

Technology Fee Concept Paper Final Proposal

Title: Implementation of Electronic Medical Record Software for Educational Use by Health Science Center Students, Residents, and Faculty

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Sponsoring Organization: College of Dentistry, College of Medicine, College of Pharmacy

Purpose: The US healthcare system is rapidly moving to Electronic Medical Records (EMRs) with the federal goal of national implementation by 2014. (1,2) While EMRs have been shown to improve both the quality and safety of healthcare, less than 25% of hospitals in the US have implemented them. In part this is due to the lack of familiarity most healthcare providers have with such resources.(3)

There are significant benefits to implementation of EMRs. An EMR reduces medical errors by providing a single repository for a patient and medical information, while also serving as a resource for epidemiologic or health research data. This in turn can facilitate quality improvement in patient assessments and interventions. (3,4) Furthermore, because each patient only has one record generated, it will be electronically shared between the interdisciplinary team. This permits information to be communicated among multiple health professionals, including students and residents, who can in turn coordinate patient care and services. (4-9) UF Health Sciences Center students and graduates must be prepared to utilize EMRs in educational settings and future practice.

Although the use of EMRs has its benefits, studies involving provider perceptions on the implementation of EMRs have also identified concerns about their use. Key barriers to EMRs implementation included a reduced comfort level with EMR technology, an increased time requirement for data entry and reduced face to face interactions between patients and providers. (10) It is therefore imperative that healthcare providers are not only comfortable with the format for information entry for EMRs but that they can obtain this information in a method that does not diminish patient- provider interactions. (11)

Our proposed project will establish an educational version of the UF HSC EMRs on a server that is separate from that used for actual patient care. This educational version will be used to teach both health professional students and post-graduate residents how to effectively use these EMRs. At the HSC, Shands Hospital uses EPIC as an EMR and the UF Dental Clinics use AxiUm as an EMR. Both of these EMRs will be established for educational use so that our health professional students are better prepared as they enter their careers.

Impact/Benefit:

Approximately 2400 students, and over 1200 faculty members within the Colleges of Dentistry, Medicine, and Pharmacy could benefit and approximately an additional 1000 students and 200 faculty from the other HSC colleges are anticipated to join once Interprofessional Education cases are fully developed.

Benefits to Student Learning: Students in the 6 HSC colleges and post-graduate residents will benefit most from this project. Not only will this project allow our students and post-graduate residents to become familiar with the use of EPIC and AxiUM, but they will be trained to enter data into the EMR as they converse with patients. This is particularly important because patients prefer to have face-to-face communication with the health care provider rather than having a provider who is focused primarily on the computer screen.

The use of an EMR format also prompts students to ask pertinent questions and utilize appropriate assessment techniques during patient interactions. Furthermore, at least one study also found that when students interact with EMRs earlier in their careers they may be more likely to utilize higher level EMR services which are currently underutilized. (12) These higher level services included screening reminders, motivational messages, appointment keepers and discussion aids for patient generated questions.(6) Thus our premise is that if students encounter patient cases early in their curriculum that require them to interface with the EMR, they will be both better prepared for clinical rotations during their curriculum and will provide better patient care as UF graduates.

Moreover, as interdisciplinary cases are developed, these students will also benefit by learning how to work as an interprofessional team. This is important because future practitioners must learn how to individually document their

care and also collaboratively care for a patient as a team. By utilizing the same simulated patient record we propose that our students, residents and faculty will also be better prepared to practice in the new model of patient care that incorporates the expertise of multiple providers to improve patient care.

Benefit to Resident learning: The educational version of EPIC and AxiUm can better prepare dental, medical, and pharmacy students and residents for their learning experiences and assess their performance throughout their clinical years and residencies. Furthermore, an increased level of familiarity with EMRs may offer students, residents and faculty the ability to expand their EMR use to conduct epidemiological and health systems research which will in turn mentor future investigators. (6)

Benefits to Faculty Productivity & Effectiveness: Currently, a database for housing patient cases and EMR software educational use is not available. Faculty members are using either paper-based or web-based cases that require the expertise of an individual who knows HTML. EPIC and AxiUm software provides a database framework and structure that enables faculty members to more efficiently prepare and maintain patient cases. Faculty members will also benefit from this project because this technology provides a database with a structured data-entry format enabling them to easily build patient cases for teaching purposes. Complex patient cases could be set up to be flagged for teaching in a longitudinal fashion, something that is currently missing in most paper cases. The teaching database will also permit information to be de-identified and generated in a “just in time” format if faculty believe that will enhance student learning. This format allows a systematic release of information which mimics what would occur in a clinical setting when the provider orders laboratory and other assessment tests. (5) These teaching patient cases will also serve as examples of a coordinated record of dental, medical and pharmacy services, allowing a future expansion of interdisciplinary patient care to be taught. Finally by having students use EMR to write patient care notes, faculty will be able to critique these notes in a more efficient fashion. (12-14)

Benefits to the HSC: Use of EMR’s for educational purposes promotes efficiency. The HSC as a whole will benefit as students will learn how to use these EMRs during their pre-clinical courses and when they start their clinical rotations, the faculty and Shands staff will not have to orient them about how use EPIC and AxiUm during their clinical rotations. Therefore, HSC faculty and Shands Staff will be able to more efficiently prepare learners for their clinical experiences at Shands.

A team of individuals from Shands IT, and three of the Health Science Center (HSC) Colleges have agreed to work together to implement use of the EPIC software for education needs within the HSC. Similar experiences in other institutions have resulted in reduced training costs by at least one half of a training FTE position. Lastly, the collaboration both UF & Shands faculty on this project promotes the Health Science Center’s strategic goal of UF faculty and Shands staff working together to provide quality interprofessional health care and promote interprofessional education.

Effectiveness Assessment:

The EMR project will be implemented in four phases. This educational process will allow students/residents to learn in stepwise format where each phase will reinforce the prior educational objectives. Faculty members from each college plan to implement and assess the first two phases within the first year of the protocol approval and funding. The description of each phase is outlined in Table 1.

Table 1: Phases of EMR Development
<p>Phase I: Use of the EMR: to Teach Students How to enter patient data into an EMR in a correct and efficient format:</p> <ul style="list-style-type: none"> • Students will be provided instructions on how to enter patient information into the EMR in a complete and orderly fashion that produces a complete and accurate record.
<p>Phase II: Students will be taught how to effectively communicate with a patient as data is entered into the EMR. During the first professional year, dental, pharmacy, and medical students will learn how to interview patients while entering the information into an EMR.</p> <ul style="list-style-type: none"> • Students will be instructed on the appropriate physical and conversational techniques that may be used during a patient interview while entering patient data into the EMR • After individual practice sessions, students will be individually assessed at the Harrell Center via a simulated patient interaction and use of either EPIC or AxiUm.

<p>Phase III: Each college will develop patient cases that require longitudinal care of the patient; Assessment of EBM links to complete a patient note; Identification of Errors within cases (This includes writing a patient care plan using the RIME criteria for SOAP notes)</p> <ul style="list-style-type: none"> • Students will be given a patient case in an EMR to assess or “work-up” • Medical information/ procedures will be revealed only when the student/ resident requests a particular order (additional informational/educational resources/links within the system may be utilized) • Students/Residents will be asked to write a SOAP note addressing the patient’s problems/concerns • Faculty will grade the student/resident notes
<p>Phase IV: Interdisciplinary patient cases and communication methods will be developed</p> <ul style="list-style-type: none"> • Patient cases will be generated and shared between the three colleges. • Each patient will have multiple “medical/dental” problems that are inter-linked. This will force the students/residents from each college to request “consults” or clarification on the patient care process. • The medical team (including the students from all colleges will work together to generate a complete and comprehensive “care plan” for their patient.

Phase I will be evaluated using pre- and post-training measurements as described by Bloom et al. The scoring system will measure the number of data entry or omission errors compared to an appropriately completed EMR. Phase II will be evaluated by measuring the behaviors described by Morrows et al. These behaviors and criteria are found in Table 2.

<p>Table 2: Constructs of EMR-specific Behaviors (Morrows et al. reference # 11) (This interaction will be videotaped for grading in the Harrell center)</p>	
Adjust the geography:	
a.	Student/ resident did not have their back to the patient during the exam
b.	Adjusted the chair to be at eye-level with the patient
c.	Adjusted the screen so the patient could see it
d.	Student/resident moved close enough for me to read the screen in a “triangle” fashion.
Triad: Provider-patient EMR relationship:	
a.	Student/ resident introduced him/herself before turning to the computer
b.	Introduced the computer into the triad
c.	Shared EMR information on the screen during the exam to bring the patient into the triad, rather than keeping them outside the view
d.	Maintained good eye contact with patient during the encounter
e.	Alerted patient verbally when turning attention from me to the computer
Using the computer to teach/enhance the quality of care:	
a.	Showed patient his/her vital signs
b.	Graphed patient’s vital signs or showed flowsheets or trends in my health
c.	Asked if patient would like a copy of his/her data
d.	Accessed other online patient education materials for patient
Follow-Up:	
a.	Asked how patient desired to be notified of any new information or testing (i.e. Text message; e-mail; calls)
b.	Told patient when it would be recommended that he/she return (made note in EMR)
c.	Made recommendations for websites or resources that might improve patient care

Sustainability: The cost of using EMR for educational purposes is associated with the implementation of the software for educational use. The additional funds needed to sustain the project should be minimal and will be supported by the College Deans.

ADA: All HSC students completing patient care experiences at UF Clinics and Shands must use EPIC and AxiUm patient-care version. Procedures are in place to address ADA needs of students in both the patient care setting and the classroom.

References/ Resources:

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5. Adibe BA, Jain SH. Electronic Health Records: Potential to Transform Medical Education. *American Journal of Managed Care*. 2010;16:SP62-63.
6. Krist AH, Woolf SH. A Vision for Patient-Centered Health Information Systems. *JAMA*. 2011.305(3):300-301.
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10. Hill HK, Stewart DCL, Ash JS. Health Information Technology Systems Profoundly Impact Users; A Case Study in a Dental School. *Journal of Dental Education*. 2010;74(4):434-445
11. Morrow JB, Dobbie AE, Jenkins C, et al. First-year Medical Students Can Demonstrate EHR-specific Communication Skills: A Control- group Study. *Fam Med* 2009;41(1):28-33.
12. Peled J, Sagher O, Morrow J, et al. Do electronic health records help or hinder medical education? *PloS Med* 2009;6.
13. Stephens MB, Gimbel RW, Pangaro L. Commentary: The RIME/EMR Scheme: An Educational Approach to Clinical Documentation in Electronic Medical Records. *Academic Medicine*. 2011;86:11-14.
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Technology Fee Concept Paper Proposal Budget

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BUDGET

EDU Hardware/Software Costs*

Item	Quantity	One Time	Annual
Full time FTE	1	\$65,000.00	\$65,000.00
Citrix Server Hardware	2	\$6,609.00	N/A
Terminal Server Client Access Licenses	260	\$5,200.00	\$1,300.00
Citrix Concurrent Client Access Licenses	30	\$7,500.00	\$1,125.00
BLOB Server Hardware	1	\$4,092.00	N/A
EDU Cache Region HW	1	\$5,000.00	\$750.00
EDU Cache Region Storage	100 Gig	\$250.00	\$58.00
Backups	220 Gig	\$94.82	\$94.82
Cache Support	12 hours One Time 60 hours Annual	\$420.00	\$2,100.00
Epic Server Support	13 hours One Time 12 hours Annual	\$455.00	\$420.00
AxiUm data migration	60hours One Time 12 hours Annual	\$2,100.00	\$420.00***
TOTAL		\$96,720.82	71,267.82**

* Costs do not include the ability for students to print, scan, or dictate (partial or full dictation)

**Medical residents will use this after the pilot and therefore, GME will help sustain the costs as well.

*** Dental students will use throughout their curriculum; therefore, COD will help sustain this cost.

