Improving outcomes with interoperable EHRs and secure global health information infrastructure [1]

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[1] This paper reflects the discussion results of the min-symposia entitled “Improving outcomes with interoperable EHRs and secure global health information infrastructure” held during the Annual IEEE EMBS Conference, 2007, in Lyon, France
Aspects Discussed

1. Introduction
2. Towards a Unifying Structure
3. Interoperability and the Context
4. Interoperability solutions in HIS Interoperability in IS - An example: CPOE (Computer Prescription Order Entry) By R. Beuscart
5. Developing interoperable watermarking mechanisms for healthcare by G. Coatrieux
6. Making Health Identification Interoperable in Europe by C. Quantin
The System

• What Is ‘A System’?
  ▪ Is Your Idea of A System -- Their Idea of A System?

• ‘An Aspect or Component’ Will Often Have Working Relationships w/Other Aspects/Components And, Or Other Systems Entirely

• In Terms of ‘Interoperability’ All Aspects And, Or Components Must Be Considered And Treated Simultaneously & Holistically*

* Emphasizing the importance of the whole, and the interdependence among all parts
Misuse & Correction

• The Misuse of The Term “Interoperability” Is Confusing Professionals About The Manner In Which ‘Information Systems’ Need To Be Composed -- In Order To Achieve Mission Success

• ‘Information Systems’ Include
  • People (E.g. By Extension Organizations, Procedures..)
  • Processes (E.g. Skill, Competence..)
  • Tools & Techniques (E.g. Information Technologies, Formulations..)
Monumental Misunderstanding & Misrepresentation!

• Rising Misunderstanding In The Meaning of The Term "Interoperability"

• Among Other Things, Axiologically, The Term "Interoperability" is Increasingly (Mis)Used

"Guiding Principles"

Conference on 'The Next Generation Information Environment (NGIE),'
The EHR is the core of the HIS.

Orders and Results (IRIS)

CPOE

Drugs

Security and traceability of information

Patient Record

Specialized records

Healthcare Networks & External Communications (GPs, other hospitals, ...)

Figure A
Roadblocks to Interoperable, Portable, Consumer-Centered Electronic Health Records and an e-Health System

Frank Ferrante (at IEEE EMBS workshop in NY September 2 2006 ---From Mike Corrigan & Thomas Jepsen IEEE-USA MTPC)
Introduction and Overview

The MTPC has identified a number of roadblocks to EHRs and an e-Health system. The committee will formulate an overall policy paper on the roadblocks and our recommendations to remove them. In addition, we have responded to or plan to respond to individual legislative proposals and other government activities to make recommendations on how to best circumvent the roadblocks. The following items have been identified as potential roadblocks. A status of our activities in each area is also provided. The committee has developed a model for EHRs based on a sketch by Rep. Chris Cannon of Utah that illustrates the locations of many of the roadblocks in the system.
Lack of a Unique Personal Healthcare Identifier

• **The Problem**: Privacy considerations are preventing the establishment of a unique personal healthcare identifier across providers and insurers and these considerations are likely to take some time to resolve.

• **Current Status**: IEEE-USA Voluntary Healthcare Identifier Position Statement, 17 June 2004

• **Proposed Action**: One approach is to adopt the state-of-the-practice approach developed by the Certification Commission for Healthcare Information Technology (CCHIT) and leave a universal healthcare identifier as a research effort.
Lack of Incentives for Insurance Carrier Interoperability

- **The Problem**: Health Insurers have no incentives for carrier-to-carrier interoperability, which is in the interest of the healthcare consumer.

- **Current Status**: HR4859 provides this incentive by requiring interoperable EHRs across providers of care in the Federal Employee Health Benefit Plan.

- **Proposed Action**: The MTPC has written a letter to the committee to support the legislation and to comment on its technical approach. The MTPC will continue to follow the legislative hearings and meet with the subcommittee staff.
Lack of Incentives for Hospital to Hospital Interoperability

• **The Problem**: Hospitals have little incentive for hospital to hospital interoperability of records

• **Current Status**: The MTPC has invited Dr S. Tirmizi from the Department of Veterans Affairs to speak to the committee at its June meeting to discuss hospital interoperability and other issues to determine what additional action is appropriate

• **Proposed Action**: Recommend inclusion of language requiring/funding hospital to hospital EHR interoperability in upcoming legislation (HR2234, HR747?). Comment on Regional Health Information Organization (RHIO) results and strategy to the Office of the National Coordinator for Health Information Technology
Lack of Incentives for Provider to Provider Interoperability

• **The Problem:** Providers have some incentives to develop EHRs and to interoperate electronically with insurance carriers. They have less incentive to interoperate with each other or to provide access to the provider EHR to the healthcare consumer.

• **Current Status:** Two bills would fund some aspects of this: HR747 and HR4157 and these bills could become keystones of consumer-centered EHRs. HR4157 removes the restrictions between hospitals and individual providers (or groups) to share a system by allowing the hospital to pay for the individual providers e-Health system. This creates an exception to the “Stark” restrictions that prohibit payments between healthcare providers that make referrals to each other. Also, HR2234 provides grants to small healthcare providers to implement EHRs.

• **Proposed Action:** Letters of support for these bills
Lack of Interoperable Middleware for HIPAA-Compliant Identification, Authentication, and Access Control

• **The Problem**: Interoperable identification, authentication, and access control middleware to all EHR components is necessary to achieve successful EHRs.

• **Current Status**: MTPC has been in discussion with Rep. Chris Cannon of Utah and his staff on the issue. MTPC has developed a model of EHR relationships based on a sketch by Rep. Cannon.

• **Proposed Action**: Rep. Cannon is interested in potential hearings on the issue. MTPC will help define the issue and find appropriate participants.
Lack of Reliable, Accessible Healthcare Information

• **The Problem**: Reliable and easily accessible healthcare information is essential to consumer-centric healthcare. Such information is needed to use the personal EHR,

• **Current Status**: Peer to peer approaches, such as those used by Amazon, e-Bay, and others have the potential to make EHRs much more useful

• **Proposed Action**: MTPC is planning a conference for the fall
Lack of Focus on a High-Payoff Population

• **The Problem**: Geriatric care is potentially the largest beneficiary of EHR benefits, both because of the percentage of care provided to that group and the likelihood of multiple providers with inadequate inter-provider communication.

• **Current Status**: Community integration of healthcare efforts, and related “aging in place” efforts could have major benefits for Medicare, Medicaid, and other local social service programs, and should be encouraged.

• **Proposed Action**: The committee is reviewing the Chronic Care recommendations of the American Health Information Community (the Advisory Committee to the Department of Health and Human Services and may decide to pursue a position paper in this area
Lack of a Consistent, Current Base of Standards

• **The Problem:** The HIPAA legislation is a major driving force for standards that could be used as the basis for EHRs and the NHIN. Unfortunately, the set of standards chosen is now becoming out of date.

• **Current Status:** MTPC has recommended a set of standards in its NHIN white paper and letter in support of HR4157. However, the providers and insurance carriers are concerned with the timetables proposed for adopting the new standards versions.

• **Proposed Action:** The committee is updating its letter on HR4157. The MTPC may add to its recent white paper assessing Interoperability in the area of standards updating. We should support measures to create a faster and more efficient update procedure – see the new language in HR4157.
No Plan for Integration of Genomic Data into EHRs

- **The Problem:** There is currently no plan to integrate genomic data into EHRs. Such data is expected to play an increasing role in the determination of appropriate preventive measures and treatments.

- **Current Status:** Two efforts that could play a role are the Personal Genome Project and a potential Large U.S. Population Cohort Project on Genes, Environment and Disease.

- **Proposed Action:** The committee is preparing a response to the Request for Comments on the *Policy Issues Associated with Undertaking a Large U.S. Population Cohort Project on Genes, Environment and Disease*, due by July 31, 2006. Also, HL7 has a working group looking at including genomic data in the EHR. We may want to participate.
Lack of Incentives for a Full, Lifetime Personal Health Record

• **The Problem**: A full PHR is essential for consumer-based medicine and there are few incentives to develop one.

• **Current Status**: Commercial stand-alone and integrated PHRs have limited functionality.

• **Proposed Action**: Recommend that HR 4859 include a full PHR. Participate in the NOVA RHIO to drive a full PHRI.
Certification Standards

• **The Problem**: Certification standards are needed in order for companies to develop interoperable EHR products.

• **Current Status**: Certification standards are the responsibility of the Certification Commission for Health Information Technology (CCHIT). So far, CCHIT has only completed certification criteria for ambulatory EHRs.

• **Proposed Action**: We may want to support development of additional certification standards
Network Reliability

• **The Problem**: If we are going to use the Internet to transmit critical health-related data, we need to establish requirements for reliability and availability

• **Current Status**: There are currently no standards for Internet reliability and availability

• **Proposed Action**: Establish liaison with standards groups
Lack of a Well-Defined Architecture for NHIN

- The Problem: Since the RFI on NHIN architecture put out by HHS in 2004, little has been done to define a standard NHIN architecture.

- Current Status: NIH is soliciting input on functional requirements for NHIN.

- Proposed Action: IEEE-USA should create a position on the subject (i.e. no centralized database, peer to peer or RHIO as preferred architecture), and perhaps become more directly involved. Major architecture efforts are underway in the four RHIO contracts awarded by ONCHIT.
Lack of Uniform Privacy and Security Standards

- **The Problem**: Currently, HIPAA privacy and security rules may be superceded by state and local rules, creating a complex and confusing patchwork of security/privacy regulations relating to EHR.

- **Current Status**: HR4157 proposes a study of the impact of this. Alternatives are either a) a single uniform national standard, based on HIPAA security/privacy, or b) “harmonization” of all existing state and local regulations.

- **Proposed Action**: We may want to draft a position.
Limited PHR

- Personal Health Record
- Health Insurance Payer Records
- Hospital Records
- Physician Office Records
- Dental Office Records
- Pharmacy Office Records
- Laboratory Records
- Radiological Records
- EMT Records

Uncertified
- Demographics
- Allergies
- Medications

Full PHR

- Personal Health Record
- Health Insurance Payer Records
- Hospital Records
- Physician Office Records
- Dental Office Records
- Pharmacy Office Records
- Laboratory Records
- Radiological Records
- EMT Records

Certified
- Demographics and Identity
- Links to other EHR components

Provider EHRs

- Carrier EHR

Personal EHR

- Personal Health Record
Personal Health Record

Lifetime Full PHR

Links

Environmental Records

Personal Health Record

Anonymized Links with Trusted Reverse Channel

Public Health Records

Research Records

Genomic Records

Pediatric Records

Military and VA Records

Employer and Self Insurance Carrier Records

Medicare Records
eHealth
Systemic
Interoperability

Start with:

Human - Machine
(Computer, television, telephone, wireless communications devices, etc.)
Interoperability
Must include:

PROCESS Interoperability
TECHNOLOGY Interoperability
PEOPLE Interoperability
Why do we need NHIN?

- Reduce the number of medical errors through fast and ubiquitous access to medical information online
- Restrain the rising cost of providing healthcare
- Provide fast access to healthcare information in emergency situations
Functions of the NHIN

- Fast, Ubiquitous Access to online Electronic Health Records
- Online Claims Processing
- Transport of Medical Images
- Emergency Medical Response
- Coordination of Health Information Networks
- Telehealth for rural/underserved areas
- Longitudinal EHR
- Home Healthcare
- E-Prescription
Healthcare Professionals use NHIN to access/update/transfer electronic health records
Healthcare Professionals use NHIN to treat and diagnose patients using telemedicine and home healthcare.
Patients use NHIN to access/verify Personal Health Record (PHR) information.
Public Health Officials use NHIN to broadcast healthcare/epidemiological alerts
Emergency First Responders use NHIN to obtain PHI in emergency situations

- Hospitals/Large Clinics
- Remote Facility (Telemedicine)
- Home Healthcare
- Public Health Agency
- Small Clinics
- Patient Access to PHR
- Emergency First Responders
Healthcare Professionals use NHIN to submit/process/pay insurance claims

- Hospitals/Large Clinics
- Insurers
- Remote Facility (Telemedicine)
- Home Healthcare
- Emergency First Responders
- Public Health Agency
- Small Clinics
- Patient Access to PHR
Public Health Agencies use NHIN to obtain information on quality of healthcare

- Hospitals/Large Clinics
- Insurors
- Remote Facility (Telemedicine)
- Home Healthcare
- Public Health Agency
- Emergency First Responders
- Patient Access to PHR
- Small Clinics
Pharmacists use NHIN to fill prescriptions electronically
THE ONC-COORDINATED FEDERAL HEALTH INFORMATION TECHNOLOGY STRATEGIC PLAN: 2008-2012

SYNOPSIS

JUNE 3, 2008
Using the Power of Information Technology to Transform Health and Care
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<td>Objective 1.3: Promote nationwide deployment of electronic health records (EHRs) and personal health records (PHRs) and other consumer health IT tools.</td>
<td>Objective 1.4: Establish mechanisms for multi-stakeholder priority-setting and decision-making.</td>
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