Delivering on the Promise of Electronic Medical Records: Opportunities, Constraints, and Developments

Claremont Graduate University

December 3, 2004

Symposium Summary

Abstract

The first CGU-QTC Health Symposium was held on December 3rd, 2004 at the Claremont Graduate University (CGU), Claremont, California. It was conducted as a research symposium with participation from regional and national healthcare experts focused on different segments of the healthcare system in the US. The main goal of the symposium was to explore the promise of Electronic Medical Records (EMR) from both a research and practice perspective. The symposium had four objectives: 1) to understand the promise of EMR, 2) to discuss innovations and deployment occurring in EMR, 3) to focus in on exemplar deployments, and 4) to identify key research and policy issues. A wide array of perspectives was offered by plenary speakers during interactive sessions. Among the key themes were that a significant gap exists between the promise of EMR and the institutional incentives needed to implement these systems, that there would be considerable value in developing a taxonomy of EMR use types that would facilitate uses such as for medical evaluations and disability assessments, and that there was a regional opportunity to develop regional EMR architectures and related collaborative research programs. Participants expressed an interest in further pursuing these themes through ad hoc workgroups, as well as through a possible follow-on workshop.
Background

The rise of electronic and online systems has allowed consumers unparalleled opportunities to manage their business and personal affairs. Email systems provide a one-stop communication means for accessing professional and social networks. Online banking services provide easy access to a range of banking, investment, and financial management services. Yet, the promise of an Electronic Medical Record (EMR) that is available to the consumer and to the spectrum of providers and payers working on the patient's behalf remains a major opportunity that has yet to be realized. This research symposium focused on that opportunity, key developments, and some of the challenges that lie ahead. The perspective was a regional one, considering the opportunities identified within our region and how we can benefit from the experiences at the national level as well as those of other regions.

Importance of the Electronic Medical Record

Gaining a complete picture of an individual's health history is a cornerstone of the ability to improve treatment and outcomes. Complete information is one of the five key requirements needed to accomplish the goal of “...anytime, anywhere medical care information and decision support”. The information technology needed to create accessible, complete, longitudinal electronic medical records is becoming a reality. Complex EMR systems already exist, for example, in VA facilities nationwide. In the private sector, dramatic improvements in online Medical Evaluations technologies are making it possible to develop a rich database of medical information and health parameters specific to an individual. Such evaluations can provide vital baseline information that complements and extends the data captured from clinical encounters.

Technological and Institutional Challenges

Health care providers and payers in the public and private sectors have established broad programs to facilitate the exchange of health data. As part of the Federal government's eGov initiatives, a National Health Information Infrastructure has high priority and in early 2003, the government's two largest direct health care providers, the Departments of Defense and Veterans Affairs, announced a commitment to realizing seamless data exchange. In announcing this cooperative effort, Secretary of Health and Human Services Thompson also stated that “we cannot do it alone...the private sector will be crucial” in achieving the vision of an integrated medical information infrastructure. Regional examples, such as the Santa Barbara Data Exchange, provide models for public-private partnerships that can facilitate seamless institutional integration.

CGU RESEARCH SYMPOSIUM

This workshop featured a series of presentations and in-depth discussions on the key topics influencing the development and evolution of the lifetime healthcare record concept. (See Appendix 3 for a detailed agenda and program). Our perspective is primarily a regional one, but one informed by national and international thinking on the
topic, as well as by the pioneering experiences that have shaped the present state of affairs.

**Format**

The format of the roundtable was one of active discussion, in which all participants will be involved in each session as discussants. The goal of each panel will be to formulate positions or recommendations for the future development of regional public-private healthcare networks, especially in the southern California region. The workshop was hosted by the School of Information Science at Claremont Graduate University, with sponsorship from QTC Management, Inc.

**Objectives**

The objectives of the workshop were:

- To understand the promise of EMR, especially as relates to a comprehensive picture of the individual
- To examine EMR implementation, especially innovative process and developments
- To illustrate model EMR cases, especially as they suggest insights and opportunities
- To determine pressing research and policy needs, including technical, institutional and societal issues

**Workshop Findings**

This summary focuses on the implications of the presentations and discussions relative to the four workshop objectives. (For access to more complete content, visit the workshop web site [http://is.cgu.edu/emrworkshop](http://is.cgu.edu/emrworkshop).)

**Objective 1: Understanding EMR**

- *Discussing EHR and EMR in Context*

  The first objective of the workshop was to understand the promise of EMR, especially as it relates to a comprehensive picture of the individual. Panelists agreed that EMR represents an important range of information within a context of broader health records called EHR, and hence it is defined as an important subset of EHR. A comprehensive overview of EMR and EHR was provided by defining its elements and requirements and by presenting the current state of these records with regards to implementation goals, barriers and opportunities. A major theme of the discussions throughout the day was that EMR needs to be concerned with the multiple contexts that surround its implementation. This would include institutional context (e.g., hospitals, providers), medical context (e.g., use for chronic disease or disabilities), and user context (e.g., lifestyle users and patient users). The effects of the variety in consumer expectations were also identified as an important factor in further adoption of these systems.
• **EMR and EHR as a Knowledge Base for the Future**
Among the elements of EMR, which are recording, accessing, sharing information, interoperability, unique patient identification, security and authentication, auditing and order entry, unique patient identification is still a big issue. Beside the fact that full implementation of EMR can fulfill a large set of requirements, this will take time and the growth in use will increase the number of areas EMR can be utilized. Based on the Institute of Medicine (IOM) “Growth Timeline” presented by Dr. Eugene Kroch, EMR systems in 2004-2005 can capture only essential electronic patient data and has limited decision support and reporting capabilities. However, in 2008-10 fully functional EHR systems with significant knowledge/decision support are expected to be in place with an extensive use outside of immediate patient care. Knowledge sharing through EMR to identify what works and what does not is an important promise and this will elevate the role of EMR from a collector and documenter that they have today to a helper, colleague and even a mentor from a physician perspective.

• **The Economic Factors Influencing EMR**
Dr. Kroch discussed the administrative and clinical drivers for EMR adoption and the role of IT in reducing medical errors. However, besides these promises there are certain barriers to EMR use such as high financial cost coupled with uncertain financial benefits and high initial physician time requirement that slows down the EMR implementation and adoption. It was mentioned that the physicians do not have high expectations from EMR and involving them more in the process of designing and creating EMR may help to increase the number of successful implementations and adoption rates. With the current EMR implementation model there is an imbalance in terms of the benefits stakeholders get in return to certain improvements EMR is promising (See Appendix 1 – Figure 1). Improvement that provides a complete gain for the patients will be complete loss for hospitals and hence this imbalance introduces skepticism in funding EMR projects. It was mentioned by Dr. Kroch that more projects are funded and the funding for these EMR projects to date has targeted projects coming from public sector.

• **The Need for a Taxonomy**
With these barriers and promises of EMR in mind, Mr. Steeve Kay presented a different view to the definition of EMR. Mr. Kay introduced a high level definition of human state and grouped it under three states which are healthy state, sick or injured state, and disabled state (See Appendix 1 – Figure 2). At each state data is collected with different goals and procedures in mind. In the first state the motivation is to ascertain well-being, whereas in the second state the question is more focused on curing, and the final state moves beyond curing by looking at rehabilititating and compensating the individual. These differences between three medical states of a person formed the basis for Mr. Kay’s taxonomy of medical information, which is an attempt to organize this amorphous information set into three distinct groups. For information that is collected at “Healthy State”, “Sick State”, and “Disabled State” the taxonomy proposes different names, which are Electronic Health Record (EHR), Electronic Medical Record (EMR), and Electronic Disability Record (EDR) respectively. Other panelists and presenters supported this point of view since it also brings a solution to the confusing list of acronyms and their meanings.
Objective 2. Innovations and Developments

Among the leaders in adopting healthcare information technology have been the government agencies responsible for providing healthcare and healthcare coverage — the single largest providers of such care in the U.S. — the Department of Veterans Affairs, the Department of Defense and the Centers for Medicare and Medicaid Services (CMS). Two of the workshop speakers provided insight into the challenges of EMR implementation in this environment and reported on some recent developments.

- **Necessity as the Mother of Innovation at DoD and VA**

**Col. Janice Lee** is the Air Force Medical Service Chief Information Officer working in the Office of the Surgeon General. As a career medical officer in the Air Force, she has had the opportunity to observe the development of and interact with the Composite Health Care System II (CHCSII) and its predecessor system CHCS. CHCSII is a clinical information system that is designed to generate and maintain comprehensive, life-long, computer-based patient record for each DoD Health System beneficiary.

The DoD healthcare system is unique in several ways, as discussed by Col. Lee. One key characteristic is that the DoD system must operate around the clock and worldwide. It is arguably the only healthcare system in the world that must operate on this scale. With no prior model on which to base a healthcare information system to support this kind of operation, DoD has been required to innovate in order to operate. Among these innovations have been:

- Store-and-forward capabilities so that medical data collected in the field can be uploaded and combined with a comprehensive medical record when communications permit;
- Combining public and private care modalities to meet service level commitments while minimizing fixed costs of direct care facilities (Tricare), which requires a means to consolidate records across a multi-modal system;
- Reaching out to a far-flung and diverse patient base by providing patient access to health care information and appointment scheduling online from anywhere;

The kinds of challenges faced by DoD and that have forced it to innovate_map some commonalities with the challenges that will need to be addressed in order to construct a national healthcare information infrastructure. **Scalability, population mobility and geographic dispersal, interoperability among systems, and the incorporation of legacy data** are key issues that DoD has encountered and that will face any national infrastructure.

- **The Influence of Scalability on Future Designs**

The problem of scalability was highlighted in this discussion. Scalability was assumed to be solved with CHCSII by designing it as a web-based system. However in practice, the lag time was unacceptably slow for busy medical practitioners. An important question for researchers and system developers will be how to design a system that avoids intolerable latency while using an architecture that is technologically flexible. Innovation in this area will be needed and several of the discussants posed considerations for solutions. The broad question was framed by **Dr. Leonard Kleinman**, “What is a reasonable architecture for the future?” **Dr. Lorne Olfman** suggested that web services might be a
potential solution, although Gene Kroch felt that web services would not be sufficiently scalable. Col. Lee suggested looking at solutions in terms of “transaction intensity” and considering modeling a healthcare information infrastructure on similarly transaction-rich infrastructures, such as banking. From another perspective, Dr. Randall Maxey (National Medical Association) suggested that centralization is a proven method of delivering massive applications over a wide area and that the time might be ripe to consider moving back toward centralized systems and away from a decentralized model.

- **Solution Convergence**
Solving problems held in common often leads to a convergence of solutions. For DoD and VA, both have had to create solutions to providing healthcare to a large and diverse population that is highly mobile. As noted above, both organizations have developed sophisticated EHR systems out of necessity (and partially under mandate). To permit patients to access their health information any time and anywhere, both organizations have also developed web-based personal healthcare interfaces, Tricare Online and My HealtheVet. The VA online interface is among the first ever web-enabled portals to actual health data for patients. Len Klienman pointed out in his comments that the VA has been dealing with integrated EMR implementation for over a decade and reiterated that the innovations that VA has produced, including the web interface, are model systems in the context of a developing national infrastructure.

- **The Role of the Private Sector in Innovation**
While there are still challenges to be faced in applying the lessons in innovation provided by DoD’s experience, the private sector has already begun moving forward to build on these and other innovations, such as those pioneered in the VA healthcare system. One example is the adaptation of VA’s highly successful in-house EMR system, VistA, for use in the private sector. Dr. Scott Shreeve, CEO of Medsphere, described how his firm is using VistA software, which has been made available by the VA as an open source product, as a means to automate smaller practices where budgets and technological expertise present a barrier to more commercial EHR products. Physician acceptance is high, not only because of the relatively low cost, but also because 80% of American physicians are already familiar with the VistA interface thanks to their earlier training in the VA healthcare system. This example illustrates the important role of the private sector, not just in serving as a driver of innovation, but also as an innovation disseminator. In considering the architecture of a national healthcare information infrastructure, this facet of private sector activity should not be overlooked, especially when the case is often made by large software companies that their natural role in the process is as the drivers of software innovation.

**Objective 3: EMR Cases**
The presentations illustrated several model EMR cases from federal level to regional level. All of them suggested insights and opportunities for future EMR implementations.

- **An All-Digital Hospital**
Mr. William Arsenault is the acting CEO for the California Heart and Surgical Hospital (CHSH), breaking ground in Loma Linda in January 2005. This physician-built and managed facility is the first new hospital to receive construction approval in California in over 10 years. CHSH will be the first hospital in California to be designed and built as an
all-digital facility. Mr. Arsenault cited several drivers for the decision to go all-digital, but specifically noted that this decision was not driven by any particular fondness for technology. Rather, he stated that meeting the goals of the hospital’s stakeholders essentially required an all-digital solution. The drivers he cited included:

1. Fundamental changes in the relationship between physicians and hospital management, including the desire of physicians to exert more control;
2. Gaining the ability to control costs by collecting data more effectively;
3. Using information technology to gain a competitive advantage and leverage local commitment to IT infrastructure;
4. Consumerism driving patients to seek the highest-quality facility.

Several critical success factors were cited as contributing to the CHSH initiative:
1. The commitment of top practitioners to this model—physicians required to commit to the all-digital framework in order to sign on to the project;
2. Commitment of the city of Loma Linda to high-speed communication infrastructure—bringing high-speed access to each and every home;
3. Commitment to provide top quality service in every aspect of the patient’s experience;
4. The importance of selecting a super-vendor rather than struggling with fragmented sourcing.

- **Telehealth Programs in the Veterans Affairs Healthcare System**

The case of Telehealth in the Greater Los Angeles Veterans Health System was presented by Dr. Len Kleinman, Telehealth Director. One of the programs the VA has initiated is Care Coordination/Home Telehealth (CCHT). The goal of CCHT is to make prompt interventions for issues that might otherwise be neglected and cause avoidable acute care episodes or long-term institutional care. One key element was the effective use of information technology to maintain patients in their homes. Dr. Kleinman described the use of a simple in-home device, the HealthBuddy, that uses a telephone modem connection to carry out two-way health communications with patients. Patients are asked a series of questions (developed by their care coordinating nurses) and use a simple keypad to respond. The system has been placed with an initial group of patients since September 2004 and led to some preliminary insights:

1. Case selection must be appropriate in order to use the technology effectively. For example, high-risk patients with heart failure, COPD, and diabetes with comorbidities are the best candidates.
2. Patient identification may need to be supported with a DSS for practitioners.

Other telehealth projects within the GLA health system are in the start-up phases, such as telemental health and educational kiosks designed to provide supplemental health services in rural areas that lie a prohibitive distance from the main facility in West Los Angeles.

- **A Regional Healthcare Information Organization (RHIO): Santa Barbara County Care Data Exchange**

The two cases described above are not specific instances of EMR, but rather use EMR as an essential component of their services. CHSH and the VA telehealth programs are both
excellent examples of how much can be done when an organization or a service is not hobbled by legacy systems. Both of these are flourishing while other systems that do not have that freedom are hampered in their abilities to succeed with healthcare information systems.

A more EMR-centric case was briefly presented by Dr. Gene Kroch within his broader discussion of the state of EHR. This case was the Santa Barbara County Care Data Exchange, a nationally-recognized regional healthcare information organization (RHIO). SBCCDE serves an area containing approximately 200,000 patients within a network of hospitals, clinics, pharmacies, and the public health department committed to exchanging clinical data at the point of care. The project features a fully-operational peer-to-peer data exchange.

Lessons learned from the Care Data Exchange experience include:
1. The importance of identifying the source of funds to build and support such an exchange. SBCCDE has been termed a “demonstration” project and is currently funded with pilot funds. Dr. Kroch cited the ability of future RHIOs to secure funding as a critical factor for success;
2. Attracting and securing participation from providers in the absence of a push from consumer demand;
3. The advantages of the regional model in establishing a workable system scale.

Objective 4: Research and Policy Needs

The presentation raised myriad research and policy needs. At the highest level of federal policy, the HIT Policy panel has outlined four goals, each with three strategies (See Box 1).

<table>
<thead>
<tr>
<th>Goal 1 – Inform Clinical Practice</th>
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<tbody>
<tr>
<td>• Strategy 1 – Incentivize EHR adoption</td>
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<td>• Strategy 2 – Reduce risk of EHR adoption</td>
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<td>• Strategy 3 – Promote EHR in rural/underserved areas</td>
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<th>Goal 2 – Interconnect Clinicians</th>
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<td>• Strategy 1 – Foster regional collaborations</td>
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<td>• Strategy 2 – Develop NHIN</td>
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<td>• Strategy 3 – Coordinate Federal HIS</td>
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<th>Goal 3 – Personalize Care “Consumer-Centric”</th>
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<td>• Strategy 1 – Encourage use of personal health records</td>
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<td>• Strategy 2 – Enhance informed choice</td>
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<td>• Strategy 3 – Promote telehealth systems</td>
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<tr>
<th>Goal 4 – Improve Population Health</th>
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<td>• Strategy 1 – Unify health surveillance architectures</td>
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<td>• Strategy 2 – Streamline quality/health status monitoring</td>
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<td>• Strategy 3 – Accelerate research/dissemination</td>
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Box 1 – Goals and Strategies
• **Inform Clinical Practice**

The discussion among panelists included elements related to each of these policy goals. As regards to the goal of inform clinical practice through EHR adoption, Dr. Kleinman noted that the VA has a long history of adoption experience. The different experiences of VA, DOD and local implementations point to the need to better understand the influence and cost of legacy systems on the speed and effectiveness of EMR implementation and the possibilities for creating wholesale changes in EMR systems. Research by Dr. Thomas Horan and colleagues at CGU has underscored the need to understand how EMR can be integrated into the physicians work practice (See Appendix 4 for publication list).

• **Collaboration**

On the issue of collaboration, several key areas for policy and technical investigation were identified. For example, Gene Kroch noted policy tradeoffs between supporting regional and national architectures. Steeve Kay observed that a key technical challenge—and one with policy implications—was to clarify the standards for medical assessment across agencies, for example between the Veterans Administration and the Social Security Administration. Bill Arsensault described his hospital’s choice to “go digital” and to do so in a manner that obliterated legacy systems—that is, to start fresh with a completely new, next generation system. Dr. Robert Jenders’ prepared presentation noted both the organizational and technical challenges (including national language processing) to achieving HL7, a generalized coding scheme for medical records. Ms. Synthia Molina’s discussion on ABC Codes noted the importance of making certain that a complete range of codes are adopted, suggesting a research question about the impact of coding schemes on healthcare operations and the relationship between the acceptance of codes and the application of treatments.

• **Customer-centric Services**

There was considerable discussion about the need for and challenges in achieving “customer centric” electronic services. Tom Horan noted that for many technologies (email, vhs), emerging consumer demand has served as an important “tipping point” between early adopters and subsequent widespread use. Gene Kroch agreed, but noted one of the complexities of the health care system was that it was not a true market and therefore systematic incentives (for providers, purchasers, and consumers) had to be considered. Steeve Kay and others observed that the Electronic Health Record (EHR) provided the template for more widespread use of electronic records, not just during conditions of sickness. Synthia Molina noted that research is needed to better understand how policy, politics, organizations and technology intersect to facilitate or thwart widespread adoption of a more consumer centric approach. Dr. Kleinman noted that the implementation myHealth-eVet provides a cutting edge example of such an approach and that studying it may provide lessons for other customer-based population.

• **Improving Public Health**

On the broader issue of improving public health, Col. Lee noted that having a more complete and robust electronic health system would assist the services in tracking the nature and magnitude of “symptoms”, such as the “Gulf War syndrome”. Having databases that can facilitate the such epidemiological research. Steeve Kay noted how there are varying standards and methods for dealing with health, medical conditions and
disability. These differences create tremendous inefficiencies in the system. Research is needed, he continued, that help devise systems that can efficiently measure citizens health, medical and, where needed, disability conditions.

When considering such population-level systems, the issue of scalability and interoperability become paramount. Just how to achieve a system that can track real time epidemiological information on a massive scale becomes a daunting technical, organizational and policy challenge. Research is needed on technical innovations (such as interchange protocols) and policy strategies to overcome significant historical and economic barriers to cooperation.

In addition to the policy and research recommendations that related to the four national goals, two other important points emerged from the discussions. One item pertained the magnitude of the effort needed. There was widespread consensus that the magnitude of the effort needed to aggressively implement EMR vastly exceeded the efforts to date, and this included acknowledgement of recent federal government pushes for IT in health care. Secondly, there was considerable discussion on the need and opportunity for creating a Southern California research network to address the unique needs and opportunities in the region. Len Klienman noted that, indeed, southern California has the capacity for leadership in medical informatics, though other regions such as northern California have been better organized to date. Gene Kroch confirmed that regional approaches seem to have appropriate scale to innovate. Moreover, as demonstrated by several of the entrepreneurs that participated in the forum, Southern California has a strong history of technological innovation and that bodes well for medical informatics innovation in the region.

Conclusions and Next Steps

The participants noted the ongoing need for research and information sharing about opportunities and challenges to EMR implementation. Tom Horan noted that the findings from the symposium would be used to inform future research undertaken by CGU and hoped it would be of assistance to other symposium attendees as well. Several participants commented that a follow-up meeting would be helpful to clarify these opportunities. Tom Horan closed by noting that CGU is considering a follow-on symposium in 2005 and that this might presents a useful platform to forward the insights and networks formed at this symposium.
Appendix 1 – Figures and Tables

Who Benefits if a Goal is Achieved?

<table>
<thead>
<tr>
<th>Some worthy improvement goals</th>
<th>The Business Case</th>
<th>The Economic Case</th>
<th>The Social Case</th>
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<tr>
<td></td>
<td>Hospital</td>
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<td>Indemnity</td>
<td>DRG</td>
<td>FFS</td>
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<tr>
<td>Lower disease incidence through prevention</td>
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<td>No</td>
<td>Yes</td>
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<td>Fewer lab tests from reduction of re-work</td>
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<td>Shorter hospital stays through efficiency</td>
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<td>Increased employee productivity</td>
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<td>Enhanced patient quality of life</td>
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<td>Reduced mortality, longer life expectancy</td>
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<td>No</td>
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Figure 1

A Taxonomy of Medical Information

- Electronic Medical Record (EMR), as we know it today, is synonymous with Electronic Health Record (EHR) - both are often used to represent all three medical states.
- Using the three-state model, I propose that we organize this amorphous information set into three distinct groups:
  - Healthy State ➔ Electronic Health Record (EHR)
  - Sick State ➔ Electronic Medical Record (EMR)
  - Disabled State ➔ Electronic Disability Record (EDR)

Figure 2
## Appendix 2 – AGENDA

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Description</th>
<th>Speakers</th>
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<tr>
<td>8:00 - 8:30</td>
<td>REGISTRATION AND COFFEE</td>
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<td>8:30 - 9:00</td>
<td>OPENING</td>
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<td><strong>Greetings</strong></td>
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<tr>
<td>Lorne Olfman, Ph.D.</td>
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<td>Professor and Dean, School of Information Science, Claremont Graduate University</td>
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<tr>
<td><strong>Workshop Objectives</strong></td>
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<tr>
<td>Tom Horan, Ph.D.</td>
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<td>Associate Professor, School of Information Science, Claremont Graduate University</td>
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<tr>
<td>9:00 - 10:00</td>
<td>EMR PROMISE AND CHALLENGE</td>
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<td><strong>Keynote Address</strong></td>
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<td>Eugene Kroch, Ph.D.</td>
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<td>CareScience</td>
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<td>10:00 - 10:15</td>
<td>BREAK</td>
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<tr>
<td>10:15 - 11:15</td>
<td>EMR DEVELOPMENTS AND INITIATIVES</td>
<td>Steeve Kay, President and CEO, QTC Management, Inc.</td>
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<td>Col. Janice Lee, MD</td>
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<td>U.S. Air Force</td>
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<td>Scott Shreeve, MD</td>
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<td>Co-Founder and Chief Medical Office, Medsphere Systems Corp.</td>
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<tr>
<td><strong>Discussion</strong></td>
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<td>12:00 - 1:00</td>
<td>LUNCH</td>
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<td>1:00 - 1:45</td>
<td>CASE STUDY</td>
<td>William Arsenault, MBA</td>
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<td>CEO, California Heart and Surgical Hospital</td>
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<td><strong>Discussion</strong></td>
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<td>1:45-2:45</td>
<td>RESEARCH PERSPECTIVES</td>
<td>Leonard Kleinman, MD, MPH</td>
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<td>Director, Telehealth Program: VA Greater Los Angeles Healthcare System</td>
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<td>Synthia Molina, MBA</td>
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<td>CEO Alternative Link Inc., Albuquerque, NM</td>
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<td>2:45-3:00</td>
<td>HEALTH RECORD STANDARDS AND INTEGRATION</td>
<td>Robert A. Jenders, MD, MS, FACP</td>
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<tr>
<td>Associate Professor of Clinical Medicine</td>
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<td>Enterprise Information Services, Cedars-Sinai Medical Center</td>
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<td>University of California, Los Angeles</td>
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<td><strong>Discussion</strong></td>
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<td>3:45 - 4:15</td>
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Appendix 3 - DETAILED PROGRAM

INTRODUCTION

The rise of electronic and online systems has allowed consumers unparalleled opportunities to manage their business and personal affairs. Email systems provide a one-stop communication means for accessing professional and social networks. Online banking services provide easy access to a range of banking, investment, and financial management services. Yet, the promise of an electronic medical record that is available to the consumer and to the spectrum of providers and payers working on the patient's behalf, remains a major opportunity that has yet to be realized. This research symposium will focus on that opportunity, key developments, and some of the challenges that lie ahead. The perspective will be a regional one, considering the opportunities identified within our region and how we can benefit from the experiences at the national level as well as those of other regions.

Importance of the Electronic Medical Record

Gaining a complete picture of an individual's health history is a cornerstone of the ability to improve treatment and outcomes. Complete information is one of the five key requirements needed "to accomplish the goal of...anytime, anywhere medical care information and decision support" [1]. The information technology needed to create accessible, complete, longitudinal electronic medical records is becoming a reality [4]. Complex Electronic Medical Record systems already exist, for example, in VA facilities nationwide [5]. In the private sector, dramatic improvements in online Medical Evaluations technologies are making it possible to develop a rich database of medical information and health parameters specific to an individual [6]. Such evaluations can provide vital baseline information that complements and extends the data captured from clinical encounters.

Technological and Institutional Challenges

Health care providers and payers in the public and private sectors have established broad programs to facilitate the exchange of health data. As part of the Federal government's eGov initiatives, a National Health Information Infrastructure has high priority and in early 2003, the government's two largest direct health care providers, the Departments of Defense and Veterans Affairs, announced a commitment to realizing seamless data exchange [2]. In announcing this cooperative effort, Secretary of Health and Human Services Thompson also stated that "we cannot do it alone...the private sector will be crucial"in achieving the vision of an integrated medical information infrastructure [3]. Regional examples, such as the Santa Barbara Data Exchange, provide models for public-private partnerships that can facilitate seamless institutional integration.

CGU RESEARCH SYMPOSIUM

This workshop will feature a series of brief presentations and in-depth discussions on the key topics influencing the development and evolution of the lifetime healthcare record concept. Our perspective is primarily a regional one, but one informed by national and international thinking on the topic, as well as by the pioneering experiences that have shaped the present state of affairs.
The format of the roundtable will be one of active discussion, in which all participants will be involved in each session as discussants. The goal of each panel will be to formulate positions or recommendations for the future development of regional public-private healthcare networks, especially in the Southern California region. The workshop will be hosted by the School of Information Science at Claremont Graduate University, with sponsorship from QTC Management, Inc. Proceedings of the workshop discussions will be made available to all participants in printed form and via a participants-only section of the CGU IS website.

**Objectives**

A select group of experts has been invited nationally and from the Southern California region to discuss:

1) The Promise of the Electronic Medical Record: Integrating for a comprehensive picture of the individual;
2) EMR Implementation: Processes and Procedures
3) Case Analysis: Model Projects informing progress;

Discussants are drawn from the realms of healthcare providers, payers, service providers, and academic research.

**Keynote Address: Electronic Medical Record (EMR) Promise and Challenge**

Momentum is building rapidly for implementation of the electronic medical record. The recent establishment of a national healthcare infrastructure coordinator has accelerated movement in this direction. Modernizing healthcare records with a view toward reducing medical error is seen as a national priority. Yet healthcare is an inherently local enterprise. Most healthcare is delivered at the local/regional level. As such, a regional approach, with a view toward later implementation of wider interoperability may hold the best prospect for success. Our first roundtable session will explore the nature of the EMR and its implications for data sharing among region-wide entities.

**Issues and Influences**

Some of the key questions being addressed in discussions of e-Medical Records today include:

- How should the EMR be structured: developing flexible solutions to accommodate EMRs in different environments, e.g. treatment encounters vs. medical/health evaluation encounters.
- EMRs have different purposes, depending on the context of use. How does this reality shape the technological response?
- What constitutes a functional definition of the EMR? How can that definition best be stated so that all types of EMR situations are represented?
- What is the current state of the art in EMR?
- Who is implementing EMR and how is it succeeding in networked environments?
- What are the prospects for integration of localized EMRs into a longitudinal...
healthcare record?

- What is an appropriate framework for achievement?

**Keynote Speaker: Eugene Kroch, Ph.D**

**Vice President of Research, CareScience**

Dr. Eugene Kroch will frame the discussion of these issues. One important example of a data-sharing regional healthcare network is the Santa Barbara County Care Data Exchange. The Exchange exemplifies not only technological advancement, but also the synergy of the public-private partnership. Dr. Kroch will discuss SBCCDE and its path to success from the vantage point of his involvement with CareScience, the private technology development partner of SBCCDE.

**Panel 1: EMR Developments and Initiatives**

Examples of successful early adoption of interoperable healthcare records are somewhat rare. One project that has accepted the challenge and can inform the directions of future efforts, is the integration of healthcare records in The Department of Defense (DoD) and the Veterans Administration (VA). A look into the technical and managerial challenges of a large-scale healthcare records integration project can provide signposts for managing integration with the larger enterprise as well as structuring interoperability at a more local level.

In the private sector, medical evaluations provide an opportunity to create a lifelong medical profile, but require a comprehensive analysis of the systems involved. Assessing the readiness of organizations to implement interoperability plans is a key first step on the road to success. Hospitals such as the new California Heart and Surgical Hospital represent cutting-edge opportunities to develop completely integrated digital systems without the limitations of legacy systems.

Both national and regional healthcare projects involve multilateral cooperative efforts in data sharing. Each participant will almost inevitably need to interface with many other organizations. How does a participant maintain level of service while simultaneously meeting multiple partners' requirements? One case in point involves the digital exchange of records and the use of secure digital signatures. In a multi-lateral exchange of records, how can trust issues be managed and deployment issues be resolved?

Following the presentations, the discussion will focus on core issues of successfully implementing comprehensive EMR systems.

**Speakers:**

**Steeve Kay**

**CEO, QTC Management, Inc. Diamond Bar, CA**

QTC Management, is the largest provider of disability evaluations to the Department of Veterans' Affairs and thus an active participant in contributing healthcare data to the emerging lifetime health record for former military personnel.

**Col. Janice Lee**

**Air Force Medical Service Chief Information Officer, Office of the Surgeon General.**

Col. Lee is responsible for all Air Force Information Management/Information
Technology (IM/IT) policy and plans and is an advisor to the Surgeon General on AF and Military IM/IT actions. She has served as Director AFMS CHCS II Deployment Team, Commander, 436th Medical Operations Squadron, Director, Medical Education, Chairperson, Department of Family Practice, Flight Commander and Medical Director for the USAF Physician Assistant Training Program, Course Supervisor, for Management for Chiefs of Hospital/Clinic Services Course and as Chief, Family Practice Clinic.

Scott Shreeve, MD

Co-Founder and Chief Medical Officer

Medsphere Systems Corporation, Irvine, CA

Dr. Shreeve is a practicing emergency medicine physician who has been actively involved in the design, development, and distribution of life science technologies that improve the delivery of healthcare and enhance the quality of life. Dr. Shreeve is a graduate of the University of Utah School of Medicine and completed his emergency medicine training at the University of Arizona Health Science Center. Dr. Shreeve is a founder and Chief Medical Officer of Medsphere Systems Corporation, the provider of the OpenVista Enterprise Healthcare Information System. OpenVista is the open source version of the highly acclaimed VistA information system developed by the Department of Veterans Affairs.

Case Study

William C. Arsenault

Chief Executive Officer, California Heart & Surgical Hospital, Loma Linda, CA

Mr. Arsenault has over 25 years of business experience in corporate general and financial management. He has been successful in managing medical start-up and turnaround companies. Mr. Arsenault has been actively involved in bringing a new hospital to the Inland Empire. Working with several prominent physicians in the community, along with Medical Development Associates, Carmel, Indiana, a state of the art facility is scheduled to break ground in January of 2005. Mr. Arsenault will describe the business, medical, and technical vision driving, CH&SH, the first digital hospital to be constructed in California.

Panel 2: Research Perspectives

Laying the groundwork for a successful EMR network requires buy-in from a wide array of participants and policy makers. This session will turn to issues that could be informed by research, including policy as well as technical analysis. The discussion will be organized to consider two items from the day’s discussion; first, unknowns in terms of organizational interoperability required for a successful EMR and, second, the potential role of electronic health-disability profiles (including outcomes) in contributing to EMR initiatives.

Moderator:

Thomas A. Horan, Ph.D.

School of Information Science, Claremont Graduate University

Dr. Horan is Associate Professor in the School of Information Science at Claremont
Graduate University, where he is also the Executive Director of the Claremont Information and Technology Institute (CITI). His areas of research include the development and deployment of advanced information technologies and policies in the domains of healthcare and community informatics. Dr. Horan will moderate a discussion on research and policy trends.

**Leonard Kleinman, MD, MPH**

**Director of the Telehealth Program at the VA Greater Los Angeles Healthcare System**

Dr. Kleinman is developing and managing telehealth programs in coordination of care/home health, mental health, dermatology, ocular health, and continuing medical education. He formerly was the Lead Physician for Primary Care and the Chief of the General Internal Medicine Division at the West Los Angeles VA Medical Center. He has been a consultant for the Los Angeles County Department of Health Services, the California Office of Statewide Health Planning and Development, and the Medical Board of California. He is an Associate Clinical Professor of Medicine at the Geffen School of Medicine at UCLA. Dr. Kleinman received his Medical degree from the Keck School of Medicine at the University of Southern California. He is a graduate of the Family Practice Residency Program at the Kaiser Permanente Los Angeles Medical Center and the Preventive Medicine Residency Program at the UCLA School of Public Health. During his career, He has been an innovator and leader in the delivery of preventive clinical services, health systems quality management, medical informatics, and the training/utilization of mid-level practitioners.

**Synthia Molina, MBA**

**CEO, Alternative Link, Albuquerque, NM**

Synthia Molina holds a BS in management and organizational psychology and completed her MBA in strategy, leadership and general management at the Drucker School at Claremont Graduate University. She has spent more than two decades helping healthcare pioneers lead emerging markets. She specializes in industry transformation, market leadership and quality systems and has worked in both the healthcare and educational arenas.

**Panel 3: Health Record Standards and Integration**

In order to improve patient safety and enhance the quality of clinical care, government agencies, software vendors, standards development organizations and professional societies are cooperating to develop a national health information infrastructure (NHII) in the USA. This collection of information services and resources would securely aid the sharing of patient data and clinical knowledge for use at the point of care. Standards for representing both data and decision support knowledge are important in order to realize the vision of the NHII.

To discuss the implications of nationally-adopted standards; what they mean for clinical practice and for inter-organizational cooperation at the regional level is Dr. Robert Jenders, of Cedars-Sinai Medical Center.

**Speaker:**

**Robert A. Jenders, MD, MS, FACP**
**Associate Professor, Department of Medicine**

*Cedars-Sinai Medical Center (CSMC), University of California, Los Angeles*

Dr. Jenders will discuss "The Ties that Bind: Facilitating the National Health Information Infrastructure Through the Use of Standards". Dr. Jenders is a member of the Enterprise Information Services group at CSMC, where his work focuses on clinical decision support systems, electronic health records and vocabularies. A general internist, he provides clinical care and teaches in the clinical programs of the Department of Medicine. Dr. Jenders also serves as co-chair of the clinical decision support technical committee of Health Level Seven, the principal international standards development organization for health care computing. He is a member of the Patient Safety Task Force of the Healthcare Information and Management Systems Society and also is a member of workgroups of the National Immunization Program (CDC), the California Healthcare Foundation and the American Health Information Management Association (AHIMA). As a topic leader at the recent NHII meeting in the USA and a committee co-chairman in a standards development organization, Professor Jenders will review plans for the NHII in the USA. He will further review pertinent standards under development in Health Level Seven that will facilitate development of the NHII.

The discussants will adopt a regional focus to discuss the impact of public and private initiatives on regional healthcare infrastructure and what lessons can be learned and applied to our own region in the context of the day's presentations and discussion.

**REFERENCES**


2. FEDERAL GOVERNMENT ANNOUNCES FIRST FEDERAL eGOV HEALTH INFORMATION EXCHANGE STANDARDS. 2003, Department of Health and Human Services: Washington, DC.


Appendix 4 – CGU’s List of Publications


