear and
47 automatic identification regarding whether a note is scribed as verbally instructed by the provider
48 or written by a student as part of the educational experience. If this is not possible, then students
49 should be required to clearly indicate when they are acting as scribes rather than students.⁴

1 Scribing allows students to obtain a firsthand view of a broad spectrum of clinical medicine. It also
2 strengthens the student's medical knowledge, clinical decision making, and patient interaction and
3 bedside manner. The process of capturing medical information with an EHR system also puts them
4 ahead of their peers. Physicians and nurses who have scribes enter and retrieve EHR data for them
5 are able to attend to patients more efficiently, especially in the emergency department.¹⁹ The Joint
6 Commission does not endorse or prohibit the use of scribes.²⁰

7
8 The University of Toledo established a successful scribe program in which it recruits first- and
9 second-year medical students on a volunteer basis to assist in the medical center's emergency
10 department by transcribing patient information for their records. Working six-hour shifts, the
11 scribes document the patient's chief complaint and medical history and take notes on pertinent
12 findings in the physical exam. The scribes review written information with physicians after the
13 exam, and then transcribe the data into the patient's EHR. They also alert physicians when lab
14 results and imaging studies are available and document all procedures performed, consultations
15 ordered, and changes in a patient's course of care or response to treatment.¹⁹

16 17 *Clinical Decision Support Systems*

18
19 While concerns have been raised, as noted above, clinical decision support systems available
20 within EHRs have the potential to enhance medical students' knowledge and guide learning.⁷
21 Examples of decision support systems include reference materials, diagnostic assistance, clinical
22 alert systems, drug dosing assistance, and preventive care or chronic disease management
23 reminders. In a survey of clerkship directors, respondents cited clinical alert systems that inform
24 users of drug allergies or drug-drug interactions as being most frequently used and valued.² A well-
25 planned EHR can facilitate education and allow physicians to apply evidence-based medicine in the
26 clinical context and provide opportunities to teach best practices.^{7,21}

27 28 *Learning to Use the EHR in a Way to Enhance Patient Interviewing*

29
30 Many health care experts have emphasized the promising capabilities of the EHR to involve
31 patients in their own health care management and have reported that patients feel more in control
32 of their care after viewing their visit notes.^{1,22,23,24}

33
34 Medical schools are recognizing the need to teach students how to maximize the EHR in patient
35 interactions. Students at the University of Arizona College of Medicine-Phoenix began receiving a
36 20-minute training session on how to use the EHR in a "relationship-enhancing way" after the
37 college's observational studies showed that today's computer-savvy students make the same
38 missteps as older generations when using an EHR in an exam room.²⁵ The college developed a
39 training intervention that teaches students to begin an office visit by explaining to patients why the
40 computer is important to the visit, reassuring patients about confidentiality, and positioning the
41 computer screen so the patient can see the screen to review information such as medication lists,
42 laboratory values, and x-rays. Students are also taught to recognize cues to close their laptops and
43 focus solely on the patient.²⁵

44 45 ACADEMIC EHR (AEHR) SYSTEMS AND VENDORS

46 47 *Resources to Identify AEHR Systems Available for Educational Settings*

48
49 An academic EHR (AEHR) is an adapted version of a clinical information system used in acute
50 care and ambulatory facilities with modifications that customize the product for the needs of
51 academic institutions. Since most AEHR systems are custom built, information on AEHR selection

1 and resources to identify EHR systems for educational settings are not readily available. Integrating
2 an AEHR into the curriculum can be complex; many faculty lack the expertise to identify technical
3 specifications and components of an EHR, including vendor selection, implementation, training,
4 and support.²⁶ Other factors that need to be considered in the selection of an AEHR system include
5 clinical requirements, the financial resources of the medical center and high cost of technology, the
6 geographic setting, the need for outreach into the community, and an analysis of the existing and
7 predicted flow of information and work within the clinical systems.²⁷

8
9 There are several different options for academic institutions to consider. Products range from fully
10 functional AEHR systems similar to those used in the hospital setting to textbooks with
11 accompanying activities on a software disc. Educational publishing houses are also developing
12 simulated charting programs that allow students to document in a computerized format. Fully
13 functional programs that allow for a large degree of customization vary by vendor and are more
14 expensive than textbooks with accompanying software.²⁸ To support the use of EHR products used
15 by medical students and residents, some vendors offer customized templates that track author or
16 source information and the date and time of origin as well as information being moved through the
17 patient record.²⁹

18 19 INNOVATIVE TRAINING MODELS

20
21 The AMA's Accelerating Change in Medical Education (ACE) Consortium, comprising 11
22 medical schools nationwide, is developing innovative models that can be adapted at other US
23 medical schools (www.changemed.org). The Consortium's recent work includes investigating
24 the tools necessary to create a robust virtual health care learning system, including teaching EHRs.
25 Currently, each of the Consortium schools has an EHR system in place at the students' primary
26 clinical sites with some ability for students to write notes.

27
28 At Vanderbilt University School of Medicine, for example, students are allowed to write notes
29 about their patients that are displayed in the patients' medical records. The entire patient note gets
30 copied automatically to a different secure server that houses the student's personal electronic
31 portfolio. Students can also write orders that are saved as draft. Notes are evaluated to assess
32 students' documentation and reasoning skills.

33
34 The technology-enabled curriculum at New York University School of Medicine includes a virtual
35 patient panel with de-identified patient data. Third-year students are allowed to write notes and
36 have mobile access to the EHR system; fourth-year students can write notes, write orders to be co-
37 signed, and have mobile access.

38
39 At Indiana University School of Medicine, a virtual health care system (vHS) and a teaching
40 electronic medical record (tEMR) have been developed to teach clinical decision making and
41 ensure competencies in system, team, and population-based health care skills. The tEMR provides
42 a safe computer program for learners to become familiar with EHRs. Students are able to see de-
43 identified patient data to practice making entries and creating a plan of care using the EHR
44 resources. The program also includes resources to help students learn the costs of different tests,
45 the effectiveness of those tests in discriminating between two diseases, and the advantages of using
46 one test over another. Faculty are also being trained as quality and systems coaches in current
47 health systems practice to be prepared to expertly use the tEMR. The vHS learning experiences
48 will incorporate interprofessional team care and be taught by faculty from various health
49 professions. The project runs sequentially over each year of medical school across all phases of the
50 curriculum for all students across nine statewide campuses.³⁰ This model is focused on a web

1 application; users need only Internet access, the correct permissions, and a web browser to access
2 the system.

3
4 Meanwhile, third-year students at Oregon Health & Science University interact with virtual
5 patients created in a simulated EHR (sim-EHR) in two manners. Simple EHRs and standardized
6 patients are combined to teach the art of maintaining patient rapport while using an EHR. Students
7 also use a sim-EHR case to demonstrate their skills in medication reconciliation, order entry, chart
8 maintenance, and evidence-based chronic disease management.³⁰

9
10 Warren Alpert Medical School of Brown University developed a longitudinal UME EHR
11 curriculum within a series of its clinical “Doctoring” courses. The six-course, non-specialty-
12 specific program was designed to teach knowledge, skills, attitudes, and behaviors of the
13 competent, ethical and humane physician, and combined instruction and assessment in medical
14 interviewing, physical examination, cultural competency, medical ethics, and professional
15 development. This program uses an educational paradigm that models interdisciplinary teaching
16 and collaboration. An initial training session in EHR use during the third-year clinical skills
17 clerkship was also implemented to formally introduce the computer into the physician-patient
18 relationship. The program uses mock data with which students can practice. A second advanced
19 EHR training module occurs late within the final Doctoring course.¹⁴ The school also constructed
20 user-friendly, behavior-focused frameworks or “behavior grids,” drawn from existing literature, to
21 facilitate and assess interviewing skills during EHR use and provide multisource feedback.¹⁴

22 23 AMA POLICY

24
25 Policy H-315.969, Medical Student Access to Electronic Health Records, states that our AMA (1)
26 recognizes the educational benefits of medical student access to electronic health record (EHR)
27 systems as part of their clinical training; (2) encourages medical schools, teaching hospitals, and
28 physicians practices used for clinical education to utilize clinical information systems that permit
29 students to both read and enter information into the EHR, as an important part of the patient care
30 team contributing clinically relevant information; and (3) encourages research on and the
31 dissemination of available information about ways to overcome barriers and facilitate appropriate
32 medical student access to EHRs and advocate to the Electronic Health Record Vendors Association
33 that all Electronic Health Record vendors incorporate appropriate medical student access to EHRs.

34 35 SUMMARY AND RECOMMENDATIONS

36
37 The movement to EHRs provides opportunities to improve patient care as well as increase the
38 accuracy of communications. With the transition from paper records to EHRs, students in many
39 institutions are no longer able to write notes and orders (under supervision) in the actual patient
40 chart. This change is a step backward in the education of medical students. The implementation of
41 EHRs also presents significant challenges regarding patient communication, safety and privacy,
42 controls for authorship and authentication, and compliance and liability. As a first step toward
43 residency and beyond, medical students need to acquire the necessary hands-on experience,
44 without compromising patient care or safety, to enter and discuss orders and prescriptions and
45 document a clinical encounter in the medical record without direct supervision.⁴ Learning to use the
46 EHR in a way to enhance patient interviewing is also critical. Some academic institutions are
47 developing innovative teaching EHR systems, but software innovation and standardization is
48 limited. Integrating an AEHR into the curriculum can be complex, expensive, and time consuming.

1 The Council on Medical Education recommends that the following recommendations be adopted in
2 lieu of Resolutions 907-I-14 and 914-I-14, and that the remainder of the report be filed.

- 3
- 4 1. That our American Medical Association (AMA) reaffirm Policy H-315.969, Medical Student
5 Access to Electronic Health Records, which recognizes the benefits of medical students' access
6 to electronic health record systems as part of their clinical training. (Reaffirm HOD Policy)
7
- 8 2. That our AMA support medical student acquisition of hands-on experience in documenting
9 patient encounters and entering clinical orders into patients' electronic health records (EHRs),
10 with appropriate supervision, as was the case with paper charting. (New HOD Policy)
11
- 12 3. That our AMA: (1) research the key elements recommended for an educational Electronic
13 Health Record (EHR) platform; and (2) based on the research—including the outcomes from
14 the Accelerating Change in Medical Education initiatives to integrate EHR-based instruction
15 and assessment into undergraduate medical education—determine the characteristics of an
16 ideal software system that should be incorporated for use in clinical settings at medical schools
17 and teaching hospitals that offer EHR educational programs. (Directive to Take Action)
18
- 19 4. That our AMA encourage efforts to incorporate EHR training into undergraduate medical
20 education, including the technical and ethical aspects of their use, under the appropriate level
21 of supervision. (New HOD Policy)
22
- 23 5. That our AMA work with the Liaison Committee on Medical Education (LCME), American
24 Osteopathic Association (AOA) Commission on Osteopathic College Accreditation (COCA)
25 and the Accreditation Council for Graduate Medical Education (ACGME) to encourage the
26 nation's medical schools and residency and fellowship training programs to teach students and
27 trainees effective methods of utilizing electronic devices in the exam room and at the bedside
28 to enhance rather than impede the physician-patient relationship and improve patient care.
29 (Directive to Take Action)

Fiscal Note: \$5,000

REFERENCES

1. Liaison Committee on Medical Education Annual Medical School Questionnaire Part II for Academic Year 2013-2014.
2. Hammoud MH. Opportunities and challenges in Integrating Electronic Health Records into Undergraduate Medical Education: A National Survey of Clerkship Directors. *Teaching and Learning in Medicine*. 2012;24(3):219-224.
3. Guidelines for Teaching Physicians, Interns, and Residents. July 2008. Medicare Learning Network, Center for Medicare and Medicaid Services. Department of Health and Human Services.
4. AAMC Compliance Advisory: Electronic Health Records (EHRs) in Academic Health Centers. Available at: https://www.aamc.org/em/aamc/compliance_advisory.pdf (accessed 1-20-15).
5. Health Information Privacy. Health Information Technology. US Department of Health & Human Services. Available at: www.hhs.gov/ocr/privacy/hipaa/understanding/special/healthit/index.html (accessed 1-20-15).
6. Gliatto P, Masters P, Karani R. Medical student documentation in the medical record: is it a liability? *Mt Sinai J Med*. 2009 Aug;76(4):357-64
7. Tierney MJ, Pageler NM, Kahana M, et al. Medical Education in the Electronic Medical Record (EMR) Era: Benefits, Challenges, and Future Directions. *Acad Med*. 2013;88:748-752.
8. Chi J, Verghese A. Clinical Education and the Electronic Health Records; The Flipped Patient. *JAMA*. December 20, 2014;312(22):2331-2332.
9. Lown BA, Rodriguez D. Commentary: lost in translation? How electronic health records structure communication, relationships, and meaning. *Acad Med*. 2012;87(4):392-394.
10. Yang DX, Kim YA. Patient-Physician Interactions and Electronic Health Records. *JAMA*. November 6, 2013;310(17):1857.
11. Duke P, Frankel RM, Reis S. How to Integrate the Electronic Health Record and Patient-Centered Communication Into the Medical Visit: A Skills-Based Approach. *Teaching and Learning in Medicine*. 2013;25(4):358-365.
12. Rouf E, Chumley HS, Doobie AE. Electronic health records in outpatient clinics: Perspectives of third-year medical students. *BMC Med Ed*. March 31, 2008;8:13.
13. Margalit RS, Roter D, Dunevant MA, et al. Electronic medical record use and physician-patient communication: An observational study of Israeli primary care encounters. *Patient Education and Counseling*. 2006;61:134-41.
14. Wald HS, George P, Reis SP, Taylor JS. Electronic Health Record Training in Undergraduate Medical Education: Bridging Theory to Practice With Curricula for Empowering Patient- and Relationship-Centered Care in the Computerized Setting. *Acad Med*. March 2014;89(3):380-386.
15. Hammoud MM1, Dalymple JL, Christner JG, et al. Medical student documentation in electronic health records: a collaborative statement from the Alliance for Clinical Education. *Teach Learn Med*. 2012;24(3):257-66.
16. Heiman HL, Rasminsky S, Bierman JA, et al. Medical Students' Observations, Practices, and Attitudes Regarding Electronic Health Record Documentation. *Teaching and Learning in Medicine*. 2014;26(1):49-55.
17. Milano CE, Hardman JA, Plesiu A, et al. Simulated Electronic Health Record (Sim-EHR) Curriculum: Teaching EHR Skills and Use of the EHR for Disease Management and Prevention. *Acad Med*. March 2014;89(3):399-403.
18. Mintz M, Navarte HJ, O'Brien KE et al. Use of electronic medical records by physicians and students in academic internal medicine settings. *Acad Med*. 2009;84(12):1698-1704.
19. Cunningham M. Medical student scribes gain early clinical experience, assist physicians. The University of Toledo News. March 10, 2011.

20. Gellert GA, Ramirea R, Webster SL. The Rise of the Medical Scribe Industry – Implications for the Advancement of Electronic Health Records. *JAMA*. December 15, 2014.
21. Peled JU, Sagher O, Morrow JB Dobbie AE. Do Electronic Health Records Help or Hinder Medical Education? *PLoS Medicine*. May 2009;6(5).
22. Greene J, Hibbard JH. Why does patient activation matter? An examination of the relationships between patient activation and health-related outcomes. *J Gen Intern Med*. 2012;27(5):520-526.
23. Delbanco in T, Walker J, Bell SK, et al. Inviting patients to read their doctors' notes: a quasi-experimental study and a look ahead. *Ann Intern Med*. 2012;157(7):461-470.
24. White A, Danis M. Enhancing patient-centered communication and collaboration by using the electronic health record in the examination room. *JAMA*. 2013;309(22)2327-2328.
25. Peck AD. Making the EHR your partner in patient care. *Medical Economics*. September 25, 2013.
26. Gloe D. Selecting an Academic Electronic Health Record. *Nurse Educator*. July/August 2010;35(4):156-161
27. McDowell SW, Wahl R, Michelson J. Herding Cats: The Challenges of EMR Vendor Selection. *J Healthc Inf Manag*. 2003 Summer;17(3):63-71.
28. Gardner CL, Jones SJ. Utilization of Academic Electronic Medical Records in Undergraduate Nursing Education. *Online Journal of Nursing Informatics*. June 2012;16(2):
29. Weis JM, Levy PC. Copy, Paste and Cloned Notes in Electronic Health Records; Prevalence, Benefits, Risks and Best Practice Recommendations. *Chest*. 2014;145(3):632-638.
30. Accelerating Change in Medical Education. American Medical Association. Available at: www.changemeded.org (accessed 1-20-15)