An Evaluation of the Impact of the Implementation of an Electronic Medical Record Using the Open Architecture Clinical Information System (OACIS)

Tamara Odom-Maryon, Susan Butler, I. Benjamin Paz, Michelle Clements, Chuck Witt, Ashwin Kashyap, and Joyce C. Niland
City of Hope National Medical Center, Duarte, California

At the City of Hope National Medical Center (COH), the goal of our Integrated Advanced Information Management System (IAIMS) two year planning is to develop a comprehensive strategic plan for an institution-wide integrated information system. The comprehensive strategic planning process at COH revolves around four essential elements: human resources, information integration, technological resources, and an evaluation process. At COH we are embarking upon the implementation of an electronic medical record system using the open architecture clinical information system (OACIS). As part of the IAIMS process, a pilot study was conducted to compare the results retrieval component of OACIS to CARENET, the current results display system, to begin measuring the impact of the OACIS implementation. Conclusions drawn from the pilot study will be used to design a larger scale study. The pilot study consisted of two phases. In the first phase, 16 staff members from the Division of Surgery were asked to retrieve clinical laboratory and microbiology results on anonymous patients using both systems (OACIS and CARENET). The second phase of the study involved two participants who prepared daily summaries of laboratory results presented at rounds for in-house patients. In this abstract we present the design of our pilot study as well as preliminary results from the first phase and our progress with the second phase of the study.

STUDY DESIGN

Phase 1: Two tests of equal content were constructed to prevent any bias due to familiarity with a test. Each test included four patients. Participants were required to record laboratory results posted during a 48 hour period of time for a standard panel of chemistries and hematologic measures, noting the values as well as if the results were abnormal. In addition, the last five cultures reported during a two week period of time were recorded including the collection date, culture type, culture site and culture result The tests were piloted on both systems by three individuals to ensure that both tests were balanced with respect to the amount of time required to complete the exercises.

A crossover design was used. Patients were randomly assigned to groups based on two factors: 1) system order, i.e. which system was used first; and 2) test order, i.e. which test was performed first. In addition randomization was stratified by job title: 4 staff physicians, 4 surgical fellows, 4 physician's assistants or protocol nurses, and 4 secretaries. Participants completed both tests during one session. Study endpoints included the length of time required to complete the test and the error rate (total number of incorrect results/total number of results recorded). A study monitor was present during the testing sessions to observe each participant's approach to the tasks requested.

Phase 2: In this phase, study participants who prepare summaries for rounds were asked to alternate systems on a weekly basis for one month. A standard form was completed on a daily basis to record total time spent retrieving results. Participants were asked to note any system performance problems encountered. The study endpoints included the average daily time and total time for a two week period spent preparing for rounds using each system.

RESULTS Twelve participants have completed Phase I. The average test time was 26.7 minutes (range: 17 to 36) using OACIS and 32.3 minutes (range: 15 to 52) using CARENET. The total test completion time was 5-22 minutes longer using CARENET (N=7), 1-3 minutes longer using OACIS (N=4), and not different (N=1). The average error rate was 6.0% (range: 0%-16.3%) using OACIS and 7.6% (range: 0%-18.0%) using CARENET. Among 8 participants the error rate using CARENET was 0.3% to 14.0% higher and among 3 participants the error rate using OACIS was 3.4% to 12.0% higher. One participant made no errors using either system.

DISCUSSION Phase 2 is currently in progress. Preliminary results suggest similar error rates for both systems and a potential time savings using the OACIS system. In a direct comparison of both systems, participants identified OACIS as the preferable system and offered valuable suggestions to improve user satisfaction. The preliminary results from this study warrant expanding the study sample to include staff members from divisions across COH. This larger study will play an important role in demonstrating the benefits of OACIS to the general City of Hope community.

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