



2006-2007 SANTA CLARA COUNTY CIVIL GRAND JURY REPORT

ELECTRONIC MEDICAL RECORDS: HEALTHCARE COMPLEXITY, LACK OF DEFINITION AND COMMUNICATION CREATES CONFUSION

Summary

This 2006-2007 Santa Clara County Civil Grand Jury (Grand Jury) investigation began as a follow-up to a 2004-2005 Santa Clara County Civil Grand Jury report, titled “Santa Clara County Electronic Healthcare Records—The Time is Now.” That report was critical of Santa Clara County Health and Hospital System’s (HHS) efforts in developing an Electronic Medical Record (EMR) system for Santa Clara County (County) and elicited an equally critical response from HHS. This Grand Jury sought to clarify some of the misunderstandings between the report and the HHS response, and to consider the current state of EMR development in the County.

The Grand Jury came to appreciate the complexity of healthcare technology issues in the industry today through interviews with senior officials in the HHS Information Systems Department, nursing and technical staff at both custody and non-custody facilities, and a member of the Santa Clara County Board of Supervisors (BOS). The Grand Jury examined the difficulty of integrating components that address widely disparate areas of healthcare delivery under a single, coordinated data collection and presentation system. EMR is exemplary of this problem, since HHS has decided to construct an EMR system from existing components that have been implemented over past years and new functions that are planned for future years.

The Grand Jury found confusion throughout the County in peoples’ understanding of the concept and scope of an EMR system and expectations about how and when such a system might be available. For example, “Ambulatory Electronic Medical Record” (A-EMR), which is being introduced into HHS over the next two years, is a set of applications that collects data about patient-physician encounters in the clinical, outpatient setting. In contrast, the HHS Information Technology Strategic Plan, which is discussed later in this report, describes an “Electronic Medical Record” as “a patient-centric record database, often but not always focusing on the ambulatory patient health care delivery process.” In this statement, A-EMR is clearly identified as a part of EMR as a whole, but, depending on the audience, this distinction is not always made clear.

Further confusion is evidenced by the fact that the two major entities in HHS that will use the system, Valley Medical Center and Custody Health, have different needs and expectations for an EMR. Custody Health has special documentation and reporting requirements, some mandated by State regulations regarding inmate healthcare, that

may not be recognized by A-EMR project planners. Lack of consistent communication of EMR system goals and status from HHS to the technology planners, project managers, and those who will be using an EMR system in their work further exacerbates this confusion.

EMR is an initiative with high visibility and broad scope. However, people who will use the system and who have expectations of its features and functions differ in their understanding of what it will be. For these reasons, the Grand Jury recommends that the BOS direct HHS to:

- Prepare a formal definition of EMR including its purpose, its components, and specific deliverables. The definition needs to contain a definitive list of all of the components to be included in EMR.
- Involve Custody Health as an equal partner in the planning and implementation of EMR.
- Prepare a financial projection of the total implementation and ongoing maintenance cost of EMR, itemized by its components.
- Develop a communication plan that updates project goals and status monthly to all entities and levels of HHS. Plan meetings with staff to discuss plans and status, and to prepare and deliver appropriate training.
- Mandate the use of EMR.

Background

The 2004-2005 Civil Grand Jury report criticized development efforts at HHS toward an EMR stating that “projects are largely uncoordinated, and the Grand Jury could find no documented long-range vision or integrated plan for these projects.” HHS officials responded:

In truth, SCVHHS’s electronic medical/healthcare record development efforts are coordinated and well planned as is evidenced in our Annual Report and Strategic Plans. ... The Annual Report shows the complexity and breadth of the SCVHHS portfolio of Information Systems in existence today, all of which are integrated into the overall goal of achieving an Electronic Health Record (E.H.R.). These applications share/exchange information and feed into the core clinical database, or repository, the Lifetime Clinical Record (LCR), which is a key component in development of a functional EHR.

This rebuttal says there are many complex applications in the current HHS portfolio, and that these applications are integrated into a goal of an EMR, but not that they are an EMR. The Grand Jury studied many documents to understand the current state of EMR in the County. Five key documents are:

- Santa Clara Valley Health & Hospital System Information Technology Strategic Plan (February 2006) – Kurt Salmon Associates
- Presentation to Health & Hospital Committee titled “Presentation on Information Technology and Health Care” (May 5, 2006) – Acting Executive Director, SCVHHS
- Santa Clara Valley Health & Hospital System Information Services Annual Report (June 2006) – SCVHHS Information Services Department
- Presentation to BOS titled “Various Actions Related to Siemens Contract Term, Component Termination Amendments and Salary Ordinance Additions” (September 26, 2006) – Acting Executive Director, SCVHHS
- Santa Clara Valley Medical Center A-EMR Ambulatory Electronic Medical Record (April 2007)

The Grand Jury is impressed with the scope of HHS initiatives at SCVMC that have been implemented toward the realization of an “electronic hospital.” The Information Technology Strategic Plan (ITSP), prepared by Kurt Salmon Associates in February 2006, commends HHS, “Although not an early adopter, ... SCVHHS is now well positioned to advance its IT environment without incurring the risks inherent in leading the charge to adopt the latest innovation.”

However, the Grand Jury is not convinced that HHS senior management has a well-defined vision of EMR scope, limits, and costs. That lack of definition propagates confusion about EMR throughout the organization. The Grand Jury reviewed problems found in efforts toward EMR implementation in the County healthcare system.

Discussion

The Grand Jury conducted interviews with a member of the BOS and many HHS staff personnel from senior managers, to nurse managers in custody and non-custody facilities, project managers, and technical support personnel. In the course of these interviews, the Grand Jury observed demonstrations of current data collection and presentation of applications as well as the new systems in development for launch in Spring 2008.

The Grand Jury discovered three related problems regarding EMR within HHS: (1) there is no formal definition of Electronic Medical Records at any level, (2) communication of goals and strategies to those who will use and be affected by an EMR system is confusing and ineffective, and (3) the County cannot anticipate EMR development costs if there is no understanding of the scope of the project.

Lack of Definition of EMR

There is no formal definition of an Electronic Medical Record system in any of the documentation provided to the Grand Jury nor has HHS management been able to provide a definition. The Grand Jury specifically asked for the HHS definition of EMR and received an unsatisfactory response (see Appendix A). HHS management is able to discuss general concepts about EMR, and is able to confirm those applications identified in the ITSP that will be included in EMR. However, HHS cannot produce a definitive list of functions and features in EMR or a timeline of when those functions will be available to the healthcare staff.

Currently, HHS uses Invision from Siemens Medical Solutions, Inc. as its core Clinical Information System (CIS). The Lifetime Clinical Record (LCR) is the data repository of patient information within Invision. In May 2006, HHS made a presentation to the Health & Hospital Committee of the BOS entitled *The Electronic Medical Record: SCVMC's Road to the Electronic Health Record*. Appendix B(1) is a list, taken from the presentation, of the various departmental computer systems that interface with the LCR. The LCR and its associated data is what HHS management points to when asked if it has an EMR system.

NextGen Healthcare Information Systems, Inc. is a company that has partnered with Siemens to provide an A-EMR system. An ambulatory patient is one who comes to the hospital or a clinic to receive healthcare service, then leaves; that is, they do not remain in the hospital as an inpatient. HHS is in the process of implementing A-EMR with an expected launch in Spring 2008. Appendix C is a diagram from the ITSP that shows EMR as a data repository that stores patient information from a variety of healthcare encounters, one of which is the ambulatory environment. Appendix B(4) is a list, also from the ITSP, of clinical care processes that should be included in an A-EMR system. Appendix B(4) is a list of functions and modules available in the NextGen A-EMR, not all of which will be included in the Spring 2008 launch.

A senior HHS official stated that when A-EMR is fully implemented and deployed throughout the County sometime in 2009, the EMR system will be complete. When asked about the inpatient side of healthcare delivery, the official said that it was already complete in the LCR applications. The diagram in Appendix C, however, shows several major clinical processes as well as critical care and emergency department that are components of EMR that are not automated and linked to the LCR. There are numerous references in the ITSP to HHS needing to acquire an EMR. In the May 2006 presentation to the Health & Hospital Committee of the BOS, HHS states that "readiness for the EMR is assured."

In its own documents and presentations within the last year, HHS describes "readiness for" and "goal of achieving" an EMR as a future goal. This same assessment of the state of EMR is presented in the ITSP. However, in interviews with the Grand Jury, HHS represents EMR as essentially complete. In fact, in an article in the Silicon Valley/San Jose Business Journal in June 2005, an HHS official responded to questions

about the 2004-2005 Grand Jury report that “By 2008, the health and hospital system will not only have a *complete* [emphasis added] electronic health record system at a cost of \$33 million but will be able to share that data with other county agencies.” Without a clearly stated definition of EMR, there is no way to know which perspective is correct.

Communication of Goals and Strategy

When senior management lacks a clear direction for EMR, lower-level staff cannot help but be confused. The ITSP states “Communications regarding IT activities across and within SCVHHS is not consistently clear or constant. This is symptomatic of the broader IT oversight and organization issues.”

In September 2006, HHS made a presentation to BOS titled *Various Actions Related to Siemens Contract Term, Component Termination Amendments and Salary Ordinance Additions*. In the presentation, HHS states:

When implemented, the A-EMR will eliminate the requirements to create, file, store, retrieve and transport approximately 2,200 paper records required at each clinic and custody location daily. These changes will result in a sizeable reduction in medical records staffing. The A-EMR will also automate patient charging. It is anticipated that once the system is fully installed in 2009, VMC will be able to collect an additional \$2.3 million of revenue annually thereafter.

Contrary to these statements, the Grand Jury learned that implementation of A-EMR would not replace paper records within the specified time frame. Numerous examples where the use of paper records would be mandated by legal requirements or medical practices were demonstrated to the Grand Jury by staff at various sites. HHS clarified that the number of paper records that are transported each day is closer to 4,000 files when Custody Health and the satellite clinics are included. As of this report, the use of electronic medical records in lieu of paper medical records has not been resolved.

Nowhere is the lack of communication having a greater impact than in the area of Custody Health. In 2001, Custody Health began a project, called Jail Medical Information Management System (JMIMS), to acquire an EMR system. Custody Health had produced a document describing over 1,000 data elements and system features required of an EMR in the Custody Health environment. The specifications addressed all areas of interaction with inmates including the initial health screening by a nurse during the booking process, scheduling physician appointments in the jail clinic and Valley Medical Center, logging nurse progress notes, producing Medication Administration Records (MAR), interfacing healthcare and court appointments with the Criminal Justice Information Control (CJIC) system, and producing reports required by the State. The project was halted when HHS began planning the A-EMR project in 2004.

Failure of HHS to clearly communicate the functionality of A-EMR to Custody Health has resulted in confusion and concern over whether this product will serve their needs. As an example, HHS says A-EMR will serve all of Custody Health needs, while Custody Health points to all of the surrounding support functions they require outside of the direct patient-physician encounter as not being addressed. A-EMR addresses the outpatient environment, while the majority of the Custody Health effort is more like the inpatient environment. Nurses must do patient scheduling, write progress notes, and perform medication ordering and administration, not only because an inmate is not allowed the freedom to do these things, but because the State requires extensive documentation regarding inmate healthcare. HHS believes the inpatient EMR components are essentially complete, but Custody Health looks at the available electronic records through VMC as useful but incomplete.

The A-EMR project design teams are working to develop special data entry screens to solve Custody Health nurse assessment problems, but Custody Health members who are represented on various A-EMR project committees were completely unaware that a demonstration system of these features was nearly ready. The A-EMR project leaders stated that they have seen the Custody Health EMR specifications and that all their needs are met. When asked for details of how each requirement in the Custody Health specification was addressed in A-EMR, the Grand Jury was told that “gap analysis” was in progress. The Grand Jury is unsure how A-EMR project leaders can know that all of Custody Health needs are met if they have not yet matched its requirements to A-EMR system functions.

Financial Planning

HHS has stated that implementation of A-EMR will cost approximately \$8 million. However, determining the true cost of the system needs to include the ongoing costs of ancillary functions such as paper file record management. Without a formal definition of EMR, it is unclear whether the County should expect that spending for an EMR system is nearly done or just beginning.

Conclusion

HHS clearly has a very complex task to manage. There is no single vendor or application that addresses all aspects of healthcare delivery related to the EMR. Healthcare delivery applications include patient scheduling and billing, patient-physician encounters, prescription ordering, medical tests and test results, managing the care giving environment, and numerous other activities. All of these functions overlap and interact, which adds another layer of complexity of data integration.

However, EMR is a concept that creates expectations in decision-makers and planners as well as healthcare workers who use computer systems in their work. It is incumbent on HHS to define EMR in order to address those expectations. The absence of written deliverables and the lack of education of potential users and decision-makers create an image of EMR lacking substance.

The Grand Jury recommends that, after input from various user groups, HHS prepare and publish a definition of EMR so that everyone can understand its mission. The Grand Jury also recommends that HHS develop a method of communicating regularly and consistently with all decision-makers and users about goals and progress on its path to an EMR.

Findings

Santa Clara Valley Health & Hospital System officials declined an invitation to review these report findings before publication.

The following findings were reviewed with the other subject agencies:

- F1:** HHS has not published a formal definition that defines EMR components, deliverables, and costs.
- F2:** A member of the BOS was unable to convey to the Grand Jury that they understand what the functional components of EMR are that HHS is going to deliver.
- F3:** Custody Health, which is expected to be a primary user of EMR, has had minimal input and involvement in the definition and planning of this project.
- F4:** The total cost of EMR has not been determined. The \$8 million A-EMR project currently being implemented may represent only a small part of the true cost of a countywide EMR system.
- F5:** There is a lack of communication of HHS goals and strategies for EMR to those who will implement and be affected by the system. System features are being developed without consulting with those who will use them.
- F6:** Implementation of this system is expected to draw resistance from some potential users.

Recommendations

The 2006-2007 Civil Grand Jury recommends that the Board of Supervisors direct HHS to take the following actions:

- R1:** Prepare a formal definition of EMR, including its purpose, its components, and specific deliverables. The definition needs to contain a definitive list of all of the components to be included in EMR.
- R2:** See Recommendation 1.
- R3:** Involve Custody Health as an equal partner in the planning and implementation of EMR.
- R4:** Prepare a financial projection of the total implementation and ongoing maintenance cost of EMR broken down by its components.
- R5:** Develop a communication plan that updates project goals and status monthly to all entities and levels of HHS. Plan meetings with staff to discuss plans and status, and to prepare and deliver appropriate training.
- R6:** Mandate use of EMR.

Appendix A: Verbatim email exchange (names excised) between a Grand Juror and a senior management official at HHS.

An example of HHS unable to provide a specific, clear definition of an EMR system.

Grand Juror:

When we first met, [name] asked us for our definition of EMR but we have never gotten a definition from you what HHS uses as a working definition of EMR. I see a lot of projects, applications and diagrams in the Strategic Plan that seem to relate to an EMR system, but can't find a vision statement or goal -- "EMR serves this purpose and consists of these functions and data. When all of that is in place, we will have an EMR system."

If there is a definition of EMR in the Strategic Plan, please reference it for me. If you have a definition in another document or taped to the wall somewhere, let me know and I can come pick it up. If you do not have a definition of EMR, let me know that too.

HHS response:

To clarify, a good starting point may be generally accepted definitions in the industry. The Health Information Management Systems Society (HIMSS) defines EMR and EHR as follows:

HIMSS EHR = "The Electronic Health Record (EHR) is a longitudinal electronic record of patient health information generated by one or more encounters in any care delivery setting. Included in this information are patient demographics, progress notes, problems, medications, vital signs, past medical history, immunizations, laboratory data and radiology reports."

HIMSS EMR = "EMR definition — An EMR is electronically originated and maintained clinical health information, derived from multiple sources, about an individual's lifetime health status and health care. An EMR is supported by clinical decision systems and replaces the paper medical record as the primary source of patient information."

As is evident, there is overlap and the A-EMR emphasizes only the Ambulatory Electronic Medical Record based on the patients [sic] encounter in the ambulatory care setting at this time. This means that the focus of this electronic record differs from a more global perspective.

The HER [sic], on the other hand, emphasizes the more "longitudinal" aspects of the patient record and is more broad in its scope of gathering clinical data from multiple systems and contributing to a repository of this data, the Lifetime Clinical Record, which has been discussed and has been demonstrated to the Civil Grand Jury.

Appendix B: Function Lists

SCVHHS Presentation *The Electronic Medical Record: SCVMC's Road to the Electronic Health Record* (May 2006) –

(1) Major Systems Investments VMC and Departments: “The missing piece of the puzzle is the A-EMR”

- Core Health Information System (Siemens)
- Cardiology (Heartlab)
- Enterprise Wide Scheduling (GE)
- Diagnostic Imaging and PACS (Siemens and Agfa)
- Emergency Department (Wellsoft)
- Clinical Laboratory and Pathology (Misys and CoPath)
- Medical Records (SoftMed)
- Nutrition and Food System (CBORD)
- Perioperative Services (SIS)
- Renal Care (CyberRen)
- Physical Medicine & Rehabilitation (MediServe)
- Respiratory Care System (MediServe)
- Managed Care (Siement/Perot)

(2) What Does the Future Hold?

- Rules-based Computerized Provider Order Entry (CPOE)
- Medication Administration Checking
- Automated Vital Signs
- Computerized Patient Assessments
- Patient Safety Bar Code
- Inpatient EMR
- Expansion of Wireless, Mobile Computing and Secure Communications

Appendix B: Function Lists - continued

Kurt Salmon Associates *Santa Clara Valley Health & Hospital System Information Technology Strategic Plan* (February 2006) –

(3) Diagram “The CDR/EMR/EHR Database Continuum” (p II-36)

- Electronic Health Record
 - Computerized Patient Record (CPR/EMR)
 - Clinical Data Repository (CDR)
 - CPOE
 - Order Communication
 - Results Retrieval
 - Clinical Documentation
 - Vital Signs & I&Os
 - MAR
 - Clinical Decision Support
 - Critical Care
 - Ambulatory Electronic Medical Record
 - Emergency Department
 - Home Health
 - Acute Care
 - Patient’s Personal Data

(4) Diagram “The EMR Ambulatory Environment” (p II-37)

- Clinical Care Processes (EMR)
 - Workflow Management
 - Patient Summary
 - Chart/Results Review
 - Encounter Documentation
 - Order Entry
 - Clinical Decision Support
 - Medication Management
 - Health Maintenance
 - Disease Management
 - Immunization Record
 - Digital Imaging
 - Patient Education
 - Phone Notes
 - Clinical Messaging
 - Remote Access
 - Personal Health Record
 - Dictation/Transcription
 - Document Imaging
 - Tools for Reporting

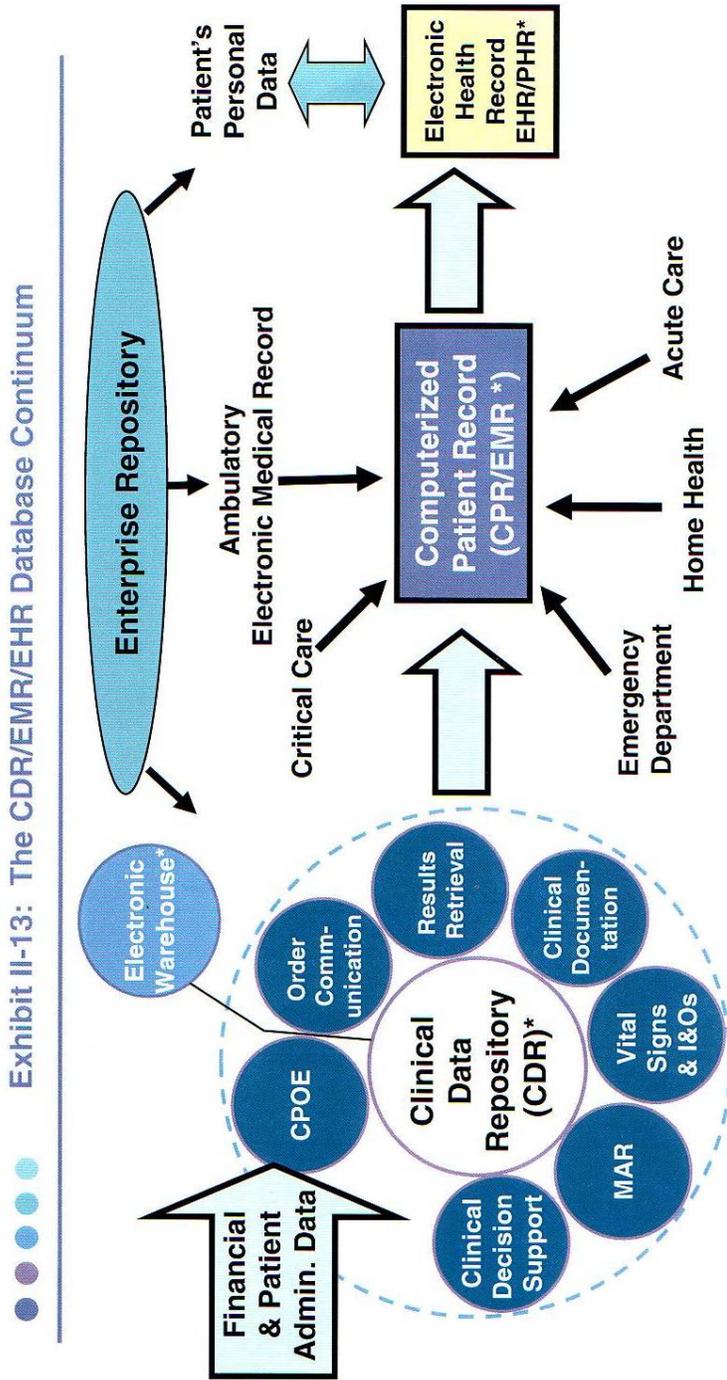
Appendix B: Function Lists - continued

(5) NextGen Functions & Module List – Base functions in NextGen A-EMR system for limited release in Spring 2008

- Patient Registry
- Electronic Chart (EMR)
- Workflow Management
- Electronic Superbill
- Image Management
- Coding Optimization
- Follow Up / Recall Tracking
- Lab Module
- Fax Capability
- Prescription Generation
- Graphing
- Advance Security
- Enterprise Data Sharing
- Template Editor
- Knowledge Base
- Medication Module
- Interface Engine
- Provider Approval Queue
- Allergy Module
- Family Unit Module
- First Data Drug Database
- NextGen EMR RTF Monitor
- NextGen OPTIK User License
- NextGen Patient Education
- NextGen Edits
- InfoScan Formulary Database
- ACP PIER Content
- Diagnosis & Procedure Code Tables
- Crystal Reports

Appendix C: The EMR Environment

Santa Clara Valley Health & Hospital System
 Information Technology Strategic Plan (February 2006)
 Kurt Salmon Associates



Clinical Information System

* = See definitions

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Interviews

September 18, 2006	Santa Clara Valley Health & Hospital System official.
November 15, 2006	Santa Clara Valley Health & Hospital System officials.
January 19, 2007	Santa Clara Valley Health & Hospital System officials.
March 7, 2007	Santa Clara Valley Health & Hospital System officials.
March 12, 2007	Santa Clara Valley Health & Hospital System officials.
March 26, 2007	Santa Clara Valley Health & Hospital System officials.
April 1, 2007	Santa Clara Valley Health & Hospital System Valley Health Clinic staff.
April 2, 2007	Santa Clara Valley Health & Hospital System Custody Health officials.
April 9, 2007	Santa Clara Valley Health & Hospital System Valley Health Clinic staff.
April 11, 2007	Santa Clara Valley Health & Hospital System Custody Health official.
April 16, 2007	Santa Clara Valley Health & Hospital System Valley Health Clinic staff.
April 24, 2007	Santa Clara Valley Health & Hospital System Custody Health official.
April 25, 2007	Santa Clara Valley Health & Hospital System Custody Health official.
May 4, 2007	Santa Clara Valley Health & Hospital System official.
May 7, 2007	Santa Clara County District Attorney's Office official.
May 23, 2007	Santa Clara Valley Health & Hospital System Custody Health official. Santa Clara Valley Health & Hospital System official.
May 31, 2007	Member of Santa Clara County Board of Supervisors.

PASSED and **ADOPTED** by the Santa Clara County Civil Grand Jury on this 19th day of June 2007.

Ronald R. Layman
Foreperson

David M. Burnham
Foreperson Pro tem

Kathryn C. Philp
Secretary