

HIMSS Electronic Health Record Definitional Model Version 1.0

Prepared by HIMSS Electronic Health Record Committee

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Background

The HIMSS Electronic Health Record committee chartered this effort to support measurement of the penetration of electronic health records in health systems and physician practices by 2010. The EHR Definition Model includes an operational EHR definition, key attributes, essential requirements to meet attributes, and measures used to assess the extent to which an organization is using an EHR.

Electronic Health Record Attributes and Essential Requirements

Purpose:

To develop a definitional model of a fully functional Electronic Health Record (EHR) that includes:

- EHR definition
- Key attributes and essential requirements
- Evidence for each attribute that will demonstrate the essential requirements have been met. Mandatory evidence is bolded.

This definitional model will be the basis of assessing the extent to which an organization is using an EHR by 2010.

Definition:

The Electronic Health Record (EHR) is a secure, real-time, point-of-care, patient-centric information resource for clinicians. The EHR aids clinicians' decision-making by providing access to patient health record information where and when they need it and by incorporating evidence-based decision support. The EHR automates and streamlines the clinician's workflow, closing loops in communication and response that result in delays or gaps in care. The EHR also supports the collection of data for uses other than direct clinical care, such as billing, quality management, outcomes reporting, resource planning, and public health disease surveillance and reporting.

Attributes, Essential Requirements, and Evidence¹²³⁴

1. Provides secure, reliable, real-time access to patient health record information where and when it is needed to support care.

Essential Requirements:

- Provides tools, including access audit trails, to guarantee patient health information confidentiality and security.
- Available and reliable 24/7.
- Responsive enough to integrate with the clinician workflow.
- Accessible where needed—inpatient and ambulatory care sites, remote access,

Evidence that an implemented EHR possesses these attributes:

- **Meets HIPAA requirements.**
- 99.9% availability
- **Response time appropriate to task completion and user acceptance.**
- Clinicians can access where and when needed for patient care.
- Access audit trails.

2. Captures and manages episodic and longitudinal electronic health record information.

Essential Requirements:

- Checks information captured or imported for reasonableness and provides time stamps, information source, and amendment audit trail.
- Complies with approved industry standards for message and vocabulary / content.
- Accepts information from external systems and automated data capture devices such as patient monitors, laboratory analysis equipment, and bar code scanners.
- Ideally accepts and integrates health record information from outside of the immediate organization, including medication dispensing information from community pharmacies.
- Provides tools for unique patient identification and information integration across systems and settings without a common patient identifier.
- Permits efficient data entry of all orders and documentation by authorized clinicians. This includes prescription writing and refill management. Ideally supports various means of clinician entry (e.g., keyboard, voice, pointer device, or handwriting recognition). Ideally documentation includes clinical reasoning and rationale.
- Supports electronic signature where permitted by law.
- Accepts patient self-reported health information.
- Ideally differentiates between patient historical data (applicable across visits and across continuum of care, e.g. allergies) versus episodic data (applicable with one visit, e.g. breath sounds from last respiratory assessment) and supports copying data forward as appropriate to support continuity of care, accuracy of ordering, and efficiency of clinical documentation.

Evidence that implemented EHR possesses these attributes:

- Supports government endorsed message and content standards (DICOM, HL7, LOINC, RxNorm).
- **Accepts and integrates information from a range of external systems covering more than one setting of care.**
- **A high percent (81-99%) of physician orders and documentation is done by physicians directly using the system.**
- **A high percent (81-99%) of care team member documentation (patient observations and results, orders, interventions, problems, care delivered, and patient outcomes) is done directly using the system.**
- Patients report satisfaction with communication of their pertinent health data between the members of the healthcare team across settings.
- Clinicians report satisfaction with the continuity of care supported.
- Clinicians report time savings, increased accuracy and compliance with the entry of orders and clinical documentation.

3. **Functions as clinicians' primary information resource during the provision of patient care.**

Essential Requirements:

- Includes patient problem list, patient history and physical exam, allergies, immunizations, medications dispensed and administered, orders, diagnostic results and images (at least in ED and ICU, OR), most recent vital signs and Input/Output.
- Facilitates access to the patient information needed with integrated views, specialty specific forms, and flagging of information outside of normal limits.
- Provides access tools and displays that can be tailored to role or specialty and customized to end user preferences. Ideally provides problem, disease, and situation specific (i.e. ED, NICU) integrated patient views.
- Provides access to knowledge sources at any point within the clinical workflow.
- For subsequent episodes or encounters, provides access to relevant information from the prior care.
- Organizes and prioritizes patient-related communications such as messages and diagnostic results and supports management of communications until resolution.
- Ideally EHR information also includes progress/nursing/visit note/consult documentation and patient functional status in coded form.
- Ideally electronic health information accessible includes information from outside of the organization.

Evidence that implemented EHR possesses these attributes:

- **Organization policy is that the EHR is the source of patient information to use in delivery of care.**
- Ideally the information is complete enough that it is also the official medical record as permitted under law.
- **Physicians and other clinicians routinely access Integrated views of patient information for a high percent (81-99%) of patients as they provide care.**
- Paper medical records are no longer routinely pulled for every patient interaction.

4. **Assists with the work of planning and delivering evidence-based care to individual and groups of patients.**

Essential Requirements:

- Supports assessment and ordering appropriate to the clinical situation.
- Supports interdisciplinary care planning, delivery, and monitoring of time based plans and patient outcomes (care plans, disease management).
- Provides tools to support the work of the physician / clinician for individual patients: patient lists, task lists, and task completion.
- Provides tools for planning and organizing the clinicians' work, today, this shift, this clinic session, during offices hours, etc.

- Provides tools to facilitate teamwork and coordination process: coverage, handoffs, escalation, and delegation.
- Provides tools for monitoring policy compliance, quick notification of changes in patient status, and potential adverse events.
- Provides tools to facilitate and manage order communication to diagnostic and therapeutic areas and monitor completion process.
- For hospital-based care, gathers data and performs checking to support regulatory and accreditation requirements (e.g., JCAHO safe care standards, Leapfrog standards for medication error prevention, Medicare scope of work).
- For ambulatory care, gathers data and performs checking to support regulatory and accreditation requirements (e.g., HEDIS, Medicare scope of work).
- Includes decision support tools to guide and critique medication administration—right patient, right drug, right dose, right time, right route.
- Includes basic decision support tools such as order sets, interdisciplinary treatment plans, and rules based documentation templates, as well as complex tools such as care paths and rules-based prompting, to reduce practice variance in the ordering and care delivery process.
- Ideally provides recommendations and alerts tailored to the individual patient condition, situation, and preferences and supports clinicians in directing the course of care, e.g., suggests potential and time relevant problems to care providers to consider for a specific patient based on automated scanning of pertinent patient data documented by all members of the care team.
- Ideally includes evidence of patient outcomes related to patient condition and treatment and care delivery processes.

Evidence that implemented EHR possesses these attributes:

- Evidence of medication error rate reduction.
- Evidence of reduction in adverse outcomes sensitive to Nurse Staffing (i.e. Length of stay, patient falls, urinary tract infection, pressure ulcers, hospital acquired pneumonia, wound infection, hospital death, etc.)⁵
- Consistent significant (greater than 40%) reduction in nurse documentation time as compared to the previous manual processes.
- **Over 90% compliance with electronic documentation requirements.**
- More than 75% of care team site EHR as one of the top reasons for job satisfaction. Reasons include enhanced interdisciplinary communication, enhanced coordination of care, reduction of duplicate work, enhanced communication of patient information, and enhanced patient safety.
- **Clinical decision support has been applied to physician / clinician order entry process to address potential problems with high-risk medications identified in the organization's safety program.**
- **Clinical decision support has been applied to the care delivery process to address potential problems with high-risk areas of adverse outcomes.**

- **The organization has evidence that incorporated decision support reminders and alerts are closing identified gaps in patient safety, quality, and cost.**

5. Captures data used for continuous quality improvement, utilization review, risk management, resource planning, and performance management.

Essential Requirements:

- Supports reporting to evaluate processes and outcomes of care.
- Supports reporting regarding compliance with care and process standards.
- Integrates EHR information with financial information and other external data such as patient satisfaction and industry comparative data for purposes of analyzing process and practice performance.
- Supports data modeling tools for evaluation of potential changes.
- Captures patient health related data needed to identify intensity of service for predictive resource allocation.
- Ideally supports real-time surveillance and alerting of potential adverse events.
- Ideally provides concurrent care, management-level, on-line displays enabling easy access to summary views of pertinent information for groups (cohorts) of patients (e.g., all patients on a specific care unit, all patients assigned to a particular case manager, all patients associated with a specific physician / group practice, all patients with specific symptoms and demographics, etc.) to support managers' detection and resolution of potential quality, staffing, and risk management issues.

Evidence that implemented EHR possesses these attributes:

- **Data captured in the EHR is the source used by the organization's quality and safety program to assess, measure, and manage quality.**
- On last audit visit (e.g., JCAHO, CMS, HEDIS, etc.), auditor relied on EHR documentation to conduct review rather than pull the paper medical record.
- The organization has multiple examples of where the EHR helped in meeting regulatory, safe practice, and quality initiatives.
- The organization uses EHR data for resource planning.
- Supervisory personnel, case managers, physicians report decreased incidence of undetected signs and symptoms of impending deterioration of patient's condition and increased incidence of timely intervention.

6. Captures the patient health-related information needed for medical records and reimbursement.

Essential Requirements:

- Captures the episode and encounter information to pass to billing (e.g., triggers transmissions of charge transactions as by-product of on-line interaction including order entry, order statusing, result entry, documentation entry, medication administration charting).

- Automatically retrieves information needed to verify coverage and medical necessity.
- As a byproduct of care delivery and documentation, captures and presents all patient information needed to support coding. Ideally performs coding based on documentation.

Evidence that implemented EHR possesses these attributes:

- Clinically automated revenue cycle – examples of reduced error rate on claims.
- Clinical information needed for billing is available on the date of service.
- **Physicians and clinical teams perform no extra tasks exclusively for medical record coding and reimbursement.**

7. Provides longitudinal, appropriately masked information to support clinical research, public health reporting, and population health initiatives.

Essential Requirements:

- Identifies populations of patients who can benefit from health management initiatives.
- Identifies and tracks patients who are enrolled in health management programs.
- Provides integrated disease management support for education, outreach, and care to enrolled patients.
- Supports mandatory reporting, state health, product liability reporting, social welfare reporting.

Evidence that implemented EHR supports these attributes:

- Organization has a specific program when EHR is used to identify and track patients in health management and / or disease management program.
- **Clinicians do not perform additional data entry to support health management programs and reporting.**
- Organization has history and examples of using EHR for clinical research and responding to public health requirements.

8. Supports clinical trials and evidenced-based research.

Essential requirements:

- Supports the identification of patients for recruitment.
- Ideally supports the protocols and additional documentation and reporting needed for clinical trials.

Evidence that implemented EHR supports these attributes:

- Organization shows increase in participation in clinical trials.
- Organization shows development of own evidence.

¹ CPRI-HOST Electronic Health Record Core Attributes

² A Restatement of Gartner's CPR Definition Update: 12 December 2000, Thomas Handler, MD Note #: TU-12-9718

³ ISO 2.1, Electronic Health Record Characteristics

⁴ Using Innovative Technology to Enhance Patient Care Delivery, American Academy of Nursing Technology and Workforce Conference, July 12 –14, 2002

⁵ Buerhaus study funded by Congress as part of a national research agenda