

Continuity of Care Record: Foundation for Quality

Effective clinical decision-making relies upon easy access to accurate, up-to-date clinical information on patients. Although hospitals and other providers currently emphasize new information technologies such as computerized physician order entry and physician portals, healthcare providers continue to struggle with the most basic of tasks: access to complete patient records. Due in part to the difficulty in accessing this information, it is estimated that over 30% of all medical tests are ordered in response to the absence of a result from a previously ordered test. Providing ready access to basic patient information, irrespective of point of care, can only enhance care and reduce costs.

Rooted in Continuity of Care

Medical and nursing students learned about the importance of continuity of care during their training years. Almost all student clinicians are assigned patients who they follow throughout their training program. This assignment of clinician to patient is based on the premise that frequent and regular contact builds a knowledge base for the clinician that can be tapped to develop more appropriate treatment plans for each patient. This, in turn, produces better outcomes and healthier patients.

Although continuity of care was once a gold standard for treatment, our mobile society, frequent changing of health plans, and super-specialization make the concept somewhat quaint and a bit unrealistic. Medicine is too complex today to assume that a single physician will be the predominant

provider of care. In fact, circumstances often dictate the key provider, and that person changes in lock step with those circumstances. Fortunately new information technology provides a method to offer continuity of the patient record if not the provider. In addition, the Federal government, through the work of William Yasnoff, MD, at NHII (National Health Information Infrastructure), is working to facilitate the interoperability of systems so that the information can truly be shared across technology platforms.

ASTM Working to Set Standard

The American Society of Testing and Materials (ASTM), a voluntary international standards organization and a trusted source for technical standards for materials, products, systems, and services, is leading a consortium of interested organizations in the development of a continuity of care record, or CCR. Other organizations involved in the project include the American Academy of Family Physicians, the American Medical Association, HIMSS, and the Patient Safety Institute.

The CCR standard, intended to be utilized by all healthcare information technology vendors that produce products that manage patient clinical information, encompasses key patient data points. This core data set offers a snapshot-in-time of the

The CCR forms the most fundamental type of clinical decision support: relevant patient information as determined by the various practitioners that care for the patient.

patient, and provides only the most relevant facts about a patient's healthcare status. The data within the CCR is prepared by each practitioner at the time of the healthcare encounter with the expectation that the next practitioner will be able to readily access the information. Organized and transportable, the CCR may be prepared, displayed, and transmitted on paper or electroni-

The screenshot displays a web interface titled "Personal HealthKey Viewer" showing a "Continuity Of Care Record" for a patient named Dr. John Quins. The interface is organized into several sections:

- From:** Acme Electronic Health Record
- Type:** Electronic Health Record
- Version:** Version 3.25 Beta
- To:** Dr. John Quins
- Address:** 1010 Home Road San Francisco, CA 94304
- Phone:** 415-555-1212
- Email:** johndq@acmedemo.com

Patient Detail:

Name: Dr. John Quins	Address: 1010 Home Road San Francisco, CA 94304
Phone: 415-555-1212	Email: johndq@acmedemo.com
Date Of Birth: 1917-01-16	Gender: Male
Language: English-Fluent	Religion: Catholic
Race: Caucasian	Ethnicity: Irish

Problems, Diagnoses, and Conditions:

Onset	Condition	Code	Status
1999-04	Competitive Heart Failure, Etiology - Benign Hypertensive Heart Disease	402.11	Active
1994-02	Diabetes Mellitus, Type II(Adult-Onset, Insulin Dependent, Labile)	250.02	Active
Age 32	Hypertension, Benign, Etiology - Renal	402.00	Active
Onset: 2003-01-25	Myocardial Infarction, Antek, Septal	410.00	Resolved
2002-03-25	atrial fibrillation	427.01	Chronic

Alerts, Adverse Reactions, and Allergies:

Description	Code	Reaction	Causative Agent	Date	Comment
Allergy Reaction	995.2	Anaphylaxis, LifeThreatening	Penicillin	Initial Occurrence	
Allergy Reaction	995.2	Rash/Eruption, Mild	Sulfis	Initial Occurrence 2002-03	Patient states that he is unsure whether or not he really is allergic, as he was taking too new medications at the same time.

Sample CCR displayed through a Web interface.Courtesy of CapMed.

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The CCR's core data set is made up of the following elements:

- **CCR Identifying Information** – referring practitioner, dates, and purpose of referral
- **Patient Identifying Information** – used to create unique patient identifiers without the need for a centralized system
- **Patient Insurance/Financial Information** – basic information on eligibility for benefits
- **Advance Directives** – resuscitation instructions as might be found in living wills and healthcare proxies
- **Patient Health Status** – detailed information about the patient's condition (See side-bar)
- **Care Documentation** – detail on the patient-practitioner encounter
- **Care Plan Recommendation** – planned or scheduled tests, procedures, or regimens of care
- **Practitioners** – information about healthcare providers

The CCR takes advantage of specified XML code, a Web-based technology that supports interoperability. Information can be both imported and exported in the CCR while CCRs can be interchanged between otherwise incompatible systems. For example, CCR data can be prepared, transmitted, and viewed in a variety of formats including a Web browser (e.g., Internet Explorer), an HL7 CDA-compliant document, secure email, and any XML-enabled word processing document.

ASTM and its supporters believe the CCR will facilitate the transfer of patient information among providers, thereby improving quality of care, while additionally creating a viable, useable personal health record. Its flexibility significantly lowers barriers to acceptance as indicated by the varied organizations that support its creation. ASTM expects its Healthcare Informatics Committee

to vote on the CCR standard before the end of 2004.

CCR Boosts Personal Health Records

The pending implementation of the CCR standard provides a boost to companies developing personalized health record applications. Although several companies offer online personal health records, the recent advances in the development of flash computer memory provide an inexpensive and portable way to manage and transport that information.

USB flash memory or flash drive is a computer memory chip that is able to store computer programs and data. Currently, many computer users store key data on these chips and transport the data rather than a computer from one location to another. The flash drive, about the size of a small key chain when packed in its protective plastic case, can be plugged into almost any personal computer and utilized without the need for extensive setup. In most instances the computer applications required to access the data exist on the host computer, but when necessary, those applications can be stored and launched from the flash drive.

Several companies plan to take advantage of the CCR standard and already offer personalized health records on flash drives. The adoption of the CCR standard by vendors over time will increase the value of these personalized health records as more data becomes available to them. Although online health records have been offered for some time, their acceptance is limited. The portability, ease of use, and personal nature of a device that you carry around with you should boost the acceptance of personal health records and a CCR among patients and providers.

If access to relevant patient information is a key step to enhancing patient safety, improving quality, and reducing unnecessary testing, the CCR deployed on a flash drive is a needed step.

PATIENT HEALTH STATUS

- **Conditions, diagnose, problems, family history**
- **Adverse reactions, allergies, clinical warning, and alerts**
- **Social history and health risk factors**
- **Medications**
- **Immunizations**
- **Vital signs and physiologic measurements**
- **Laboratory results and observations**
- **Procedures and imaging**
- **Other (as defined by domain specific applications)**

Although I cannot predict the speed of acceptance by patients and providers of this easy-to-use and necessary treatment tool, it is clear that its utility greatly surpasses that of paper records. !

References

- Tessier, C. (2004). *Continuity of care record*. Retrieved September 27, 2004, from <http://www.astm.org/cgi-bin/SoftCart.exe/COMMIT/COMMITTEE/E31.htm?E+mystore>
- CapMed, A division of Bio-Imaging Technologies, Inc., Newtown, PA. www.capmed.com

Barry Chaiken has more than 18 years of experience in medical research, epidemiology, clinical information technology, risk management, and patient safety. As founder of his own company, he has worked on quality improvement studies and clinical investigations for the National Institutes of Health, the Framingham Heart Study, and Boston University Medical School. Dr. Chaiken is board-certified in general preventive medicine and public health and is a fellow of HIMSS. He is the chief medical officer of ABQURP and may be contacted at bchaiken@docs.network.com.