

An EMR Designed for Teaching and Educational Research Based on Regenstrief Institute's Gopher System

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Abstract

Recognizing a significant gap between what students are taught in medical school and what physicians need to know in the modern practice of medicine, many experts have called for medical schools to improve student skills in areas including multidisciplinary teamwork, data analytics and electronic medical records. To help align medical education with a skillset future physicians will require, the Regenstrief Institute recently developed a standalone version of its Gopher computerized physician order entry system designed expressly for use in teaching environments. The system, known as tEMR, combines a rich patient database with the Gopher's clinical decision support architecture to deliver lessons and assess learners' interaction with the system.

Background

While US medical schools matriculate students with a depth of scientific knowledge, it is recognized that these same students graduate with inadequate training in subjects including health economics, health policy, and medical informatics. Adding to this gap is a trend within medical school hospitals that limits medical student access to electronic medical records at a time when electronic health records are becoming more central to patient care.¹ The Regenstrief Institute, with the support of the AMA's "Accelerating Change in Medical Education" (ACE) initiative, created a standalone version of its homegrown EMR (known as Gopher²), called the teaching EMR (tEMR) which will help close the gap. The tEMR was designed to support the revised curriculum at the Indiana University School of Medicine. Within the tEMR, students are not involved in patient care so the privacy and security issues which limit student access in production EMRs are not a concern. However, the tEMR does deliver a real world EMR experience; 1) as a branch of an in-use production EMR and 2) through the use of a synchronized, de-identified database of real patient data. The tEMR leverages functionality created for the production EMR to deliver customized education content and to assess students' critical thinking processes.

System demonstration

After discussing the tEMR's infrastructure and patient database, we propose to demonstrate several unique features of the Regenstrief tEMR. First, we will show the novel application of Gopher's clinical decision support architecture to deliver 'educational alerts' to students in a customized, contextual manner. We will demonstrate, using Regenstrief's RAVE rule-authoring platform, how educators can create this custom content. We will demonstrate a novel implementation of OpenInfoButton³ also designed to deliver customized content for students. Finally, we will demonstrate how detailed logs of student interaction with the system, including data review and clinical orders, are used to assess critical thinking skills.

Relevance

The software developed for this project will be released open-source. One of our principle design objectives is to develop software that can be used at medical schools across the country as well as for the education of non-physician learners. We believe attendees will find a variety of use cases—both didactic and research—for which the tEMR will be of benefit

References

1. Pageler, NM, Friedman, CP, Longhurst, CA. Refocusing Medical Education in the EMR Era. JAMA. 2013 Jan;310(21), 2249-50.
2. McDonald CJ, Tierney WM. The Medical Gopher--a microcomputer system to help find, organize and decide about patient data. West. J. Med. 1986 Dec;145(6):823-829.
3. Del Fiol G, Haug PJ, Cimino JJ, Narus SP, Norlin C, Mitchell JA. Effectiveness of topic-specific infobuttons: a randomized controlled trial. J Am Med Inform Assoc. 2008 Nov-Dec;15(6):752-759 (OpenInfobutton: <http://www.openinfobutton.org>)