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Health Informatics — HL7 Electronic Health Records-System Functional Model, Release 2 (EHR FM)

Informatique de santé — Modèle fonctionnel d'un système de dossier de santé électronique, publication 2 (EHR FM)

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Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

ISO/HL7 10781 was prepared by Technical Committee ISO/TC 215, *Health informatics*.

This second edition cancels and replaces the first edition (ISO/HL7 10781:2009), which has been technically revised.

Introduction

Information for readers

EHR System Functional Model Release 2.0 is based on a series of predecessors, starting in 2004 with the release of the first consensus Draft Standard, followed in 2007 by Release 1, then in 2009 with Release 1.1, jointly balloted with ISO/TC 215 and CEN/TC 251. Release 2.0 reflects many changes, including ballot comments that had been made on past ballots and where the HL7 EHR Work Group had committed to bringing consideration of requested changes forward. It also includes comments that were considered for future use from the ISO ballot of 2009 as well as considerations of the Comment Only ballot that was circulated in May 2011.

Other inclusions were made as a result of the multiple EHR System Functional Profiles that have been written on Functional Model Releases 1 and 1.1. There was great learning in those various domain as well as companion profiles. The EHR-S FM also incorporated two other Draft Standards for Trial Use: HL7 EHR Lifecycle Model and HL7 EHR Interoperability Model.

Changes from previous Release

The HL7 EHR-System Functional Model Release 2 had its first normative ballot in May 2012. The key changes as a result of the first normative ballot included the following.

- Moved the normative parts of the Glossary into the Conformance clause section as use of glossary consistently is key to ease in reading and understanding the model.
- Improved consistency in representation of Headers, Functions and Conformance Criteria throughout the model.
- Updated the conformance clause for ease of reading especially as it related to the different types of profiles: domain profiles and companion profiles.
- Provided clarity for functional description and related conformance criteria.
- Updated the content to be more current.

To see all of the comments and reconciliation of the Normative 1 ballot, please see the HL7 Ballot Website for the ballot cycle of May 2012.

Background

What are Electronic Health Record Systems?

The effective use of information technology is a key focal point for improving healthcare in terms of patient safety, quality outcomes, and economic efficiency. A series of reports from the US Institute of Medicine (IOM) identifies a crisis of "system" failure and calls for "system" transformation enabled by the use of information technology. Such a change is possible by "an infrastructure that permits fully interconnected, universal, secure network of systems that can deliver information for patient care anytime, anywhere."(HHS Goals in "Pursuing HL7 EHR Functional Standard" in Memorandum to HIMSS from C. Clancy and W. Raub co-chairs of HHS Council on the Application of Health Information Technology, dated November 12, 2003.) A critical foundational component for resolving these system and infrastructure issues is the Electronic Health Record System (EHR-S).

In developing this EHR-S Functional Model, HL7 relied on three well-accepted definitions: two provided by the US. Institute of Medicine and one developed by the European Committee for Standardization/ Comité Européen de Normalization (CEN). This Functional Model leverages these existing EHR-S definitions and does not attempt to create a redundant definition of an EHR-S.

Existing EHR System Definitions

The IOM's 1991 report, The Computer-Based Patient Record: An Essential Technology, and updated in 1997 (Dick, R.S, Steen, E.B., and Detmer, D.E. (Editors), National Academy Press: Washington, DC) defined an EHR System as follows.

- The set of components that form the mechanism by which patient records are created, used, stored, and retrieved.
- A patient record system is usually located within a health care provider setting. It includes people, data, rules and procedures, processing and storage devices (e.g. paper and pen, hardware and software), and communication and support facilities.
- The 2003 IOM Letter Report, Key Capabilities of an Electronic Health Record System, defined the EHR System as including:
- Longitudinal collection of electronic health information for and about persons, where health information is defined as information pertaining to the health of an individual or health care provided to an individual.
- Immediate electronic access to person- and population-level information by authorized, and only authorized, users.
- Provision of knowledge and decision-support that enhance the quality, safety, and efficiency of patient care.
- Support of efficient processes for health care delivery.

The 2003 ISO/TS 18308 references the IOM 1991 definition above as well as ISO 13606:

- A system for recording, retrieving and manipulating information in electronic health records.

How were the Functions Identified and Developed?

To achieve healthcare community consensus at the outset, the functions are described at a conceptual level, providing a robust foundation for a more detailed work. Functions were included if considered essential in at least one care setting. Written in user-oriented language, the document is intended for a broad readership.

Functional Granularity is a term used to describe the level of abstraction at which a function is represented. Functions that are commonly grouped together in practice or by major systems have been consolidated where appropriate; functions requiring extra or separate language or involving different workflows have been kept separate where appropriate. For example, decision support is maintained as a separate section, but mapped to other key sections, to indicate the "smart" function behind an action. All of the functions could be expanded into more granular elements but a balance between a usable document and an unwieldy list of functions has been agreed upon. The goal of determining an appropriate level of functional granularity at this time is to present functions that can be easily selected and used by readers of this standard, but that are not so abstract that readers would need to create a large number of additional functions within each function.

Although the determination of functional granularity is a relatively subjective task, systematic evaluation of each function by diverse groups of industry professionals has resulted in a level of granularity appropriate for this EHR-S Functional Model. Every attempt has been made to provide supporting information in the functional descriptions to illustrate the more granular aspects of functions that may have been consolidated for usability purposes.

Keeping with the intent of this EHR-S Functional Model to be independent with regard to technology or implementation strategy, no specific technology has been included in the functions, but may be used in the examples to illustrate the functions. Inclusion of specific technologies in the examples does not endorse or support the use of those technologies as implementation strategies.

Drafts of the EHR-S Functional Model and of specific functions have been widely reviewed by healthcare providers, vendors, and other stakeholders. This proposed standard reflects input from all these reviewers.

Health Informatics — HL7 Electronic Health Records-System Functional Model, Release 2 (EHR FM)

1 Scope

The HL7 EHR System Functional Model provides a reference list of functions that may be present in an Electronic Health Record System (EHR-S). The function list is described from a user perspective with the intent to enable consistent expression of system functionality. This EHR-S Functional Model, through the creation of Functional Profiles for care settings and realms, enables a standardized description and common understanding of functions sought or available in a given setting (e.g. intensive care, cardiology, office practice in one country or primary care in another country).

The HL7 EHR-S Functional Model defines a standardized model of the functions that may be present in EHR Systems. From the outset, a clear distinction between the EHR as a singular entity and systems that operate on the EHR, i.e. EHR Systems, is critical. Section 1.1.3 describes the basis and foundation for the HL7 definition of an EHR System. Notably, the EHR-S Functional Model does not address whether the EHR-S is a system-of-systems or a single system providing the functions required by the users. This International Standard makes no distinction regarding implementation; the EHR-S described in a Functional Profile may be a single system or a system of systems. Within the normative sections of the Functional Model, the term "system" is used generically to cover the continuum of implementation options. This includes "core" healthcare functionality, typically provided by healthcare-specific applications that manage electronic healthcare information. It also includes associated generic application-level capabilities that are typically provided by middleware or other infrastructure components. The latter includes interoperability and integration capabilities such as location discovery and such areas as cross application workflow. Interoperability is considered both from semantic (clear, consistent and persistent communication of meaning) and technical (format, syntax and physical connectivity) viewpoints. Further, the functions make no statement about which technology is used, or about the content of the electronic health record. The specifics of 'how' EHR systems are developed or implemented is not considered to be within the scope of this model now or in the future. This EHR-S Functional Model does not address or endorse implementations or technology, nor does it include the data content of the electronic health record.

Finally, the EHR-S Functional Model supports research needs by ensuring that the data available to researchers follow the required protocols for privacy, confidentiality, and security. The diversity of research needs precludes the specific listing of functions that are potentially useful for research.

This Functional Model is not:

— a messaging specification;

— an implementation specification;

— a conformance specification;

— an EHR specification;

— a conformance or conformance testing metric;

— an exercise in creating a definition for an EHR or EHR-S.

The EHR-S Functional Model is not sufficient to provide a longitudinal health record; however, it will contribute to its development. The information exchange enabled by the EHR-S supports the population of clinical documents, event summaries, minimum data sets, claims attachments, and in the future will enable a longitudinal health record.

Additionally, it is important to note that the EHR-S Function Model does not include a discussion of clinical processes or the interaction of the healthcare actors. However, ISO 13940 is an international standard that does outline key principles and processes in the provision of healthcare. Users of the EHR-S FM can refer to ISO 13940 for clinical processes that EHR systems support.

This EHR-S Functional Model package includes both Reference and Normative sections.

Table 1 — Normative Status Types

Status	Description
Reference	Content of the EHR-S Functional Model Package that contains information which clarifies concepts or otherwise provides additional information to aid understanding and comprehension. Reference material is not balloted as part of the standard.
Normative	Content that is part of the EHR-S Functional Model which HL7 committee members and interested industry participants have formally reviewed and balloted following the HL7 procedures for Balloting Normative Documents. This HL7 developed Functional Model document has been successfully balloted as a normative standard by the HL7 organization.

Each section within this document is clearly labelled "Normative" if it is normative. For example, in Clause 7, Conformance Clause, subclauses 7.2 and 7.4 are normative.

In the external Annex A, Function List, the Function ID, Function Name, Function Statement, and Conformance Criteria components are Normative in this Functional Model.

2 Normative references

The following documents, in whole or in part, are normatively referenced in this document and are indispensable for its application. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO/TR 12773-1:2009, *Business requirements for health summary records — Part 1: Requirements*

ISO/TS 13606-4:2009, *Health informatics — Electronic health record communication — Part 4: Security*

ISO/TS 17090-1:2002, *Health informatics — Public key infrastructure — Part 1: Framework and overview*

ISO 18308:2011, *Health informatics — Requirements for an electronic health record architecture*

ISO/IEC 2382-8:1998, *Information technology — Vocabulary — Part 8: Security*

ASTM E1769:1995, *Standard guide for properties of electronic health records and record systems*

3 Terms and definitions

3.1
access control
means of ensuring that the resources of a data processing system can be accessed only by authorized entities in authorized ways

3.2
base functional profile
existing domain or companion functional profile from which new functional profiles are created and/or derived

3.3
conformance
fulfilment of a product, process or service of specified requirements

3.4
conformance criteria
requirements indicating the behaviour, action and/or capability that constitutes implementation of the function

3.5
conformance clause
section of a specification that defines the requirements, criteria or conditions to be satisfied in order to claim conformance

3.6
conformance statement
description of the functions in an EHR system that have been implemented, reflecting the degree to which an EHR system has met the functional profile's requirements and which may include optional functions and information

3.7
derived functional profile
functional domain or companion profile that is created from a base functional profile (i.e. child functional domain profile to children's hospital domain profile)

3.8
extension
capability of an EHR-S to incorporate additional functionality beyond what is defined in the Functional Profile

3.9
functional profile
subset of the Functional Model, in which functions have been designated (sometimes in varying degrees) for certain EHR systems or healthcare delivery settings or narrow operation requirements

3.10
informative functional profile
registered functional profile that has successfully completed formal public scrutiny via the HL7 consensus process

3.11
inherited criterion
one of a set of conformance criteria listed in a parent function that is inherited by all its children functions

3.12
registered functional profile
functional profile that has successfully completed HL7 EHR Work Group registration process and review

3.13
situational criterion
criterion that is required if the circumstances given are applicable

EXAMPLE IF/Then or Dependent SHALL.

4 Overview and definition of the Functional Model (Normative)

The EHR-S Functional Model is composed of a list of functions, known as the Function List, which is divided into seven sections: Overarching, Care Provision, Care Provision Support, Population Health Support, Administrative Support, Record Infrastructure and Trust Infrastructure.

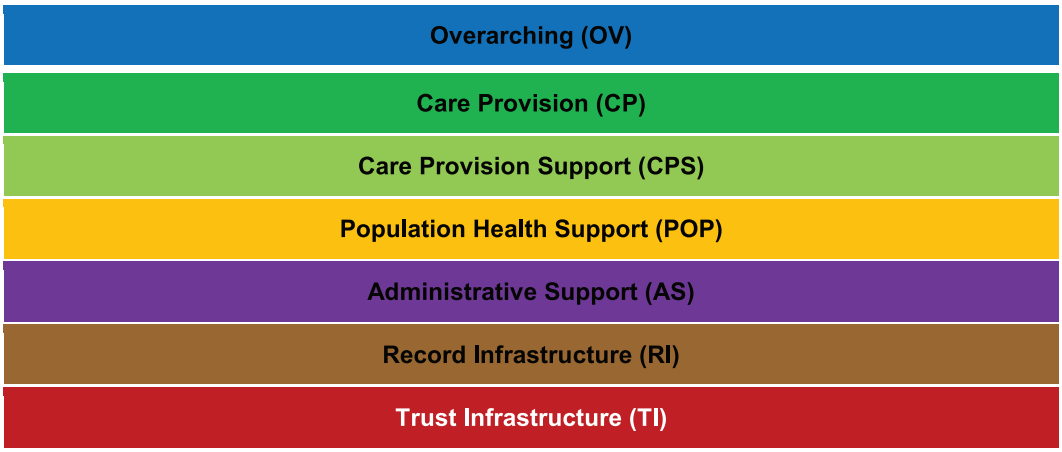

Figure 1 — Function List Sections

Within the seven Sections of the Functional List the functions are grouped under header functions which each have one or more sub-functions in a hierarchical structure.

4.1 Sections of the Function List

The seven sections of the function list reflect content of the Interoperability Model, now integrated in the Functional Model, and input from several profiles if the R1.1 version of the Functional Model. Below is a summary description of each of the seven sections:

- Overarching: The Overarching Section contains Conformance Criteria that apply to all EHR Systems and consequently must be included in all EHR-S FM compliant profiles.
- Care Provision: The Care Provision Section contains those functions and supporting Conformance Criteria that are required to provide direct care to a specific patient and enable hands-on delivery of healthcare. The functions are general and are not limited to a specific care setting and may be applied as part of an Electronic Health Record supporting healthcare offices, clinics, hospitals and speciality care centres.
- Care Provision Support: The Care Provision Support Section focuses on functions needed to enable the provision of care. This section is organized generally in alignment with Care Provision Section. For example, CP.4 (Manage Orders) is supported directly by CPS.4 (Support Orders).
- Population Health Support: The Population Health Support Section focuses on those functions required of the EHR to support the prevention and control of disease among a group of people (as opposed to the direct care of a single patient. This section includes functions to support input to systems that perform medical research, promote public health, and improve the quality of care at a multi-patient level.
- Administrative Support: The Administrative Support Section focuses on functions required in the EHR-S to enable the management of the clinical practice and to assist with the administrative and financial operations. This includes management of resources, workflow and communication with patients and providers as well as the management of non-clinical administrative information on patients and providers.
- Record Infrastructure: The Record Infrastructure Chapter consists of functions common to EHR System record management, particularly those functions foundational to managing record lifecycle (origination, attestation, amendment, access/use, translation, transmittal/disclosure, receipt, de-identification, archive…) and record lifespan (persistence, indelibility, continuity, audit, encryption). RI functions are core and foundational to all other functions of the Model (CP, CPS, POP, AS).

- Trust Infrastructure: The Trust Infrastructure Chapter consists of functions common to an EHR System infrastructure, particularly those functions foundational to system operations, security, efficiency and data integrity assurance, safeguards for privacy and confidentiality, and interoperability with other systems. TI functions are core and foundational to all other functions of the Model (CP, CPS, POP, AS and RI).

4.2 Functional Profiles

While the Functional Model should contain all reasonably anticipated EHR-S functions, it is not itself intended as a list of all functions to be found in a specific EHR-S. Functional Profiles should be used to constrain the functions to an intended use. This document defines the Functional Model and describes the general use of profiles and priorities (See 1.4 Anticipated Uses).

In the aggregate, the Functional Model is intended to include the superset of functions from which a subset can be generated by the user. This subset created by the user illustrates what is needed within an EHR-S. Only a subset of the superset of functions will apply to any particular EHR-S Profile.

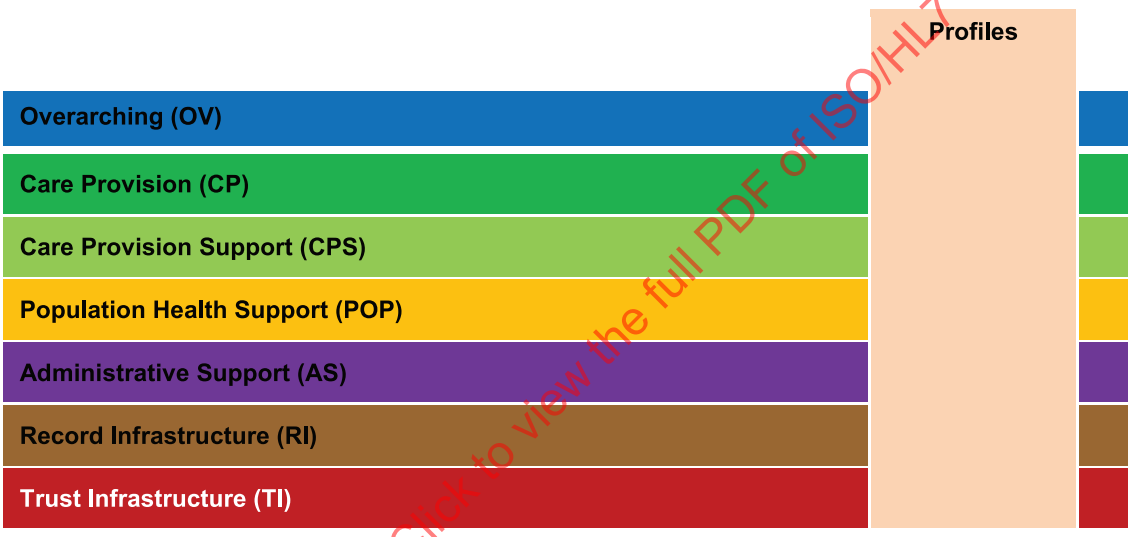

Figure 2 — Profiling from the EHR-S FM

Figure 2 shows that a profile would include all seven sections of the Functional Model, however it may not be necessary to include all the functions and criteria within each section. A profile may include additional functions and criteria to meet the requirements of the profile.

The Conformance Clause is a high-level description of what is required of profiles and implementations. It, in turn, refers to other parts of the standard for details. The Conformance Clause describes concepts critical to the understanding and implementation of the Functional Model, such as: '*What is a profile? What are Conformance Criteria? Or How do you know what is mandatory versus optional*? A Conformance Clause can also provide a communication between the implementers (vendors) and users (buyers) as to what is required, and gives meaning to the phrases, "conforming profile" and "conforming EHR system". Additionally, it serves as the basis for testing and certification activities which may be performed by organizations external to HL7.

Refer to the Conformance Clause, Clause 7, for additional information related to the rules for selecting and adding Conformance Criteria in the development of a Functional Profile.

4.3 EHR-S Function List Components

The EHR-S Function List is a list (superset) of functions organized into discrete sections. Functions describe the behaviour of a system in user-oriented language so as to be recognizable to the key stakeholders of an EHR-S.

EHR-S functions can be used to:

- Facilitate describing end user defined benefits such as patient safety, quality outcomes and cost efficiencies in terms of standard EHR-S functions.
- Promote a common understanding of EHR functions upon which developers, vendors, users and other interested parties can plan and evaluate EHR-S functions.
- Provide the necessary framework to drive the requirements and applications of next level standards, such as EHR content, coding, information models, constructs and interoperability for information portability between sub-systems of an EHR-S and across EHR-S'.
- Establish a standards-based method by which each realm (country) can apply these EHR functions to care settings, uses, and priorities.
- Inform those concerned with supporting subsequent use of data initially collected for the purpose of care (also known as "secondary use") on what functions can be expected in an EHR System.
- Inform those concerned with supporting realm-specific health information infrastructure on what functions can be expected in an EHR Systems.

Each function in the HL7 EHR-S Functional Model is identified and described using a set of elements or components as detailed below.

Table 2 — Function List Example

ID	Type	Name	Statement	Description	Conformance Criteria
CP.1	H	Manage Clinical History	Manage the patient's clinical history lists used to present summary or detailed information on patient health history.	Patient Clinical History lists are used to present succinct "snapshots" of critical health information including patient history; allergy intolerance and adverse reactions; medications; problems; strengths; immunizations; medical equipment/devices; and patient and family preferences.	
CP.1.4	F	Manage Problem List	Create and maintain patient- specific problem lists.	A problem list may include, but is not limited to chronic conditions, diagnoses, or symptoms, injury/poisoning (both intentional and unintentional), adverse effects of medical care (e.g. drugs, surgical), functional limitations, visit or stay-specific conditions, diagnoses, or symptoms..	
CP.1.4	C				1. The system SHALL provide the ability to manage, as discrete data, all active problems associated with a patient.
CP.1.4	C				2. The system SHALL capture and render a history of all problems associated with a patient.
CP.1.4	C				3. The system SHALL provide the ability to manage relevant dates including the onset date and resolution date of problem.

4.3.1 Function ID (Normative)

This is the unique identifier of a function in the Function List (e.g. CP.1.1) and should be used to uniquely identify the function when referencing functions. The Function ID also serves to identify the section within which the function exists (CP = Care Provision Section) and the hierarchy or relationship between functions (CP.1.1 is at the same level as CP.1.2, CP.1.1 is also a parent of CP.1.1.1 and child of CP.1; in many cases the parent is fully expressed by the children. For a detailed discussion and graphic of the parent and child relationship, see 6.6.1 Hierarchical Structure in Chapter 6, Conformance Clause.)

4.3.2 Function Type (Reference)

This is an indication of the line item as being a Header (H), Function (F) or Conformance Criteria (C). The Tag (T) is used to identify a new section in the spreadsheet and its related functions in the spreadsheet. A Tag has no directly associated Functions or Criteria.

4.3.3 Function Name (Normative)

This is the name of the Function and while expected to be unique within the Function List; it is not recommended to be used to identify the Function without being accompanied by the Function ID.

Example Manage Medication List.

4.3.4 Function Statement (Normative)

This is a brief statement of the purpose of this function. While not restricted to the use of structured language that is used in the Conformance Criteria (see below); the Statement should clearly identify the purpose and scope of the function.

Example Create and maintain patient-specific medication lists.

4.3.5 Description (Reference)

This is a more detailed description of the function, including examples if needed.

Example Medication lists are managed over time, whether over the course of a visit or stay, or the lifetime of a patient. All pertinent dates, including medication start, modification, and end dates are stored. The entire medication history for any medication, including alternative supplements and herbal medications, is viewable. Medication lists are not limited to medication orders recorded by providers, but may include, for example, pharmacy dispense/supply records, patient-reported medications and additional information such as age specific dosage.

4.3.6 Conformance Criteria (Normative)

Each function in the Function List includes one or more Conformance Criteria. Conformance Criteria, which exist as normative language in this standard, define the requirements for conforming to the function. The language used to express a conformance criterion is highly structured with standardized components with set meanings. The structured language used to define Conformance Criteria in the Function List is defined in the Conformance Chapter: Sections 2.4 Conformance Criteria and Section 2.9 Glossary Action Verb Hierarchy and Use.

5 Anticipated Uses (Reference)

HL7 is an international community and supports the development of Functional Profiles, which may be country specific (HL7 realm) specifications within a standard. It is anticipated that there will be profiles registered with HL7 that designate a subset of functions from the model for use in specific care settings (e.g. Behavioural Health) or functional areas (e.g. the Records Management and Evidentiary Support EHR). Examples of functional profiles will be included as reference documents in the HL7 How-to Guide for Creating Functional Profiles

5.1 Anticipated Development Approach: Functional Profiles

A “Functional Profile” is a selected set of functions that are applicable for a particular purpose, user, care setting, domain, et cetera. Functional profiles help to manage the master list of functions. The full Functional Model is not intended to apply to any single EHR-S implementation.

As such, an EHR system does not conform directly to the Functional Model; rather, it conforms to one or more Functional Profiles. For more information about creating, registering, and balloting Functional Profiles, see Chapter Two: Conformance Clause, Sections 2 and 6.

Functional profiles are the expression of usable subsets of functions from this EHR-S Functional Model. In this EHR-S Functional Model the reader will see a long list of Function Names and Function Statements, which serve as reasonable representations of functions that may be needed for a clinical environment. The list of functions is not intended to be used in its entirety. For example, the functions outlined in this model apply differently to different care settings. Many of the functions in the model apply to a nursing home setting, but some like CP.1.7.2.3 (Manage Orders for Blood Products and Other Biologics) would not apply. The list of functions is not considered to be in a usable form until a Functional Profile or constraint is generated.

The act of creating a Functional Profile is to support a business case for EHR-S use by selecting an applicable subset of functions from the EHR-S Functional Model list of functions, in effect constraining the model to meet specific requirements. For example, a Functional Profile may be created by a

purchaser, to indicate requirements; by a vendor, to indicate the capability of specific products; or by any person/entity wishing to stipulate a desired subset of functions for a particular purpose, including a care setting within a specific realm. Once an applicable subset of functions has been selected, the person/entity creating the profile gives each function a priority of essential now, essential future or optional. For more information about the steps to creating a Functional Profile, see the HL7 *How-to Guide for Creating Functional Profiles and Related Tooling*.

Readers may wish to focus on the specific section of the EHR-S Functional Model that is more relevant for their everyday work. For example, a clinician might read the Care Provision and Care Provision Support sections very closely, while technical specialists might focus especially on the Trust Infrastructure section. Within an organization, it might be helpful to delegate responsibility for scrutinizing the different sections among staff with different responsibilities and expertise.

Three vignettes are included here to help readers in different positions or organizations envision how they would study, and ultimately utilize the EHR-S Functional Model.

5.1.1 Scenario 1 – Group Practice

Dr. Smith is part of a 50-person group practice. The practice currently has a clinical information system that provides billing, scheduling, and other administrative support. For several reasons, it will need to be upgraded or replaced within 2 years. It does not include electronic health records. Dr. Smith and interested colleagues review an Ambulatory Care registered profile to see how the use setting and scenario illustrate the EHR functions related to their practice; they look at the Ambulatory Care prioritization of the individual functions that a group of experts working with HL7 have identified. With a good understanding of what the EHR functions would mean for their practice, Dr. Smith and several other providers then focus on the Care Provision and Care Provision Support sections, while clinic administration staff look at the Administrative Support section, while the technical support staff look at the Trust Infrastructure section. They all meet to discuss their conclusions. They plan to use the list of functions in discussions with vendors about their next IT system, recognizing that some functions may not yet be available.

5.1.2 Scenario 2 - Hospital

Mr. Jones is the Chief Informatics Officer in a large hospital organization Their IT system was installed two years ago and includes patient tracking and ordering components; it was upgraded for compliance with the United States HIPAA (Health Insurance Portability and Accountability Act). It does not include clinical decision support, performance monitoring, or public health reporting. Mr. Jones asks the Chief Medical Officer to organize a review of the HL7 EHR-S Functional Model while his team also reviews it. They both begin by looking at an Acute Care balloted profile to see how a group of experts working with HL7 have identified how an EHR-S could be used within a hospital. The scenario and prioritization of the individual functions is helpful. The CMO and several doctors and senior nurses review the Care Provision and Care Provision Support sections of the EHR-S Functional Model Acute Care profile; the CIO and his team focus on the Trust Infrastructure section but also look at the Care Provision and Care Provision Support sections. A small team of providers and IT staff meet to discuss their conclusions. They plan to use the list of functions in discussions with vendors about adding decision support, performance monitoring, and public health reporting to their existing system, recognizing that their budget will only allow very limited expansion in the near term.

5.1.3 Scenario 3 - IT Vendor

Ms. Green is the head of the clinical systems division of a large health IT company. Their product line includes both dedicated EHR systems and integrated systems that include an EHR. Their EHR and integrated systems have some decision support for medication ordering, but no performance monitoring/reporting functions. While most of their clients are larger provider organizations and hospitals, they are planning to expand into the small practice and home health markets with a simple, less expensive clinical system. In anticipation of HHS's implementation of the Medicare Reform law, which provides financial incentives for providers who use IT to track patients, the company wants to add a range of functionality to its products that would meet or exceed the Medicare requirements.

Ms. Green asks her staff to review the entire HL7 EHR-S Functional Model package, and also review the care setting profile examples included as exhibits in theHL7 How-to Guide for Creating Functional Profiles and Related Tooling. Based on the examples of care setting Functional Profiles, they determine that they could add a relatively small number of functions to various products to be able to offer superior products for current and future clients. They see value in the EHR-S Functional Model for their discussions with their clients about upgrades or new purchases.

5.2 Examples of Current Use

5.2.1 Functional Profile for Clinical Research based on the EHR-S FM

Below is the text of a November 2009 HL7 Press Release demonstrating industry use:

Ann Arbor, Michigan, USA–November 5, 2009– Health Level Seven® (HL7®), the global authority for interoperability and standards in healthcare information technology with members in 57 countries, today announced it has published the healthcare industry's first ANSI (American National Standards Institute)-approved standard that specifies the functional requirements for regulated clinical research in an electronic health record system (EHR-S). The HL7 EHR Clinical Research Functional Profile for EHR systems is based upon the HL7 EHR Work Group's EHR System Functional Model Release 1, which is also an ANSI-approved American National Standard.

The EHR Clinical Research Functional Profile defines high-level requirements critical for using electronic health record data for regulated clinical research, and provides a roadmap for integrating the information environment that must support both the patient care and the downstream clinical research processes. According to Donald Mon, PhD, co-chair of the HL7 EHR Work Group and member of the HL7 Board of Directors, "This profile is an excellent demonstration of how important functional requirements for secondary data use, such as clinical research, can be integrated into the patient care work flow and documented in EHR systems." Pharmaceutical, biotechnology, clinical research technology vendor, healthcare technology vendor, and federal regulatory stakeholders from the United States and the European Union collaborated for two years to identify and address a broad list of data protection, regulatory and ethical research requirements. The EHR Clinical Research Functional Profile is also a resource for the Certification Commission for Healthcare Information Technology (CCHIT) Clinical Research Work Group as they define new clinical research certification criteria for EHR systems. This functional profile will be complemented by the EHR-Clinical Research interoperability specification, currently being developed by the Health Information Technology Standards Panel (HITSP). Additionally, Dr. Rebecca Kush, President and CEO of the Clinical Data Interchange Standards Consortium (CDISC), commented that "CDISC is pleased to be a collaborator and to contribute clinical research standards and eSource Data Interchange concepts towards these initiatives. The ultimate goal is to accelerate the pace at which research informs healthcare for the benefit of patients and this functional profile contributes to the achievement of that goal."

5.2.2 AHRQ Announces Children's Electronic Health Record Format

Below is an excerpt from a February, 2013 Press Release demonstrating industry use of the HL7 Child Health Functional Profile: http://www.ahrq.gov/news/newsroom/press-releases/2013/childehrpr.html

The benefits of electronic health records (EHRs) may become more widely available to children through an EHR format for children's health care announced today by the US. Department of Health and Human Services' Agency for Healthcare Research and Quality (AHRQ) and Centres for Medicare and Medicaid Services (CMS).... Use of EHRs continues to improve the quality and safety of health care in the United States, but many existing EHR systems are not tailored to capture or process health information about children. The EHR format for children's health care announced today includes recommendations for child-specific data elements such as vaccines and functionality that will enable EHR developers to broaden their products to include modules tailored to children's health of Paediatrics (AAP) and the American Academy of Family Physicians. The format is built on specifications from sources that include the Health Level Seven International (HL7®) EHR-S Functional Model, the HL7 Child Health Work Group's Child Health Functional Profile, and the HHS Health Resources and Services Administration's Health IT for Children Toolbox.

See the link below to access a copy of the "Children's EHR Format" http://healthit.ahrq.gov/childehrFormat

5.2.3 Linking clinical content descriptions to the EHR-S FM (Reference)

HL7 has ongoing initiatives to link clinical content descriptions to functions and criteria in the EHR-S FM. This clinical content linkage can be helpful input to developers of EHR-systems. Examples of these clinical content descriptions include the Domain Analysis Models (DAMs) and Detailed Clinical Models (DCMs). Each of these examples can be linked to applicable sections of the EHR-S FM. For example, a Care Plan DAM which can be linked to a care planning functions in the Care Provision and Care Provision Support sections in the EHR-S FM.

At a more detailed level, the DCMs can be linked to specific functions in the EHR-S FM or EHR-S Functional Profiles. For example, a DCM for the Apgar score can be linked to CP.3.1 Conduct Assessments and CPS 3.1 Support for Standard Assessments. Another example is using the DCM for blood pressure with CP.3.2 Manage Patient Clinical Measurements.

On the level of data elements, which can be specified in a DCM, or in a data table, the linkage to EHR-S FM is usually through an individual criterion. For example, CP.3.2 Manage Patient Clinical Measurements, for example criterion 'The system SHALL provide the ability to capture patient vital signs including blood pressure, temperature, heart rate, and respiratory rate, as discrete elements of structured or unstructured data."

Finally, similar to function T4 Standard Terminology and Terminology Services, a function could be created for DCM and DCM services. The work on this function could be considered for inclusion in the next version of the EHR-S FM.

6 Conformance Clause

6.1 Introduction (Reference)

The following is the EHR Work Group approved Conformance Clause. As important background on conformance, please note the following:

1. This Conformance Clause defines what it means to conform to the EHR-S Functional Model.
2. Conformance to the Functional Model is defined for functional domain profiles, and for functional companion profiles. An EHR system does not directly conform to the Functional Model, rather it conforms to one or more Functional Profiles.
3. Conformance criteria are associated with functions in the EHR-S Functional Model.
4. This Conformance Clause does not specify testing or validation procedures to determine whether an EHR system conforms to a Functional Profile or whether a Functional Profile conforms to the EHR-S Functional Model.

6.2 Scope and Field of Application (Normative)

This *Conformance Clause* defines the minimum requirements for *Functional Profiles* claiming conformance to the EHR System Functional Model. It also identifies how EHR systems achieve conformance to the Functional Model, which is via the system's conformance to a particular functional domain profile, multiple Functional Profiles, or combination of domain and companion profiles. This clause specifies:

5. The purpose, structure, and use of conformance criteria that are to be included in the Functional Model and conforming Functional Profiles,
6. The rules for defining conforming Functional Profiles of the Functional Model,

7. The relationship between Functional Profiles and EHR systems,
8. Sample Conformance Clauses and use case scenarios,
9. Guidance on the conformance requirements that a Functional Profile might levy on EHR systems,
10. Guidance on the purpose and use of an EHR system Conformance Statement.

While the conformance requirements for Functional Profiles can be found in this clause, they necessarily reference the Functional Model and other sources.

This Conformance Clause does not specify testing or validation procedures to assess a Functional Profile's conformance to the Functional Model. It also does not specify testing or validation procedures to determine whether an EHR system conforms to a Functional Profile or matches its Conformance Statement.

6.3 Concepts (Normative)

6.3.1 Functional Profiles

Creating a Functional Profile is a method for defining subsets of the Functional Model. A Functional Profile is a specification which uses the Functional Model to indicate which functions are required, desired, or implemented for certain EHR systems, healthcare delivery settings, or for other purposes (e.g. profile for Records Management and Evidentiary Support EHR).

Functional Profiles can be created by healthcare community stakeholders with interest in using and/or providing a Functional Profile for an EHR system. Functional Profiles can represent the functionality required and desired for a care setting or application, or reflect the functionality incorporated in a vendor's EHR system.

(NOTE: During the process of creating a profile, it may be important to discuss clinical processes and/or the interaction of the healthcare actors. The international standard 'ISO 13940 System of Concepts to Support Continuity of Care' provides an outline of key principles and processes in the provision of healthcare. We would highly recommend reviewing this standard as part of your work.)

Once a Functional Profile is defined it can be implemented by EHR systems or it may trigger the creation of derived Functional Profiles. A *derived Functional Profile* is a Functional Profile that is created from an existing Functional Profile, inheriting functions from the base (existing) Functional Profile.

There are two types of Functional Profiles. The Functional Domain Profile is the common type of profile used to describe an EHR system for use in one or more care settings, or to describe an EHR system for use in a selected realm to meet the rules, regulations and standards applicable for that realm. The Functional Companion Profile is a type of profile that must be paired with one or more Domain Profiles. The purpose of a Companion Profile is to add unique features to an EHR System, such as for research or for evidentiary support. For example, many EHR systems in a clinic environment do not need to support clinical research. But for a clinic that was supporting advanced research, they might want an EHR system that was both capable of all of the expected functions for routine clinic patient care activities, but also had unique features to support the needs for research reporting and clinical trials.

There are two types of mandatory inheritance in the EHR-S FM. All Functional Domain Profiles will inherit all functions in the Overarching section of the Function List Chapter and their related "SHALL" criteria. All criterion listed in a parent function will be applicable to all the children of that parent function.

A formal process exists for registering and balloting Functional Profiles. Functional Profiles that are submitted to the HL7 EHR WG with an attestation of conformance to Section 6: Conformance Clause of the HL7 EHR-S Standard and successfully complete review by the WG are designated as "*Registered Functional Profiles*". Registered Functional Profiles that undergo formal public scrutiny via the HL7 consensus process as an Informative EHR WG ballot at the committee level will be designated as *HL7 Informative functional domain or companion profiles*. HL7 Informative Functional Profiles are eligible to undergo full membership ballot via the HL7 consensus process. *For additional information on registering*

and/or balloting Functional Profiles, see the reference information in the How To Guide for Profiles (under development).

6.3.2 Conformance Model

Conformance to the Functional Model is defined for Functional Profiles. A functional domain profile conforms either (1) directly to the Functional Model or (2) to another conforming functional domain profile. NOTE: All domain profiles must include all the functions and "SHALL" criteria of the Overarching Chapter. An EHR system does not conform directly to the Functional Model; rather, it conforms to a functional domain profile, or to a domain profile in combination with a selected companion profile. Thus, Functional Profiles claim conformance to the Functional Model and EHR systems claim conformance to one or more conforming domain Functional Profiles. An EHR system can also claim conformance to a domain Functional Profile, in combination with one of more companion profiles. An EHR system cannot claim conformance to only a companion profile. Figure 3 illustrates this relationship.

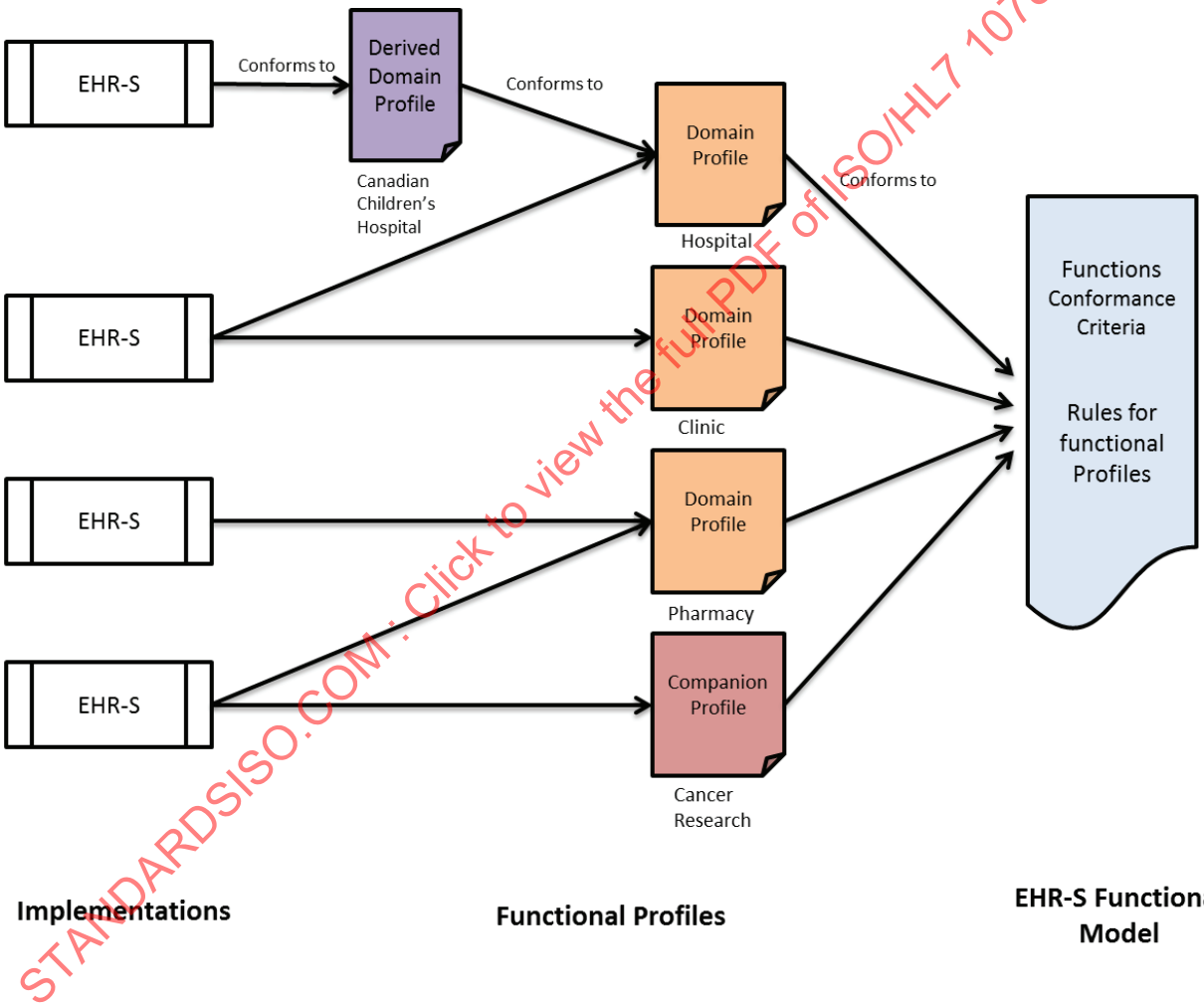

Figure 3 — Conformance Relationships

6.3.3 Profile Traceability

Functional Profiles allow for added specificity and extensibility to the Functional Model with changes allowed to the base FM functions and criteria. However, section six of this chapter defines rules for these changes. It is also required that any changes and additions be tracked. Two added columns in profiles accomplish this. One column will document the unique source FM row number for each item in the new profile (or source profile for a derived profile). The second column will provide codes for the type of changes from the source FM (or source profile). Together, these two traceability columns will keep track of the origins of the functions or criteria – and whether it is modified or unchanged from

that within the FM or the source profile. This may be important when questions arise as to where did it come from, why did you choose or modify it, etc. It can also be helpful to have traceability back to the FM functions and criteria if and when revisions to a profile or for derived profile are needed to reflect care setting, regulatory, technology changes – or a future new release of the FM.

6.4 Normative Language (Normative)

The following keywords (i.e. normative verbs) **SHALL** be used to convey conformance requirements.

- SHALL — to indicate a mandatory requirement to be followed (implemented) in order to conform. Synonymous with 'is required to'.
- SHALL NOT — to indicate a prohibited action. Synonymous with 'prohibited'.
- SHOULD — to indicate an optional recommended action, one that is particularly suitable, without mentioning or excluding others. Synonymous with 'is permitted and recommended'.
- MAY — to indicate an optional, permissible action. Synonymous with 'is permitted'.

The EHR-S Functional Model (i.e. all chapters) contains normative, informative and reference sections. In this Conformance Clause chapter, the normative content defines how a Functional Profile achieves conformance to the Functional Model.

6.5 Conformance Criteria (Normative)

Every function in the Functional Model is associated with a set of conformance criteria. These *conformance criteria* form the basis for determining whether the function has been implemented.

6.5.1 Criteria in the Functional Profile

Functional Profiles also have conformance criteria associated with functions in the Functional Profile. The Functional Profile's criteria are either (1) adapted from the Functional Model criteria with care-setting and application specific information or (2) if no care-setting or application specific criteria are present, inherited directly from Functional Model. Functional domain and companion profiles **MAY** change Functional Model criteria to match the needs and priorities of the Functional Profile's constituency, e.g. by making it more specific, or changing it from 'may' or 'should' to 'shall'. Functional Profiles **MAY** change the criteria of a function to allow for alignment to realm specific nomenclature, including language distinctions and implication of non-English translations. In these cases, the International Organization for Standardization (ISO) country code (ISO 3166 Country Codes) **SHALL** be appended to the function ID in the Functional Profile.

The functional domain profile **SHALL NOT** be made less restrictive than the Functional Model by changing 'shall' criteria to 'may' or 'should' criteria (The functional companion profile MAY be less restrictive that the FM by ignoring 'shall' criterion). Functional domain and companion profiles **MAY** also add additional criteria.

6.5.2 'Dependent SHALL' Criteria

Conformance criteria that contain the keyword 'shall' **and** a dependency on situational conditions are called 'dependent shall' criteria. The 'dependent shall' **SHALL** contain the phrase "in accordance with scope of practice, organizational policy, or jurisdictional law" or other appropriate grammatical tie-in words (e.g. 'based on' rather than 'in accordance'). A 'dependent shall' criteria is used to highlight only these (i.e. scope of practice, organizational policy or jurisdictional law) conditions. A 'dependent shall' criterion is a mandatory criterion for Functional Profiles and situational for EHR systems. Specifically,

- All functional domain profiles SHALL inherit the criterion if the function appears in the Functional Profile.

- An EHR system is required to implement the Dependent SHALL criterion only if the criterion is applicable per the stated dependency in the Functional Model. (If the Dependent SHALL criterion is not applicable to the profile, the developer of the profile may still use the criterion if desired.)

6.5.3 Referencing Other Criteria or Functions

There is often a link between functions and their criteria with other functions and criteria. For example, a given function may depend on another function or on a specific criterion associated with another function.

A criterion in the Functional Profile that references another function in the Functional Profile **SHALL** reference that function by indicating its name and ID, as "X.n.n (Name)". If the referenced function is required to be implemented, then all the 'shall' criteria of this referenced function apply. If the referenced function is a parent with children, the reference must be explicit on whether the children are included in the reference, all or selected ones. See the examples below:

- The system SHALL/SHOULD/MAY conform to TI.1.1 (Entity Authorization).
- The system SHALL/SHOULD/MAY conform to TI.2 (Audit) and all child functions.
- The system SHALL conform to CPS.4 Support Orders, and separate function(s). The systems SHALL conform to CPS.4.3 Non-medication Orders. The systems SHALL conform to CPS.4.6 Support for Referrals and all children functions.

A criterion in the Functional Profile that references a specific criterion in another function **SHALL** reference that function by rewriting the referenced criterion as one of its own and indicating the function and criterion number from where it came (e.g. F#, CC3).

6.6 Functional Model Structure and Extensibility (Normative)

6.6.1 Hierarchical Structure

Functions **MAY** be contained (i.e. nested) within other functions. A nested function is a 'child' to its 'parent' (i.e. the function that contains it). A child **SHALL** always have a parent. A function that is not a parent to another function is considered a 'leaf'. Figure 2 illustrates this hierarchical structure.

The Functional Model is represented as a hierarchical list of functions, consisting of functional header parents, functional header children and functional leaf functions. Headers include an ID, Name and "H" in the column labelled "Type". Parent and Child Headers **MAY** contain conformance criteria only if the criteria apply to all its descendent functions (i.e. children, grandchildren, and leafs). Parent, Child and Leaf functions contain at a minimum the following: ID, Name, Statement, Description, and Conformance Criteria and have an "F" in the "Type" column. Conformance criteria listed in a parent function **SHALL** be inherited by all its children functions. Conformance Criteria have a "C" in the "Type" column.

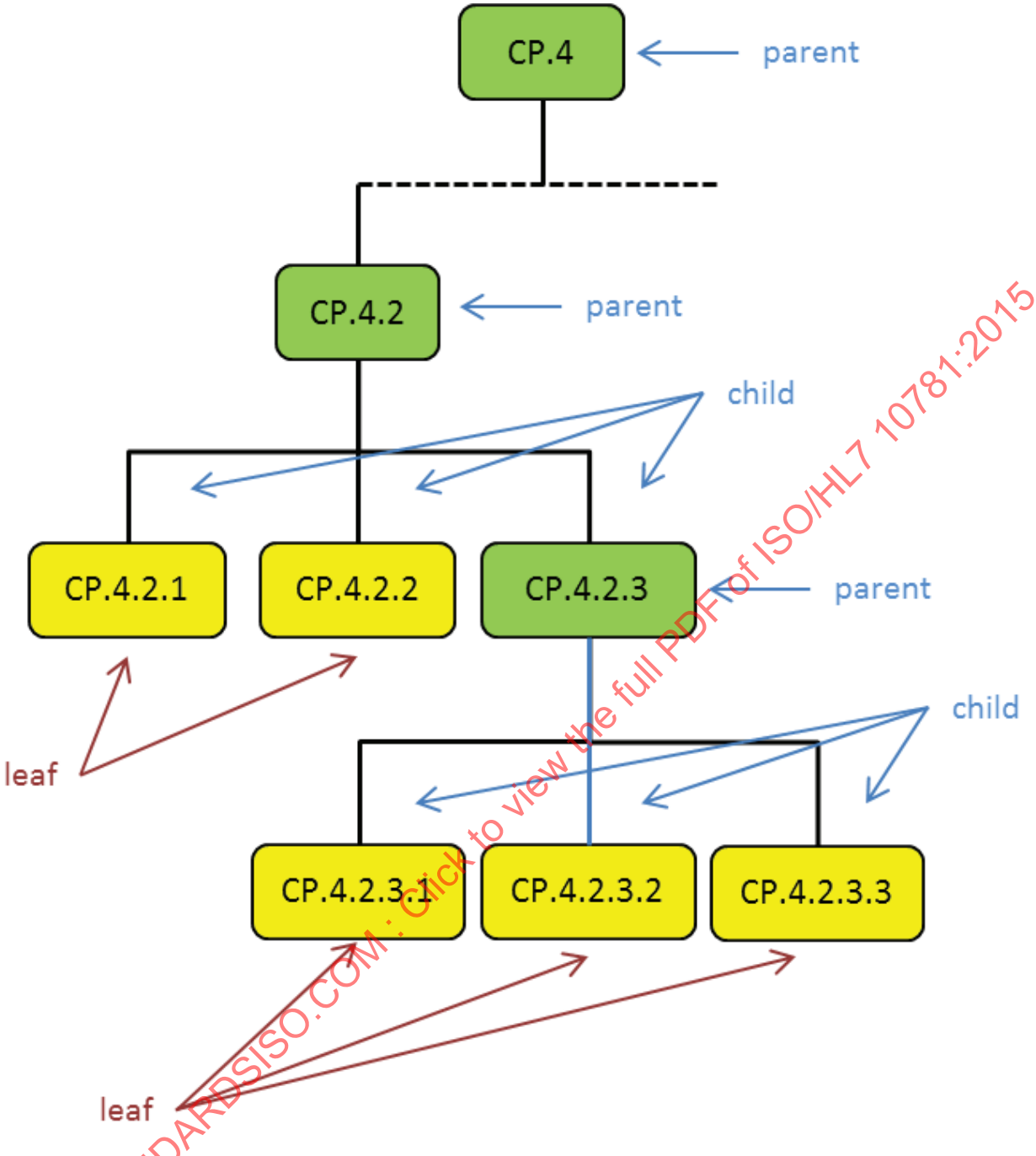

Figure 4 — Portion of the Functional Model hierarchical structure

NOTE The numbering schema above reflects functions in the Care Provision chapter. For instance, CP.4.2 is the function 'Manage Medication Orders.

Functional Profiles either:

- Select functions from the Functional Model for inclusion in the Functional Profile,
- Deem a function in the Functional Model as not applicable, thus do not select it for inclusion in the Functional Profile, or,
- Add a new child function when it has been determined that there is no applicable function in the Functional Model to represent a functional need in the Functional Profile.

6.6.2 Naming Convention

Functional Profiles **SHALL NOT** change the name or statement of a function except to allow for alignment to realm specific nomenclature, including language distinctions and implication of non-English translations. In these cases, the International Organization for Standardization (ISO) country code (ISO 3166 Country Codes) **SHALL** be appended to the function ID in the Functional Profile. It is recommended that the HL7 Affiliate for the respective realm coordinate with the profile development process to maintain a mapping of the Functional Model function name and/or statement and the realm-adjusted name and/or statement.

6.6.3 Priorities

Functional Profiles indicate the importance and/or immediacy of a Functional Profile by associating a priority with a function. Three priorities have been defined, Essential Now, Essential Future, and Optional.

- Essential Now indicates that the implementation of the function is mandatory, as of the profile issuance date.
- Essential Future indicates that the implementation of the function is currently optional but will be mandatory at some future time, which is specified by the Functional Profile
- Optional indicates that the implementation of the function is optional.

Any or all of these priorities **SHALL** be used in a Functional Profile. If the Essential Future priority is used, then Functional Profiles are required to define the timeframe associated with implementing functions. A timeframe **MAY** be a date, time allotment (e.g. year 2014 or 4 months after Functional Profile publication), or event (e.g. republication of this Functional Profile). A Functional Profile **MAY** define multiple timeframes for the Essential Future priority. If multiple timeframes are defined, then the timeframe **SHALL** be used to qualify each occurrence of the Essential Future priority (e.g. EF-2015, EF-2016).

6.6.4 Extensibility

To accommodate changes in technology as well as Functional Profiles' needs, the Functional Model is designed for extensibility, for functions and their related criteria. Incorporation of additional functions in the Functional Profile beyond what is defined in the Functional Model is accommodated through a set of rules for adding new functions as defined in 6.7.2.

Incorporation of additional criterion, changing the sequence of criterion and providing greater profile-specific detail, beyond what is defined in the Functional Model, is accommodated through a set of rules for adding new criterion or changing existing criterion as defined in 6.7.2.

6.7 Functional Profile Conformance (Normative)

A Functional Profile claiming conformance to the Functional Model **SHALL** meet all requirements specified in the 6.7.1 Rules for Functional Domain Profiles or in the 6.7.5 Rules for Functional Companion Profiles.

6.7.1 Rules for Functional Domain Profiles

Functional domain profiles that adhere to the Rules for Functional Profiles **SHALL** claim conformance to the version of the EHR-S Functional Model from which it was derived.

Functional Profiles claiming Functional Model conformance SHALL:

1. Identify the Functional Model with version/date, from which the Functional Profile is derived.
2. Include a description, version and issuance date of the Functional Profile.

3. Contain a Conformance Clause which

   a) Defines the requirements that EHR systems must satisfy in order to claim conformance to the Functional Profile;

   b) Defines the requirements that Functional Profiles derived from the Functional Profile (i.e. derived Functional Profiles) must satisfy in order to claim conformance to the Functional Profile;

   c) Specifies that functions designated with the priority 'Essential Now' SHALL be implemented by conformant EHR systems;

   d) Specifies that functions designated with the priority 'Essential Now' SHALL be included in any derived Functional Profiles;

   e) If Essential Future is used, defines the meaning of 'Essential Future', including specifying the timeframe for when these functions are required to be implemented;

   f) Requires that at least one function, regardless of its priority, be implemented in order for an EHR system to claim conformance to the profile.

4. Include all functions in the Overarching section of Function List as Essential Now and identify functions from other sections of Function List of the Functional Model that are applicable to the functional domain profile. For each identified function, indicate its priority (i.e. Essential Now, Essential Future or Optional).

5. For each function, derive conformance criteria based on the Functional Model's conformance criteria.

   a) In the Functional Profile, there SHALL be at least one criterion for each function that is mandatory (a 'shall' criterion).

   b) If there are 'shall' criteria (for the function in the Functional Model), then those criteria SHALL also exist for the function (in the Functional Profile). Additionally, if the function is split (in the Functional Profile), then the parent's 'shall' criteria SHALL appear in at least one child of that function.

   c) If, as yet there is no 'shall' criterion (for the function in the Functional Model), then at least one of the 'should' or 'may' criterion SHALL be made mandatory, i.e. a 'shall' criterion.

   d) Adhere to the rules for referencing functions or criteria in 6.5.3.

6. For any function in the Functional Model where one or more criteria are 'dependent shall' criteria, the Functional Profile for that function SHALL

   a) Replicate verbatim each 'dependent shall' in the Functional Profile, regardless of whether the dependent situation applies or not;

   b) When the dependent situation applies, create 'shall' criteria that apply the dependency to the 'dependent shall' criterion, resulting in one or more new, constrained versions of the 'dependent shall' criterion;

   c) State the specific scope of practice, organizational policy, and/or jurisdictional law which applies or state why these dependencies do not apply.

7. Adhere to the rules for creating new functions in Functional Profiles in 6.7.2.

8. Adhere to the rules for creating and changing conformance criteria in 6.5.

9. Complete the two traceability columns, see 6.3.3, for any changes to functions or criteria, and include the following codes for type of change: (N/C for no change; A for added; M for modified.).

10. Be structured in accordance with the structural requirements defined for the Functional Model in 6.6.1.

11. Use the Glossary Action verbs for modifying or creating new conformance criterion.

Functional domain profiles claiming conformance to the Functional Model MAY:

1. Create additional functions according to the rules specified in 6.7.2;
2. Contain conformance criteria more specific and limited in scope than those of the Functional Model;
3. Replace the text 'standard(s)-based' found in some criteria with specific standards and/or specifications named at the most discrete level of designation;
4. Change a 'should' criterion to a 'shall' or a 'may' criterion;
5. Change a 'may' criterion to a 'shall' or a 'should' criterion;
6. Ignore a 'should' or 'may' criterion in the Functional Model (i.e. not include it in the Functional Profile);
7. Add additional conformance criteria beyond those in the Functional Model;
8. Make the order of the conformance criteria significant (e.g. put all 'shall' criteria first);
9. Enforce common resolution of ambiguous semantics of the Functional Model;
10. Make the Functional Profile public (e.g. published on a website) so interested parties can see/use it;
11. Submit the Functional Profile for registration review by the HL7 EHR Work Group.

Functional domain profiles claiming conformance to the Functional Model SHALL NOT:

1. Specify any requirements that would contradict or cause non-conformance to the Functional Model;
2. Modify the name or statement of any function in the Functional Model, except to allow for alignment with realm specific nomenclature as specified in 6.6.2;
3. Change a mandatory conformance criteria to an optional criteria (i.e. replace the 'shall' within the criteria to 'should' or 'may') of any function in the Functional Model;
4. Modify any requirements of a function not selected for the Functional Profile (i.e. all unselected functions default to the Functional Model's criteria. If a profiling group wants to change something, they SHALL promote it into their Functional Profile).

6.7.2 Rules for Creating New Functions in Functional Profiles

If a function is not adequately specified for a Functional Profile or does not exist, the Functional Profile **SHALL** only create new children, the new children can be parents or leafs. Figure 5 illustrates the addition of a new child function.

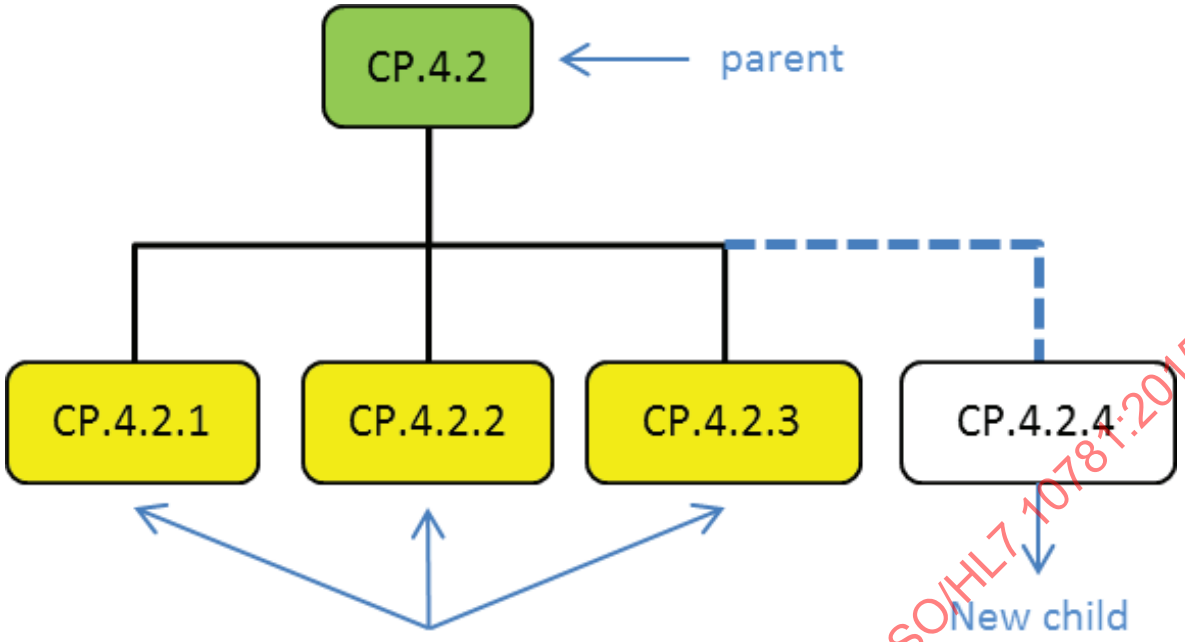

Figure 5 — Creating a new function

The following rules specify the method for creating new functions.

1. Whenever possible, conformance criteria SHOULD be used to avoid creating a new function. This may be done, for example, in cases where the original function's conformance criteria are too broad: divide the Functional Model's or base Functional Profile's inherited conformance criteria into two criteria in the Functional Profile, one being mandatory and the other optional. If this is not possible, the creation of a new child function and associated criteria is allowed if necessary to clearly define the profile requirements.

2. When a 'leaf' function exists (a child that is not a parent) but is too broadly specified in the Functional Model or base Functional Profile for conformance criteria to adequately constrain it, then the function MAY be split as follows:

3. The original 'leaf' function is retained as the parent of its newly created children functions, or

4. The original 'leaf' function's conformance criteria SHALL be distributed among its children functions.

5. When no candidate function exists to express the requirements of a Functional Profile, a new child function MAY be created (e.g. adding a new kind of summary list under the summary list's parent).

6. 'Parent functions SHALL NOT be split. This preserves the structure of the underlying Functional Model in the Functional Profiles.

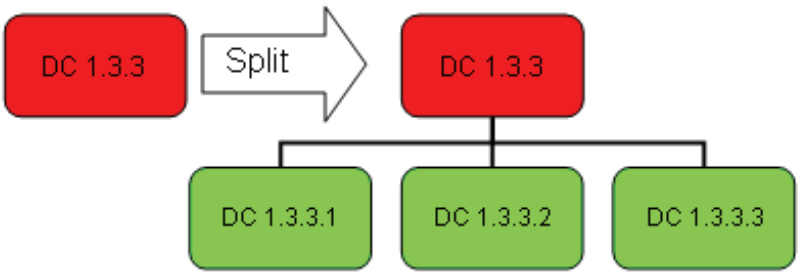

Figure 6 — Splitting a function

If new children functions are created by a Functional Profile that is balloted or registered, these new functions will be captured by the HL7 EHR WG and tracked for review. The EHR WG WILL use these new functions and related criterion as input and candidates for changes to the Functional Model (e.g. inclusion, relaxation of conformance criteria). The EHR WG MAY maintain a file of functions and criterion reviewed and rejected for inclusion in a future version of the FM.

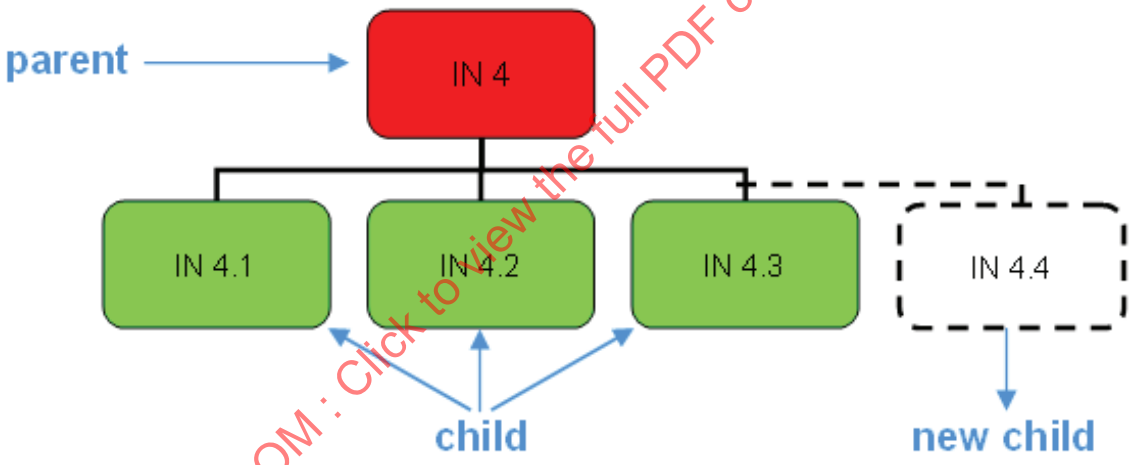

Figure 7 — Adding a new child function

Function IN 4.4 is added as a new child which is a sibling to IN 4.1, IN 4.2, and IN 4.3.

6.7.3 Rules for Derived Functional Profiles

Derived functional domain profiles claiming conformance to one or more base functional domain profiles SHALL:

1. Adhere to all the rules for Functional Domain Profiles as specified in 6.7.1;
2. Adhere to the rules for creating new functions as specified in 6.7.2, if not prohibited by the base Functional Profile;
3. Identify the base Functional Profiles from which it is derived;
4. For each function inherited from a base Functional Profile, retain and not change mandatory conformance criteria to optional conformance criteria.

6.7.4 Conformance Statement

Functional Profiles **MAY** want to require that a conformance statement be produced for systems claiming conformance to the profile. A *Conformance Statement* provides information about an EHR system, by presenting in a uniform manner the functions that have been implemented by the EHR system. A blank (i.e. yet to be completed) Conformance Statement typically takes the form of a questionnaire or checklist, to be completed for each EHR system.

A Conformance Statement provides a concise summary of a Functional Profile. It follows a standard layout, thus providing EHR system vendors and users a quick overview of the Functional Profile's functions. Moreover, it can also be used to highlight optional functions and capabilities supported by the EHR systems as well as document any extensions (i.e. additional functionality beyond what is in the Functional Profile) or specializations that have been made. An EHR system's Conformance Statement provides information that can be used in assessing the EHR system's conformance to a specific Functional Profile. Additionally, organizations wishing to acquire an EHR system **MAY** produce a Conformance Statement to indicate the functions that are required and/or desired in an EHR system

Functional Profiles **MAY** want to include a blank, to be completed, sample Conformance Statement in order to promote consistency among completed Conformance Statements. Conformance Statements can be useful in determining the chances of interoperability between two EHR systems, by comparing the functions supported by each EHR system. Additionally, for conformance testing purposes, it can be used to facilitate the selection of tests that would be applicable to a particular EHR system being tested. For example, if an EHR system did not implement functions designated as 'Essential Future', this would be evident in the Conformance Statement and the tests for these functions (which are unimplemented) would not be performed.

6.7.5 Rules for Functional Companion Profiles

Functional companion profiles that adhere to the Rules for Functional Profiles **SHALL** claim conformance to the version of the EHR-S Functional Model from which it was derived. Functional companion profiles will follow the 6.7.1 Rules for Functional Domain Profiles and the 6.7.3. Rules for Derived Functional Profiles, except for the exceptions and addition described below:

Functional companion profiles claiming Functional Model conformance SHALL:

1. Adhere to 6.7.2 for adding new functions;
2. Contain a Conformance Clause which
    a) Defines at least one functional domain profiles for which the companion profile can be linked that EHR systems must satisfy in order to claim conformance, or state any specific domain profiles that can or cannot be link to the companion profile,
    b) Defines the requirement(s) that companion profiles derived from the base functional companion profile (i.e. derived Functional Profiles) must satisfy in order to claim conformance to the functional companion profile;
3. Include **only functions being modified** from the Overarching section of Function List as Essential Now and identify functions from other section of Function List of the Functional Model that are applicable to the functional companion profile. For each identified function, indicate its priority (i.e. Essential Now, Essential Future or Optional);
4. For each function, derive conformance criteria based on the Functional Model's conformance criteria;
    a) In the Functional Profile, there **SHALL** be at least one criterion for each function that is mandatory (a 'shall' criterion);
    b) If there are 'shall' criteria (for the function in the Functional Model), then those criteria **MAY** also exist for the function (in the functional companion profile) if changes. Additionally, if the

function is split (in the Functional Profile), then the parent's 'shall' criteria **MAY** appear in at least one child of that function;

5. For any function in the Functional Model where one or more criteria are 'dependent shall' criteria, the functional companion profile may elect to ignore the criterion, but **if selected** for that function **SHALL** follow the rules of 6.7.1.

Functional companion profiles claiming conformance to the Functional Model MAY:

6. Ignore a 'shall', "should' or 'may' criterion in the Functional Model (i.e. not include it in the Functional Profile).

There are no exceptions to 6.7.5. for Derived Functional Companion Profiles.

6.8 Use Cases and Samples (Reference)

6.8.1 Functional Profile Use Cases

Care setting

It is determined that a new care setting functional domain profile is needed to reflect the care setting specific requirements. To help ensure widespread use and uniformity, the Functional Profile authors elect to undergo the registration review followed by the HL7 consensus process (i.e. submitting the registered Functional Profile for an "Informative" committee level ballot). If successful, the result will be designated a HL7 Informative Functional Profile.

After looking at current list of HL7 informative Functional Profiles, the decision to create a new Functional Profile is made. Each function in the EHR System Functional Model is examined and those that are relevant to the care setting are chosen. From these functions, a small set of 'core' functions are selected as being essential and mandatory. For each function, conformance criteria is developed either adapting the Functional Model conformance criteria or in a few cases, using the Functional Model criteria as is. To complete the Functional Profile, a description of the Functional Profile, including its intended use and audience as well as a Conformance Clause is written. The Functional Profile is made public by publishing it on various websites. Additionally, the Functional Profile is submitted to HL7's EHR technical committee for registration review, comment and ballot.

Community of interest derived functional domain and companion profiles

A community of interest (e.g. regional health information exchange network) wants a functional domain profile to reflect their specific needs, and the needs of one of their members to support clinic research.

The Community of Interest doesn't want to create a new Functional Profile from scratch. After looking at the list of Registered Functional Profiles, they find an existing Functional Profile that is very close to what they want. Using this Functional Profile as the base, they accept all the functions designated as 'Essential Now', reject functions designated as 'Future' and add several more functions. For each function, they review the conformance criteria and adapt the criteria to reflect their situational information.

For the one member of the community that needs to support research, a functional companion profile is created. The Functional Profile is only needed to address the narrow areas of operation that are specific to research. So, the group finds an existing companion profile for clinical research and modifies it to reflect the functions needed for the specific disease state implications for the research activities of their member. Now the Community of Reference can seek a vendor that can meet the needs of both the domain profile for the group and the companion profile for the unique member.

Vendor functional domain profile and overarching conformance

A vendor with an EHR system wants to claim conformance to the EHR System Functional Model.

The vendor identifies and lists all the functions that are in his product. The vendor adds a description and a Conformance Clause (see samples in 7.2). This is the vendor's functional domain profile. If the vendor has actually implemented all the functions listed, then this is equivalent to 'Essential Now'

and these functions are mandatory. If functions that are currently implemented and those that will be implemented in the future are listed, then the Functional Profile comprises 'Essential Now' and 'Essential Future' and/or optional functionality. Finally, the vendor adds conformance criteria for each function, inheriting some criteria directly (without change) from in the Functional Model. But can also add new criterion to reflect added system features. If all children of a function have the same new criterion, that criterion would be moved to the parent function as overarching, and applicable to all the children. This is appealing in that, the vendor has the opportunity to list all the current functionality and if desired, indicate future plans. In essence, this is similar to a vendor Conformance Statement (a concept most vendors are already familiar with). A vendor may create multiple Functional Profiles.

6.8.2 Sample Functional Domain Profile Conformance Clauses

To aid Functional Profile developers in developing a Conformance Clause for their Functional Profile, as required by 6.1 rule #3, the following examples are offered. Note: in these examples, the keywords 'shall', 'should', and 'may' are capitalized and bold. This is a convention to draw attention to the keywords.

Conformance Clause for a care-setting functional domain profile

This functional domain profile defines the conformance requirements for EHR systems and derived functional domain profiles. To conform to this Functional Profile, all 'Essential Now' functions **SHALL** be implemented. 'Essential Now' functions are considered mandatory functions. An EHR system is conforming if it implements all the functions designated as 'Essential Now' and the mandatory conformance criteria associated with that function. A derived functional domain profile is conforming if it follows the Rules for Functional Profiles.

Mandatory conformance criteria are indicated by the keyword 'shall'. Optional conformance criteria are indicated by the keywords 'should' or 'may'.

EHR systems **SHALL** provide a Conformance Statement structured according to the rules and policies defined in this Functional Profile.

Conformance Clause for an application

E-Application is an application that if included in a care-setting specific system **SHALL** conform to this Functional Profile. E-Application is an application that has a defined set of attributes of which a minimum set of functions is required of any system claiming this e-Application functionality. Two levels of conformance are designated:

- Core Conformance comprises the functions in the minimal set of functions that are designated as 'Essential Now'.
- Advanced Conformance comprises the entire minimal set of functions (i.e. all 'Essential Now' as well as those designated 'Essential Future' functions).

A system **MAY** claim conformance to either the Core or Advanced Conformance levels, if it implements all the mandatory criteria for the functions at the conformance level for which the claim is being made.

Functions designated with the priority 'Essential Now' indicate core functionality. These functions are required to be implemented in order to claim conformance to E-Application, regardless of the level of conformance (i.e. core or advanced) to which the claim is made.

Functions designated with the priority 'Essential Future' indicate advanced functionality. These functions are required to be implemented in order to claim advanced level conformance. 'Essential Future' functions become mandatory 18 months after publication of this Functional Profile and thus, required for immediate implementation in order to claim conformance at either the core or advanced levels.

Conformance Clause for a vendor system functional domain profile

Conformance is defined for My-EHRsystem. All functions in this Functional Profile are mandatory, are deemed as 'essential now', and **SHALL** be implemented in order to conform to this Functional Profile.

Conformance Clause for a community of interest functional companion profile

Conformance is defined for BuyMyDiabetesEHR. To conform to this functional companion profile, all functions labelled as 'essential now' **SHALL** be available and have been implemented,, and all functions labelled 'essential now' in the Long Term Care or Ambulatory domain profile must also be available and implemented. Functions labelled 'essential future' are optional, in that they are present for informational purposes only and **MAY** be implemented in future functional companion profiles.

6.8.3 Interpreting and Applying a Conditional 'SHALL' (Reference)

Conformance criteria in the FM and those created can be structured in the simple format an Actor followed by normative verb followed by action or property. For example: The system **SHALL** capture demographic information as part of the patient record.

However, there are two conditional forms for which if the condition is true, then the following text must apply. One is If/Then. If condition, then Actor followed by normative verb followed by action. If the condition is not met (i.e. false) then ignore the rest of the sentence. For example, IF data are exchanged with internal or external systems, THEN the system **SHALL** conform to function IN 5.1 (Interchange Standards)

The other is a 'Dependent Shall' format. Actor followed by normative verb followed by action/interaction followed by 'according to scope of practice, organizational policy, or jurisdictional law'. For example, "The system **SHALL** enable EHR-S security administrators to grant authorizations to principals according to scope of practice, organizational policy, or jurisdictional law."

The following example of a Functional Model 'dependent shall' criterion will be used to illustrate conditional concepts throughout this section.

Functional Model criterion: The system SHALL enable EHR-S security administrators to grant authorizations to principals according to scope of practice, organizational policy, or jurisdictional laws.

6.8.4 General Concepts

The purpose of the 'dependent shall' is to allow Functional Profiles to constrain a Functional Model 'shall' criteria based on situational conditions such as policy and legal implications. Specifically, the 'dependent shall' criteria in the Functional Model are 'shall' criteria + a dependency, where the dependency is defined by:

- Scope of practice which applies to the EHRs user's scope of practice and refers to best practices within the user's discipline – which may be care setting specific or not.
- Organizational policy which refers to a plan or course of action intended to influence and determine decisions, actions, and other matters of a group of persons organized for a particular purpose within an association and structure through which individuals cooperate systematically to conduct business.
- Jurisdictional law which refers to the territorial range of authority or control with the power, right, or authority to interpret, apply, and declare the body of rules and principles governing the affairs of a community and enforced by a political authority; a legal system.

The structure of the 'dependent shall' criteria in the Functional Model is the same as the 'shall' criteria except with the addition of the phrase "in accordance with scope of practice, organizational policy or jurisdictional law" or other appropriate grammatical tie-in words (e.g. based on rather than in accordance). Note that all three dependencies are present in the Functional Model 'dependent shall' criteria. It is the Functional Profile that narrows it to any one dependency or any combination of the three. Moreover, in the Functional Profile, the specific scope of practice, organizational policy, and/or jurisdictional law which necessitates evoking the 'dependent shall' is explicitly identified.

For example: (derived from the Functional Model criterion above)

Functional Model criterion: The system SHALL enable EHR-S security administrators to grant authorizations in accordance with HIPAA.

The difference between a 'shall' criterion and a 'dependent shall' criterion is shown in Table 3 below.

Table 3 — Differences between 'shall' and 'dependent shall'

	'SHALL' Criterion	'Dependent SHALL' Criterion
Be present in the Functional Profile	Yes, either verbatim or modified (e.g. constrained or refined)	Yes, verbatim. If dependency exists, add additional criteria reflecting the dependency.
Implemented by EHR systems	Yes.	Situational - only implement if the dependency exists. Specifically, EHR system does not implement the 'dependent shall' criterion (as copied from the FM), but does implement additional 'shall' criteria created to reflect the dependency.

6.8.5 Rationale for 'Dependent SHALL'

The reason for using a 'dependent shall' in the Functional Model is to highlight these criteria and bring them to the attention of the reader – both developers of Functional Profiles as well as other users. These criteria are considered to be special cases, where there are one or more dependencies that affect these criteria, across multiple care settings. Using the 'dependent shall' ensures that developers of all Functional Profiles address the criterion and consciously decide whether the criterion in question is applicable, based on the stated dependency.

Regardless of whether a dependency exists or not, the 'dependent shall' is copied verbatim into the Functional Profile. The reasons for this are:

- Adherence to the rule that a 'shall' criterion is always inherited by the Functional Profile.
- Consistency with handling the 'dependent shall' under all conditions (i.e. when there are dependencies and when there are not.
- Retention of the 'dependent shall' so that it is present for derived profiles.
- Retention of the 'dependent shall' so that it remains effective for this profile if future requirements change (i.e. the dependency may not be applicable at this present time, but may be applicable in the future due to changes in scope of practice, organizational policy or jurisdictional law.

6.8.6 How to Apply the 'Dependent SHALL'

The way to interpret and apply a 'dependent shall' criterion in a functional domain profile is as follows:

- Copy the criterion into the Functional Profile.
- Review the criterion and determine if any of the dependencies are applicable to the Functional Profile.
- Dependency exists

If one or more dependencies are applicable to the Functional Profile (e.g. there are jurisdictional legal requirements), add one or more 'shall' criteria that refine and further constrain the 'dependent shall' with respect to the dependencies.

For the new criteria, add an explanation and/or citing for the dependency. For example, jurisdictional legal requirements for this Functional Profile are defined by Federal Regulations (see 45 CFR Parts 160, 162 and 164 – The HIPAA Security Rule. The explanation or citing may be in an appendix. It is likely that multiple criteria will reference the same explanation or citing.

Examples:

Functional Profile criteria

1. The system SHALL enable EHR-S security administrators to grant authorizations to principles in accordance with HIPAA*.

2. The system SHALL enable EHR-S security administrators to grant authorizations for roles in accordance with 42 CFR Part 2*.

Dependency Explanation

NOTE For a US realm Functional Profile, the Health Insurance Portability and Accountability Act of 1996 (HIPAA) as well as other jurisdictional legal requirements or other more stringent requirements would be applied to 'dependent shall' criteria in the Functional Profile.

Table 4 — Summary of actions when dependency exists

FM	Dependency Applicable?	Applicability	Functional Profile
Dependent SHALL	Yes	Mandatory	Copy SHALL from FM
		Mandatory	Add additional criteria to reflect the dependencies. Use 'shall'.
		Mandatory	Add explanation or citing
		Optional	Add additional criteria derived from 'dependent shall'. Use 'shall', 'should' or 'may'.

No Dependency exists

If no dependency is applicable to the functional domain profile (i.e. there are no scope of practice, organizational policies or jurisdictional legal requirements that apply), then document the rationale for deciding that no dependencies apply. This explanation may be in an appendix. It is likely that this explanation will apply to multiple 'dependent shall' criteria.

Table 5 — Summary of actions for when no dependencies

FM	Dependency Applicable?	Applicability	Functional Profile
Dependent SHALL	No	Mandatory	Copy SHALL from FM
		Mandatory	Add explanation
		Optional	Add additional criteria derived from 'dependent shall'. Use 'shall', 'should' or 'may'.

- Add additional criteria – regardless of whether a dependency exists or not.

It is always permissible for a Functional Profile to add new criteria. Add new criteria that are derived from the 'dependent shall'. Use any keyword: 'shall', 'should' or 'may' (see Clause 3) in these new criteria.

Examples:

1. The system **SHOULD** enable EHR-S security administrators to grant authorizations to principals.

2. The system **MAY** enable EHR-S security administrators to grant authorizations for roles.

3. The system **SHOULD** enable EHR-S security administrators to grant authorizations within contexts.

4. The system **SHALL** enable EHR-S security administrators to grant authorizations for roles for organizations with 10 employees or more.

7 Glossary

7.1 Preface (Reference)

The majority of this glossary is classified as REFERENCE. The Action-Verb Structure section is NORMATIVE. This glossary is provided as guidance for preparing and interpreting HL7 Electronic Health Record System functional profile specifications and conformance statements. The goal is to promote clarity and consistency when interpreting and applying the text of the HL7 Electronic Health Record System Functional Model (EHR-S FM).

This Glossary is intended to be international in application. However, each realm may want to adjust terms to their own language.

7.2 Introduction (Normative)

The Health Level Seven International (HL7) Electronic Health Record System Functional Model (EHR-S FM) Glossary is an HL7 reference document that provides a set of definitions and guidelines in order to ensure clarity and consistency in the terms used throughout the functional model. The Glossary includes the definition of important terms used in the expression of EHR systems' functionalities, and comprises a consensus-based list of Action-Verbs and specific guidelines for constructing conformance criteria (CC).

Action-Verbs play a critical role in phrasing conformance criteria (CC). Extensive efforts were made to categorize and normalize Action-Verbs and to develop guidelines for creating clear and consistent CCs throughout the EHR-S FM. Continuity with previous EHR-S FM versions is provided by including Glossary terms that have been deprecated, accompanied by suggestions for preferred replacement terms. Vigorous efforts were deployed to reduce the ambiguities inherent in the use of human language; care was used to respect the fundamental meaning of words and to avoid domain specific usage of terms.

7.3 Overview (Reference)

HL7's EHR Work Group intends to continually unify the glossaries that support both the EHR and Personal Health Records (PHR) System Functional Models, since both models overlap in health care information coverage and system functionalities, and since readers are often the same people. It is expected that Functional Profiles (FP) created within the context of the EHR-S FM will align with and respect this Glossary. However, this Glossary will not provide definitions for all the terms used in Functional Profiles. FPs will typically use context-specific, realm-specific, or specialized terms associated with their area of focus, and will need to incorporate a complementary glossary for these special terms.

In the case where FPs are merged, care should be exercised to ensure that the same Action-Verbs are used with the same meaning, and that identical meanings are conveyed with the same Action-Verb. It is recommended that existing FPs be re-examined and updated to better align with this Glossary.

Some common terms and Action-Verbs have not been included in this Glossary. For example, terms like 'computer', 'keyboard', 'archive' and 'compact' are considered general computer field terms that do not need to be defined here. Some other terms reflect functionalities inherent in any computer system and are not defined here, e.g. compute. Readers who desire definitions of terms not covered in the Glossary are invited to consult trusted dictionaries or encyclopaedias. Where definitions of terms are taken from recognized sources, specific references are included.

For historical purpose, an Appendix is provided that describes the previous hierarchies of Action-Verbs used in the EHR-S FM and the PHR-S FM, and the overall logic that guided the Glossary team in arriving at the current model.

7.3.1 Known Issues (Reference)

The following are known issues with this version of the glossary:

- This Glossary has been revised for Action-Verbs only. The Glossary Team (GT) intends to re-examine the other glossary terms in the future.
- Care has been taken to align definitions with trusted dictionaries. The two (2) main dictionary sources have been:

http://dictionary.reference.com/index.html, and

The Canadian Oxford Dictionary (for definitions only).

- Where definitions have been obtained from other trusted sources, the source is noted in the Reference column of the table. Invitations are extended to interested parties to complete the Reference column where applicable.
- Definitions provided are not expected to align with the various definitions included in other standards, jurisdictional laws and regulations or in domain specific glossaries. This glossary aims at being health care domain independent and universal.

7.4 The Action-Verb Structure (Normative)

The Action-Verbs to be used for writing conformance criteria in the EHR-S FM and the PHR-S FM are organized in three (3) categories, each with its own set of Action-Verbs:

- A system access category;
- A data management category; and
- An auditing category.

Each category consists of Action-Verbs that collectively represent a logical set of actions distinct from the other two (2) categories. All Action-Verbs at all levels are defined in the glossary section of this document (Section Four: Glossary), and illustrative examples are provided.

7.4.1 Secure (System) Category

The Secure System category provides Action-Verbs for controlling access (authenticating and authorizing users), tracking activities (logging and auditing), and sustaining operations. This category has one parent, Secure (System), and three (3) intermediate children: Control Access, Track, and Sustain (Operations).

Table 6 — Action-Verbs represented in Secure System category

Secure (System)				
Control Access		Track		Sustain (Operations)
Authenticate	Authorize	Log	Audit	

- Track (govern; control; administrate; oversee; inspect; examine; assess; observe; monitor; police; enforce; check)
- Sustain (Operations) Keep the system running correctly (e.g. sustain operations; quality; integrity; throughput; mirror; reliability; failover; failsafe; versioned; virus-free; leak-free; up-to-date; safeguard).

7.4.2 Data Management Category

The Data Management category provides Action-Verbs for the complete range of data handling actions by a system. The category has one parent, Manage (Data), and five (5) children with subsets: Capture, Maintain, Render, Determine, and Manage-Data-Visibility.

Table 7 — Action Verbs representing the Data Management category

Manage (Data)										
Capture	**Maintain**			**Render**			**Exchange**	**Determine**		**Manage data visibility**
	Store	Update	Remove							
Auto-populate Enter Import Receive	Archive Backup Decrypt Encrypt Recover Restore Save	Annotate Attest Edit Harmonize Integrate Link Tag Untag	Delete Purge	Extract	Present	Transmit	Export Import Receive Transmit	Analyse	Decide	De-identify Hide Mask Re-identify Unhide Unmask

The first three subsets cover the capture, maintenance and rendering of data as follows:

- Capture: Auto populate fields of data based on partially filled information, Enter data manually, Import data from an external source (which may be a device), and Receive data from another system (which may be in a device).
- Maintain: Store, Update and Remove data:
- Store: Save data on local media, Backup data on backup storage media, and Encrypt data for security and privacy purposes;
- Update: Edit data by modifying it, Annotate data with notes, Tag data with labels, Harmonize data with other sources, Integrate data together, and Link data to other data;
- Remove: Delete data from the index or directory, and Purge data from the storage media.
- Render: Extract data based on certain criteria, Present data on an attached device, and Transmit data to external systems or devices.

The next subset provides verbs for the determination of actions in processing data:

- Determine: Analyse data using rules and analytical steps and then Decide appropriate actions as a result of that analysis.

The final subset allows the construct of statements restricting the visibility of data and reversing those actions:

- Manage-Data-Visibility: De-Identify data as to prevent associating the data to a specific person, Hide data so that only authorized users can see that the data exist, and Mask data so that users can see that the data exist but only authorized users can actually view the actual data.
- To reverse these actions: Re-Identify, Unhide, and Unmask.

7.4.3 How Action-Verbs are defined

In this Glossary section, Action-Verbs are defined in the following manner:

For an Action-Verb that has a parent, the Action-Verb's definition will start with the immediate parent verb and then a restatement of the meaning of the Action-Verb, followed by at least one (1) example labelled as such. Examples will use the Action-Verb being defined with explanatory descriptions where relevant. An illustrative example follows:

- PRESENT (Action-Verb): To RENDER (the parent Action-Verb) data by delivering the data to local users in a meaningful and appropriate way. For example, the system may PRESENT an alert automatically when a newly-arriving lab value is received that is out of normal range.

For a top level Action-Verb, the definition will include the next immediate level of children, followed by at least one (1) example labelled as such. Examples will use the Action-Verb being defined with explanatory descriptions were relevant. An illustrative example follows:

- MANAGE (DATA) (Action-Verb): To handle data by capturing, maintaining, and rendering data, determining actions about data, and managing data visibility. For example, the system shall provide the ability for a user to MANAGE patient and family preferences as they pertain to current treatment plans.

7.4.4 Deprecated Verbs

The Glossary includes deprecated Action-Verbs, with suggestions on how to phrase their meaning using the standardized list of Action-Verbs and qualifiers as explained in 7.4.3 How Action-Verbs are defined.

In this Glossary, the term deprecated is used to qualify Action-Verbs that were previously used in conformance criteria and are not part of the updated hierarchy of Action-Verbs; therefore, deprecated Action-Verbs should not be used. These deprecated Action-Verbs have been labelled as such. Examples of deprecated Action-Verbs include ALERT, QUERY, and SEARCH.

In conformance, the use of verbs which are specific in definition and use allows for greater understanding and consistency of conformance criteria throughout the model.

7.5 Guidelines for Use (Reference)

Contributors to the contents of the EHR-S FM must be thoroughly familiar with this 'Guidelines For Use' section. It is critical to the integrity of the EHR-S FM that key terms have a consistent meaning throughout the EHR-S FM specification.

7.5.1 General Guidance

Throughout the EHR-S FM, terms used for stating Conformance Criteria (CC) must respect meanings as conveyed in the definitions provided in this Glossary. Using the Action-Verbs rigorously will result in clearly written Conformance Criteria (CC) and help ensure consistent communication of functional requirements. Furthermore, combining various functional models and functional profiles is facilitated when a controlled set of terms is used consistently. Therefore, use of synonyms or local jargon should be avoided.

In the EHR-S FM, Statements and Descriptions should be written in 'business-like language', defining in business and user terms system capabilities that support user needs. CC should be written from the system's perspective, with rigor and consistency across functional areas, using Action-Verbs and the guidelines; CC should not be duplicates of the Statements and Descriptions. However, scope wise, both Statement/Description and the corresponding CC must address the same functionalities.

CC represents a fundamental component of the EHR-S FM by defining its functionalities in precise terms. Significant efforts were invested in developing a set of Action-Verbs with precise definitions that must be used in the construction of CC. The next section provides specific guidance on how CC should be composed.

Since various realms may require the use of certain terms (for example, a term that is embedded in national law), this EHR-S FM Glossary maintains a realm-independent perspective. The long term intent is to construct CC that are computable and easy to validate as to their grammar and contents when it is relevant (e.g. use of list of approved Action-Verbs).

7.5.2 Constructing Rigorous Conformance Criteria

Rigor, clarity and consistency in crafting CCs are of paramount importance. The following rules are to be followed whenever possible:

- It is generally preferable to use separate CCs instead of trying to include multiple actions in a single criteria, unless such a combination provides for an economy of statements and is unambiguous.
- Where an action can be performed both automatically by the system and manually upon initiation by the user, separate CCs must be composed.

Selected verbs in conformance criteria should be at the proper level of granularity. If a parent verb in a hierarchy is used, then it means that the actions of all the children verbs under it are pertinent and apply.

- For example, instead of saying MAINTAIN clinical data which would imply storage, update and deletion of data, one would say STORE and UPDATE data if deletion of data was not allowed.
- For example, if a given CC expects EDIT and TAG to be reasonable application of the function, but that ANNOTATE, HARMONIZE, INTEGRATE, LINK are unreasonable, then the word MAINTAIN should be avoided in lieu of the more precise "EDIT and TAG".
- An example of multiple Action-Verbs: The system SHALL provide the ability to CAPTURE, STORE, EDIT, and TAG-as-deprecated the entries in the registry or directory so that it is current.

The general grammar to use in developing rigorous CCs has the following structure:

The system [SHALL | SHOULD | MAY] [provide the ability to] [Action-Verb] [object(s)] [participant(s)] [qualifier(s)] ["according to scope of practice, organizational policy, and/or jurisdictional law"].

- The system is the subject of all the Conformance Criteria. Therefore [subject(s)] is not a parameter and has been replaced by 'the system'.
- [SHALL | SHOULD | MAY]: mandatory. One – and only one – of these three auxiliary verbs must be used. Meanings are defined in EHR-S FM Conformance Clause document and are repeated here for convenience:

SHALL – to indicate a mandatory requirement to be followed (implemented) in order to conform. Synonymous with 'is required to'.

SHOULD – to indicate an optional recommended action, one that is particularly suitable, without mentioning or excluding others. Synonymous with 'is permitted and recommended'.

MAY – to indicate an optional, permissible action. Synonymous with 'is permitted'.

- [provide the ability to]: this is optional and is used when the action will depend on a user intervention;
- [Action-Verb]: mandatory. The Action-Verb must come from the standardized list presented in this Glossary and respect the definitions provided. When another verb would appear preferable, it is suggested to look for that verb in the Glossary definition section where it may be listed with suggestions for a replacement verb and composition. This guide provides numerous examples.
- [object(s)]: mandatory. Identifies the object(s) of the action.
- [participant(s)]: optional. Covers users (or external systems) that participate or are affected by the specified action.
- [qualifier(s)]: optional. This might relate to time, interval, condition(s). Can include (for example): "automatically", "manually", "in real time", "according to the business rules"
- ["according to scope of practice, organizational policy, and/or jurisdictional law"]: optional, when the action could be governed by relevant practices, policies and/or laws.

Note that "…provide the ability to…" is a key phrase that means "manual intervention is expected". Note also that "The system SHALL…" means that the system is required to perform the relevant function when all factors and specified conditions are met.

Some examples of rigorous CCs follow:

- The system SHALL provide the ability to PRESENT the list of scheduled patients according to selected criteria such as provider name, dates, time of day, nature of visit, etc. using language of choice.
- IF a provider attempts to prescribe a drug using the system, THEN the system SHALL DETERMINE whether interactions exist between the newly prescribed drugs and the medications on the patient's current medication list, and RENDER an appropriate response to the provider, according to scope of practice, organizational policy, and/or jurisdictional law.

The verb 'Conform' is used with a special meaning in the FM and is not part of the Action-Verb model. It is a special instruction for including the functional requirements of one function in another function.

- For example: The system SHALL conform to function IN.1.1 (Entity Authentication).

7.5.3 Examples of Rewording Conformance Criteria using the Proper Action-Verbs

Examples are taken from the EHR S FM R1.1 version. These examples are provided as illustrations of improving the composition of CC, and do not imply that the CC will remain the same in later releases of the EHR-S FM.

- The system SHOULD provide the ability to ~~access~~ PRESENT summarized information through customized views based on prioritization of chronology, problem, or other pertinent clinical parameters.
- The system SHALL provide the ability to ~~finalize~~ TAG a document or note as finalized.
- The system SHOULD provide the ability to ~~derive order sets from care plans~~ DETERMINE and PRESENT the appropriate order sets based on an analysis of care plans.
- IF the system is used to ~~enter, modify or exchange~~ CAPTURE, UPDATE or RENDER data, THEN the system SHALL conform to function IN.1.5 (Non-Repudiation), to provide the traceability necessary so that the sources and receivers of data cannot deny that they entered/sent/received the data.
- The system SHOULD provide the ability to ~~communicate~~ TRANSMIT the order to the correct recipient(s) for order fulfilment.
- The system SHALL provide the ability to ~~deactivate~~ TAG a problem as deactivated.
- The system SHALL provide the ability to ~~group tests done on the same day~~ ANALYSE and PRESENT tests in such a manner that those done on the same day are grouped together.
- The system MAY provide the ability to ~~create~~ CAPTURE a terminology map.
- The system MAY ~~notify~~ RENDER a notification to the clinician when specific doses are due.

Other examples of older verbs or phrases that were reviewed in context, and then re-written using the newest Action-Verb set include:

Table 8 — Verb/Phrase Differences between Release 1.1 and Release 2

Release 1.1	Release 2
Create	MAINTAIN and RENDER
Add, input	CAPTURE
Define, Tailor, Specify, Set	CAPTURE and MAINTAIN
Generate	RENDER
Cite, Include	CAPTURE and RENDER
Export	EXTRACT and TRANSMIT
Find, Identify	EXTRACT the information needed to…
Specify	TAG
Prompt	RENDER a notification

Clarification of Terms

"Distinctions"; "Important Distinctions"; "Nuanced Terms"; "Special Notes"; "Troublesome Terms"

7.5.3.1 "Medication Order" versus "Prescription Order"

7.5.3.1.1 Motivation

The EHR_S FM contains functionality that supports the management of orders for medications, devices, therapies, etc. The Work Group discovered a need to clarify the distinction between "medication orders" and "prescription orders".

7.5.3.1.2 Details of differences

A Prescription Medication is a licensed medicine that is regulated by legislation and requires an order from an authorized practitioner before the medication may be obtained. The term is used to distinguish it from over-the-counter drugs which can be obtained without a prescription. Different jurisdictions have different definitions of what constitutes a prescription drug. [Adapted from Wikipedia: "Prescription Medication"]

A "Medication Order" is an instruction from an authorized practitioner (or prescriber) (e.g. physician, physician's assistant, dentist, or nurse practitioner) for the dispensing of prescription or non-prescription drugs. That act is documented in the EHR system. A "Prescription" is a document that is transmitted (for example to a pharmacy) in response to the creation of a Medication Order.

7.5.3.1.3 Guidance

"Prescription" should be used when referring only to those instances that a law requires.

"Medication order" is the preferred term in the EHR-S Functional Model

Annex A
(normative)

Function List

Please refer to the included files EHRS_FM_R2_FunctionList.html and EHRS_FM_R2_FunctionList.pdf for the EHR-S FM function list. Two formats are included for the reader's convenience.

Annex B
(informative)

Glossary of Terms for EHR-S FM

Table B.1 — Glossary of terms for EHR-S FM

Term	Definition	Reference
Accept	Instead, use ''PRESENT or RENDER a message of acceptance, based on the determination (ANALYSE and DECIDE) that the data are valid". Adjust to the context.	This verb has been deprecated as a Verb Hierarchy term.
Access	Instead, use CONTROL-ACCESS if the context is one of controlling access to the system. Use RENDER or PRESENT or another relevant Action-Verb when the context is one of accessing data.	This verb has been deprecated as a Verb Hierarchy term.
Access control	A means of ensuring that the resources of a data processing system can be accessed only by authorized entities in authorized ways.	(ISO/IEC 2382-8, 1998)
Accountability	The property that ensures that the actions of an entity may be traced uniquely to that entity.	(ISO/IEC 2382-8, 1998) cited in ISO/TS 18308
Active order	Active – In a state of action. Order – Request for a certain procedure to be performed.	America Heritage Dictionary, Second College Edition, Houghton Mifflin Company, Boston, 1991.
Activity	See health care activity	
Actor (in the healthcare system)	Health professional, healthcare employee, patient/consumer, sponsored healthcare provider, healthcare organization, device or application that acts in a health related communication or service.	(ISO/TS 17090:—, 2001 modified) cited in ISO/TS 18308
Administrative-acceleration of registration	A delayed patient-registration workflow technique. Very useful for providing care in urgent situations, where life-saving activities supersedes patient-registration requirements.	
Advanced Directive	Advance directives are legal documents that allow an individual to convey his/her desires regarding end-of-life care including the use of antibiotics, tube feedings, and resuscitation. This document is not a healthcare power of attorney or a living will.	
Adverse reaction	An unintended result or effect that is undesirable and/or sometimes harmful.	
Adverse sensitivity	A condition expected to result in undesirable physiologic reaction to an amount of a substance that would not produce a reaction in most individuals.	
Affirm	Instead, use TAC (with an appropriate qualifier). Affirm, Assert, Declare, Indicate, and State are synonyms.	This verb has been deprecated as a Verb Hierarchy term.
After Action	Adjective typically used in conjunctions with report, briefing or other means of information dissemination. "An **after action review** is a structured review or de-brief process for analysing *what* happened, *why* it happened, and *how* it can be done better, by the participants and those responsible for the project or event. Its use has extended to business as a knowledge management tool and a way to build a culture of accountability." "An **after action report** is any form of retrospective analysis on a given sequence of goal-oriented actions previously undertaken, generally by the author himself."	1. http://en.wikipedia.org/wiki/After_action_review 2. http://en.wikipedia.org/wiki/After_action_report
Aggregate (Population Health context)	A collection of individuals, families, or other groupings that is associated because of similar social, personal, health care, or other needs or interests. The grouping exists for the purpose of providing a single measurement or observation for statistical analysis. For example, "left-handed patients were ten percent more likely to receive flu immunizations than right-handed people at the Main Street Clinic last year". (Note: aggregate-level data are often de-identified within the Population Health context.)	Miller-Keane Encyclopedia and Dictionary of Medicine, Nursing, and Allied Health, Seventh Edition. © 2003, an imprint of Elsevier, Inc.
Aggregate data (IT context)	Data that has been collected from two or more sources.	Computer Desktop Encyclopedia copyright ©1981-2012 by The Computer Language Company Inc.
Alert (used as noun)	A type of Notice that requires recipient's action.	

Table B.1 *(continued)*

Term	Definition	Reference
Alert	Instead, use "RENDER or PRESENT or TRANSMIT an alert to a person or another system (including a device)". An Alert typically occurs after analysing some data and arriving at a decision that someone must be alerted. See DETERMINE for some examples.	This verb has been deprecated as a Verb Hierarchy term.
Allergy	An exaggerated immune response or reaction to a substance that is generally not harmful (Ref: MedLine Plus, US National Library of Medicine, NIH). The manifestation of an allergy includes a variety of physiologic responses (e.g. rash, itching, hypotension, anaphylaxis) and can be dependent on the route of exposure (inhalation, skin contact, ingestion).	
Amend	Instead, use EDIT.	This verb has been deprecated as a Verb Hierarchy term.
Analyse	To DETERMINE actions in the flow of processing data by comparing, correlating, or weighting certain data and by applying clinical or business rules, hence leading to a decision (see DECIDE). For example, the system may ANALYSE patient information using a drug-interaction database and a set of clinical rules. Another example is that the system may ANALYSE various protocols relative to a patient's condition. Another example is that a person may ANALYSE a proposed update to a patient's home address and DECIDE to reject the proposed update.	
Annotate	To UPDATE data by attaching comments or notes to the data without editing the data. For example, an Attending physician may ANNOTATE the information entered by the Resident physician before signing the report.	
Append	Instead, use the term EDIT. This means editing data by adding new data to existing data.	This verb has been deprecated as a Verb Hierarchy term.
Appropriate	A suitable, proper, or dependent context-sensitive identification, designation, or qualification. The term "appropriate" is used in this document to codify the need for flexibility to cover conditions that may be best resolved dynamically. The meaning of the term "appropriate" is clarified in this document by corresponding examples.	
Architecture	The structure of components, their inter-relationships, and the principles and guidelines governing their design and evolution over time	ISO 18308
Archive (verb)	To STORE data by moving the data to long-term storage media and deleting or purging data on the original online storage, according to scope of practice, organizational policy, and/or jurisdictional law. For example, the system at the Oak Street Hospital automatically ARCHIVES patient-related data that is older than eight years by encrypting and compressing it, moving it to long-term storage, purging it, identifying the data by month and year, and creating a pointer to the archived data. Another example is that a system may automatically ARCHIVE outpatient clinic schedules that are being replaced.	
Archive (noun)	The process of moving one or more EHR extracts to off-line storage in a way that ensures the possibility of restoring them to online storage when needed without loss of meaning. Wherever possible, archived data should be technology-independent so that future users do not have dependencies on obsolete technology from the past.	ISO/TS 18308

Table B.1 *(continued)*

Term	Definition	Reference
Assent (Patient)	Assent "is to agree to something especially after thoughtful consideration".1 However, in clinical care this typically applies to patients with somewhat limited decision-making capability, such as children and those with some form of mental impairment (e.g. mild dementia).1 In the context of medical research, it can be "a child's affirmative agreement to participate in research."2 "Assent, rather than informed consent, is relevant to decision making with patients with irreversible impairments of decision-making capacity but who do not altogether lack decision-making capacity." Additionally, "some children are mature enough in their decision-making capacity that decisions should be made with them, even though as a matter of law decisions are made by and for them by their parents".3 For children, "the purpose of an assent process is not to provide a second consent but to allow the child to have an appropriate level of involvement in the decision-making process about something that affects him"4.	http://www.merriam-webster.com/dictionary/assent (accessed 6 Feb 2013) US Federal Regulation, 45 CFR 46.402, Department of Health and Human Services, http://www.hhs.gov/ohrp/sachrp/20061109sachrppappendixa.pdf (accessed 6 Feb 2013) "Informed Consent, Assisted Consent, and Assent in Geriatric Health Care", Laurence B. McCullough, Ph.D., Professor of Medicine and Medical Ethics, Associate Director for Education, Center for Medical Ethics and Health Policy, Baylor College of Medicine, at: http://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=6&cad=rja&ved=0CFYQFjAF&url=http%3A%2F%2Fwww.bioethics.union.edu%2Fbio%2Fmccullough%2F1.ppt&ei=T3ASUcXqPKvD0AHT6YGoDg&usg=AFQjCNGmVxijttj_KsbDQ3ixt5prKK3iXQ&bvm=bv.41934586,d.dmQ (accessed 6 Feb 2013) "Assent is Not Consent", Journal of Medical Ethics, 2012; 38:3,at: http://jme.bmj.com/content/38/1/3.full (accessed 6 Feb 2013)
Assert	Instead, use TAG (with an appropriate qualifier). Affirm, Assert, Declare, Indicate, and State are synonyms.	This verb has been deprecated as a Verb Hierarchy term.
Assessment	1 (in medicine and nursing) an evaluation or appraisal of a condition. 2 the process of making such an evaluation. 3 (in a problem-oriented medical record) an examiner's evaluation of the disease or condition based on the patient's subjective report of the symptoms and course of the illness or condition and the examiner's objective findings, including data obtained through laboratory tests, physical examination, medical history, and information reported by family members and other health care team members. See also nursing assessment, problem-oriented medical record.	Mosby's Medical Dictionary, 8th edition. © 2009, Elsevier.
Atomic elements	Atomic elements are foundational numerical clinical measures that can be used to calculate more clinically-useful measures, such as using height and weight (the atomic measures) to derive BMI (a higher level discrete element).	
Attest	To UPDATE information by ATTESTing that an EHR record (or part of an EHR record) is genuine. For example, a resident physician may ATTEST that the information contained in an EHR record was created by her. Another example is that an attending physician may annotate a resident's version of the record and then ATTEST to those changes. Note: Attestations may be applied, affixed or bound to an EHR record, for example, via a digital signature, certification, or other verifying mark.	
Attestation	The process of certifying and recording legal responsibility for a particular unit of information.	ISO/TS 18308
Audit	To TRACK system-initiated or user-initiated activities by analysing logs based on policies or rules. For example, the system may automatically AUDIT the daily log for multiple-failed-log-on-attempts. Another example is that an administrator may AUDIT the excessive use of extraordinary (i.e. "break-the-glass") access to certain patient information in the Emergency Department.	
Augment	Instead, use EDIT, ANNOTATE, or LINK with the appropriate qualifiers. Augmentation is the addition of information to existing healthcare data.	This verb has been deprecated as a Verb Hierarchy term.

Table B.1 *(continued)*

Term	Definition	Reference
Authenticate	To CONTROL ACCESS to a system by validating the identity of a user, another system or a device before authorizing access. For example, the system may AUTHENTICATE Dr. Jones by validating his identity using a UserID and a biometric device. Another example is that the system rejects Sara Smith's attempt to AUTHENTICATE to the system after three failed password entries.	
Authority	Body that has legal powers and rights.	(ISO/IEC 2382-8, 1998) as cited in ISO/TS 18308
Authorization	The process of granting or denying access to a network resource. Most computer security systems are based on a two-step process, sometimes more. The first stage is authentication, which ensures that a user is who he or she claims to be and in some cases, that the user is not already on the system. The second stage is authorization, which allows the user access in varied degrees to various resources based on the pre-assigned privileges associated with the user's identity.	http://www.csgnetwork.com/glossarya.html#authorization
Authorize	To CONTROL ACCESS to a system by applying permissions to use certain functionality or to view certain data. For example, the system may AUTHORIZE Dr. Jones, an Emergency Department physician, to view Emergency Department patient records (note: We assume that the administrator has entered a set of permissions for all Emergency Department physicians). Another example is that the system does not AUTHORIZE deletion by Sara Smith of a patient record that has already been signed.	
Automatically	A qualifier used to indicate that the action will be done by the system, independently of any user intervention. For example, the system shall automatically determine that the user has the privileges to use the requested functionality.	
Auto-populate	To CAPTURE data by inputting it automatically using previously-existing data, providing a default value, or deriving it from other data, or by following various data-entry business rules. For example, the system may AUTO-POPULATE the city, state/province, and country fields when a user enters a zip-code. Another example is that the system may AUTO-POPULATE a newborn's home address with the mother's home address.	
Background process	Background processes, are processes running behind the scene without human interaction or intervention. Sometimes employed to perform certain maintenance activities or to deal with abnormal conditions arising in the lifetime of the instance.	http://www.dbasupport.com/oracle/ora9i/background_process01.shtml
Backup (verb)	To STORE data by placing a copy of the data onto an electronically-accessible device for preservation in case the original is lost, corrupted, or destroyed. For example, a system may BACK UP the incremental changes made to a patient's record by storing it locally on a daily basis. Another example is that an administrator may BACK UP a complete copy of certain data by storing it at an offsite facility.	
Backup (noun)	A copy of data for the specific intent of ensuring its preservation and possible restoration in case the original is lost, corrupted, or destroyed	
Behavioural healthcare	Continuum of services for individuals at risk of, or suffering from mental, addictive, or other behavioural health disorders.	www.mentalhealth.samhsa.gov/publications/allpubs/MC98-70/default.asp
Best practice	Best Practices are practices that incorporate the best objective information currently available regarding effectiveness and acceptability.	www.samhsa.gov/grants/2005/nofa/sm65011_jail_appenAtol.pdf
Bind	To ensure a persistent relationship between two (or more) pieces of information. For example, one may bind an author's (digital) signature to the corresponding health record content created by that author. Another example is that one may bind certain metadata to an electronic document. Another example is that one may bind a certain laboratory result (report) to a corresponding laboratory order.	
Boundaries	Something that indicates a border or limit. The border or limit so indicated.	http://dictionary.reference.com/search?q=boundaries&r=66
Business Rule	From the information system perspective, "a business rule is a statement that defines or constrains some aspect of the business. It is intended to assert business structure, or to control or influence the behavior of the business."1 In the healthcare world, there are a variety of areas in which business rules may be developed and applied. Examples include (but are not limited to) coding, billing, claim filing and reimbursement, resource management (personnel, beds, supplies, equipment), workflow optimization, and clinical decision support. The last is a specialized area particular to clinicians that can require a very robust set of complex algorithms that incorporate specific rules.	1. The Business Rules Group, at http://www.businessrulesgroup.org/defnbrg.shtml, accessed 5 June 2013.
Calculate	Instead, use "DETERMINE and STORE" or "DETERMINE and PRESENT", as appropriate in the context.	This verb has been deprecated as a Verb Hierarchy term.

Table B.1 *(continued)*

Term	Definition	Reference
Capture	To MANAGE data by auto-populating, entering, importing, or receiving the data, either through human intervention or automated means. For example, a system may CAPTURE patient's data entered by a physician through the keyboard or sent by the physician using a mobile device. Another example is that the system may CAPTURE laboratory results by automatically receiving laboratory data or by keyboard entry for locally performed tests.	
Care Guidelines (synonymous with Health Care Guidelines)	Recommendations that are offered by a caregiver to a patient or are recommendations that are recognized by care providers as being appropriate. In general, care guidelines are based on expert knowledge of assessing, treating and/or managing a particular medical condition. Care guidelines for providers include the important subset of Clinical Practice Guidelines. According to the US Agency for Healthcare Research and Quality (AHRQ), clinical practice guidelines can be categorized into a number of areas: Assessment of Therapeutic Effectiveness, Counselling, Diagnosis, Evaluation, Management, Prevention, Rehabilitation, Risk Assessment, Screening, Technology Assessment, and Treatment.	http://guideline.gov/about/glossary.aspx
Care Plan	A care plan is an ordered assembly of expected or planned activities, including observations, goals, services, appointments and procedures, usually organized in phases or sessions, which have the objective of organizing and managing health care activity for the patient, often focused upon one or more of the patient's health care problems. Care plans may include order sets as actionable elements, usually supporting a single session or phase. Also known as Treatment Plan.	HL7 Clinical Decision Support team, Jim McClay, SAGE guideline consortium, University of Nebraska Medical Center
Care Plan (alt)	A personalized statement of planned health care activities relating to one or more specified health issues.	ISO 18308, [EN 13940–1:2007, modified]
Care Process	A task (or set of tasks) that is/are clinically-oriented. Care processes are comprised of care planning, care delivery, and follow up tasks.	
Care Team	A group or collection of individuals who provide health care to an individual for a given health care episode, health care setting, or health condition.	
Cascade (noun)	Something arranged or occurring in a series or in a succession of stages so that each stage derives from or acts upon the product of the preceding.	http://www.m-w.com/cgi-bin/dictionary?book=Dictionary&va=cascade
Chain-of-Trust Agreement	A requirement certain administrative procedures may be implemented that guard the integrity, confidentiality and availability of sensitive data. A Chain-of-Trust Agreement is such a procedure. It is essentially a Non-Disclosure Agreement that governs the transmission of data through an electronic medium. The sender and recipient agree to protect the data electronically transmitted between them.	http://www.hipaadvisory.com/action/legalqa/advisor/HIPAAdvisor5.htm
Change history	A record of changes that have occurred over time, as to a document or other change controlled item. The log can serve as an audit record for activity in a file system.	http://en.wikipedia.org/wiki/File_change_log
Change log	A record of changes that have occurred over time, as to a document or other change controlled item. The log can serve as an audit record for activity in a file system.	http://en.wikipedia.org/wiki/File_change_log
Chronicity	Those attributes or dimensions that could be associated with a chronic condition. Chronicity-related attributes may include: time period (e.g. childhood, pubescence, constant), duration of condition (e.g. brief, extended, sustained, habitual), duration of episode (e.g. sleeping hours, self-limiting, consistent), level (e.g. mild, moderate, or severe condition or pain), and/or periodicity or frequency (e.g. a seasonal allergy).	
Clinical Data / Information	Data/information related to the health and health care of an individual collected from or about an individual receiving health care services. It includes a caregiver's objective measurement or subjective evaluation of a patient's physical or mental state of health; descriptions of an individual's health history and family health history; diagnostic studies; decision rationale; descriptions of procedures performed; findings; therapeutic interventions; medications prescribed; description of responses to treatment; prognostic statements; and descriptions of socio-economic and environmental factors related to the patient's health.	CPRI, 1996b; ASTM 1769
Clinical decision support	Clinical Decision Support (CDS) refers broadly to providing clinicians or patients with clinical knowledge and patient-related information, intelligently filtered or presented at appropriate times, to enhance patient care. Clinical knowledge of interest could range from simple facts and relationships to best practices for managing patients with specific disease states, new medical knowledge from clinical research and other types of information.	http://www.himss.org/ASP/topics_clinicalDecision.asp
Clinical documentation	Documentation of clinical observations, services, or communications. Clinical documentation can be captured as structured or unstructured data. Clinical documentation also includes documentation that is preliminary, final, attested, or not-yet-attested.	
Clinical documents	Documents created surrounding the process of providing health care and used in support of clinical decisions. See Also: Clinical Information.	

Table B.1 *(continued)*

Term	Definition	Reference
Clinical image	A clinical image is a non-textual, pictorial depiction of clinical information (for example: a radiograph, picture, video, or waveform). There are different types of clinical images, to include a picture (e.g. dermatology photo) or radiograph (X-Ray image), video clip (e.g. colonoscopy), audio clip (e.g. heart sounds), waveform (e.g. EKG, foetal monitor), and scanned image (.pdf file). The inherent difference between a clinical image and other types of data are that images generally require a higher degree of complexity (e.g. software code) in order to properly interpret and be "computable", if at all. (Note: most dictionaries, including medical and IT dictionaries, only think of a picture as being an image. However, for the purposes of the HL7 EHR FM, all of these categories of "multi-media digital objects" are included in this definition).	
Clinical information	Information about a patient, relevant to the health or treatment of that patient, which is recorded by or on behalf of a healthcare professional. NOTE: Clinical information about a patient may include information about the patient's environment or about related people or animals where this is relevant.	
Clinical Practice Guideline (CPG)	A statement that includes recommendations intended to optimize patient care. It is informed by a systematic review of evidence and an assessment of the benefits and harms of alternative care options.	"Clinical Practice Guidelines We Can Trust", Committee on Standards for Developing Trustworthy Clinical Practice Guidelines Board on Health Care Services, Institute of Medicine (IOM) of the US National Academies of Science, May 17, 2011, at: http://www.iom.edu/~/media/Files/Activity%20Files/Quality/SystemReviewCER/Workshop%20Presentations/Shelly%20Greenfield.pptx, (accessed 21 Feb 2013)
Clinical process	The set of interrelated or interacting health care activities performed by one or more health care professionals	ISO 18308
Clinician	Health professional who delivers health services directly to a patient/client	ISO/TR 12773-1
Clinical tasks	Tasks whose results are recorded in clinical documents.	
Code set(s)	Under HIPAA, this is any set of codes used to encode data elements, such as tables of terms, medical concepts, medical diagnostic codes, or medical procedure codes. This includes both the codes and their descriptions. HIPAA requires every provider who does business electronically to use the same health care transactions, code sets, and identifiers. Code sets are the codes used to identify specific diagnosis and clinical procedures on claims and encounter forms.	http://aspe.hhs.gov/admnsimp/faqcode.htm www.cms.hhs.gov/TransactionCodeSetsStands/
Coding system	Combination of a set of code meanings and a set of code values, based on a coding scheme. NOTE Code meanings are typically represented by terms or rubrics, but they can have other representations. Code values are typically numeric or alphanumeric	ISO 18308, [EN 1068:2005]
Coding Scheme	A collection of rules that maps the elements of one set on to the elements of a second set NOTE: The two sets considered here are (1) a set of 'code meanings' (or 'coded set'), and (2) a set of 'code values' (or 'code set'). Those sets are not, per se, part of the coding scheme.	ISO 18308, [ISO/IEC 2382-4:1999] [EN 1068:2005]
Coded	References a vocabulary, code set, or database, such as SNOMED, MEDCIN, etc.	
Cohort	A group of individuals who share a characteristic at some specific time and who are then followed prospectively, with data being collected at one or more suitable intervals. The most common use of the term is to describe a birth cohort, in which all the group members are born in a specified time period, but other common characteristics could define the cohort, such as marriage date, exposure to an infectious agent, or date of diagnosis or of treatment for a disease.	Miller-Keane Encyclopedia and Dictionary of Medicine, Nursing, and Allied Health, Seventh Edition. © 2003, an imprint of Elsevier, Inc.
Common Content (within context of Orders):	Identical information for separate orders (e.g. medication [e.g. dose, frequency, patient instructions, patient identifier, ordering provider], laboratory, non-medication) for the same patient, class of order or ordering event.	
Communication with medical devices	Interfacing and integration ranging from the device to the database level in support of creation of clinical documents. Examples include automatic importation of blood pressure readings and viewing of ECGs.	
Compendium	In the context of Pharmacy, a compendium is a collected body of information detailing the standards of strength, purity, and quality of drugs.	http://medical-dictionary.thefreedictionary.com/compendium
Compute	Instead, use "DETERMINE and STORE" or "DETERMINE and PRESENT" as appropriate in the context.	This verb has been deprecated as a Verb Hierarchy term.

Table B.1 *(continued)*

Term	Definition	Reference
Concept	A unit of knowledge created by a unique combination of characteristics	ISO 18308, [ISO 1087-1:2000]
Confirmation service (BAA)	A service that provides identification, control, accounting, and documentation of all changes that take place to system hardware, software, firmware, supporting documentation, and test results throughout the life span of the system.	All In One CISSP Certification Exam Guide, Shon Harris, CISSP, MCSE, CCNA, 2002, McGraw Hill, Osborne, Berkley, CA.
Confidentiality	(The/A) property that information is not made available or disclosed to unauthorized individuals, entities or processes	[ISO TS / EN 13606–4: 2007, modified]
Configure	Instead, use "MANAGE configuration parameters for …". For example, the user may desire to STORE configuration parameters regarding the preferred type of human language. Another example is that an administrator may UPDATE configuration parameters that control external access to the system by restricting access during the weekends.	
Conform	To comply. Note: The verb 'Conform' is used with a special meaning in the FM and is not part of the Action-Verb model. It is a special instruction for including the functional requirements of one function in another function. For example: "The system SHALL conform to function IN.1.1 (Entity Authentication)".	
Conformance	The fulfilment of specified requirements by a product, process, or service.	HL7 EHR-S Functional Model Chapter 2: Conformance Clause
Conformance criteria	Statements of requirement indicating the behaviour, action, capability that constitutes implementation of the function.	HL7 EHR-S Functional Model Chapter 2: Conformance Clause
Conformance clause	A section of a specification that defines the requirements, criteria, or conditions to be satisfied in order to claim conformance.	HL7 EHR-S Functional Model Chapter 2: Conformance Clause
Conformance statement	A statement associated with a specific implementation of a profile of the EHR-S Functional Model.	HL7 EHR-S Functional Model Chapter 2: Conformance Clause
Consent (noun)	An agreement, approval, or permission as to some act or purpose given voluntarily by a competent person.	ISO 18308, [Black's Law Dictionary, 2008]
Consent (Informed)	"Consent by a patient to a surgical or medical procedure or participation in a clinical study after achieving an understanding of the relevant medical facts and the risks involved." The key distinction between Informed Consent and Assent is that in Informed Consent, the individual providing said consent is considered to be fully capable of making a decision relevant to the course of action being presented to him or her, while in Assent the individual may not be fully capable of making the decision. See Assent.	http://medical-dictionary.thefreedictionary.com/informed+consent (accessed 6 Feb 2013)
Consumer (in relation to healthcare services)	An individual who may become a subject of care.	ISO/TR 12773-1
Control Access	To AUTHENTICATE users and/or systems and AUTHORIZE access to functionality and/or data. For example, the system may CONTROL ACCESS to the patient's data by authenticating Dr. Jones' identity and authorizing him to update his patient's records. Another example is the system may CONTROL ACCESS to the system by refusing a hospital visitor the ability to authenticate to the system. NOTE: the set of CONTROL ACCESS Action-Verbs requires data specifying permissions. This permission data are managed via the MANAGE data Action-Verbs set.	
Correct	Instead, use EDIT.	This verb has been deprecated as a Verb Hierarchy term.
Create	Instead, use "DETERMINE and STORE" or "DETERMINE and RENDER" or "DETERMINE and PRESENT" as appropriate to the context.	This verb has been deprecated as a Verb Hierarchy term.
Critical value (also Panic value)	A result (e.g. laboratory, radiology, pathology) on a patient that must be reported immediately to care provider, which may require urgent therapeutic action1. Use of critical or panic values is part of the concept of "decision levels" in laboratory medicine; when a particular value for reporting lab test results exceed a DL are exceeded, a response by a managing clinician is required2.	http://medical-dictionary.thefreedictionary.com/critical+value http://medicaldictionary.thefreedictionary.com/decision+levels
Current medication	A medication that a patient is using, either on a regular basis or on an ad hoc basis (e.g. "two pills as needed for pain"). A medication that has been dispensed to a patient and whose administration has not yet been completed or finished according to the medication's intended duration, dose, frequency, and quantity.	
Dashboard	A dashboard is a data representation tool which polls information from a system(s) and presents it to the user to allow them to make decisions and take actions, and which reflects the impact of these actions in a timely fashion so as to facilitate the user in dynamically continuing to alter their behaviours.	

Table B.1 *(continued)*

Term	Definition	Reference
Data aggregation	A process by which information is collected, manipulated and expressed in summary form. Data aggregation is primarily performed for reporting purposes, policy development, health service management, research, statistical analysis, and population health studies.	ISO/TS 18308
Data Enterer	A person who transferred the content, written or dictated by someone else, into a clinical document. The guiding rule of thumb is that an author provides the content found within the header or body of the document, subject to their own interpretation, and the Data Enterer adds that information to the electronic system. In other words, a Data Enterer transfers information from one source to another (e.g. transcription from paper form to electronic system).	CDAR2_IG_IHE_CONSOL_DSTU_R1.1_2012JUL, HL7 Implementation Guide for CDA® Release 2: IHE Health Story Consolidation, DSTU Release 1.1 (US Realm) July 2012
Data validation	A process used to determine if data are accurate, complete, or meet specified criteria. NOTE – Data validation may include format checks, completeness checks, check key tests, reasonableness checks, and limit checks.	(ISO/IEC 2382-8, 1998) as cited in ISO/TS 18308
Decide	To DETERMINE actions in the processing of data by choosing a certain alternative based on an analysis, and acting accordingly. For example, the system may DECIDE to render a notification to off-duty nurses to report for duty based on clinic rules and the receipt of a tornado alert. Another example is that the system may DECIDE to RENDER an alert to a clinician that a prescribed drug is contraindicated with the patient's listed allergies, based on the analysis conducted.	
Decision support prompts	Any computer based support of medical, managerial, administrative and financial decisions in health using knowledge bases and/or reference material. [In this sense the term is essentially synonymous with Knowledge-Based Systems, and some users use the term this way in preference to the terms Expert System or Knowledge-Based System, e.g. a system that uses statistical look-up to provide users with decision support may be regarded as a Decision Support System, therefore care should be taken in making this identification between the terms].	http://www.centc251.org/Ginfo/Glossary/tcglosd.htm
Decision support system	Any computer based support of medical, managerial, administrative, and financial decisions in health using some processing logic with knowledge bases and/or reference materials.	
Declare	Instead, use TAG (with an appropriate qualifier). Affirm, Assert, Declare, Indicate, and State are synonyms.	This verb has been deprecated as a Verb Hierarchy term.
Decrypt	To STORE data by converting encrypted data back into its original form, so it can be understood. For example, the system may DECRYPT clinical data received from an authenticated external laboratory system.	
Decryption	Decryption is the process of converting encrypted data back into its original form, so it can be understood.	http://searchsecurity.techtarget.com/sDefinition/0,,sid14_gci212062,00.html
De-identification	The process of removing the association between a set of identifying data and the data subject.	ISO 18308, [ISO/TS 25237:2008]
De-identify	To MANAGE-DATA-VISIBILITY by removing identifiers from data in such a way that the risk of identifying an individual is very small under the circumstances, as specified by scope of practice, organizational policy, and/or jurisdictional law. For example, a system may DE-IDENTIFY data for a researcher who wants to perform an analysis of drug effectiveness on diabetic patients. Another example is where a hospital may DE-IDENTIFY data for a set of patients to transmit to a university professor looking for illustrative cases for educational work.	
Delete	To REMOVE data by making it inaccessible to the application. For example, a user may DELETE an existing patient-appointment at the request of the patient. Note: In the case where the data becomes invalid but needs to remain in the system, the word "TAG" is preferred over the word "DELETE" or the word "Nullify". This type of action is considered a data "Tagging" process and not a data deletion process. For example, a health information management professional may desire to TAG a certain clinical term as obsolete, but the term needs to remain in the system for backward compatibility purposes.	
Deprecate	Instead, use TAG with an appropriate qualifier. Deprecation of certain information may be required when that data becomes invalid, but needs to remain in the system. For example, a health information management professional may desire to TAG a certain clinical term as deprecated, but the term is retained in the system for backward compatibility purposes.	
Deprecated-Verb	In this Glossary, the term "deprecated" is used to qualify Action-Verbs that were previously used in conformance criteria and are not part of the current set of hierarchy of Action-Verbs; therefore, deprecated Action-Verbs should not be used. These deprecated Action-Verbs have been labelled as such. Examples of deprecated Action-Verbs include ALERT, QUERY, and SEARCH.	
Derived profile	A profile that is created from an existing profile.	HL7 EHR-S Functional Model Chapter 2: Conformance Clause

Table B.1 *(continued)*

Term	Definition	Reference
Determine	To MANAGE data by analysing it and making a decision based on the analysis. For example, the system may DETERMINE the possible severity of a patient's allergic reaction to a proposed drug by analysing the patient's profile against a drug database and deciding whether the clinician should be presented with an alert or not. Another example is that a system may DETERMINE the next steps in a workflow based on an analysis of a patient's lab results, the patient's profile, and the clinical rules of the clinic, this analysis leading to a decision as to the appropriate next steps in the clinical process.	
Digital signature	Digital signature (or public-key digital signature) is a type of method for authenticating digital information analogous to ordinary physical signatures on paper, but implemented using techniques from the field of public-key cryptography. A digital signature method generally defines two complementary algorithms, one for signing and the other for verification, and the output of the signing process is also called a digital signature.	http://en.wikipedia.org/wiki/Digital_signature
Digital signature (alt)	Any representation of a signature in digital form, including an image of a handwritten signature. The Authentication of a computer entry in a health record made by the individual making the entry.	AHIMA, Health Information Management and Technology: Pocket Glossary. Page 74. 2006
Directive	Instruction how to proceed or act.	ISO 18308, [Oxford English Dictionary, 2008]
Directory	In computing, a directory, catalogue, or folder, is an entity in a file system which contains a group of files and other directories. A typical file system contains thousands of files, and directories help organize them by keeping related files together.	http://en.wikipedia.org/wiki/Directory
Disable-Access	Instead, use "CONTROL ACCESS by removing permissions to use specific functionality and/or manage specific data".	This verb has been deprecated as a Verb Hierarchy term.
Disclose	Instead, use "RENDER and TAG" with a label that identifies the data's purpose as "for disclosure use only".	This verb has been deprecated as a Verb Hierarchy term.
Disease management	A broad approach to appropriate coordination of the entire disease treatment process that often involves shifting away from more expensive inpatient and acute care to areas such as preventive medicine, patient counselling and education, and outpatient care. This concept includes implications of appropriate versus inappropriate therapy on the overall cost and clinical outcome of a particular disease.	http://cancerweb.ncl.ac.uk/cgi-bin/omd?disease+management
Discrete capture	Capture of an individual item of data.	http://www.m-w.com/dictionary/capture
Discrete data	Data that are often grouped by similar types of values and segregated into individual fields. (Contrast with free text data.) Note: A discrete data field may contain free text data.	
Dispense (a medication)	The process of dispensing a medication begins after the prescription/medication order is filled and the medication becomes available for use. Dispensing includes transporting the medication and documenting that fact that the medication was transported. Note: Dispensing a medication requires that the prescription or medication order must first be filled. Note: in the EHR-S FM, the term "fill" will represent the combined notions of medication filling and dispensing.	
Display (verb)	Instead, use PRESENT.	This verb has been deprecated as a Verb Hierarchy term.
Document (noun)	(noun form) See "Clinical Document." (noun form) – a writing conveying information.	http://www.m-w.com/dictionary/document
Document (verb)	Instead, use ENTER, or "TAG with" appropriate references, or "LINK to" sources.	This verb has been deprecated as a Verb Hierarchy term.
Documentation	All "notes" are "documentation," but not all "documentation" are "notes". Therefore, the broader term "documentation" should be used, unless the use of "notes" as a subset is specifically intended. See "Notes."	
Edit (verb)	To UPDATE data by correcting, amending, appending, or augmenting the data. For example, the physician may EDIT the patient's home address by correcting the civic number from 368 to 638 Oak Street. Another example is that a physician may EDIT existing notes about an injury by appending an X-ray picture of a broken bone.	
e.g.	exempli gratia (Lat.) For example; including but not limited to just the ones listed.	
EHR	An Electronic Health Record (EHR) is a comprehensive, structured set of clinical, demographic, environmental, social, and financial data and information in electronic form, documenting the health care given to a single individual.	(ASTM E1769, 1995)
Electronic Health Record	Information relevant to the wellness, health and health care of an individual, in computer-processable form and represented according to a standardized information model.	ISO 18308

Table B.1 *(continued)*

Term	Definition	Reference
Electronic Health Record Architecture	A formal description of a system of components and services for recording, retrieving and handling information in electronic health records.	ISO 18308
Electronic Health Record System	A system for recording, retrieving and handling information in electronic health records.	ISO 18308, [ISO/EN 13606-1:2008]
Electronic messaging systems	Messages with a definite originator and one or more recipients, viewable on a computer or other electronic device. Common examples include cellular phone text messages and electronic mail.	
Electronic Consult (e-Consult, Teleconsultation	The business practice of a provider (often Primary Care) requesting advice, interpretation and/or recommendation for disposition (treatment, prescriptions, etc.) from another provider (the consultant), often specialist, via electronic means and not requiring a face to face interaction between the patient and the specialist. It includes patient demographic and medical information relevant for clinical providers to obtain or provide expert opinion and/or advice regarding a patient, and ideally is captured in the patient's electronic health record. The consulting (specialist) provider evaluates and/or interprets and can render diagnostic and treatment recommendations. The requesting provider orders and documents prescriptions, laboratory requests and/or other services as a result. Responsibility for care still medico-legally rests with the requesting provider, so feedback to that provider is a necessary part of the teleconsultative process. Thus, the requesting provider will also derive professional growth. An example is a Family Practice physician sending an e-Consult to a Dermatologist for assistance in evaluating and recommending treatment for an intractable skin condition. NOTE: This differs from Electronic Referral in that in an Electronic Consult the requesting provider maintains responsibility for the patient	
Electronic Referral (e-Referral, Telereferral)	The business practice of a provider requesting advice, interpretation and/or recommendation for disposition (treatment, prescriptions, etc.) from another provider (the "referred-to" provider), usually a specialist, via electronic means and not requiring a face to face interaction between the patient and the specialist. It includes patient demographic and medical information relevant for clinical providers to obtain or provide expert opinion and/or advice regarding a patient, and ideally is captured in the patient's electronic health record. The referred-to (specialist) provider evaluates and/or interprets and can render diagnostic and treatment recommendations and can also order and document prescriptions, laboratory requests and/or other services as a result. Responsibility for care transfers to the referred-to provider. An example is a Family Practice physician "e-referring" a patient to a nephrologist to manage the renal (kidney organ system) care of a patient. NOTE: This differs from Electronic Consult in that in an Electronic Referral the requesting provider relinquishes management and responsibility for the patient's particular condition to the referred-to provider (but may maintain responsibility for all other aspects of the patient's management)	

Table B.1 *(continued)*

Term	Definition	Reference
Electronic Signature (e-Signature)	An electronic sound, symbol, or process, attached to or associated with a contract or other record and used as the legal equivalent of a written signature. An electronic sound, symbol, or process, attached to or logically associated with a contract or other record and executed or adopted by a person with the intent to sign the record A signature that consists of one or more letters, characters, numbers or other symbols in digital form incorporated in, attached to, or associated with an electronic document.	The American Heritage® Dictionary of the English Language, Fourth Edition copyright ©2000 by Houghton Mifflin Company. Updated in 2009. Published by Houghton Mifflin Company. US "Electronic Signatures In Global and National Commerce Act of 2000", Public Law 106–229, 15 USC 7006, Sec. 106, page 10 at: http://www.gpo.gov/fdsys/pkg/PLAW-106publ229/pdf/PLAW-106publ229.pdf (accessed 21 Feb 2013) Canadian "Personal Information Protection and Electronic Documents Act - S.C. 2000, c. 5 (Section 31) ", at: http://laws-lois.justice.gc.ca/eng/acts/P-8.6/page-14.html#docCont (accessed 21 Feb 2013). See also: "European Legislation on eSignature", at: http://ec.europa.eu/information_society/policy/esignature/eu_legislation/index_en.htm "The European Electronic Signature Directive, at http://ec.europa.eu/information_society/eeurope/2005/all_about/security/electronic_sig_report.pdf, pages 27-30
Eliminate	Instead, use DELETE or PURGE as applicable.	This verb has been deprecated as a Verb Hierarchy term.
Encounter (noun)	Encounter serves as a focal point linking clinical, administrative, and financial information. Encounters occur in many different settings – ambulatory care, inpatient care, emergency care, home health care, field and virtual (telemedicine).	http://www.ncvhs.hhs.gov/040127p1.htm
Encrypt	To STORE data by transforming the data into a form that is difficult to understand by unauthorized people or systems. For example, the system may ENCRYPT sensitive information such as the patient's financial information.	
Encryption	Encryption is the conversion of data into a form, called a ciphertext, which cannot be easily understood by unauthorized people.	http://searchsecurity.techtarget.com/sDefinition/0,,sid14_gci212062,00.html
Enter	To CAPTURE data by inputting it manually (for example, via a keyboard) or through other input devices. For example, the user may manually ENTER the patient's street address via the keyboard. Another example is that the user may ENTER the patient's body weight via an electronic weight scale.	
Enterprise	A generic term describing an extremely large network. It is usually used as a definition of 500 stations or greater.	http://www.csgnetwork.com/glossarye.html#enterprise
Entity	Something that has separate and distinct existence and objective or conceptual reality. Something that exists as a particular and discrete unit. An organization (as a business or governmental unit) that has an identity separate from those of its members.	http://www.m-w.com/cgi-bin/dictionary?book=Dictionary&va=entity
Entity (alt)	A concrete or abstract thing of interest, including associations among things.	ISO 18308, [ISO/IEC 2382]
Entry	Documentation of a discrete item of health information NOTE: an entry may for example represent the documentation of a clinical observation, an inference, an intention, a plan or an action.	ISO 18308
Event	An event is anything that takes place or happens to the patient or is related to the patient, especially something important such as an incident (e.g. adverse event), procedure or diagnosis. From the HL7 RIM: A stimulus that causes a noteworthy change in the state of an object, or a signal that invokes the behaviour of an object.	

Table B.1 *(continued)*

Term	Definition	Reference
Evidence based resources	Evidence-based practice is a "conscientious, explicit and judicious use of current best evidence in making decisions about the care of individual patients. The practice of evidence-based medicine means integrating individual clinical expertise with the best available external clinical evidence from systematic research".	http://www.fhs.mcmaster.ca/rehab/research/ebr.html
Exchange		
Explicit consent	Permission that is freely and directly given, expressed either viva voce or in writing.	ISO 18308
Export	Use RENDER instead.	This verb has been deprecated as a Verb Hierarchy term.
External-ly-sourced	Refers to an object captured from outside the user's EHR system. Examples of externally-sourced object include: faxes, referral authorizations, consultant reports, lab results and encounter notes from another healthcare organization, and patient/resident correspondence of a clinical nature.	
Extract	To RENDER data by locating, retrieving and possibly assembling data based on certain criteria and for certain purposes. For example, a system may EXTRACT for a clinician all the X-ray reports regarding the patient's chest. Another example is that the system may automatically EXTRACT allergy history when the physician enters a prescription. Another example is that a system may EXTRACT for a researcher the number of pneumonia-like cases treated at the Emergency Department within a specific time period. Another example is that a system may EXTRACT and aggregate information using a cohort of patients who have pneumococcal disease and categorize that cohort by specific age-ranges.	
Family History	A record of health information about a person and his or her close relatives. A complete record includes information from three generations of relatives, including children, brothers and sisters, parents, aunts and uncles, nieces and nephews, grandparents, and cousins. Families have many factors in common, including their genes, environment, and lifestyle. Together, these factors can give clues to medical conditions that may run in a family. By noticing patterns of disorders among relatives, healthcare professionals can determine whether an individual, other family members, or future generations may be at an increased risk of developing a particular condition. An essential part of a patient's medical history in which he or she is asked about the health of members of the immediate family in a series of specific questions to discover any disorders to which the patient may be particularly vulnerable, such as "Has anyone in your family had tuberculosis? diabetes mellitus? breast cancer?" Hereditary and familial diseases are especially noted. The age and health of each person, age at death, and causes of death are charted. Often a genogram is developed for pictorial documentation. The family health history is obtained from the patient or family in the initial interview and becomes a part of the permanent record. Other questions, such as those concerning the age, sex, relationships of others in the household, and marital history of the patient, may also be asked if the information has not already been secured.	http://ghr.nlm.nih.gov/handbook/inheritance/familyhistory
Fast Track	An accelerated patient registration workflow technique. Very useful for rendering care in an emergency situation and quickly discharging acute care patients.	
Foetal Death	Death prior to the complete expulsion or extraction from its mother of a product of human conception, irrespective of the duration of pregnancy and which is not an induced termination of pregnancy. The death is indicated by the fact that after such expulsion or extraction, the foetus does not breathe or show any other evidence of life, such as beating of the heart, pulsation of the umbilical cord, or definite movement of voluntary muscles. Heartbeats are to be distinguished from transient cardiac contractions; respirations are to be distinguished from fleeting respiratory efforts or gasps	
Fill (a prescription or a medication order)	The process of filling a prescription or medication order begins after the order is validated. The process includes checking the perpetual inventory supply of medicinal ingredients, then preparing, collating, and reviewing the final medication product. The process ends when a decision is made as to whether the medication should (or should not) be dispensed. Note: A medication order that has been filled may or may not be dispensed (e.g. a patient may refuse to acquire a medication). Note: in the EHR-S FM, the term "fill" will represent the combined notions of medication filling and dispensing.	
Filterable	The ability to programmatically separate and constrain data into specific value sets.	
Flag	Instead, use "RENDER an alert", or "PRESENT an alert", or "TRANSMIT a notice", if the intent is to signal a situation (i.e. flag a situation).	This verb has been deprecated as a Verb Hierarchy term.
Flow sheets	A tabular summary of information that is arranged to display the values of variables as they change over time.	http://www.centc251.org/Ginfo/Glossary/tcglosf.htm
Formulary	A preferred list of drug products that typically limits the number of drugs available within a therapeutic class for purposes of drug purchasing, dispensing and/or reimbursement. A government body, third-party insurer or health plan, or an institution may compile a formulary. Some institutions or health plans develop closed (i.e. restricted) formularies where only those drug products listed can be dispensed in that institution or reimbursed by the health plan.	http://www.hrsa.gov/opa/glossary.htm

Table B.1 *(continued)*

Term	Definition	Reference
Function	A computation which takes some arguments or inputs and yields an output. Any particular input yields the same output every time. More formally, a mapping from each element in the domain to an element in the range. A subroutine which returns a value.	
Generate	Instead, use "DETERMINE and STORE" or "DETERMINE and PRESENT" or "DETERMINE and RENDER" as appropriate to the context.	This verb has been deprecated as a Verb Hierarchy term.
Generic orders	General treatment orders.	
Genotype	1. The genetic makeup, as distinguished from the physical appearance, of an organism or a group of organisms. 2. The combination of alleles located on homologous chromosomes that determines a specific characteristic or trait.	The American Heritage® Science Dictionary Copyright © 2005 by Houghton Mifflin Company. Published by Houghton Mifflin Company.
Genetic Disorder (also Genetic Illness, Inherited Disorder)	A disease or condition caused by an absent or defective gene or by a chromosomal aberration, as in Down Syndrome.	The American Heritage® Science Dictionary Copyright © 2005 by Houghton Mifflin Company. Published by Houghton Mifflin Company.
Grant-Access	Instead, use CONTROL ACCESS.	This verb has been deprecated as a Verb Hierarchy term.
Guidelines	An indication or outline of policy or conduct.	http://www.merriamwebster.com/dictionary/guideline
Harmonize	To UPDATE data by aligning and reconciling it with other information in the system, or with the data of another system (or systems). For example, the system may HARMONIZE a patient's new home address with the data of systems of other members of the care-team.	
Health care	Activities, services, or supplies related to the health of an individual.	ISO 18308, [EN 13940–1:2007]
Health care activity	Undertakings (assessments, interventions) that comprise a healthcare service.	ISO/TR 12773-1
Health care service	Service provided with the intention of directly or indirectly improving the health of the person or populations to whom it is provided.	ISO/TR 12773-1
Health information	Information about a person relevant to his or her health.	ISO 18308
Health issue	Issue related to the health of a subject of care, as identified or stated by a specific health care party.	ISO 18308
Health care party	Organization or person involved in the process of health care.	ISO 18308, [EN 13940–1:2007]
Health Care Professional	See Health Professional.	
Health Care Provider	See Provider.	
Health Condition	aspect of a person or group's health that requires some form of intervention NOTE These interventions could be anticipatory or prospective, such as enhancing wellness, wellness promotion or illness prevention (e.g. immunization). b) symptoms, health problems (not yet diagnosed), diagnoses (known or provisional), e.g. diabetes, or physiological changes that affect the body as a whole or one or more of its parts, e.g. benign positional vertigo, and/or affect the person's well-being, e.g. psychosis, and/or affect the person's usual physiological state, e.g. pregnancy, lactation.	ISO/TR 12773-1
Health Information	For the purposes of this standard, Health Information is information regarding the health of an individual (or group of individuals), or is information regarding the health care provided to an individual (or group of individuals). Heath information includes, but is not limited to: an Electronic Health Record (EHR), statement, entry, document, report, note, chart, extract, or metadata. Second-tier health information includes, but is not limited to: administrative, financial, workflow, clinical, and quality measurement information.	
Health mandate	Statement authorized by the subject of care, an authorized representative of the subject of care, or by the authority of law, defining the scope and limits of the specific role assigned to one health care party, and delineating its responsibilities towards that subject of care with regard to this role.	ISO 18308, [EN 13940–1:2007]
Health Professional	Person who is authorized by a recognized body to directly provide certain healthcare services.	ISO/TR 12773-1

Table B.1 *(continued)*

Term	Definition	Reference
Health-Related-factors	Circumstances, influences, causes or issues that affect or describe a patient's ability to receive or respond to treatment, or maintain wellness (including physical, mental, social, spiritual, community, and/or economic dimensions). A patient's strengths (positive factors) or weaknesses (negative factors) may impact a patient's care or recovery and may be recorded as part of the EHR to support the development of care plans and treatment options (e.g. coverage by insurance (typically a positive factor) versus unemployment (typically a negative factor). Examples of factors include: family support, financial support, health insurance levels, good overall health, employment status/type, access to care, and education level. Heath-related factors may be included in a patient's problem list (e.g. ambulatory status, or addictions). An example of an active patient-specific strength is that of an adult child providing care for an elderly parent during his/her seasonal break from college.	
Hide	To MANAGE-DATA-VISIBILITY by making specific information invisible so that the existence of the information is not expressed except to authorized users; viewers of the patient record receive no indication that the hidden information exists or does not exist. For example, the system may HIDE the existence of a patient's psychiatric record from all viewers except for the patient's psychiatrist. Note: the verb "unhide" is an acceptable verb to reverse the action of hiding.	
Identifier	A piece of information used to claim an identity, before a potential corroboration by a corresponding authenticator	ISO 18308, [ENV 13608–1]
Identify	Instead, use other Action-Verbs adapted to the context. For example, instead of '…to uniquely identify a patient…', one should say '…to MAINTAIN a unique identifier for a patient…' Another example is: instead of '…to help identify the patient….', use '…help DETERMINE the identity of the patient.'.	This verb has been deprecated as a Verb Hierarchy term.
i.e.	id est (Lat.) ; in other words; that is.	
Immunization History	A complete, incomplete, or partially-complete list of immunizations for a given patient. Note: When a given immunization history is conveyed, it is also very important that the immunization history's frame of reference is conveyed. Temporal and organizational scope attributes are required to accurately specify the extent of the history. If that scope is specified, it becomes relatively simple to understand and merge/reconcile immunization data; if that scope is not specified, the meaning of the "history" cannot be determined. For example, receiving a set of immunization records accompanied by a facility identifier and date range would specifically indicate that only records from that facility/entity and for that date range are provided. If the patient had only received immunizations from that facility, or the facility holding the immunization records confirms that they have the complete immunization history of the patient, then the attributes could be elevated to 'all' facilities and 'lifetime' date range. We need to distinguish a 'history of immunizations' from an 'immunization history'. The former connotes/implies a chronological rendering of *known* immunizations and therefore is by-definition, known and complete. The latter implies a complete rendition of the set of all possible immunizations	
Implied Consent	Consent inferred from signs, actions, or facts, or by inaction or silence.	ISO 18308
Import	To CAPTURE data into a local system by proactively accessing data from an external source and then downloading and integrating the data into the local system. For example, the system may IMPORT the latest drug trial data every Friday evening. Another example is that the user may IMPORT various sets of best practices related to juvenile diabetes.	
Including	Indicates a minimum set of values. The system may support additional values, but must support those listed as "included".	
Indicate	Instead, use TAG with an appropriate qualifier. Affirm, Assert, Declare, Indicate, and State are synonyms.	This verb has been deprecated as a Verb Hierarchy term.
Informative functional profile	A functional profile that has successfully completed formal public scrutiny via the HL7 consensus process.	HL7 EHR-S Functional Model Chapter 2: Conformance Clause
Information Semantics	Information Semantics are defined by an information model and a terminology model. The terminology model may be constrained by standard value sets and/or code sets. For example, terms for vaccinations may be constrained by the federal government. Another example is that a list of drugs may be constrained by a particular formulary.	
Input	Instead, use CAPTURE, ENTER, RECEIVE, IMPORT or AUTO-POPULATE, depending on the context and scope of actions described.	This verb has been deprecated as a Verb Hierarchy term.
Integrate	To UPDATE data by merging other data with the existing data in a controlled manner. For example, a user may INTEGRATE summaries of health care services that were provided in another jurisdiction into the patient's local record. Another example is that an EHR system may INTEGRATE a single-sign-on application with the EHR system's existing user-authentication services. Another example is that an EHR system may INTEGRATE multiple third-party modules to enhance its capabilities.	

Table B.1 *(continued)*

Term	Definition	Reference
Integrity	Assurance that the data being accessed or read has neither been tampered with, nor been altered or damaged through a system error, since the time of the last authorized access. The state of an artefact that has not been deliberately or accidentally altered.	ISO 18308
Interchange standards	Standards by which information, typically electronic data, are exchanged. Examples include the HL7 Clinical Document Architecture.	
Internet Engineering Task Force (IETF) RFC 3881	"The Internet Engineering Task Force is a large open international community of network designers, operators, vendors, and researchers concerned with the evolution of the Internet architecture and the smooth operation of the Internet. . . It develops s Internet standards expressed in Request for Comment (RFCs). RFC 3881 defines "the format of data to be collected and minimum set of attributes that need to be captured for security auditing in healthcare application systems. The format is defined as an XML schema, which is intended as a reference for healthcare standards developers and application designers. It consolidates several previous documents on security auditing of healthcare data."	http://www.ietf.org/about/ http://tools.ietf.org/html/rfc3881
Interoperate	To coordinate information, services, and/or functionality among systems.	
Interpretation	To conceive in the light of individual belief, judgment, or circumstance.	http://www.merriamwebster.com/dictionary/interpreting
Intervention	The act or fact of interfering so as to modify. Specifically, any measure whose purpose is to improve health or to alter the course of a disease.	http://www.mercksource.com/pp/us/cns/cns_hl_dorlands.jspzQzpgzEzzSzppdocszSzuszSzcommonzSzdorlandszSzdorlandzSzdmd_i_10zPzhtm#12456410
Input mechanism	An approach, typically utilizing a user interaction device, for data input. Examples include a keyboard and mouse.	
Intolerance	A non-immunological adverse physiological sensitivity to a substance. It may be manifested by an inability to endure, withstand, absorb, or metabolize a substance (e.g. lactose).	
Issue	See Problem.	
Label (verb)	Use "TAG with a label".	This verb has been deprecated as a Verb Hierarchy term.
Legal-Hold	Note: The system cannot legally-hold various facts. Rather, the system may provide the ability to tag certain data that may be under legal review.	
Link (verb)	To UPDATE data by associating one piece of data with another piece of data. For example, the system may LINK a patient's encounter note with the patient's lab results. Another example is that a system may LINK attestable changes to a patient's record to the author's identifying information.	
Log (verb)	To TRACK system-initiated or user-initiated activities (including access to data and/or functionality, attempts to access data and/or functionality, actions performed on data and/or functionality, and changes to system characteristics or versions) by storing a chronological trace of these activities. For example, the system may LOG the fact that modifications were made to a patient's record by storing the date, time, and identity of the user who modified the record as well as what changes were made to that record. Another example is that the system may LOG the fact that updates were applied to a drug-interaction database table, by storing the date and time at which it was updated.	
Logical Record	A Logical Record is a reference to a data record that is independent of its physical location. A Logical Record may be physically stored in two or more locations.	
Maintain	To MANAGE data by storing, updating, and/or removing the data within a system. For example, a system may provide the ability for a clinician to MAINTAIN data by keeping or discarding it. Another example is that a system may provide the ability for a clinician to MAINTAIN data by correcting or annotating it.	
Maintenance	The act of maintaining or the state of being maintained. The work of keeping something in proper condition; upkeep.	http://www.bartleby.com/61/56/M0045600.html
Maintenance and versioning (used as a phrase)	The management of multiple revisions of the same unit of information.	http://en.wikipedia.org/wiki/Versioning
Manage (Data)	To handle data by capturing, maintaining, and rendering data, determining actions about data, and managing data visibility. For example, the system may provide the ability for a user to MANAGE patient and family preferences as they pertain to current treatment plans. Another example is that a clinician's system may provide the ability for the clinician to MANAGE patient data by creating a patient's record, updating a clinical note, utilizing clinical decision support tools, and transmitting the patient's billing information.	

Table B.1 *(continued)*

Term	Definition	Reference
Manage-Data-Visibility	To MANAGE data by de-identifying/re-identifying, masking/unmasking or hiding/unhiding that data. For example, the system may provide the ability for an administrator to MANAGE-DATA-VISIBILITY in terms of who is allowed to view what specific patient data.	
Management	The act or art of managing. The conducting or supervising of something.	http://www.merriamwebster.com/dictionary/management
Mask (verb)	To MANAGE-DATA-VISIBILITY by obscuring (masking) specific data elements in order that this information is not available except to authorized users; viewers of the patient record can see that the data exists but cannot see actual contents. For example, the administrator may MASK the pregnancy status of all patients who are below the age of 18 except for the obstetric unit staff. Note: the verb "unmask" is an acceptable verb to reverse the action of masking.	
Masking	Data masking is the process of obscuring (masking) specific data elements within data stores. It ensures that sensitive data are replaced with realistic but not real data. The goal is that sensitive customer information is not available outside of the authorized environment. Effective data masking requires data to be altered in a way that the actual values cannot be determined or reengineered, functional appearance is maintained, so effective testing is possible.	Wikipedia
MAY	Indicates an optional, permissible action. Synonymous with 'is permitted'.	HL7 EHR-S Functional Model Chapter 2: Conformance Clause
Medical	Relating to the study or practice of medicine; "the medical profession"; "a medical student"; "medical school".	http://wordnet.princeton.edu/perl/webwn?s=medical
Medication reconciliation	Medication reconciliation is the comprehensive evaluation of a patient's medication regimen any time there is a change in therapy in an effort to avoid medication errors (e.g. omissions, duplications, dosing errors, or drug interactions), and to observe the patient's medication compliance and adherence patterns. The medication reconciliation process should include a comparison of the existing and previous medication regimens and should occur at every transition of care in which new medications are ordered, existing orders are rewritten, existing order are adjusted, or if the patient has added nonprescription medications to [his or her] self-care.	ImprovingCareTransitions:OptimizingMedicationReconciliation.March2012.AmericanPharmacistsAssociationandtheAmericanSocietyofHealthSystemsPharmacists.See:http://www.ashp.org/DocLibrary/Policy/PatientSafety/Optimizing-Med-Reconciliation.aspx
Merge	Instead, use INTEGRATE.	This verb has been deprecated as a Verb Hierarchy term.
Messaging standard	A messaging standard, in the context of Health IT, specifies the structure or format of electronic data exchange, enabling disparate healthcare applications to exchange key sets of clinical and administrative data. "HL7's Version 2.x (V2) messaging standard is the workhorse of electronic data exchange in the clinical domain and arguably the most widely implemented standard for healthcare in the world. This messaging standard allows the exchange of clinical data between systems. It is designed to support a central patient care system as well as a more distributed environment where data resides in departmental systems."	1. http://www.hl7.org/implement/standards/product_brief.cfm?product_id=146, accessed 5 June 2013
Metadata	Data about data; more specifically, data that provides more information about a piece or set of data.	US Department of Health and Human Services, Office of the Secretary, 45CFR Part 170, Metadata Standards to Support Nationwide Health Information Exchange, page 1, August 9, 2011.
Modify Access	Instead, use: "MANAGE data regarding permissions"	This verb has been deprecated as a Verb Hierarchy term.
Non-repudiation	Assurance that the entry or message came from a particular user. It will be difficult for a party to deny the content of an entry or creating it.	http://www.ahima.org/infocenter/guidelines/ltcs/5.1.asp
Notes	The naming rules in this document only apply to "clinical notes." Within this document we are using the term "clinical note" to have a special meaning. For purposes of this document, a clinical note is a clinical document (as defined by the HL7 CDA Standard) where the document was produced by clinical professionals and trainees either spontaneously (e.g. I write my admitting note) or in response to a request for consultation... They are to be distinguished from patient reports such as radiology reports, pathology reports, laboratory reports, cardiac catheterization reports, etc., that are generated in response to an order for a specific procedure. Names for most of these later concepts are accommodated well by the clinical LOINC naming structure, and are already well covered by existing terms within the LOINC database.	http://www.regenstrief.org/loinc/discussion/Clinical/ontology.doc
Notice	A Notification, an Alert, or a Reminder. Information presented or transmitted to an interested party. For example, an alert, reminder, note, or message may convey an announcement, warning, issue, or new state/condition. Note: Use of these terms may have differing legal connotations in various realms.	

Table B.1 *(continued)*

Term	Definition	Reference
Notification	A type of Notice that does not necessarily require recipient's action.	
Notify	Instead, use "RENDER or PRESENT or TRANSMIT a notification to a person or another system (including a device)".	This verb has been deprecated as a Verb Hierarchy term.
Nullify	Instead, use "TAG as nullified".	This verb has been deprecated as a Verb Hierarchy term.
Obfuscation	In programming, an often practiced process to make code unclear for someone else to follow. It is an intentional effort to mislead or confuse. The term obfuscation is often used in virus issues.	http://www.csgnetwork.com/glossaryo.html
Obsolete (verb)	Instead, use "TAG as obsolete".	This verb has been deprecated as a Verb Hierarchy term.
On-demand	The manual exercise of certain system functionality. For example, drug-drug interaction checking may automatically occur at the moment that a clinician is ordering a certain drug. However, the clinician may also want to examine the drug interactions that may occur for a drug that was previously ordered by another physician; thus, the clinician would exercise the drug-drug interaction checking functionality "on demand". Another example is that the clinician may want to examine the alerts and notifications that exist for a given set of drugs (without having a specific patient in mind).	
Order (verb)	Instead, use "ENTER the parameters for an order".	This verb has been deprecated as a Verb Hierarchy term.
Order sets	Order sets are prepared in (order) sessions as multi-disciplinary templates, including nursing, medical, pharmacy and allied health action items. The order sets have been reviewed by professional service organizations and are organized into problem oriented care plans wherein each order set serves to organize one session or phase of the overall plan of care. Problem and session encoding of order sets ensure that order sets are employed in relevant clinical contexts and care plans, and that order sessions may be merged when multiple guidelines apply to a single patient.	HL7 Clinical Decision Support team, Jim McClay, SAGE guideline consortium, University of Nebraska Medical Center.
Organization	Unique framework of authority within which a person or persons act, or are designated to act towards some purpose.	ISO 18308, [ISO/IEC 6523-1:1998]
Other system	A separate system that is an affiliated, federated, integrated, or partnering system.	
Patient	One who is suffering from any disease or behavioural disorder and is under treatment for it.	http://216.251.232.159/semdweb/internetsomd/ASP/1549985.asp
Patient and family preferences	Health care treatment choices influenced by but not limited to language, religious, or cultural preferences selected by the patient and family.	
Patient identifier	A Patient Identifier is a set of data that is used for uniquely distinguishing one patient from another patient.	
Patient record	A paper or electronic tool for collecting and storing information about the healthcare services provided to a patient.	Health Information Management Technology: An Applied Approach. Merida L. Johns, PhD, RHIA, Editor, AHIMA, Chicago, IL, 2007
Patient representative	Designated to bearing the character or power of the patient; acting for the patient's benefit, e.g. guardian, legal representative, surrogate, or advocate.	http://cancerweb.ncl.ac.uk/cgi-bin/omd?representative
Patient-level data	Within the context of the Population Health arena, the term "patient-level data" refers to data that is collected (and analysed) regarding a single patient. For example, "Person123 is left-handed". (Note: patient-level data are often de-identified within the Population Health context.) Furthermore, data regarding a single patient can sometimes be aggregated within the scope of that patient's data. For example, Person123 has been pregnant six times. Compare with "aggregate-level data".	
Patient-originated data	Patient-provided and/or patient-entered data. For example, an individual patient (or the patient's representative) may provide or enter health information from personal memory and/or by using information that was recorded on a piece of paper. For example, a patient may enter "1970-12-29" into a date-of-birth field.	
Permission (Parental)	Parental Permission is an affirmation or agreement, provided by the parent or guardian of a patient, to undertake a clinical action. "The American Academy of Pediatrics believes that in most cases, physicians have an ethical (and legal) obligation to obtain parental permission to undertake recommended medical interventions. In many circumstances, physicians should also solicit a patient assent (see Assent [Patient]) when developmentally appropriate. In cases involving emancipated or mature minors with adequate decision-making capacity, or when otherwise permitted by law, physicians should seek informed consent (see Consent [Informed]) directly from patients."	"Informed Consent, Parental Permission, and Assent in Pediatric Practice", Paediatrics Vol. 95 No. 2 February 1, 1995 (re-affirmed May 2011), pp. 314 –317, American Academy of Paediatrics, Committee on Bioethics, at: http://pediatrics.aappublications.org/content/95/2/314.abstract (accessed 6 Feb 2013)

Table B.1 *(continued)*

Term	Definition	Reference
Permit Access DEPRECATED VERB	Instead, use "AUTHENTICATE a user and AUTHORIZE access based on permissions assigned to that user".	This verb has been deprecated as a Verb Hierarchy term.
Persist	Instead, use "STORE".	This verb has been deprecated as a Verb Hierarchy term.
Personal health record	Health record, or part of a health record, for which the subject of care or a legal representative of the subject of care is the data controller	ISO 18308
Phenotype	The physical appearance of an organism as distinguished from its genetic makeup. The phenotype of an organism depends on which genes are dominant and on the interaction between genes and environment.	The American Heritage® Science Dictionary Copyright © 2005 by Houghton Mifflin Company.
Policy (privilege management and access control)	A set of legal, political, organizational, functional and technical obligations for communication and cooperation.	ISO 18308, [ISO 22600-1:2014]
Population Health	Collections of health-related concepts (for example, health outcomes) that pertain to groups, rather than to individuals. Population Health groups are often distinguished based on stakeholder interest, for example, according to geography, employment, socioeconomic sector, age, or ancestry.	
Practice guidelines	Systematically developed statements to standardize care and to assist in practitioner and patient decisions about the appropriate health care for specific circumstances. Practice guidelines are usually developed through a process that combines scientific evidence of effectiveness with expert opinion. Practice guidelines are also referred to as clinical criteria, protocols, algorithms, review criteria, and guidelines.	www.mentalhealth.samhsa.gov/publications/allpubs/MC98-70/default.asp
Present	To RENDER data by delivering the data to local users in a meaningful and appropriate way. For example, the system may PRESENT to a physician (upon manual request) a list of patients who are scheduled for care today, ordered by time-of-day, with the patient's known diagnosis using the physician's preferred terminology and language of choice. Another example is that the system may PRESENT an alert automatically when a newly-arriving lab value is received that is out of normal range. Another example is that a system may PRESENT to a physician a patient's lung respiration sounds. Another example is that a system may PRESENT patient-instructions using an audio and video system. Note: It is reasonable to assume that any data that is presented ought to be formatted, filtered, translated, transformed, mapped, and/or normalized, etc., as appropriate.	
Prevention	Actions taken to reduce susceptibility or exposure to health problems (primary Prevention), detect and treat disease in early stages (secondary prevention), or alleviate the effects of disease and injury (tertiary prevention).	http://depts.washington.edu/hsic/resource/glossary.html
Principal (adjective)	Highest in rank, authority, character, importance, or degree; most considerable or important; chief; main; as, the principal officers of a Government; the principal men of a state; the principal productions of a country; the principal arguments in a case (e.g. principal diagnosis).	http://cancerweb.ncl.ac.uk/cgi-bin/omd?principal
Principal (noun)	A user, organization, device, application, component, or object. The person primarily or ultimately liable on a legal obligation.	http://www.meriam-webster.com/cgi-bin/dictionary/principal
Principal provider	The person who is the most responsible and accountable for managing or coordinating the members of a care team(s) that deliver health care to an individual.	
Principle	An accepted or professed rule of action or conduct, an adopted rule or method for application in action.	Dictionary.com
Print	Instead, use RENDER, PRESENT, OR TRANSMIT, depending on the context.	This verb has been deprecated as a Verb Hierarchy term.
Prioritize	Instead, use "TAG with a priority level", or "DETERMINE priorities".	This verb has been deprecated as a Verb Hierarchy term.
Privacy	The quality or state of being hidden from, or undisturbed by, the observation or activities of other persons, or freedom from unauthorized intrusion; in healthcare-related contexts, the right of a patient to control disclosure of protected health information.	AHIMA Master Glossary, 3rd Edition
Problem	Entity for which an assessment is made and a plan or intervention is initiated. NOTE The term "issue" is often used rather than "problem" by many allied health professions, especially in the more social/psychological disciplines. The term "condition" is also sometimes used to describe pregnancy and other non-disease health states which nevertheless usually involve interaction with a health system.	ISO/TR 12773-1

Table B.1 *(continued)*

Term	Definition	Reference
Problem list	The problem list of a given individual can be described by formal diagnosis coding systems (such as DRGs, NANDA Nursing Diagnosis, ICD9, DSM, etc.) or by other professional descriptions of health care issues affecting an individual. Problems can be short or long term in nature, chronic or acute, and have a status. In a longitudinal record, all problems may be of importance in the overall long term care of an individual, and may undergo changes in status repeatedly. Problems are identified during patient visits, and may span multiple visits, encounters, or episodes of care.	HL7 Version 3.0 Edition 2006 Glossary
Profile	A subset of the Functional Model, in which functions have been designated (sometimes in varying degrees) for certain EHR-S implementations or Healthcare Delivery Settings.	HL7 EHR-S Functional Model Chapter 2: Conformance Clause
Protocol	A set of instructions that describe the procedure to be followed when investigating a particular set of findings in a patient, or the method to be followed in the management of a given disease. Please refer to: Algorithm, Care Pathway, Practice Parameter.	http://www.coiera.com/glossary.htm
Provide the ability to ...	The term "... provide the ability to..." conveys the notion that the corresponding system functionality will enable a user to perform a given task, rather than having the system perform the task itself (i.e. without user intervention). Additional consideration: An EHR system may not always be capable of correctly performing a specific action automatically. Consider the difference between the following two criteria: "The system SHALL LINK a record to a single patient" and "The system SHALL provide the ability to LINK a record to a single patient." The first criterion requires the system to perform the task of identifying a patient and linking a certain record to a single patient. In this case, the system may not be able to perform this task to an acceptable level of assurance (for example, when a patient uses two different first names "Liz" and "Elizabeth"). The second criterion requires the system to provide the user with the ability to uniquely identify a patient and to link a certain record to that patient (for example, via a screen that displays a list of potentially-matching patients whereby the user can manually link the record to the correct patient).	
Provide access to	Instead, use CONTROL ACCESS, or PRESENT, as appropriate to the specific context.	This verb has been deprecated as a Verb Hierarchy term.
Provider	Person or organization involved in or associated with the delivery of healthcare to a subject of care, or caring for the well-being of a subject of care.	ISO/TR 12773-1
Pseudonymize	To affix an alternate identity to EHR record entry/data content. Pseudomynization allows data to be re-identified by the source or other authorized entity. Per Wikipedia: "Pseudonymization" is a procedure by which the most identifying fields within a data record are replaced by one or more artificial identifiers. There can be a single pseudonym for a collection of replaced fields or a pseudonym per replaced field. The purpose is to render the data record less identifying and therefore lower customer or patient objections to its use. Data in this form is suitable for extensive analytics and processing.	
Public Health	1. An area of health care that deals with the health of populations in geo-political areas, such as States and counties. 2. A field of medicine concerned with safeguarding and improving the health of the community as a whole.	1. Pocket Glossary for Health Information Management and Technology, Second Edition, 2010 2. Dorland's Medical Dictionary
Purge	To REMOVE data by making it unrecoverable at the storage and/or media-level. For example, the system may PURGE the patient record for John Smith according to a rule that targets all records that are older than seven years. (Note: Destroy and Purge are synonyms; PURGE is the preferred term.)	
Query	Instead, use ANALYSE or RENDER (or its children Action-Verbs), because queries or searches are implied when rendering or analysing data.	This verb has been deprecated as a Verb Hierarchy term.
Reactivate	Instead, use TAG with an appropriate qualifier. Reactivation of certain information may be required when that data, previously deprecated or made inactive, becomes valid again. For example, a health information management professional may desire to TAG a certain clinical term as reactivated.	
Real-time	Since the concept of "real-time" is ambiguous, describe the actual event. For example, instead of "Present the drug-drug interaction notification in real-time"; rather, "Present the drug-drug interaction notification at the time that the drug is being prescribed".	
Receive	To CAPTURE data from an external source by taking in that data without manual / real-time user intervention. For example, the system may RECEIVE various emails for a clinician who will later review them. Another example is that the system may RECEIVE from authenticated and authorized external systems laboratory results for a given patient. Another example is that the system may RECEIVE a facsimile transmission from an external device.	
Reconcile	Instead, use ANALYSE and DECIDE, or DETERMINE, or HARMONIZE depending on the context and the meaning intended.	This verb has been deprecated as a Verb Hierarchy term.