Emergency Department Information Systems (EDIS) Functional Profile

EDIS Functional Profile Working Group
Emergency Care Special Interest Group
Health Level 7

Based on the EHR-S Functional Model, Release 1

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Introduction

The EDIS Functional Profile, a project of the HL7 Emergency Care Special Interest Group, is aimed at developing an *HL7 Normative Functional Profile* for emergency department information systems, conforming to the HL7 Electronic Health Record (EHR) Functional Model. By creating a robust and usable functional profile outlining the essential functions of an EDIS, and including specific conformance criteria for EDIS evaluation, we hope to achieve an open and objective standard for the development, refinement, evaluation of information systems employed in the ED.

Background

Founded in 1987, Health Level Seven is a not-for-profit healthcare standards development organization (SDO) accredited by the American National Standards Institute (ANSI). While traditionally involved in the development of messaging standards used by healthcare systems to exchange data, HL7 has begun to develop other standards related to healthcare information systems. In 2002, a newly formed HL7 EHR special interest for group began development of a functional model for electronic health record systems (EHR-S). Shortly thereafter, a number of organizations approached HL7 to develop a consensus standard to define the necessary functions for an EHR-S. The EHR SIG was promoted to a full technical committee, and in 2004 published the *EHR-S Functional Model* as a Draft Standard for Trail Use (DSTU). [1] The Functional Model underwent membership level ballot in September of 2006 and January 2007, and was approved an HL7 standard in February 2007. The EHR-TC intends that unique functional profiles (herein referred to as profiles) be developed by subject matter experts in various care settings and specialties (i.e. behavioral health, inpatient, anesthesia, long-term care) to inform developers, purchasers, and other stakeholders of the functional requirements of systems developed for these domains.

The HL7 EC-SIG was founded last year to inform HL7 and other healthcare standards development organizations (SDOs) of the unique requirements and workflows of emergency care. In an effort to obtain the widest participation possible, the EC-SIG co-chairs solicited input and membership from domestic and international specialty societies, including ACEP, SAEM, AAEM, ENA, and the Canadian and Australasian Emergency Medicine Societies. Participation was solicited from the vendor community through invitations and presentations. At the initial meeting of the SIG, the co-chairs unanimously agreed that one of its initial work products be a functional profile for EDIS. The American College of Emergency Physicians (ACEP) sponsored membership in the EC-SIG in the form of funded awards for travel and expenses to HL7 meetings. Infrastructure was secured from an unrestricted grant from XPress Technologies to set up an intranet site and weekly teleconferences to supplement face to face meetings at HL7 conferences. An EDIS-FP workgroup was convened that currently includes over thirty physicians, nurses, medical informatics experts, EDIS developers, and engineers. Membership in HL7 is not a prerequisite for participation.

The Certification Commission on Health Information Technology (CCHIT) adopted the EHR FM in 2005 as a tool for evaluation of ambulatory systems. Based upon evaluation criteria developed from the EHR Functional Model, CCHIT began certification of these systems in 2006.[4] CCHIT recognizes the value of expanding certification to address particular specialties, care settings, and specific patient populations, and has begun pursuing expansion of certification. ACEP endorsed concept of certification and the development of a unique EDIS-FP in a letter to CCHIT in 2005, and began coordinating activities with the SIG and WG to promote adoption of the FP as the basis for CCHIT certification for EDIS. In January, the EC-SIG and ACEP coauthored a response to the CCHIT environmental scan further promoting the EDIS FP as the principle framework for developing EDIS certification. On the basis of this profile development, CCHIT announced their proposal to expand certification to EDIS systems in February of 2007, with certification commencing sometime in late 2008 or early 2009.

Methods and Project Plan

The project was structured into four discrete phases:

1. *Organization* – solicitation of participants, determination of scope and care setting of profile, and development of project plan and overview.

2. *Formalization* – step by step development of EDIS functions and conformance criteria.

3. *Harmonization* –comparison with, incorporation into, and alignment with the EHR FM.
   - *Define functional priorities and timeframes (see below) for functions*
   - *Accept or reject other functions from FM.*
   - *Incorporate unique EDIS functions defined in step 2 through sibling child relationships with EHR FM functions*
   - *Incorporate and modify conformance criteria*

4. *Finalization* – attention to detail, wording, language, and conformance in preparation for EHR – TC registration, verification and registration.

We began the EDIS-FP project by taking a broad look at the functions required of ED systems, with only organizational reference to the EHR FM. We employed this methodology to maximize the potential discovery of functions that the EHR-TC may not have considered in the FM. It has also permitted us to approach the project using an outline familiar to subject matter experts unfamiliar with the FM. We began with a typical scope of ED care, beginning with a "heads-up" and moving through patient arrival, triage, nursing and physician assessment, orders, results, procedures, ongoing assessments, and finally admit/transfer/discharge planning. Use case methodology was employed where appropriate.

Harmonization of the workgroup product and the EHR FM was performed in order for the profile to become a registered profile. First time readers should be understand that the EHR-TC has defined specific methodologies for profile development and conformance, which are outlined in the *How-To Guide for Creating Functional Profiles* and *Conformance Clause* sections of the EHR functional model. [5] Each function in the functional model was evaluated for its applicability to emergency department care. In turn, each function identified by the workgroup was evaluated for inclusion in an existing function within the functional model.

The workgroup has identified a writing committee and is in the process of publishing a summary document targeted to practicing emergency department providers and managers to use as a guide to system evaluation and selection. This profile is the first profile to be formally registered with HL7.

The development of the EDIS FP has and continues to employ a traditional, open, standards development approach. Everyone's contributions and concerns are addressed. Your input is welcome.

EDIS: Definition, Standards, Implementation and Interoperability

> ***An Emergency Department Information System (EDIS) is an extended EHR system used to manage data in support of Emergency Department patient care and operations. The functions of an EDIS may be provided by a single application or multiple applications.***

Standards Basis for this EDIS Definition: The EDIS functional profile is a standards work derived from the HL7 EHR Functional Model, which is in turn based on *ISO/TR-20514 Health informatics -- Electronic health record -- Definition, scope and context.* [3] According to the ISO EHR standard:

> *"The primary purpose of the EHR is to provide a documented record of care that supports present and future care by the same or other clinicians…Any other purpose for which the health record is used may be considered secondary."*
>
> *"The Core EHR contains principally clinical information; it is therefore chiefly focused on the primary purpose. The Core EHR is a subset of the Extended EHR. The Extended EHR includes the whole health information landscape; its focus therefore is not only on the primary purpose, but also on all of the secondary purposes as well. The Extended EHR is a superset of the Core EHR."*

The EDIS FP workgroup decided that while many of the functions that form a traditional EDIS (i.e. charting, order entry, results reporting, and) may constitute core EHR functions, other functions (i.e. patient tracking, disposition management, financial functions, and administrative support) clearly constitute important secondary uses of an EDIS.

Systems, Components & Applications: Emergency departments have fundamental commonalities, but each is also different. Each EDIS may in fact consist of a collection of systems, applications, modules, or components, developed on different architectures. For example, an ED might pair one vendor's clinical documentation system with another's tracking, discharge, or prescribing system. Hence, an EDIS may be provided by a single vendor, multiple vendors, or by one or more development teams.

Interoperability: All components, modules, or applications within an EDIS should respond to users in a well integrated fashion. Thus each component, module or application must be interoperable to the degree required by the function description and conformance criteria specified in this profile. ISO 20514 states:"*The key to interoperability is through standardization of requirements for the EHR (record) architecture (e.g. ISO/TS 18308:2004) and ultimately the standardization of the EHR architecture itself (e.g. ENV 13606-1:2000)".*

Organization

The profile is divided into three sections: *Direct Care*, *Supportive* Functions and *Information Infrastructure*. Each section defines a broad category of functions applicable to an EDIS. Because of this organization, many traditional concepts and tasks typical of an EDIS can be found interspersed throughout the document, depending upon whether aspects constitute patient tracking, administrative functions, clinical workflow, tasks/orders, clinical documentation, or clinical decision support, etc. For example, items related to the ED triage process can be found in documentation as well as clinical decision support. Readers looking for a general overview of typical ED functions should refer to the EDIS Overview and Functions section at the end of this introduction.

Direct Care	Functions employed in the provision of care to individual patients. Direct care functions are the subset of functions that enable delivery of healthcare or offer clinical decision support.
DC.1	Care Management
DC.2	Clinical Decision Support
DC.3	Operations Management and Communication
Supportive Functions	Functions that support the delivery and optimization of care, but generally do not impact the direct care of an individual patient. These functions assist with the administrative and financial requirements associated with the delivery of healthcare, provide support for medical research and public health, and improve the global quality of healthcare.
S.1	Clinical Support
S.2	Measurement, Analysis, Research and Reports
S.3	Administrative and Financial
Information Infrastructure	Functions that define the heuristics of a system necessary for reliable, secure and interoperable computing. These functions are not involved in the provision of healthcare, but are necessary to ensure that the EDIS provides safeguards for patient safety, privacy and information security, as well as operational efficiencies and minimum standards for interoperability. Functions may be provided by the EDIS itself, by the supporting infrastructure, or a combination of both.
IN.1	Security
IN.2	Health Record Information and Management
IN.3	Registry and Directory Services
IN.4	Standard Terminologies and Terminology Services
IN.5	Standards-based Interoperability
IN.6	Business Rules Management
IN.7	Workflow Management
IN.8	Application Performance

Functional Priorities

The EHR TC and EC-SIG recognize that clinical computing is an evolving field, and that many of the desired functions of EHR-S are not currently available. Certain functions, for instance access to regional health information, may not be feasible or essential now because widespread adoption of regional health information organizations (RHIOs) has yet to occur. Nevertheless, it is important for functional profiles to outline major trends and articulate a vision for functionality (especially interoperability) for the future. Furthermore, the delineation of potential functions for future implementation and adoption should guide vendors in development, and help purchasers develop and articulate to vendors a strategic vision for future functional requirements.

Each function in the profile is assigned a single priority as follows:

E	**Essential Now**	The function must be available and users must be able to implement it. In assigning this priority, the workgroup believes that the function is critical to the delivery of care in the ED. When determining the priority for a particular function, the workgroup determined that such functions should support the delivery of effective healthcare, ensure patient safety, and maximize ED efficiency.
EF[YY]	**Essential Future**	The function must be available and users must be able to implement it before the two digit year indicated. In assigning this priority, the workgroup understands that these functions may not be available at present, but are part of a general trend towards additional functionality that should be possible as standards development and IT implementations mature. The assignment of these functions should inform system developers and purchasers of a general roadmap for future functionality in EDIS.
O	**Optional**	The function is desirable but not a critical component of an EDIS. In assigning this priority, the workgroup believes that these functions should be considered helpful features of an EDIS, but are not critical for ED care or operations.

Conformance Clause

This profile is based on HL7 EHR-S Functional Model, Release 1. [5]

Key to the Functional Model and derived profiles is the concept of *conformance* which may be defined as *"verification that an implementation faithfully meets the requirements of a standard or specification"* [2]. In the functional model and in derived profiles, the general concept of conformance may be expressed a number of forms. For instance, a profile can be said to conform to the functional model if it adheres to the defined rules specified by the functional model specification. Similarly, an EDIS may claim conformance to this profile if it meets all the requirements outlined in the profile.

Conformance of ED Information Systems
This EDIS Functional Profile defines two levels of conformance for an EHR system *or systems* employed in the emergency department domain. For a vendor or developer to claim conformance with this profile, a conformance statement SHALL be produced for all systems evaluated using this profile.

1. "Basic Conformance" is comprised of the functions designated as 'Essential'.
    - As of the date of this publication, to claim "Basic Conformance" with the EDIS FP, an EHR system shall include all functions designated as 'Essential Now', and each function must satisfy the conformance criteria designated as 'SHALL'.
    - In the future, and until such time as this Functional Profile is revised, to claim "Basic Conformance" with the EDIS FP, a EHR system shall include all functions designated as 'Essential Future' with the implementation year equal to or less than the year in which conformance is claimed, as well as functions designated as 'Essential Now', and each function must satisfy the conformance criteria designated as 'SHALL'.

2. "Advanced Conformance" comprises the set of functions designated as 'Essential' as well as 'Optional'.

- As of the date of this publication, to claim "Advanced Conformance" with the EDIS FP, an EHR system shall include all functions designated as 'Essential Now' and 'Optional', and each function must satisfy the conformance criteria designated as 'SHALL'.
- In the future, and until such time as this Functional Profile is revised, to claim "Advanced Conformance" with the EDIS FP, a EHR system shall include all functions designated as 'Essential Now' or 'Essential Future' with the implementation year equal to or less than the year in which conformance is claimed, as well as functions designated as 'Optional', and each function must satisfy the conformance criteria designated as 'SHALL'.

Conformance of Derived Profiles

The EDIS Functional Profile Working Group recognizes that vendors, purchasers, and other members of the EDIS community may wish to develop their own profiles. The Working Group contends that the EDIS FP includes all the functions that can be reasonably expected to be available in an EDIS. However, we also recognize the value in the development of derived profiles applicable to certain subsets of EDIS systems. *The workgroup strongly feels that the development of derived profiles will likely be essential to support the evaluation of systems designed to support subsets of EDIS functions.* Based upon feedback from vendors, we anticipate that derived profiles for stand-alone *tracking* and *clinical documentation* systems should be developed to support certification in those niches within the EDIS space. Other derived profiles may be required.

In order for a derived profile to claim conformance with the EDIS FP, the profile must include all essential functions outlined in the Basic Conformance section for ED Information Systems above. Derived profiles must not change the function name or statement, and must include all SHALL conformance criteria in all functions. A derived profile can not claim conformance if the derived profile includes functions that have not been defined in this EDIS FP. The Workgroup solicits feedback regarding functions encountered in the development of a derived profile not encountered in the EDIS FP.

Conformance Criteria

Each function defined in the model or profiles is associated with specific *conformance criteria* which are statements used to evaluate and determine if a particular function is met (i.e. "the system SHALL capture, display and report all immunizations associated with a patient").

Conformance criteria have been developed in accordance with the standards set forth by the EHR technical committee. In order to ensure consistent, unambiguous understanding and application of the functional profile, the use of a consistent set of keywords (normative verbs) have been employed to describe conformance requirements as outlined below.

Realm

This profile was developed for the U.S. realm. However we feel it is highly applicable to international settings with the understanding that language used to describe potential users of the system may require some clarification. The EC-SIG invites feedback and participation from members of HL7 or other standards development organizations, as well as emergency care providers outside the U.S. and offers our assistance in the development of profiles for non-U.S. realms.

Readers Guide

Readers who are unfamiliar with the EHR Functional Model, upon which this profile is based, may find the organization and numbering of this document confusing. The workgroup strongly urges readers to familiarize themselves with the EHR Functional Model, including the chapters on How-To and Conformance. [5] The How-to Guide for creating profiles suggests that profile developers maintain the numbering of all functions implemented in a specific profile. While re-numbering of functions is permitted under certain rules, the workgroup decided to retain the numbering scheme of the parent Functional Model. Where certain functions have been deemed not applicable to this profile, those function numbers have been skipped. Where the workgroup determined that a new function was required, these functions were given the next appropriate number based upon the function's location in the profile.

Normative Language

The key words SHALL, MUST, SHOULD, MAY, and RECOMMENDED in this document are to be interpreted as described in RFC 2119 (available at: http://www.ietf.org/rfc/rfc2119.txt)

- SHALL – indicates a mandatory, required action. Synonymous with 'is required'.
- MUST – equivalent to 'SHALL'
- SHOULD – indicates an optional, recommended action that is particularly suitable, without mentioning or excluding other actions. Synonymous with 'is permitted and recommended'.
- MAY – indicates an optional, permissible action. Synonymous with 'is permitted'

Additional, clarification is necessary to understand the standardized nomenclature used to describe the functions of a system. The following chart, adapted from the EHR FM, illustrates the hierarchy of nomenclature. For example, "capture" is used to describe a function that includes both direct entry "create" and indirect entry through another device "input". Similarly, "maintain" is used to describe a function that entails reading, updating, or removal of data.

MANAGE				
Capture		**Maintain**		
Input Device (Ext.)	Create (Int.)	Read (Present)	Update	Remove Access
		View Report Display Access	Edit Correct Amend Augment	Obsolete Inactivate Destroy Nullify Purge

EDIS Users

The ED is a unique care setting where a number of non-clinical associates as well as administrators and managers must have access to the system. Furthermore, users may at different times have different roles. For instance, a nurse may on one day work as a nurse, while on another day work as a nurse practitioner.

The following table should be used as a guide to the nomenclature used to describe users who may interact with an EDIS. This table is *not* intended to serve as a hierarchical description of ED roles or as a description of access control policies, attributes, or credentials, but is intended to provide a means to rigorously define different groups of users. For instance, functions pertaining to the functions related to prescribing are usually granted to physicians, physician assistants and nurse practitioners, so users of such functions would be described as a 'licensed prescriber' but not as a 'user' or a 'provider'.

User										
Health Care Student	**Staff**		**Provider**							
	Administrator	**Support Staff**	**Ancillary Provider**	**Nurse**	**Licensed Prescriber**					
					Nurse Practitioner	**Physician Assistant**	**Physician**			
							Attending Physician		**Resident**	
							ED-based Attending	**Non-ED-based Attending**	**ED Resident**	**Non-ED-based Resident**

EDIS Overview and Functions

The following section describes some of the major functions and tasks essential in an EDIS.

Tracking

In emergency medicine, the concept of tracking connotes multiple concepts. Tracking may refer to the tracking of the patient's physical location as well as the patient's progress through an ED encounter (i.e. arrival, in room, awaiting consults, awaiting labs, ready for discharge). Tracking physical location can be accomplished by capturing updates to the patient's location that are manually entered by users into the system, or it can be done in an automated fashion using radio-frequency ID (RFID) or other technologies. The system should track patient physical location through all phases of visit, from pre-arrival through disposition. At certain times the actual location of the patient may require supporting information. For instance, a patient who has been sent to radiology may require his or her patient room to be "saved" because the patient's family members or personal belongings remain.

Tracking the status of care is covered in Clinical Workflow Tracking and Task Management. Tracking of patient's progress through the ED encounter requires the capture of certain milestones in the business logic behind the system. For instance, when a patient is moved from the waiting room to a patient room, the time the patient entered the treatment area should be automatically captured. Similarly, a chair in a hallway would be considered equivalent to a patient room in terms of capturing this milestone.

Registration

Patient arrival and registration are relatively complex and time-sensitive tasks involving data capture of both clinical and administrative data. In most cases, the EDIS is not the primary system used to capture the gamut of demographic or administrative information. Instead, a record is generated in the EDIS upon patient entry, and further demographic and administrative data are sent to the system via HL7 messaging once the patient is formally registered into the hospital ADT system. Critical to this workflow is the ability to manage the patient before formal registration has occurred, the identification of a single patient ID and record in both the EDIS and hospital systems, timely generation of a hospital account or billing number to facilitate interoperability with other hospital systems. The process of merging administrative data captured in the hospital system with the unique patient record in the EDIS should be largely automated, and only require human intervention if errors in either process prevent a certain match of the data.

Because the emergency department patient is ideally first encountered by a clinical provider (i.e. triage nurse) and not registration personnel, a search for past visits in the EDIS should be available to providers to retrieve medical summary data that has been captured in previous visits, including the patients' problem list, medications or allergies. While finding a patient's record may take time, past encounter data may streamline the intake or triage process, especially for patients with complicated medical histories or for patients unable to give an accurate history. Conversely, identification of a patient's previous visits prior to triage or formal registration should not be required. In fact, it should be possible to enter a patient into the EDIS without any demographic information (i.e. John or Jane Doe).

Quick registration is another process that allows clinical providers to enter the minimal amount of data sufficient to generate a new encounter or account number for the patient. This permits clinicians to order tests and other procedures on the patient although formal registration and verification of administrative data has not yet occurred. *Full registration* is the process whereby administrative personnel capture the entire spectrum of demographic information including contacts, addresses, and insurance information. Alternative workflows are possible and may be necessary for some EDIS implementations.

Clinical Workflow and Task Management

In the ED, there exists a critical need for distributed communication of the status of workflow tasks. An essential EDIS function is the management and display of tasks to be accomplished. In the pre-EHR era, this was accomplished by various artifacts including grease boards, chart racks, stickers, etc. Systems implemented in the ED must seek to achieve a level of embedded buy-in and participation as have these time-tested and home-grown artifacts. Communication of priorities is difficult in the ED. Work to be done is constantly changing. For instance, a critically ill patient has the effect of immediate re-prioritizing all workflow. In the ED, shifting of priorities is the norm, not the exception.

The management of tasks within the EDIS requires the maintenance of a master set of tasks, the ability to invoke those tasks, and a method for displaying those tasks. Tasks include orders, consultations, clinical tasks such as transportation to radiology, and flags for patient follow-up, etc. Tasks must be assigned to at least one entity, and in the ED are usually assigned to a member of the healthcare team or to a department (i.e. radiology). Tasks are also either linked to a particular patient, or occasionally to infrastructure in the ED (i.e. a bed that needs cleaning). The EDIS should be extensible enough to accommodate the complexity of clinical task routing according to local needs. For instance, in one

ED, the assignment of an order for a “Chest Radiograph” may be assigned to the patient’s primary RN alone, who carries out the task of ordering the study in the hospital information system and contacting transport to take the patient to the radiology department (sub-optimal). In another ED, the same task might entail the creation of multiple sub-tasks to: alert the primary RN that the patient requires transport out of the department; alert the radiology technologist to perform the study; alert the transporter to transport the patient to radiology; send an HL7 message to the radiology system ordering the study.

The system must link every clinical task to a particular patient and resource. Resources may include members of the health care team, objects such as stock items, and on occasion a place in the ED chart. For instance, an order for an ECG could be linked to the patient’s primary ED nurse, to the hospital heart station, to the ECG section of the chart to prompt the ED physician for an interpretation, and to the charge capture system. The system must also display those tasks which have been ordered or initiated, but have not been completed, as well as display and notify providers about tasks which have returned results that are awaiting review.

The tracking and display of tasks takes two major forms: 1. the display of the status of tasks for an individual patient, and 2. the display of tasks for a particular member of the healthcare team (i.e. MD, RN or Tech) or external department (i.e. Radiology, Laboratory, and Admitting). In an EDIS, the optimal display of clinical tasks is visible, and communicates at a distance.

Orders

The system must provide means to order laboratory, radiology, medications, nursing tasks, and materials management. Orders are a unique subset of clinical tasks that possess certain qualities. As with all tasks, an individual order may actually comprise a number of bundled tasks. For instance, an order for a complete blood count may comprise a number of sub-tasks, including obtaining the blood specimen, transporting the specimen to the lab, initiating the order in the laboratory system, and creating tasks to the physician to complete including review and documentation of results.

For success, orders must be highly specific and customizable by personnel role, physical location, and patient-specific factors (i.e. major trauma patient). The system must be sufficiently extensible to support institutional variations and preferences. For instance, the order for an ECG may be carried out by an ED RN in one institution, by an ED technologist in another, and by a hospital ECG technologist in a third. Similarly, aerosol therapy may be the purview of nursing in one ED and respiratory care in another. Roles such as these may be shared or vary by time of day or day of week. Doppler ultrasound of the lower extremities to rule out venous thromboembolism may be done by the vascular service during the day and by radiology at night.

Clinical Documentation

The system must support the capture of clinical documentation by all ED providers including physicians, nurses, technologists, transporters, and any other providers of clinical care. The system should permit providers to document both observations and medical decision making and to reflect exactly what each provider wants to say.

A large part of routine data gathering in the ED is redundant. For example, a patient’s list of medications may be incorporated from a previous encounter, verified and updated in triage. This process is frequently duplicated by the physician or other provider as part of their history and documentation. This information re-use requires the ability to manage inter-practitioner discrepancies, allowing providers to agree, comment, update, or annotate information gleaned at different points during the encounter. Sometimes this means commenting on findings that are not duplicated, sometimes it means verification of findings, but in all cases it means not having discrepancies which can be of severe medical and medical-legal consequence. For instance, a patient with chest pain may be asked by a nurse if they have any allergies. The patient says no and is administered aspirin as part of a standard protocol for chest pain. Upon questioning by the physician the patient reports an allergy to aspirin. Proper documentation of an encounter such as this would require proper time stamps for when data was available and documented. It would obviously be wrong for the documentation to ultimately reflect aspirin allergy without noting that “No allergies” was documented by the RN.

Managing Record Completion

While ED documentation is ideally completed by the time a patient leaves the department, this is rarely possible. ED clinicians frequently must wait until the end or stay after an assigned shift, to find time to complete records. Moreover, ED records are often created discontinuously, and systems need to consider provisions for permitting staggered, delayed, and offsite completion of records as well as monitoring and reporting their completion. Furthermore, EDIS systems must consider the process of authorship (one or more providers may need to document at the same time), signature, authentication, completion and addendum of ED records. The system should provide a means for a provider to display patient records needing attention or completion. The system should provide a means to create addendums to documents that have already been signed and hence cannot be changed. The system must also allow for completion of

the encounter record in a discontinuous sequence, but to retain particular formatting. For instance, a physician may write discharge instructions and prescriptions to discharge a patient quickly, but not document the history and physical until much later. However, the chart would need to reflect the encounter in a more traditional sequence. Because of the commonly irregular, sometimes chaotic, and piecemeal acquisition of information in the ED, documentation is often accomplished in fragments, and sometimes outside of the sequencing used in other care spaces. Documentation should be able to be done in any order, with good perspectives of what has and has not been completed, as well as what remains to be completed.

ED Physicians sometime do not get documentation completed at the end of each shift. Although some stay afterward to complete the work, others take the work home and complete the medical record over the next 24-36 hours. A physician may simply want to look over his/her clinical documentation before signing each chart. Although this is not ideal, facilities should have the option to add off-site record completion when the workload demands it.

Post-Disposition Management

Numerous tasks may remain after the completion of patient care and ED departure. The system must provide a means to track all outstanding patient issues after an ED visit is completed. For example, the system must allow providers to identify patients with outstanding laboratory, radiological, or other diagnostic studies. Similarly, the system should enable a provider to flag patients requiring follow-up care that can not be arranged prior to discharge (i.e. visiting nursing care). These tasks may be delegated to a particular person, or may be displayed in a summary list viewable to all ED staff. In addition, the system may track patients requiring administrative action after discharge (i.e. patient satisfaction or other non-clinical follow-up). Finally, the system must provide a means to reconcile preliminary diagnostic test results with the final interpretations of the services requested (i.e. reconcile the initial ED interpretation of a chest radiograph with ultimate radiologist dictation), making interoperability with both the radiology information system and ECG system (currently not traditional interfaces) desirable.

Administration and Support

Management and administration of an ED can be a daunting task. An EDIS, by virtue of the data it contains should be able to support ED operations through reporting and analysis of data obtained during the ED visit. [6] Such data may be displayed as real-time warnings and alerts (dashboard data), or through retrospective established and ad-hoc reports. Collection of particular performance measures should never impede the care process. Data used in analysis should be easy to understand and robust. Evaluation of EDIS reporting functions should not concentrate on the number of available reports, but on the quality of the underlying data and the use of validated ED performance measures. [7]

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EDIS Functional Profile

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Direct Care					
DC.1	**H**	**Care Management**	**Statement:** None **Description:** *Care Management functions are those used directly by providers as they create a record and deliver patient care in the ED.* DC.1.1 functions address the mechanics of creating a single logical health record, beginning a new encounter, managing patient demographics, and managing externally generated (including patient originated) health data. DC.1.2 - DC.1.11 follow a fairly typical flow of *patient care through an ED encounter beginning with pre-arrival and moving thorough discharge.* Specific items include, but are not limited to: consents, assessments, care plans, orders, results etc. Integral to care management activities is an underlying system foundation that maintains the privacy, security, and integrity of the captured health information – the information infrastructure of the EDIS covered in the IN section. *Also essential to care management are the supporting knowledge bases, tables, and system configuration settings developed for a particular system implementation – the system support functions addressed in S section.* *In the ED, there are frequently times when actions/activities related to "patients" are also applicable to the patient representative. Therefore, throughout the profile, the term "patient" can refer to the patient and/or the patient's personal representative, guardian or surrogate.*	**E**	
DC.1.1	**H**	**Record Management**	**Statement:** None **Description:** For those functions related to data capture, data may be captured using standardized code sets or nomenclature, depending on the nature of the data, or captured as unstructured data. Data is entered by a variety of caregivers. Details of who entered data and when it was captured must be tracked. Data may also be captured from monitoring devices or other applications.	**E**	
DC.1.1.1	**F**	**Identify and Maintain a Patient Record**	**Statement:** Identify and maintain a single patient record for each patient. **Description:** A single *patient* record is needed for legal purposes, as well as to organize information unambiguously for the provider. *All* health information is captured and linked to the patient record. Static data elements as well as data elements	**E**	1. The system **SHALL** create a single logical record for each patient. 2. The system **SHALL** provide the ability to create a record for a patient when the identity of the patient is unknown. 3. The system **SHALL** provide the ability to store more than

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			that will change over time are maintained. The patient is uniquely identified, after which the record is tied to that patient. *EDIS are frequently thought of as being encounter based. However, it is advantageous to tie specific information directly to a patient so that if a patient returns, legacy data may be incorporated and updated when beginning a new encounter.* Combining information on the same patient, or separating information where it was inadvertently captured for the wrong patient, helps maintain health information for a single patient.		one identifier for each patient record. 4. The system **SHALL** associate key identifier information (e.g., system ID, medical record number) with each patient record. 5. The system **SHALL** provide the ability to uniquely identify a patient and tie the record to a single patient. 6. The system **SHALL** provide the ability, through a controlled method, to merge or link dispersed information for an individual patient upon recognizing the identity of the patient. 7. When health information has been mistakenly associated with a patient, the system **SHALL** provide the ability to mark the information as erroneous in the record of the patient in which it was mistakenly associated and represent that information as erroneous in all outputs containing that information. 8. When health information has been mistakenly associated with a patient, the system **SHALL** provide the ability to associate it with the correct patient. 9. The system **SHALL** provide the ability to retrieve parts of a patient record using a primary identifier, secondary identifiers, or other information which are not identifiers, but could be used to help identify the patient. 10. The system **SHOULD** provide the ability to obsolete, inactivate, nullify, destroy and archive a patient's record in accordance with local policies and procedures, as well as applicable laws and regulations. *11. The system **SHALL** provide a means to enter patients into the system that have been missed or who were seen during system downtime.*
DC.1.1.2	**F**	**Manage Patient Demographics**	**Statement**: Capture and maintain demographic information. Where appropriate, the data should be clinically relevant and reportable. **Description**: Contact information including addresses and phone numbers, as well as key demographic information such as date of birth, gender, and other information is stored and maintained for patient identification, reporting purposes and for the provision of care. Patient demographics are captured and maintained as discrete fields (e.g., patient names and addresses) and may be	**E**	1. The system **SHALL** capture demographic information as part of the patient record. 2. The system **SHALL** store and retrieve demographic information as discrete data. 3. The system **SHALL** provide the ability to retrieve demographic data as part of the patient record. 4. The system **SHALL** provide the ability to update demographic data.

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			enumerated, numeric or codified. Key patient identifiers are shown on all patient information output (such as name and ID# on each screen of a patient's record). The system will track who updates demographic information, and when the demographic information is updated.		5. The system **SHOULD** provide the ability to report demographic data. 6. The system **SHOULD** store historical values of demographic data over time. 7. The system **SHALL** present a set of patient identifying information at each interaction with the patient record. *8. The system **SHALL** store, at a minimum, the following information with the patient record:* • *Name* • *Date of birth* • *Administrative gender* • *Internal Patient ID* • *Account number* *9. The system **SHOULD** store:* • *Patient Address(es)* • *Telephone number(s)* • *Emergency Contact Name* • *Emergency Contact Address* • *Emergency Contact Telephone Number* • *Emergency Contact Relationship* • *Primary Practitioner Name* • *Primary Practitioner ID* • *Primary Practitioner Type* • *Primary Practitioner Address* • *Primary Practitioner Telephone Number* • *Primary Practitioner Organization*
DC.1.1.2.1		***EDIS Registration***	***Statement**: Identify the patient in the EDIS and initiate a new encounter.* ***Description**: ED workflow is unique in that care must be supported and documented immediately upon arrival. The system must be able to immediately generate a new patient encounter without the need to identify the patient or previous records.* *To maximize usability, when time permits, identification of a previous patient record in the EDIS should be possible to facilitate the triage process by recovering prior medications, allergies, problems. Data entry is minimized and time can be spent verifying, updating, and correcting data.*	***E***	*1. The system **SHALL** be able to immediately generate a new encounter at the time of patient arrival.* *2. The system **SHALL** permit the users to identify a patient's pre-existing record in the system at the time of arrival.* *3. The system **SHOULD** permit the user to search by core demographic data including name, DOB, administrative gender, patient ID number and account number.* *4. The system **SHOULD** provide the ability to retrieve legacy data once the patient is identified.* *5. The system **SHALL** provide the ability to assign an identity to a patient at the time of arrival.* *6. The system **SHALL** provide the ability to assign either a previously established identity for the patient or to create a*

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					new identity. *7. The system **SHALL** provide the ability to create a temporary identity (i.e. John Doe) for the patient.* *8. The system **SHALL** provide the ability to reconcile temporary identity assignments after care has been initiated, and further information becomes available.*
DC.1.1.2.2		***Quick Registration***	***Statement**: Receive an account number from the hospital ADT system without complete supporting demographics, in order to facilitate patient care before registration is complete.* ***Description**: The registration process, including the verification of full demographics data, insurance, contact information, etc. is frequently time consuming. To facilitate patient care in emergency situations, the system must be interoperable with other hospital systems in a time critical manner.* *In order to support interoperability with other hospital systems, for such tasks as medication or other order entry the system should be able to, in a time critical manner, receive an account number from the hospital ADT system, or alternatively, generate an account number in concert with the hospital system.*	***E***	*1. The system **SHALL** provide the ability to receive an account number from the hospital or other ADT system, before additional identifying data is known.* *2. The system **MAY** generate a temporary account number for emergent orders and other interoperability need, in the absence of an account number from the hospital or other ADT system.*
DC.1.1.2.3		***ED Merge Registration***	***Statement**: Merge the record begun in the EDIS with the formal registration in an ADT system.* ***Description**: In the EDIS environment, the EDIS is rarely used to capture full demographic or financial data. Instead, a hospital or other ADT system is used to capture this data which is then transferred or linked to the EDIS along with the account number generated for the visit. A method needs to exist to perform this transaction. An automated ADT merge is preferable, minimizing the administrative burden.*	***E***	*1. The system **SHALL** provide a means to capture data from the hospital ADT system.* *2. The system **SHOULD** merge registrations automatically based upon certain rules.* *3. The system **SHALL** provide a means to manually merge registrations if automated merge fails or is not employed..*
DC.1.1.3	**H**	**Data and Documentation from External Sources**	**Description:** External sources are those outside the EHR system, including clinical, administrative, and financial information systems, other EHR systems, PHR systems, and data received through health information exchange networks.	**E**	
DC.1.1.3.1	**F**	**Capture Data and Documentation from External Clinical Sources**	**Statement:** Incorporate clinical data and documentation from external sources **Description:** Mechanisms for incorporating external clinical data and documentation (including identification of source) such as image documents and other clinically relevant data are available. Data incorporated through these mechanisms is presented alongside locally captured documentation and notes wherever appropriate. *In the ED, consultants, EMS, social workers, respiratory*	**E**	1. The system **SHALL** provide the ability to capture external data and documentation. 2. IF lab results are received through an electronic interface, THEN the system **SHALL** receive and store the data elements into the patient record. 3. IF lab results are received through an electronic interface, THEN the system **SHALL** display them upon request.

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			therapists, and a number of other providers may not use the EDIS to document care. Therefore, a method should be available to capture or link these documents to the ED visit. *Data managed outside of the EDIS by other providers and systems should be available to providers in the ED. This data includes referral summaries, transfer summaries, DNR orders and medication lists. This data must be linked to the patient's medical record and viewable to providers in the ED.*		4. The system **SHOULD** provide the ability to receive, store and display scanned documents as images. 5. The system **MAY** provide the ability to store imaged documents or reference the imaged documents via links to imaging systems. 6. The system **SHALL** provide the ability to receive, store and present text-based externally-sourced documents and reports. 7. The system **MAY** provide the ability to receive, store and display clinical result images (such as radiological images) received from an external source. 8. The system **MAY** provide the ability to receive, store and display other forms of clinical results (such as wave files of EKG tracings) received through from an interface with an external source. 9. The system **SHOULD** provide the ability to receive, store and display present medication details from an external source. 10. The system **SHOULD** provide the ability to receive, store and display present structured text-based reports received from an external source. 11. The system **SHOULD** provide the ability to receive, store and present standards-based (i.e. CDA) structured, codified data received from an external source. *12. The system **SHOULD** provide a means to link externally stored EMS data to the patient record.* *13 The system **MAY** provide a means to import the EMS run sheet.* *14. If electronic capture is not available for EMS data, the system **MAY** allow EMS personnel to input EMS data into the system.* *15. The system **MAY** provide a means to electronically capture and audio file of a verbal EMS report.*
DC.1.1.3.1.1	***F***	***Capture EMS data***	***Statement**: Capture EMS data electronically, including telemetry, vital sign measurements, procedures performed and both structured and non-structured clinical observations.* ***Description**: In the future, interoperability between EMS systems and ED Information Systems will assist in the care*	***EF 09***	*1. The system **SHALL** provide a mechanism for the electronic capture of EMS data.* *2. The system **SHOULD** provide the ability to electronically capture patient data including medications, vital signs, and other data as structured data.*

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			provided in the ED. Electronic transmission of data may not only occur at the time of EMS arrival to the ED, but upon selection of, and en-route to, a receiving facility.		*3. The system **SHOULD** provide the ability to electronically capture digitally recorded or transmitted EMS data (i.e. EKG, telemetry, and defibrillator data, display alarms, etc.).*
DC. 1.1.3.2	**F**	**Capture Patient Originated Data**	**Statement**: Capture and explicitly label patient originated data, link the data source with the data, and support provider authentication for inclusion in patient health record. **Description**: Patients may provide data for entry into the health record or be given a mechanism for entering this data directly. It is critically important to be able to distinguish patient-originated data that is either provided or entered by a patient from clinically authenticated data. Patient-originated data intended for use by providers should be available for their use. Data about the patient may be provided by: (1) patient, (2) surrogate (parent, spouse, guardian), or (3) informant (teacher, lawyer, case worker). Patient-originated data may also be captured by interactions with devices or electronic PHR services and transmitted for inclusion into the electronic health record. Data entered by any of these must be stored with source information. A provider must authenticate patient originated data included in the patient's legal health record.	**O**	1. The system **SHALL** capture and explicitly label patient originated data. 2. IF the system provides the ability for direct entry by the patient, THEN the system **SHALL** explicitly label the data as patient entered 3. The system **SHALL** capture and label the source of clinical data provided on behalf of the patient 4. The system **SHALL** present patient-originated data for use by care providers 5. The system **SHALL** provide the ability for a provider to verify the accuracy of patient-originated data for inclusion in the patient record 6. The system **SHOULD** provide the ability to view or comment, but not alter, patient-originated data *7. The system **SHALL** provide the ability to capture patient originated data including, but not limited to, demographics, past medical history, medications, and allergies.*
DC.1.1.3.3	**F**	**Capture Patient Health Data Derived from Administrative and Financial Data and Documentation**	**Statement**: Capture and explicitly label patient health data derived from administrative or financial data; and link the data source with that data. **Description**: It is critically important to be able to distinguish patient health data derived from administrative or financial data from clinically authenticated data. Sources of administrative and financial data relating to a patient's health may provide this data for entry into the health record or be given a mechanism for entering this data directly. The data must be explicitly labeled as derived from administrative or financial data, and information about the source must be linked with that data. Patient health data that is derived from administrative or financial data may be provided by: (1) the patient, (2) a provider, (3) a payer; or (4) entities that transmit or process administrative or financial data. Since this data is non-clinical, it may not be authenticated for inclusion in the patient's legal health record.	**O**	1. The system **SHALL** provide the ability to capture and label patient health data derived from administrative or financial data. 2. The system **SHALL** provide the ability to capture and link data about the source of patient health data derived from administrative and financial data with that patient data. 3. The system **SHALL** provide the ability to present labeled patient health information derived from administrative or financial data and the source of that data for use by authorized users. 4. The system **SHOULD** provide the ability to view or comment on patient health information derived from administrative or financial data. 5. The system **MAY** provide the ability to request correction of the administrative or financial data.
DC.1.2	**F**	**Manage Patient History**	**Statement**: Capture and maintain medical, procedural/surgical, social and family history including the capture of pertinent positive and negative histories, patient-reported or externally	**E**	1. The system **SHALL** provide the ability to capture, update, and present current patient history including pertinent positive and negative elements.

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			available patient clinical history. **Description**: The history of the current illness and patient historical data related to previous medical diagnoses, surgeries and other procedures performed on the patient, and relevant health conditions of family members is captured through such methods as patient reporting (for example interview, medical alert band) or electronic or non-electronic historical data. This data may take the form of a pertinent positive such as: "The patient/family member has had..." or a pertinent negative such as "The patient/family member has not had..." *ED patients commonly receive care prior to registration, and care must be documented before registration is completed, or infrequently, before the patient is able to be identified.* *The delivery of care and clinical documentation frequently occur in a non-linear temporal sequence. However, clinical summaries created by the EDIS should re-create a traditional or standard type of record flow.*		*2. The system **SHALL** display past patient histories.* 3. The system **MAY** provide the ability to capture and present previous external histories. 4. The system **MAY** provide the ability to capture the relationship between patient and others. 5. The system **SHALL** capture the complaint, presenting problem or other reason(s) for the visit or encounter. 6. The system **SHOULD** capture the reason for visit/encounter from the patient's perspective. *7. The system **SHALL** provide a means to capture family history and social history.* *8. The system **SHOULD** provide a means of clinical documentation for all ED providers.* *9. The system **SHALL** provide the ability to capture and update new clinical documentation before the patient is registered.* *10. The system **SHALL** provide a means to distinguish between time of observation and time of data entry.* *11. The system **SHALL** reconcile documentation made in a non-linear temporal sequence.* *12. The system **SHOULD** provide multiple levels of data display (log view versus readable view) vs. not display at all.*
DC.1.2.1	***F***	***Manage Pre-Arrival Data***	***Statement:** Create and update information about incoming referrals from physicians' offices, clinics, EMS, transfers from other hospitals or emergency departments, nursing homes, etc. and link this data to the patient's record.* ***Description:** The management of information on patients who are inbound to the ED is an important component of information management in the ED. This documentation most often begins with a telephone call made from referring provider to receiving ED.* *Often, this information gets haphazardly recorded. Data must be easily accessible, central, retrievable, updatable, transportable and reusable.* *Clinical data from provider to provider is essential to quality*	***E***	*1. The system **SHALL** provide a means to document data on patients who have been referred to the ED.* *2. The system **SHALL** capture and display the **Source of Referral** and the **Reason for Referral**.* *3. The system **SHALL** provide a means to track patients who are en-route to the ED via the EMS system.* *4. The system **SHALL** display the patient who has been referred to the ED as a referral throughout the ED stay.* *5. The system **SHOULD** allow users to reserve an ED bed and assign human resources, including registration and RN staff to incoming patients.*

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			coordinated care for patients referred to the ED. Knowledge of patients who are expected to arrive helps both ED and administrative staff plan resource use in real time. *Advance notification is also common for patients arriving via EMS. This data is most often taken during a radio call, when patient demographic data is omitted for privacy concerns. As such, some systems may elect to capture this data without demographic information to be linked to the medical record when the patient arrives. EMS arrivals frequently require in-room registration. Notifying registration of incoming ambulances can direct staff to be available as soon as the patient arrives.*		*6. The system **SHALL** provide a means to view all pre-arrival data upon arrival.*
DC.1.2.2	***F***	***Manage Arrival Data***	***Statement**: Capture Arrival Data at the time of patient arrival to the ED.* ***Description**: Capture data pertinent to the ED visit including, but not limited to: Mode of arrival, Referral source (if any), Arrival time. This data need not be captured by clinical personnel, but is important for patient management as well as administrative management of the ED. ,*	***E***	*1. The system **SHALL** provide a means to document ED arrival data.* *2. The system **SHALL** capture and display **Time of Arrival** and **Mode of Arrival.** .* *3. The system **SHALL** link any data captured prior to patient arrival with the record created at the time of arrival.* *4. The system **SHOULD** provide a mechanism to vary the information taken during the arrival process, depending on local practice or patient acuity.* *5. The system **SHALL** capture the EMS Agency that Transported the Patient if the patient arrived by EMS.* *6. The system **SHOULD** capture the EMS unit that transported the patient, if the patient arrived via EMS.*
DC.1.2.3	***F***	***Manage Triage***	***Statement**: Capture Triage Assessment* ***Description**: Fundamental to emergency care is the concept of triage, whereby patients with differing problems and presentations are stratified and prioritized for care.* *Patients who are critically ill are generally brought directly back to the treatment area and seen immediately by emergency care providers. Other patients may need to wait to be seen by a provider. Depending on local practice, severity of illness, or other factors, patients may undergo triage in multiple ways and by multiple providers. An EDIS must be extensible enough to accommodate these differing workflows.*	***E***	*1. The system **SHALL** provide a means to capture a focused triage assessment.* *2. The system **SHALL** provide a means to capture a comprehensive triage assessment.* *3. The system **SHALL** provide a means to capture the initial **Chief Complaint**.* *4. The system **SHALL** provide a means to capture an initial **Presenting Problem**.* *5. The system **SHOULD** provide a means to document triage as a narrative.* *6. The system **SHOULD** provide a means to document different data for different complaints.* *7. The system **SHALL** provide a means to capture a **Triage***

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Direct Care					
					Acuity Rating *for the patient.*
DC.1.2.4	***F***	***Manage History of Present Illness***	***Statement:*** *Provide a means to capture and maintain the history of present illness and patient review of systems (ROS).* ***Description****: The history of present illness and associated review of systems are unique to each encounter. HPI and ROS may be captured as discrete data (i.e. template) or as narrative (i.e. voice recognition, typing, etc). However, there must be a method for capturing this data that allows the provider to capture the essence of the encounter as he or she feels it should be recorded.*	***E***	*1. The system **SHALL** provide a means to capture the history of present illness and review of systems.* *2. The system **SHALL** provide a means a provider to capture the HPI as narrative text and/or story.* *3. The system **MAY** provide a means to capture the HPI as discrete data.* *4. The system **SHOULD** provide a means to capture the review of system as discrete data.*
DC.1.3	**H**	**Preferences, Directives Consents and Authorizations**		**E**	
DC.1.3.1	**F**	**Manage Patient and Family Preferences**	**Statement**: Capture and maintain patient and family preferences. **Description**: Patient and family preferences regarding issues such as language, religion, spiritual practices and culture – may be important to the delivery of care. It is important to capture these so that they will be available to the provider at the point of care.	**O**	1. The system **SHALL** provide the ability to capture, present, maintain and make available for clinical decisions patient preferences such as language, religion, spiritual practices and culture. 2. The system **SHALL** provide the ability to capture, present, maintain and make available for clinical decisions family preferences such as language, religion, spiritual practices and culture.
DC.1.3.2	**F**	**Manage Patient Advanced Directives**	**Statement**: Capture and maintain patient advance directives. **Description**: Patient advance directives and provider DNR orders are captured as well as the date and circumstances under which the directives were received, and the location of any paper records or legal documentation (e.g. the original) of advance directives as appropriate.	**E**	1. The system **SHALL** provide the ability to indicate that advance directives exist for the patient. 2. The system **SHALL** provide the ability to indicate the type of advanced directives completed for the patient such as living will, durable power of attorney, preferred interventions for known conditions, or the existence of a "Do Not Resuscitate order". 3. The system **SHOULD** provide the ability to capture, present, maintain and make available for clinical decisions patient advance directives documents and “Do Not Resuscitate” orders. 4. The system **SHOULD** conform to function DC.1.1.3.1 (Capture data and documentation from external clinical sources) and capture scanned patient advance directive documents and “Do Not Resuscitate” orders. 6. The system **SHOULD** provide the ability to indicate the

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
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					name and relationship of the party completing the advance directive for the patient. 7. The system **SHALL** time and date stamp advance directives. 8. The system **SHOULD** provide the ability to document the location and or source of any legal documentation regarding advance directives.
DC.1.3.3	**F**	**Manage Consents and Authorizations**	**Statement**: Create, maintain, and verify patient decisions such as informed consent for treatment and authorization/consent for disclosure when required. **Description:** Decisions are documented and include the extent of information, verification levels and exposition of treatment options. This documentation helps ensure that decisions made at the discretion of the patient, family, or other responsible parties govern the actual care that is delivered or withheld. There may be several documents active at any one time that may govern a patient's care. Both clinical and administrative consents and authorizations are considered part of this function. A consent or authorization includes patient authorization for re-disclosure of sensitive information to third parties. Consents/Authorizations for printing should include appropriate standardized forms for patients, guardians, foster parents. The system must appropriately present forms for adolescents according to privacy rules. Some states may mandate assent. Assent is agreement by the patient to participate in services when they are legally unable to consent (e.g., an adolescent, an adult with early dementia).	**E**	1. The system **SHALL** provide the ability to indicate that a patient has completed applicable consents and authorizations. 2. The system **SHALL** provide the ability to indicate that a patient has withdrawn applicable consents and authorizations. 2. The system **SHOULD** conform to function DC.1.1.3.1 (Capture data and documentation from external clinical sources) and capture scanned paper consent and authorization documents. 3. The system **MAY** provide the ability to view and complete consent and authorizations forms on-line. 4. The system **SHOULD** provide the ability to generate printable consent and authorization forms. 5. The system **SHOULD** display the authorizations associated with a specific clinical activity (*procedure, release of information*) along with that event in the patient's electronic chart. 6. The system **SHOULD** provide the ability to document an assent for patients legally unable to consent. 7. The system **SHALL** provide the ability to document the source of each consent, such as the patient or the patient's personal representative (guardian/surrogate), if the patient is legally unable to provide it. 8. The system **SHOULD** provide the ability to document the patient's personal representative's level of authority to make decisions on behalf of the patient.
DC.1.4	**H**	**Summary Lists**		**E**	

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Direct Care					
DC.1.4.1	**F**	**Manage Allergy, Intolerance and Adverse Reaction List**	**Statement**: Create and maintain patient specific allergy, intolerance and adverse reaction lists **Description**: Allergens, including immunizations, and substances are identified and coded (whenever possible) and the list is captured and maintained over time. All pertinent dates, including patient-reported events, are stored and the description of the patient allergy and adverse reaction is modifiable over time. The entire allergy history, including reaction, for any allergen is viewable. The list(s) includes all reactions including those that are classifiable as a true allergy, intolerance, side effect or other adverse reaction to drug, dietary or environmental triggers. Notations indicating whether item is patient reported and/or provider verified are maintained.	**E**	1. The system **SHALL** provide the ability to capture true allergy, intolerance, and adverse reaction to drug, dietary or environmental triggers as unique, discrete entries. 2. The system **SHOULD** provide the ability to capture the reason for entry of the allergy, intolerance or adverse reaction. 3. The system **SHALL** provide the ability to capture the reaction type. 4. The system **SHOULD** provide the ability to capture the severity of a reaction. 5. The system **SHALL** provide the ability to capture a report of No Known Allergies (NKA) for the patient. 6. The system **SHOULD** provide the ability to capture a report of No Known Drug Allergies (NKDA) for the patient 7. The system **SHOULD** provide the ability to capture the source of allergy, intolerance, and adverse reaction information. 8. The system **SHALL** provide the ability to deactivate an item on the list. 9. The system **SHALL** provide the ability to capture the reason for deactivation of an item on the list 10. The system **MAY** present allergies, intolerances and adverse reactions that have been deactivated. 11. The system **MAY** provide the ability to display user defined sort order of list. 12. The system **SHOULD** provide the ability to indicate that the list of medications and other agents has been reviewed. 13. They system **SHALL** provide the ability to capture and display the date on which allergy information was entered. 14. The system **SHOULD** provide the ability to capture and display the approximate date of the allergy occurrence.
DC.1.4.2	**F**	**Manage Mediation List**	**Statement**: Create and maintain patient specific medication lists. **Description**: 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	**E**	1. The system **SHALL** provide the ability to capture patient specific medication lists. 2. The system **SHALL** display and report patient-specific medication lists.

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			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.		3. The system **SHALL** provide the ability to capture the details of the medication such as ordering date, dose, route, and SIG (description of the prescription, such as the quantity) when known. 4. The system **SHOULD** provide the ability to capture other dates associated with medications such as start and end dates. 5. The system **SHALL** provide the ability to capture medications not reported on existing medication lists or medication histories. 6. The system **SHALL** provide the ability to capture nonprescription medications including over the counter and complementary medications such as vitamins, herbs and supplements. 7. The system **SHALL** present the current medication lists associated with a patient. 8. The system **SHALL** present the medication, prescriber, and medication ordering dates when known. 9. The system **SHALL** provide the ability to mark a medication as erroneously captured and excluded from the presentation of current medications. 10. The system **SHALL** provide the ability to print a current medication list for patient use. 11. The system **MAY** provide the ability to capture information regarding the filling of prescriptions (dispensation of medications by pharmacies or other providers). *12. The system **SHALL** provide a means to document that a medication history is unavailable.* *13. The system **SHALL** provide a means to document a description of a medication when the medication name is unknown.* *14. The system **SHOULD** prove a means to identify one time medications taken in the recent past.* *15. The system **SHOULD** support the process of medication reconciliation as required by organizational policy, scope of practice, and jurisdictional law.*

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DC.1.4.3	**F**	**Manage Problem List**	**Statement**: Create and maintain patient specific problem lists. **Description**: A problem list may include, but is not limited to: chronic conditions, diagnoses, or symptoms, functional limitations, visit or stay-specific conditions, diagnoses, or symptoms. Problem lists are managed over time, whether over the course of a visit or stay or the life of a patient, allowing documentation of historical information and tracking the changing character of problem(s) and their priority. The source (e.g. the provider, the system id, or the patient) of the updates should be documented. In addition all pertinent dates are stored, including date noted or diagnosed, dates of any changes in problem specification or prioritization, and date of resolution. This might include time stamps, where useful and appropriate. The entire problem history for any problem in the list is viewable.	**E**	1. The system **SHALL** capture, display and report all active problems associated with a patient. 2. The system **SHALL** capture, display and report a history of all problems associated with a patient. 3. The system **SHALL** provide the ability to capture onset date of problem. 4. The system **SHOULD** provide the ability to capture the chronicity (chronic, acute/self-limiting, etc.) of a problem. 5. The system **SHALL** provide the ability to capture the source, date and time of all updates to the problem list. 6. The system **SHALL** provide the ability to deactivate a problem. 7. The system **MAY** provide the ability to re-activate a previously deactivated problem. 8. The system **SHOULD** provide the ability to display inactive and/or resolved problems. 9. The system **SHOULD** provide the ability to manually order/sort the problem list. 10. The system **MAY** provide the ability to associate encounters, orders, medications, notes with one or more problems. *11. The system **SHALL** manage pregnancy status, including the date of last menstrual period, patient reported pregnancy status, and results of bedside or laboratory testing.*
DC.1.4.4	**F**	**Manage Immunization List**	**Statement:** Create and maintain patient specific immunization lists **Description**: Immunization lists are managed over time, whether over the course of a visit or stay, or the lifetime of a patient. Details of immunizations administered are captured as discrete data elements including date, type, manufacturer and lot number. The entire immunization history is viewable.	**E**	1. The system **SHALL** capture, display and report all immunizations associated with a patient. 2. The system **SHALL** record as discrete data elements data associated with any immunization given including date, type, lot number and manufacturer. 3. The system **MAY** prepare a report of a patient's immunization history upon request for appropriate authorities such as schools or day-care centers.
DC.1.5	**F**	**Manage Assessments**	**Statement:** Create and Maintain Assessments **Description:** During an encounter with a patient, providers conduct assessments that are germane to the age, gender, and medical condition of the patient.	**E**	1. The system **SHALL** provide the ability to create assessments. 2. The system **SHOULD** provide the ability to use standardized assessments where they exist.

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			Wherever possible, this assessment should follow standard protocols although, for example, an assessment for an infant will have different content than one for an elderly patient. When a specific standard assessment does not exist, a unique assessment can be created, using the format and data elements of similar standard assessments whenever possible.		3. The system **SHOULD** provide the ability to document using standard assessments germane to the age, gender, health condition as appropriate to the EHR user's scope of practice. 4. The system **SHOULD** provide the ability to capture data relevant to standard assessment. 5. The system **SHOULD** provide the ability to capture additional data to augment the standard assessments relative to variances in medical conditions. 6. The system **SHOULD** provide the ability to link data from a standard assessment to a problem list. 7. The system **SHOULD** provide the ability to link data from a standard assessment to an individual care plan. 8. The system **MAY** provide the ability to link data from external sources, laboratory results, and radiographic results to the standard assessment. *9.* The system **SHOULD** provide the ability to compare documented data against standardized curves and display trends. *10. The system **SHALL** capture Glasgow Coma Score.* *11. The system **SHALL** capture pain score.*
DC.1.5.1	***F***	***Manage Physical Examination***	***Statement:** Provide a means to create and update physical examination findings.* ***Description**: The physical examination is unique to each encounter and problem. The PE may be captured as discrete data (i.e. template) or as narrative (i.e. voice recognition, typing, etc). However, there must be a method for capturing this data that allows the provider to capture the examination as the provider feels it should be recorded.*	***E***	*1. The system **SHALL** capture the physical examination. .* *2. The system **SHOULD** provide a means to vary the physical examination documented based upon patient problem.*
DC.1.5.2	***F***	***Manage Progress Notes***	***Statement:** Provide a means to capture and maintain progress notes or ongoing evaluations.* ***Description:** Important, and perhaps unique, to the documentation of ED care is the concept of progress notes to document improvement or decline in a patient's clinical condition over time, based upon response to therapy. Progress notes are a unique form of assessment that may be standardized for a particular problem (i.e. asthma) or observation (i.e. pain).*	***E***	*1. The system **SHALL** provide a means to record progress notes by providers.* *2. The system **SHOULD** prompt the provider for progress notes based upon various rules, including but not limited to, chief complaint, length of stay, abnormal vital signs, response to medication.* *3. The system **SHOULD** support capture and storage of progress notes as discrete data where appropriate.*

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					*4. The system **SHALL** support free-text or narrative progress notes.*
DC.1.6	**H**	**Care Plans, Treatment Plans, Guidelines, and Protocols**		**O**	
DC.1.6.1	**F**	**Present Guidelines and Protocols for Planning Care**	**Statement**: Present organizational guidelines for patient care as appropriate to support planning of care, including order entry and clinical documentation **Description**: Guidelines, and protocols presented for planning care may be site specific, community or industry-wide standards.	**O**	1. The system **SHALL** provide the ability to present current guidelines and protocols to clinicians who are creating plans for treatment and care 2. The system **SHOULD** provide the ability to search for a guideline or protocol based on appropriate criteria (such as problem) 3. The system **SHOULD** provide the ability to present previously used guidelines and protocols for historical or legal purposes 4. IF decision support prompts are used to support a specific clinical guideline or protocol THEN the system **SHALL** conform to function DC.1.8.6 5. The system **SHALL** conform to function DC.2.2.1.2 (Support for context-sensitive care plans, guidelines and protocols)
DC.1.7	**H**	**Orders and Referrals Management**	***Description:** Each ED and institution is different. When an EDIS is employed for orders or referrals management, the EDIS serves as the gateway or interface to that institution. The EDIS must support specific ordering and associated workflows identified with ED care. Dependencies should be minimized and user interactions streamlined.*	**E**	*1. The system **SHALL** maintain a list of orders available to providers in the ED. .* *2. The system **SHOULD** provide a means to name orders according to a local taxonomy.* *3. The system **SHALL** display orders that have not been fulfilled.* *4. The system **SHALL** permit order entry prior to formal registration.* *5. The system **SHOULD** provide a means for the creation of both role-based and location-based orders.* *6. The system **MAY** provide a means for sub-classification of order types based upon local interoperability needs.* *7. The system **SHOULD** provide a means to manage standing orders or orders that may be submitted by protocol by providers other than licensed providers.*
DC.1.7.1	**F**	**Manage Medication Orders**	**Statement:** Create prescriptions or other medication orders with detail adequate for correct filling and administration. Provide information regarding compliance of medication orders	**E**	1. The system **SHALL** provide the ability to create prescription or other medication orders with the details adequate for correct filling and administration captured as

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			with formularies **Description**: Different medication orders, including discontinue, refill, and renew, require different levels and kinds of detail, as do medication orders placed in different situations. The correct details are recorded for each situation. Administration or patient instructions are available for selection by the ordering clinicians, or the ordering clinician is facilitated in creating such instructions. The system may allow for the creation of common content for prescription details. Appropriate time stamps for all medication related activity are generated. This includes series of orders that are part of a therapeutic regimen, e.g. Renal Dialysis, Oncology. When a clinician places an order for a medication, that order may or may not comply with a formulary specific to the patient's location or insurance coverage, if applicable. Whether the order complies with the formulary should be communicated to the ordering clinician at an appropriate point to allow the ordering clinician to decide whether to continue with the order. Formulary-compliant alternatives to the medication being ordered may also be presented.		discrete data. 2. The system **SHALL** capture user and date stamp for all prescription related events. 3. The system **SHALL** conform to function DC.1.4.2 (Manage Medication List) and update the appropriate medication list with the prescribed medications (in case of multiple medication lists). 4. The system **SHALL** provide a list of medications to search, including both generic and brand name. 5. The system **SHALL** provide the ability to maintain a discrete list of orderable medications. 6. The system **SHALL** conform to function DC.1.7.2.1 (Manage patient care orders) and provide the ability to order supplies associated with medication orders according to the users' scope of practice in accordance with organizational policy or jurisdictional law. 7. The system **MAY** make common content available for prescription details to be selected by the ordering clinician 8. The system **MAY** provide the ability for the ordering clinician to create prescription details as needed 9. The system **MAY** make available common patient medication instruction content to be selected by the ordering clinician. 10. The system **MAY** provide the ability to include prescriptions in order sets. 11. The system **MAY** provide a list of frequently-ordered medications by diagnosis by provider which could include the full details of the medication, including SIG, quantity, refills, *dispense as written*, etc. 12. The system **MAY** provide the ability to select drugs by therapeutic class and/or indication. 13. The system **MAY** conform to function S.3.3.2 (Eligibility verification and determination of coverage) and display the results of electronic prescription eligibility and health plan/payer formulary checking. 14. The system **MAY** provide the ability to re-prescribe medication by allowing a prior prescription to be reordered

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					without re-entering previous data (e.g. administration schedule, quantity). 15. The system **SHOULD** provide the ability to re-prescribe a medication from a prior prescription using the same dosage but updating body weight. 16. The system ***SHALL*** conform to function DC.2.3.1.1 (Support for drug interaction checking) and check and report allergies, drug-drug interactions, and other potential adverse reactions, when new medications are ordered. 17. The system **SHOULD** conform to function DC.2.3.1.2 (Support for patient specific dosing and warnings) and check and report other potential adverse reactions, when new medications are ordered. 18. The system **SHALL** provide the ability to create prescriptions in which the weight-specific dose employs a starting range with incremental changes toward a target scope. 19. The system **SHOULD** conform to function DC.2.3.1.3 (Support for Medication Recommendations) *20. The system **SHALL** support institution specific formularies.* *21. The system **SHALL** provide a means to institute co-signatures for therapeutic orders based upon roles (i.e. medical student, consulting physician).* *22. The system **SHALL** permit medication order entry prior to formal registration.* *23. The system **SHALL** provide a means to order medications via continuous infusion.* *24. The system **SHALL** provide a means to order combination drugs or compounds (i.e. magic mouthwash).*
DC.1.7.2	**H**	**Non-medication Orders and Referrals Management**		**E**	
DC.1.7.2.1	**F**	**Manage Non-Medication Patient Care Orders**	**Statement**: Capture and track patient care orders. Enable the origination, documentation, and tracking of non-medication patient care orders. **Description**: Non-medication orders that request actions or items can be captured and tracked. Examples include orders to	**E**	1. The system **SHALL** provide the ability to capture non-medication patient care orders for an action or item. 2. The system **SHALL** provide the ability to capture adequate order detail for correct order fulfillment.

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			admit a patient, ambulate a patient, for medical supplies, durable medical equipment, home IV, and diet or therapy orders. Each item ordered includes the appropriate detail, such as order identification and instructions. Orders should be communicated to the correct service provider for completion		3. The system **SHALL** track the status of the ordered action or item 4. The system **SHOULD** provide the ability to capture patient instructions necessary for correct order fulfillment 5. The system **SHOULD** provide the ability to present patient instructions necessary for correct order fulfillment 6. The system **SHOULD** provide the ability to communicate the order to the correct recipient(s) for order fulfillment 7. The system **SHALL** conform to DC.2.4.2 (Support for non-medication ordering). *8. The system **SHALL** provide a means to order intravenous catheter placement and fluid therapy.* *9. The system **SHALL** provide a means to order dressings and wound care.* *10. The system **SHALL** provide a means to order a diet for the patient, including NPO status.* *11. The system **SHALL** provide a means to order an ECG and cardiopulmonary monitoring.* *13. The system **SHALL** provide a means to order ventilator therapy.* *14. The system **SHALL** provide a means to order specific patient education tasks.*
DC.1.7.2.2	**F**	**Manage Orders for Diagnostic Tests**	**Statement**: Enable the origination, documentation, and tracking of orders for diagnostic tests. **Description**: Orders for diagnostic tests (e.g. diagnostic radiology, blood test) are captured and tracked. Each order includes appropriate detail, such as order identification, instructions and clinical information necessary to perform the test. Orders and supporting detailed documentation shall be communicated to the service provider for completion of the diagnostic test(s). Some systems may contain instructions, but in some settings, instructions may be provided from external sources (e.g., handouts). *Provide a means for providers to order diagnostic tests including, but not limited to, laboratory, radiology, and special procedures.*	**E**	1. The system **SHALL** provide the ability to capture orders for diagnostic tests. 2. The system **SHALL** provide the ability to capture adequate order detail for correct diagnostic test fulfillment. 3. The system **SHALL** provide the ability to track the status of diagnostic test(s). 4. The system **SHOULD** provide the ability to capture and present patient instructions relevant to the diagnostic test ordered. 5. The system **SHALL** communicate orders to the service provider of the diagnostic test. 6. The system **SHOULD** communicate supporting detailed documentation to the correct service provider of the

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					diagnostic test. 7. The system **SHALL** conform to DC.2.4.2 (Support for non-medication ordering).
DC.1.7.2.3	**F**	**Manage Orders for Blood Products and Other Biologics**	**Statement**: Communicate with appropriate sources or registries to manage orders for blood products or other biologics. **Description**: Interact with a blood bank system or other source to support orders for blood products or other biologics. Use of such products in the provision of care is captured. Blood bank or other functionality that may come under jurisdictional law or other regulation (e.g. by the FDA in the United States) is not required; functional communication with such a system is required.	**O**	1. The system **SHALL** provide the ability to interface with systems of blood banks or other sources to manage orders for blood products or other biologics. 2. The system **SHALL** provide the ability to capture use of such products in the provision of care.
DC.1.7.2.4	**F**	**Manage Referrals**	**Statement**: Enable the origination, documentation and tracking of referrals between care providers or healthcare organizations, including clinical and administrative details of the referral, and consents and authorizations for disclosures as required. **Description**: Documentation and tracking of a referral from one care provider to another is supported, whether the referred to or referring providers are internal or external to the healthcare internal or external to the healthcare organization. Guidelines for whether a particular referral for a particular patient is appropriate in a clinical context and with regard to administrative factors such as insurance may be provided to the care provider at the time the referral is created.	**EF 10**	1. The system **SHALL** provide the ability to capture and communicate referral(s) to other care provider (s), whether internal or external to the organization. 2. The system **SHALL** provide the ability to capture clinical details as necessary for the referral. 3. The system **SHALL** provide the ability to capture administrative details (such as insurance information, consents and authorizations for disclosure) as necessary for the referral. 4. The system **SHALL** present captured referral information. 5. The system **MAY** provide the ability to capture completion of a referral appointment. 6. The system **SHOULD** provide diagnosis-based clinical guidelines for making a referral. 7. The system **MAY** provide order sets for referral preparation. 8. The system **SHALL** provide the ability to document transfer of care according to organizational policy, scope of practice, and jurisdictional law. *9. The system **SHOULD** maintain a list of providers for referrals.*
DC.1.7.3	**F**	**Manage Order Sets**	**Statement**: Provide order sets based on provider input or system prompt. **Description**: Order sets, which may include medication and	**E**	1. The system **SHALL** provide the ability to present order set(s). 2. The system **SHALL** provide the ability to order at the

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			non-medication orders, allow a care provider to choose common orders for a particular circumstance or disease state according to standards or other criteria. Recommended order sets may be presented based on patient data or other contexts.		patient level from presented order sets 3. The system **SHALL** provide the ability to record each component of an order set that is ordered. 4. The system **SHALL** conform to function DC.2.4.1 (Support for order sets) 5. The system **MAY** provide the ability for a provider to choose from among the order sets pertinent to a certain disease or other criteria. *6. The system **SHOULD** capture the order sets used by the provider during an encounter for analysis of order set use.*
DC.1.8	**H**	**Documentation of Care, Measurements and Results**		**E**	
DC.1.8.1	**F**	**Manage Medication Administration**	**Statement**: Present providers with the list of medications that are to be administered to a patient, necessary administration information, and capture administration details. **Description**: In a setting in which medication orders are to be administered by a provider rather than the patient, the necessary information is presented including: the list of medication orders that are to be administered; administration instructions, times or other conditions of administration; dose and route, etc. The system shall securely relate medications to be administered to the unique identity of the patient (see DC.1.1.1). Additionally, the provider can record what actually was or was not administered, whether or not these facts conform to the order. Appropriate time stamps for all medication related activity are generated. For some settings that administer complete sets of medications from a variety of providers' orders, it may be useful to provide an additional check for possible drug-drug or other interactions.	**E**	1. The system **SHALL** present the list of medications to be administered. 2. The system **SHALL** display the timing, route of administration, and dose of all medications on the list. 3. The system **SHOULD** display instructions for administration of all medications on the list. 4. The system **MAY** notify the provider when specific doses are due. 5. The system **SHOULD** conform to function DC.2.3.1.1 (Support for drug interaction checking) and check and report allergies, drug-drug interactions, and other potential adverse reactions, when new medications are about to be given. 6. The system **MAY** conform to function DC.2.3.1.2 (Support for patient specific dosing and warnings) and check and report other potential adverse reactions, when new medications are about to be given. 7. The system **SHALL** provide the ability to capture medication administration details – including timestamps, observations, complications, and reason if medication was not given – in accordance with organizational policy, scope of practice, and jurisdictional law. 8. The system **SHALL** securely relate interventions to be administered to the unique identity of the patient.

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					*9. The system **SHOULD** support the use of integrated point of care devices for patient and medication identification, such as barcode recognition verification of patients and medications.* *9. The system **SHALL** display medication orders that have not been fulfilled.*
DC.1.8.3	**F**	**Manage Results**	**Statement**: Present, annotate, and route current and historical test results to appropriate providers or patients for review. Provide the ability to filter and compare results. **Description**: Results of tests are presented in an easily accessible manner to the appropriate providers. Flow sheets, graphs, or other tools allow care providers to view or uncover trends in test data over time. In addition to making results viewable, it is often necessary to send results to appropriate providers using electronic messaging systems, pagers, or other mechanisms. Documentation of notification is accommodated. Results may also be routed to patients electronically or by letter.	**E**	1. The system **SHALL** provide the ability to present numerical and non-numerical current and historical test results to the appropriate provider 2. The system **SHALL** provide the ability to filter results for a unique patient. 3. The system **SHALL** provide the ability to filter results by factors that supports results management, such as type of test and date range. 4. The system **SHOULD** indicate normal and abnormal results depending on the data source. 5. The system **SHOULD** provide the ability to filter lab results by range, e.g. critical, abnormal or normal. 6. The system **SHOULD** display numerical results in flow sheets, graphical form, and allow comparison of results. 7. The system **SHALL** provide the ability to group tests done on the same day. 8. The system **SHOULD** notify relevant providers (ordering, copy to) that new results have been received. 9. The system **SHOULD** provide the ability for the user, to whom a result is presented, to acknowledge the result. 10. The system **MAY** provide the ability to route results to other appropriate care providers, such as nursing home, consulting physicians, etc. 12. The system **SHOULD** provide the ability for providers to pass on the responsibility to perform follow up actions to other providers. 13. The system **MAY** provide the ability for an authorized user to group results into clinically logical sections. 14. The system **MAY** trigger decision support algorithms from the results.

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					15. IF the system contains the electronic order, THEN the results **SHALL** be linked to a specific order. 16. The system **MAY** provide the ability for providers to annotate a result. 17. The system **MAY** display a link to an image associated with results. *18. The system **MAY** integrate with RIS or PACS system for viewing images obtained during ED visit.* *19. The system **SHALL** display reports of diagnostic studies ordered during the ED visit.* *20. The system **SHOULD** provide a means to view results of diagnostic studies ordered during prior ED visits.* *21. The system **MAY** provide a means to view prior diagnostic studies ordered within the same facility.* *22. The system **SHOULD** provide a means to view laboratory results in trend view.* *23. The system **SHALL** flag results that have been received but have not been reviewed.*
DC.1.8.4	**F**	**Manage Patient Clinical Measurements**	**Statement**: Capture and manage patient clinical measures, such as vital signs, as discrete patient data **Description**: Patient measures such as vital signs are captured and managed as discrete data to facilitate reporting and provision of care. Other clinical measures (such as expiratory flow rate, size of lesion, etc.) are captured and managed, and may be discrete data	**E**	1. The system **SHALL** capture patient vital signs including **blood pressure**, **temperature**, **heart rate**, **respiratory rate**, and **severity of pain** as discrete elements of structured or unstructured data. 2. The system **SHOULD** capture other clinical measures as discrete elements such as peak expiratory flow rate, size of lesions, oxygen saturation, height, weight, and body mass index and severity of pain as discrete elements of structured or unstructured data. 3. The **SHOULD** compute and display percentile values when data with normative distributions are entered. 4. The system **MAY** compute normal ranges for data based on age and other parameters such as height, weight, ethnic background, gestational age. *5. The system **SHALL** document both the time the vital sign was recorded as well as the time the vital sign was entered into the system.* *6. The system **SHOULD** display trends of vital signs.*

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					*7. The system **SHOULD** provide a means for automated capture and recording of vital signs via external devices.*
DC.1.8.5	**F**	**Manage Clinical Documents and Notes**	**Statement**: Create, addend, correct, authenticate and close, as needed, transcribed or directly-entered clinical documentation and notes. **Description**: Clinical documents and notes may be unstructured and created in a narrative form, which may be based on a template, graphical, audio, etc. The documents may also be structured documents that result in the capture of coded data. Each of these forms of clinical documentation is important and appropriate for different users and situations.	**E**	1. The system **SHALL** provide the ability to capture clinical documentation (henceforth "documentation") including original, update by amendment in order to correct, and addenda. 2. The system **SHALL** provide the ability to capture free text documentation. 3. The system **MAY** present documentation templates (structured or free text) to facilitate creating documentation. 4. The system **SHALL** provide the ability to view other documentation within the patient's logical record while creating documentation. 5. The system **SHOULD** provide the ability to associate documentation for a specific patient with a given event, such as an office visit, phone communication, e-mail consult, lab result, etc. 6. The system **SHOULD** provide the ability to associate documentation with problems and/or diagnoses. 7. The system **SHALL** provide the ability to update documentation prior to finalizing it. 8. The system **SHALL** provide the ability to finalize a document or note. 9. The system **SHALL** provide the ability to attribute record and display the identity of all users contributing to or finalizing a document or note, including the date and time of entry (see appropriate criteria in IN.2.2). 10. The system **SHALL** present captured documentation. 11. The system **MAY** provide the ability to filter, search or sort notes. 12. The system **SHOULD** provide documentation templates for data exchange. *13. The system **SHALL** permit clinical documentation prior to registration.*

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DC.1.8.5.1	***F***	***Acknowledge/Amend Other Provider Documentation***	***Statement:*** *Review other care giver notes and indicate or amend as permitted by legal or regulatory restrictions.* ***Description****: Scan/review notes, annotate for disparities, import when desired. Scan/review nurses notes, annotate for disparities, import when desired. Review nurses notes, assistants (Physician, Nursing) notes, ancillary care (Technicians, etc), other care givers (RT, PT, etc).* *This is a key function of documentation in an EDIS. Making this happen easily and smoothly is a matter of implementation.*	***E***	*1. The system **SHALL** provide a means to mark the documentation by another provider as read.* *2. The system **SHALL** provide a means to mark documentation by another provider as agreed or disagreed with.* *3. The system **SHALL** provide a means for a supervising attending ED physician to attest to his or her advising and direct care.*
DC.1.8.5.2	***F***	***Document Patient and Family Communication and Education***	***Statement:*** *Provide a mechanism for documentation of patient and family communications, counseling, and education.* ***Description:*** *The system should A Function allowing for entry/retrieval of a description of the counseling given to the Patient/Family regarding the condition (for which the patient was seen in the ED)* *The EHR **should** show not only the thinking about a patient's condition, but also what was communicated to patient/family, so that subsequent physicians to whom the patient is referred have a grasp of conversations that have already taken place.*	***E***	*1. The system **SHALL** provide a means to document patient education, counseling, and communication with the patient's family by the emergency physician.* *2. The system **SHALL** provide a means to document patient education provided to the patient or family.*
DC.1.8.5.3	***F***	***Manage Transfers of Care between ED Providers***	***Statement:*** *provide a means to document transfers of care between ED providers.* ***Description:*** *Patient care in the ED often spans the shifts of ED providers, necessitating support for the care transfer process. This support may include the need to document that care has been transferred to another ED provider,*	***E***	*1. The system **SHALL** provide a means to document the transfer of care between ED providers.* *2. Upon the transfer of care, the system **SHALL** record that the patient was cared for by multiple providers.* *3. The system **SHOULD** provide the ability to attribute a particular visit to a particular provider (i.e. attending physician) based upon pre-defined rules, when a patient was seen by multiple providers, but the visit must be tied to a single provider.*
DC.1.8.6	**F**	**Manage Documentation of Clinician Response to Decision Support Prompts**	**Statement**: Capture the decision support prompts and manage decisions to accept or override decision support prompts **Description**: Clinician actions in response to decision support prompts are captured and can be managed at the patient level or aggregated for organizational trending	**E**	1. The system **SHALL** provide the ability to capture clinical decision support prompts and user decisions to accept or override those prompts 2. The system **SHALL** provide the ability to record the reason for variation from the decision support prompt. 3. The system **SHOULD** provide the ability to display recorded variances upon request by authorized users of the EHR.
DC.1.8.7		***Manage Procedures***	***Statement:*** *Provide a means to document procedures performed by ED providers.* ***Description****: Procedures are an integral part of the care*	**E**	*1. The system **SHALL** provide a means to record procedures performed on the patient.* *2. The system **SHOULD** capture the procedure performed*

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			provided to ED patients. The system should support the clinical documentation of procedures performed by all providers. This documentation should also be available to support reimbursement without additional data entry by the provider.		*as coded data.* *3. The system **SHOULD** provide a means to record sufficient data to support billing.* *4. The system **SHOULD** capture indication for the procedure, applications, results and outcomes.* *5. The system **SHALL** conform to DC.1.3.3 Manage Consents and Authorizations to document procedure consents where required by local practice.*
DC.1.8.8	***F***	***Manage Medical Decision-Making***	***Statement:** Provide a means to capture and maintain the assessment and plan of the ED physician, including interpretations of laboratory, radiology, and other diagnostic tests, as well as the means to create and maintain a record of the medical decision making process.* ***Description:** The results of diagnostic tests may or may not be interpreted by both the ED physician (i.e. ECG, plain radiography) and other physicians (i.e. radiologists or cardiologists). Nevertheless, all ED provider interpretations must be recorded.* *Similarly, the development of a differential diagnosis and process used to exclude life-threatening diagnoses must be recorded. Support for documentation also includes medico-legal and billing aspects.*	***E***	*1. The system **SHALL** provide a means for physicians to document medical decision making including development of differential diagnosis and process used to exclude life-threatening diagnoses.* *2. The system **SHOULD** provide a mechanism to incorporate narrative interpretation of the physician's decision making process* *3. The system **SHALL** provide a means to record ECG interpretations by the emergency physician.* *4. The system **SHALL** provide a means to record laboratory test interpretations by the emergency physician.* *5. The system **SHALL** provide a means to record radiographic interpretations by the emergency physician.* *6. The system **SHALL** provide a means to record initial ("wet") and final radiograph interpretations by the radiology department.*
DC.1.9	**F**	**Generate and Record Patient-Specific Instructions**	**Statement**: Generate and record patient specific instructions related to pre- and post-procedural and post- discharge requirements. **Description**: When a patient is scheduled for a test, procedure, or discharge, specific instructions about diet, clothing, transportation assistance, convalescence, follow-up with physician, etc., may be generated and recorded, including the timing relative to the scheduled event.	**E**	1. The system **SHALL** provide the ability to generate instructions pertinent to the patient for standardized Procedures. 2. The system **SHALL** provide the ability to generate instructions pertinent to the patient based on clinical judgment. 3. The system **SHALL** provide the ability to include details on further care such as follow up, return visits and appropriate timing of further care. 4. The system **SHALL** provide the ability to record that instructions were given to the patient. 5. The system **SHALL** provide the ability to record the

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					actual instructions given to the patient or reference the document(s) containing those instructions.
DC.1.10	***F***	***Manage ED Disposition***	***Statement:*** *Manage the admission, discharge, or transfer process for each patient.* ***Description****: Provide a means to create a disposition for the patient.*	***E***	*1. The system **SHALL** capture the time of ED disposition.* *2. The system **SHALL** capture the time of ED departure**.*** *3. The system **SHALL** capture ED disposition.* *4. The system **SHALL** capture one or more ED Diagnoses.* *5. The system **SHOULD** capture ED diagnoses as coded data.*
DC.1.10.1	***F***	***Manage ED Discharge***	***Statement:*** *Manage the discharge process for patients discharged from the emergency department.* ***Description****: Provide means to create a complete and tailored discharge package for patients discharged from the ED. Includes instructions, prescriptions, and follow up information.*	***E***	*1. The system **SHALL** create a record of the materials provided to the patient at discharge.* *2. The system **SHALL** provide a means to manage discharge instructions.* *3. The system **MAY** provide the ability for individual providers to manage their discharge instructions.* *4. The system **SHALL** provide a means to edit discharge instructions for a particular patient.* *5. The system **SHOULD** provide a means to manage patient discharge instructions in multiple languages.* *6. The system **MAY** provide a list of appropriate discharge instructions based on age.* *7. The system **MAY** provide a list of appropriate discharge instructions based on sex.* *8. The system **MAY** provide a list of appropriate discharge instructions based on diagnosis.* *9. The system **MAY** provide a list of appropriate discharge instructions based on reading level.* *10. The system **SHALL** provide a means to document that instructions were given.* *11. The system **SHOULD** provide a means to capture via digitized signature that instructions were given.* *12. The system **SHALL** provide a means to manage work, school, or other custom forms.*

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					*13. The system **SHOULD** capture the Mode of Transport for patient's discharged from the ED.*
DC.1.10.1.1	***F***	***Manage Follow-up Care***	***Statement:** Provide scheduled vs. unscheduled follow up for patients discharged from the ED.*	***E***	*1. The system **SHALL** provide a means to provide scheduled or unscheduled but intended follow up for patients discharged from the ED.* *2. The system **SHALL** provide the ability to manage a list of follow up physicians, offices, or clinics.* *3. The system **SHALL** capture identity of the follow-up provider, the provider type, and intended date and time of follow-up if known.*
DC.1.10.1.2	***F***	***Manage prescriptions***	***Statement:** Provide a means to create prescriptions for patients discharged from the ED.*	***E***	*1. The system **SHALL** provide a means to create outpatient prescriptions with detail adequate for correct filling and administration.* *2. The system **MAY** provide a means to create and securely transmit electronic prescriptions in compliance with current regulations.* *3. The system **SHOULD** provide the ability to tailor formularies by institution, insurance or other local rules.* *4. The system **SHALL** provide a means to create outpatient prescriptions for durable items and equipment that require prescriptions.*
DC.1.10.1.3	***F***	***Manage ED to Hospital Admission***	***Statement:** Provide a means to manage patient admission from the ED to the inpatient facility. .* ***Description:** To facilitate the admission process for patients being admitted to the hospital from the emergency department, the system should permit the clinician to enter a bed request that includes all the information necessary to expedite the admission, including but not limited to admitting physician, specialty or service, type of bed, and special bed needs such as isolation, private room, 1:1 sitter.* *Communication with the hospital admitting personnel or system can take many forms. The EDIS itself may provide a list of patients and details in a view designed for hospital admitting. Alternatively, an electronic interface with a hospital bed board or scheduling system may be employed.*	***E***	*1. The system **SHALL** provide a means to notify admitting office personnel that an ED patient requires hospital admission.* *2. The system **SHOULD** display the time between disposition initiation and disposition achieved.* *3. The system **SHOULD** provide a means to specify sufficient detail to request a particular bed.* *4. The system **SHOULD** capture the times when the hospital bed is assigned and available.* *5. The system **SHOULD** capture when a patient is ready for transport to inpatient bed.* *6. The system **SHALL** capture the inpatient practitioner and inpatient practitioner type.*

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DC.1.10.1.4	***F***	***Manage Transfers***	***Statement:*** *Provide a means to manage patient transfers from ED to another facility.*	***E***	*1. The system **SHALL** provide a means to create legal transfer documentation.* *2. The system **SHALL** capture the name of the accepting physician.* *3. The system **SHALL** capture the name of the accepting facility.*
DC.1.11	***F***	***Manage Discharged Patients***	***Statement:*** *Provide a means to manage outstanding patient issues after the ED visit is completed.* ***Description****: After the completion of an encounter, a number of tasks may remain. There may be outstanding laboratory tests (i.e. blood cultures) radiology interpretations, or other tasks such as arrangement of home health aids (VNA), or calls to the patient's primary care provider during office hours to establish follow-up. There must be a way to track and document these tasks after the patient is discharged and even after clinical documentation has been finalized and signed.*	***E***	*1. The system **SHALL** provide a means to flag patients requiring follow-up after disposition from the ED.* *2. The system **SHALL** provide a mechanism for the laboratory follow-up for discharged patients.* *3. The system **SHALL** provide a mechanism for the management of radiological follow-up for discharged patients.* *4. The system **SHALL** provide a mechanism for the management of administrative follow up for discharged patients.* *5. The system **SHALL** provide a mechanism for the management of clinical follow-up for discharged patients.* *6. The system **SHOULD** provide a means to flag, document and reconcile discrepancies between ED physician interpretation, radiology wet reads, and final interpretations of radiographic studies.* *7. The system **SHOULD** provide a means to flag discrepancies between ED physician interpretation and cardiologist interpretations of ECGs, when cardiologist over read is instituted.* *8. The system **SHOULD** provide means to capture and flag errors or other issues for department analysis, administrative review, and systemic error reduction.* *9. The system **SHOULD** integrate with RIS or PACS system for ED, wet reads and final radiologist interpretations.*
DC.2	**H**	**Clinical Decision Support**		**E**	

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DC.2.1	**H**	**Manage Health Information to Provide Decision Support**		**E**	
DC.2.1.1	**F**	**Support for Standard Assessments**	**Statement**: Offer prompts to support the adherence to care plans, guidelines, and protocols at the point of information capture. **Description**: When a clinician fills out an assessment, data entered triggers the system to prompt the assessor to consider issues that would help assure a complete/accurate assessment. A simple demographic value or presenting problem (or combination) should provide a template for data gathering that represents best practice in this situation, (e.g. prompt for auscultation for murmur and check BP in both arms in a patient with chest pain).	**E**	1. The system **SHALL** provide the ability to access the standard assessment in the patient record. 2. The system **SHALL** provide the ability to access to health standards and practices appropriate to the EHR user's scope of practice. 3. The system **SHOULD** provide the ability to compare elements of assessments captured by the clinician and those available as best practices and/or evidence based resources. 4. The system **MAY** provide the ability to derive supplemental assessment data from evidence based standard assessments, practice standards, or other generally accepted, verifiable, and regularly updated standard clinical sources. 5. The system **SHOULD** provide prompts based on practice standards to recommend additional assessment functions. 6. The system **MAY** conform to function DC.1.4.3 (Manage Problem List) and provide the ability to update the problem list by activating new problems and de-activating old problems as identified by conduct of standard assessments. 7. The system **SHOULD** provide the ability to create standard assessments that correspond to the problem list. 8. The system **SHOULD** conform to function DC 2.1.2 (Support for Patient Context-driven Assessments).
DC.2.1.2	**F**	**Support for Patient Context-Driven Assessments**	**Statement:** Offer prompts based on patient-specific data at the point of information capture for assessment purposes. **Description:** When a clinician fills out an assessment, data entered is matched against data already in the system to identify potential linkages. For example, the system could scan the medication list and the knowledge base to see if any of the symptoms are side effects of medication already prescribed. Important diagnoses could be brought to the doctor's attention, for instance ectopic pregnancy in a woman of child bearing age who has abdominal pain.	**O**	1. The system **SHALL** provide the ability to access health assessment data in the patient record 2. The system **SHOULD** provide the ability to compare assessment data entered during the encounter and the accessed health evidence based standards and best practices. 3. The system **SHOULD** provide the ability to compare health data and patient context-driven assessments to practice standards in order to prompt additional testing, possible diagnoses, or adjunctive treatment.

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					4. The system **SHOULD** provide the ability to correlate assessment data and the data in the patient specific problem list.
DC.2.1.5	***F***	***Support Triage Categorization***	***Statement:*** *Provide support for triage categorization and the triage process.* ***Description:*** *The categorization of patients by triage priority is highly evidence-based. There are a number of triage classification systems available, and while most are not particularly complex, an EDIS should provide support to the assignment of these triage categories.*	***E***	*1. The system **SHALL** conform to function DC.1.2.3 Manage Triage and provide a means to create and maintain a triage acuity rating for a patient.* *2. The system **SHALL** permit the triage acuity rating to be derived from standardized ED triage scales.* *3. The system **MAY** permit the triage acuity rating to be customized according to locally derived rules.* *4. The system **SHOULD** display evidence-based triage algorithms during the triage process.* *5. The system **MAY** automatically assign a triage category in response to specific prompts for patient associated data or data already captured in the record (i.e. arrival by ambulance, age, vital signs, etc.).*
DC.2.1.6	***F***	***Support Waiting Room Management***	***Statement:*** *Provide support for prioritizing patients based upon acuity, waiting time, and practitioner load.* ***Description:*** *Triage is the most fundamental process in emergency department care. Not the collection of data on arriving patients, but the categorization and prioritization of patients who are unable to be seen immediately. Unless an ED has unlimited resources, some patients will invariable need to wait. An EDIS should support the management of these patients by displaying them and supporting decisions by the providers who are caring for them.*	***E***	*1. The system **SHALL** display a list of patients who are waiting to be seen.* *2. The system **SHOULD** provide a means to sort and display patients who are waiting to be seen by waiting time.* *3. The system **SHOULD** provide a means to sort and display patients who are waiting to be seen by triage acuity rating.* *4. The system **MAY** provide an alert when the number of patients waiting, or the patient waiting time exceeds selected thresholds.*
DC.2.2	**H**	**Care and Treatment Plans, Guidelines and Protocols**		**E**	
DC.2.2.1	**H**	**Support for Condition Based Care and Treatment Plans, Guidelines, Protocols**		**E**	
DC.2.2.1.1	**F**	**Support for Standard Care Plans, Guidelines, Protocols**	**Statement**: Support the use of appropriate standard care plans, guidelines and/or protocols for the management of specific conditions. **Description**: Before they can be accessed upon request (e.g., in DC 1.6.1), standard care plans, protocols, and guidelines must be created. These documents may reside within the system or be provided through links to external sources, and	**E**	1. The system **SHALL** conform to function DC.1.6.1 (Present guidelines and protocols for planning care) and provide the ability to access to standard care plans, protocols and guidelines when requested within the context of a clinical encounter. 2. The system **MAY** provide the ability to create and use site specific care plans, protocols, and guidelines.

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			can be modified and used on a site specific basis. To facilitate retrospective decision support, variances from standard care plans, guidelines, and protocols can be identified and reported.		3. The system **MAY** provide the ability to make site-specific modifications to standard care plans, protocols, and guidelines obtained from outside sources. 4. The system **SHOULD** identify, track and provide alerts, notifications and reports about variances from standard care plans, guidelines and protocols.
DC.2.2.1.2	**F**	**Support for Context-Sensitive Care Plans, Guidelines, Protocols**	**Statement**: Identify and present the appropriate care plans, guidelines and/or protocols for the management of patient specific conditions that are identified in a patient clinical encounter. **Description**: At the time of the clinical encounter (problem identification), recommendations for tests, treatments, medications, immunizations, referrals and evaluations are presented based on evaluation of patient specific data such as age, gender, developmental stage, their health profile, and any site-specific considerations. These may be modified on the basis of new clinical data at subsequent encounters.	**O**	1. The system **SHALL** provide the ability to access care and treatment plans that are sensitive to the context of patient data and assessments. 2. The system **MAY** provide the ability to capture care processes across the continuum of care. 3. The system **MAY** present care processes from across the continuum of care. 4. The system **MAY** provide the ability to document the choice of action in response to care plan suggestions. 5. The system **SHOULD** identify, track and provide alerts, notifications and reports about variances from standard care plans, guidelines and protocols. 6. The system **SHALL** conform to function DC2.2.1.1 (Support for Standard Care Plans, Guidelines, Protocols). 7. The system **SHALL** conform to function DC.2.1.1 (Support for Standard Assessments). 8. The system **SHALL** conform to function DC.2.1.2 (Support for Patient Context-Driven Assessments).
DC.2.2.3	**F**	**Support for Research Protocols Relative to Individual Patient Care**	**Statement:** Provide support for the management of patients enrolled in research Protocols. **Description:** The clinician is presented with appropriate protocols for patients participating in research studies, and is supported in the management and tracking of study participants.	**O**	1. The system **SHALL** provide the ability to present protocols for patients enrolled in research studies. 2. The system **SHALL** provide the ability to maintain research study protocols. 3. The system **SHOULD** conform to function S.3.3.1 (Interactions with other systems), to enable participation in research studies. 4. The system **SHOULD** provide the ability to identify and track patients participating in research studies. 5. The system **MAY** provide the ability to capture details of patient condition and response to treatment as required for patients enrolled in research studies.

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					6. If research protocols require standardized transmission of data to/from a registry or directory, THEN the system **SHALL** conform to function IN.3 (Registry and Directory Services).
DC.2.3	**H**	**Medication and Immunization Management**		**E**	
DC.2.3.1	**H**	**Support for Medication and Immunization Ordering**		**E**	
DC.2.3.1.1	**F**	**Support for Drug Interaction Checking**	**Statement**: Identify drug interaction warnings at the time of medication ordering. **Description**: The clinician is alerted to drug-drug, drug-allergy, and drug-food interactions at levels appropriate to the health care setting and with respect to the patient condition. These alerts may be customized to suit the user or group. If the patient's condition is one where, in order to view the necessary components of the health record, patient authorization or consent is required, then the system should show the medication but mask the condition for which the medication is prescribed until the required consent or authorization is available. In an emergent situation, where all health information is required to provide the most effective treatment, and it is not possible to obtain an authorization or consent, the system should provide an override function to allow access to the diagnosis or problem for which a medication was ordered. This may vary based on jurisdictional law.	**E**	1. The system **SHALL** check for and alert providers to interactions between prescribed drugs and medications on the current medication list. 2. The system **SHALL** relate medication allergies to medications to facilitate allergy checking decision support for medication orders. 3. The system **SHOULD** provide the ability to document that a provider was presented with and acknowledged a drug interaction warning. 4. The system **SHALL** provide the ability to prescribe a medication despite alerts for interactions and/or allergies being present. 5. The system **MAY** provide the ability to set the severity level at which warnings should be displayed. 6. The system **SHOULD** provide the ability to check for duplicate therapies. 7. The system **SHOULD** conform to DC.1.8.6 (Manage documentation of clinician response to decision support prompts) and provide the ability to document why a drug interaction warning was overridden. 8. The system **SHOULD** check for interactions between prescribed drugs and food detailing changes in a drug's effects potentially caused by food (including beverages) consumed during the same time period. 9. The system **SHOULD** check for drug-lab interactions, to indicate to the prescriber that certain lab test results may be impacted by a patient's drugs. 10. The system **SHOULD** provide the ability to check

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					medications against a list of drugs noted to be ineffective for the patient in the past 11. The system **SHOULD** identify contraindications between a drugs and patient conditions at the time of medication ordering.
DC.2.3.1.2	**F**	**Support for Patient Specific Dosing and Warnings**	**Statement**: Identify and present appropriate dose recommendations based on known patient- conditions and characteristics at the time of medication ordering **Description**: The clinician is alerted to drug-condition interactions and patient specific contraindications and warnings e.g. pregnancy, breast-feeding or occupational risks, hepatic or renal insufficiency. The preferences of the patient may also be presented e.g. reluctance to use an antibiotic. Additional patient parameters, such as age, gestation, Ht, Wt, BSA, shall also be incorporated	**E**	1. The system **SHALL** provide the ability to identify an appropriate drug dosage range, specific for each known patient condition and parameter at the time of medication ordering. 2. The system **SHALL** provide the ability to automatically alert the provider if contraindications to the ordered dosage range are identified. 3. The system **SHALL** provide the ability for the provider to override a drug dosage warning. 4. The system **SHOULD** provide the ability to document reasons for overriding a drug alert or warning at the time of ordering. 5. The system **MAY** transmit documented reasons for overriding a drug alert to the pharmacy to enable communication between the clinician and the pharmacist. 6. IF the maximum daily doses are known THEN the system **SHALL** apply the maximum dose per day in dosing decision support. 7. The system **SHOULD** compute drug doses, based on appropriate dosage ranges, using the patient's body weight. 8. The system **SHOULD** allow the user to specify an alternative "dosing weight" for the purposes of dose calculation. 9. The system's drug dosage functions **SHOULD** work using any component of a combination drug (e.g., acetaminophen-hydrocodone). 10. The system **SHOULD** allow the recording of the dosage used to calculate the dose for a given medication.
DC.2.3.1.3	**F**	**Support for Medication Recommendations**	**Statement**: The system should provide recommendations and options in medication and monitoring on the basis of diagnosis, cost, local formularies or therapeutic guidelines and protocols	**O**	1. The system **SHOULD** conform to function DC.2.3.1.2 (Support for Patient-Specific Dosing and Warnings) 2. The system **SHOULD** present recommendations for

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			Description: Offer alternative medications on the basis of practice standards (e.g. cost or adherence to guidelines), a generic brand, a different dosage, a different drug, or no drug (watchful waiting). Suggest lab order monitoring as indicated by the medication or the medical condition to be affected by the medication. Support expedited entry of series of medications that are part of a treatment regimen, (i.e. rapid sequence intubation, conscious sedation).		medication regimens based on findings related to the patient diagnosis. 3. The system **SHALL** present alternative treatments in medications on the basis of practice standards, cost, formularies, and or protocols. 4. The system **MAY** present suggested lab monitoring as appropriate to a particular medication.
DC.2.3.2	**F**	**Support for Medication and Immunization Administration**	**Statement**: Alert providers to potential administration errors (such as wrong patient, wrong drug, wrong dose, wrong route and wrong time) in support of safe and accurate medication administration and support medication administration workflow. **Description**: To reduce medication errors at the time of administration of a medication, the patient is positively identified; checks on the drug, the dose, the route and the time are facilitated. Documentation is a by-product of this checking; administration details and additional patient information, such as injection site, vital signs, and pain assessments, are captured. Access to drug monograph information may be provided to allow providers to check details about a drug and enhance patient education. Workflow for medication administration is supported through prompts and reminders regarding the "window" for timely administration of medications.	**E**	1. The system **SHALL** present information necessary to correctly identify the patient and accurately administer medications and immunizations such as patient name, medication name, strength, dose, route and frequency. 2. The system **SHALL** alert providers to potential administration errors such as wrong patient, wrong drug, wrong dose, wrong route and wrong time as it relates to medication and immunizations administration. 3. The system **SHOULD** alert providers to potential medication administration errors at the point of medication administration. 4. The system **SHALL** provide the ability to capture all pertinent details of the medication administration including medication name, strength, dose, route, time of administration, exceptions to administration, and administrator of the medication. 5. The system **SHALL** capture the administrator of the immunization and the immunization information identified in DC.1.8.2, Conformance Criteria #3. 6. The system **SHOULD** generate documentation of medication or immunization administration as a by-product of verification of patient, medication, dose, route and time 7. The system **SHOULD** prompt or remind providers regarding the date/time range for timely administration of medications. 8. The system **MAY** suggest alternative administration techniques based on age, developmental stage, weight, physiological status, mental status, educational level, and past physical history of the patient. 9. The system **MAY** conform to function DC.2.7.1 (Access healthcare guidance) and provide to the ability for a provider to access drug monograph information.

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DC.2.3.3	***F***	***Support Medication Reconciliation***	***Statement:*** *Medication Reconciliation refers in the US Realm to JCAHO Patient Safety Goal 8, which requires "Accurately and completely reconcile medications across the continuum of care." The ED has specific needs with respect to medication reconciliation.* ***Description:*** *Medication reconciliation is the process of identifying the most accurate list of all medications a patient is taking, including drug name, dosage, schedule and route of administration. This data is then used to ensure deliberate and safe continuation, discontinuation, substitution, or new administration of medications throughout the healthcare continuum.* *The needs regarding medication reconciliation/administration have been addressed by the principle organizations of Emergency Medicine (ACEP, ENA, AAEM) in communication with JCAHO, which has modified its approach to ED medication reconciliation to avoid to ED delays to timely ED care.*	***EF 08***	*1. The system **SHALL** support ED specific medication reconciliation according to local, national, and jurisdictional requirements (see DC 1.4.2, CC 12).* *2. The system **SHALL** display incomplete medication information captured during initial assessment.* *3. The system **SHALL** display all pre-existing medications, medications administered in the ED, as well as all new prescriptions in patient discharge instructions and chart abstracts used in transfers of care.* *4. The system **SHOULD** support real-time display or communications with hospital pharmacy personnel for mediation reconciliation.* *5. The system **MAY** support interoperability with the hospital pharmacy system to enable pharmacist medication reconciliation.* *6. The system **MAY** support notification of reconciliation discrepancies in the event a review by the pharmacy or non-ED personnel occurs after ED discharge.*
DC.2.4	**H**	**Orders, Referrals, Results and Care Management**		**E**	
DC.2.4.1	**F**	**Create Order Set Templates**	**Statement**: Capture, maintain and display order sets templates based on patient data or preferred standards or other criteria. **Description**: Order sets templates,, which may include medication orders, allow a care provider to choose common orders for a particular circumstance or disease state according to standards or other criteria. Recommended order sets may be presented based on patient data or other contexts.	**E**	1. The system **SHALL** provide the ability to create order sets templates. 2. The system **SHALL** provide the ability to maintain order sets templates, including version control. 3. The system **SHOULD** provide the ability to create order sets templates from provider input. 4. The system **MAY** provide the ability to create order sets templates for known conditions for a particular disease. 5. The system **SHALL** present the order sets templates to the provider. 6. The system **MAY** record the basis of the practice standards or criteria for the creation of the order sets templates.

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					7. The system **MAY** provide the ability to relate order sets templates to aid decision support for certain diseases. *8. The system **SHOULD** permit the inclusion of all order types relevant to a particular problem (i.e. laboratory, radiology, medications, nursing tasks, and materials management) in an order set.* *9. The system **SHOULD** allow for the customization and/or presentation of order sets by patient age, sex, or other patient factors.* *10. The system **SHOULD** allow for the customization of order sets by provider type.* *11. The system **MAY** allow for the customization of order sets by physician.* *12. The system **SHOULD** allow for the creation of standing order sets for use in triage or for specific conditions.*
DC.2.4.2	**F**	**Support for Non-Medication Ordering**	**Statement**: Display and request provider validation of information necessary for non-medication orders that make the order pertinent, relevant and resource conservative at the time of provider order entry **Description**: Possible order entry support includes, but is not limited to: notification of missing results required for the order, suggested corollary orders, notification of duplicate orders, institution specific order guidelines, guideline-based orders/order sets, order sets, order reference text, patient diagnosis specific recommendations pertaining to the order. Also, warnings for orders that may be inappropriate or contraindicated for specific patients (e.g. X-rays for pregnant women) are presented.	**E**	1. The system **SHALL** identify required order entry components for non-medication orders. 2. The system **SHALL** alert the provider, at the time of order entry, if a non-medication order is missing required information. 3. The system **SHOULD** alert providers via warnings of orders that may be inappropriate or contraindicated for specific patients at the time of provider order entry. *4. The system **SHOULD** automatically answer or pre-populate the answers to questions required for diagnostic test ordering from data within the medical record or captured during the encounter.* *5. The system **SHOULD** provide a flag of certain diagnostic studies that are being repeated within a proscribed period of time.*
DC.2.4.3	**F**	**Support for Result Interpretation**	**Statement**: Evaluate results and notify provider of results within the context of the patient's healthcare data. **Description**: Possible result interpretations include, but are not limited to: abnormal result evaluation/notification, trending of results (such as discrete lab values), evaluation of pertinent results at the time of provider order entry (such as evaluation of lab results at the time of ordering a radiology exam), evaluation of incoming results against active medication orders.	**O**	1. The system **SHALL** present alerts for a result that is outside of a normal value range. *2. The system **SHALL** display critical results that have not been acknowledged.* *3. The system **SHALL** provide a mechanism to flag results that have not returned before completion of the ED visit.*

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			In most EDIS implementations, the laboratory system generally handles critical alerts. However. It is recognized that in some implementations this may be an EDIS function. Other ways of notification of significantly abnormal results may be developed in the future, including paging, phone, and PDA.		4. The system **MAY** provide the ability to evaluate pertinent results at the time of provider order entry (such as evaluation of lab results at the time of ordering a radiology exam).
DC.2.4.4	**H**	**Support for Referrals**		**O**	
DC.2.4.4.1	**F**	**Support for Referral Process**	**Statement**: Evaluate referrals within the context of a patient's healthcare data. **Description**: When a healthcare referral is made, health information, including pertinent clinical and behavioral health results, demographic and insurance data elements (or lack thereof) are presented to the provider. Standardized or evidence based protocols for appropriate workup prior to referral may be presented.	**O**	1. The system **SHALL** provide the ability to include clinical and administrative data (e.g. insurance information) as part of the referral process. 2. The system **SHALL** provide the ability to include test and procedure results with a referral. 3. The system **MAY** provide the ability to include standardized or evidence based protocols with the referral. 4. The system **SHOULD** allow clinical, administrative data, and test and procedure results to be transmitted to the referral clinician.
DC.2.4.4.2	**F**	**Support for Referral Recommendations**	**Statement**: Evaluate patient data and recommend that a patient be referred based on the specific patient's healthcare data. **Description**: Entry of specific patient conditions may lead to recommendations for referral. For example, a patient with mild hypertension noted during a visit for an unrelated complaint could be recommended for follow up with a primary care physician. A patient who reports tobacco use could automatically be referred for cessation counseling	**O**	1. The system **SHALL** present recommendations for potential referrals based on diagnos(es). 2. The system **SHALL** present recommendations for potential referrals based on patient condition (e.g. for smoking cessation counseling if the patient is prescribed a medication to support cessation).
DC.2.4.5	**H**	**Support for Care Delivery**		**O**	
DC.2.4.5.1	**F**	**Support for Safe Blood Administration**	**Statement**: Provide checking in real-time for potential blood administration errors. **Description**: To reduce errors at the time of blood product administration, the patient is positively identified. Additionally, checks on blood product identification, amount to be delivered, route and time of administration are captured, and alerts are provided as appropriate.	**O**	1. The system **SHALL** present information necessary to correctly identify the patient and accurately administer blood products including patient name, blood product number, amount, route, and time of administration. 2. The system **SHALL** capture validation of the correct matching of the patient to the blood product. 3. The system **SHALL** capture the blood product number, amount, route and time of administration.

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					4. The system **SHALL** conform to function DC.1.8.4 (Manage Patient Clinical Measurements) and capture the blood pressure, temperature, pulse, respirations of the patient receiving the product.
DC.2.4.5.2	**F**	**Support for Accurate Specimen Collection**	**Statement**: Provide checking in real-time to ensure accurate specimen collection is supported. **Description**: To ensure the accuracy of specimen collection, the patient and specimen are positively identified. The provider is notified in real-time of potential collection errors such as wrong patient, wrong specimen type, wrong means of collection, wrong site, and wrong date and time.	**O**	1. The system **SHALL** provide the ability to present information necessary to correctly identify the patient and accurately identify the specimen to be collected including, but not limited to, patient name, specimen type, specimen source, means of collection, date and time. 2. The system **SHALL** report variation between the type of specimen order placed and actual specimen received. 3. The system **SHALL** capture the details of specimen collection.
DC.2.6	**H**	**Support for Population Health**		**E**	
DC.2.6.1	**F**	**Support for Epidemiological Investigations of Clinical Health Within a Population.**	**Statement**: Support internal and external epidemiological investigations of clinical health of aggregate patient data for use in identifying health risks from the environment and/or population in accordance with jurisdictional law **Description**: Standardized surveillance performance measures that are based on known patterns of disease presentation can be identified by aggregating data from multiple input mechanisms. For example, elements include, but are not limited to patient demographics, resource utilization, presenting symptoms, acute treatment regimens, laboratory and imaging study orders and results and genomic and proteomic data elements. Identification of known patterns of existing diseases involves aggregation and analysis of these data elements by existing relationships. However, the identification of new patterns of disease requires more sophisticated pattern recognition analysis. Early recognition of new patterns requires data points available early in the disease presentation. Demographics, ordering patterns and resource use (e.g., ventilator or intensive care utilization pattern changes) are often available earlier in the presentation of non-predictable diseases. Consumer-generated information is also valuable with respect to surveillance efforts.	**E**	1. The system **SHALL** provide the ability to aggregate patient information based on user-identified criteria. 2. The system **SHALL** apply local privacy and confidentially rules when assembling aggregate data to prevent identification of individuals by unauthorized parties. 3. The system **SHOULD** provide the ability to use any demographic or clinical information as criteria for aggregation 4. The system **SHOULD** present aggregate data in the form of reports for external use 5. The system **SHOULD** provide the ability to save report definitions for later use. 6. The system **MAY** present aggregate data in an electronic format for use by other analytical programs. 7. The system **MAY** provide the ability to derive statistical information from aggregate data.
DC.2.7	**H**	**Support for Knowledge Access**		**E**	

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DC.2.7.1	**F**	**Access Healthcare Guidance**	**Statement**: Provide pertinent information from available evidence-based knowledge, at the point of care, for use in healthcare decisions and care planning. **Description**: The information available regarding disease, disease processes, diagnostic testing, pharmaceuticals, treatment patterns and all aspects of healthcare is constantly changing. The practitioner should be able to access a wide variety of sources that provide relevant, accurate information about any given subject. Examples of resources include, but are not limited to: evidence on treatment of specific medical conditions, maintenance specific medical conditions, maintenance of wellness, drug or device trials, context specific information available through online journals, printed resources such as books and specialty organizations resources. For example, when a condition is diagnosed the provider might be directed to relevant resources that give updated clinical research, useful pharmaceutical combinations, surgical techniques, products or other information useful in the management of the specific condition under consideration.	**E**	1. The system **SHALL** provide the ability to access evidence based healthcare recommendations, with documentation of sources. 2. The system **SHOULD** provide the ability to access evidenced-based documentation appropriate for the care provider to render a timely judgment. 3. The system **MAY** provide the ability to access external evidence-based documentation. 4. *The system **SHOULD** support interoperability with knowledge bases or guidelines deployed in an enterprise.*
DC.3	**H**	**Operations Management and Communication**		**E**	
DC.3.1	**H**	**Clinical Workflow Tasking**	**Statement**: Schedule and manage tasks with appropriate timeliness. **Description**: Since the electronic health record will replace the paper chart, tasks that were based on the paper artifact must be effectively managed in the electronic environment. Functions must exist in the EHR-S that support electronically any workflow that previously depended on the existence of a physical artifact (such as the paper chart, a phone message slip) in a paper based system. Tasks differ from other more generic communication among participants in the care process because they are a call to action and target completion of a specific workflow in the context of a patient's health record (including a specific component of the record). Tasks also require disposition (final resolution). The initiator may optionally require a response. For example, in a paper based system, physically placing charts in piles for review creates a physical queue of tasks related to those charts. This queue of tasks (for example, a set of patient phone calls to be returned) must be supported electronically so that the list (of patients to be called) is visible to the appropriate user or role for disposition. Tasks are time-limited (or finite). The state transition (e.g. created, performed and resolved) may be managed by the user explicitly or automatically based on rules. For example, if a user has a task to signoff on a test result, that task should	**E**	*1. The system **SHALL** maintain a list of tasks.* *2. The system **SHALL** permit the creation of new tasks.* *3. The system **SHOULD** permit the prioritization of tasks according to the nature of the task itself.*

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			automatically be marked complete by the EHR when the test result linked to the task is signed in the system. Patients will become more involved in the care process by receiving tasks related to their care. Examples of patient related tasks include acknowledgement of receipt of a test result forwarded from the provider, or a request to schedule an appointment for a pap smear (based on age and frequency criteria) generated automatically by the EHRS on behalf of the provider.		
DC.3.1.1	**F**	**Clinical Task Assignment and Routing**	**Statement**: Assignment, delegation and/or transmission of tasks to the appropriate parties **Description**: Tasks are at all times assigned to at least one user or role for disposition. Whether the task is assignable and to whom the task can be assigned will be determined by the specific needs of care setting. Task-assignment lists help users prioritize and complete assigned tasks. For example, after receiving orders on multiple patients, the RN should be provided with a list of tasks that have been assigned to him or her. These tasks, (i.e. blood draw) can then be routed to other providers in the ED (i.e. technologist). To facilitate workflow, display of tasks by provider is helpful, so that tasks may be routed to providers who are free and available. Task creation and assignment may be automated, where appropriate. An example of a system-triggered task is when lab results are received electronically; a task to review the result is automatically generated and assigned to the licensed practitioner. Proper task assignment ensures that all tasks are disposed of by the appropriate person or role and allows efficient interaction of entities in the care process.	**E**	1. The system **SHALL** provide the ability for users to create manual clinical tasks. 2. The system **SHALL** provide the ability to automate clinical task creation. 3. The system **SHALL** provide the ability to manually modify and update task status (e.g. created, performed, canceled, pended, denied, and resolved). 4. The system **MAY** provide the ability to automatically modify or update the status of tasks based on workflow rules. 5. The system **SHOULD** provide the ability to assign, and change the assignment of, tasks to individuals or to clinical roles. 6. The system **MAY** provide the ability to manage workflow task routing to multiple individuals or roles in succession and/or in parallel. 7. The system **SHOULD** provide the ability to prioritize tasks based on urgency assigned to the task. 8. The system **MAY** provide the ability to restrict task assignment based on appropriate role as defined by the entity. 9. The system **MAY** provide the ability to escalate clinical tasks as appropriate to ensure timely completion. *10. The system **SHALL** permit the delegation of tasks to one or multiple providers.* *11. The system **SHOULD** permit the provider to re-prioritize tasks according to the patient severity, length of stay, task duration, or other criteria.*

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DC.3.1.2	**F**	**Clinical Task Linking**	**Statement**: Linkage of tasks to patients and/or a relevant part of the electronic health record. **Description**: Clinical tasks must include information or provide an electronic link to information that is required to complete the task. For example, upon ordering an ECG, two separate tasks are automatically created 1) to obtain and ECG on a particular patient, and 2) for the physician to record an interpretation.	**E**	1. The system **SHALL** provide the ability to link a clinical task to the component of the EHR required to complete the Task. *2. The system **SHALL** link each clinical task to a patient, an object in the department (i.e. bed to be cleaned), or a place on the patient's ED chart.*
DC.3.1.3	**F**	**Clinical Task Tracking**	**Statement**: Track tasks to facilitate monitoring for timely and appropriate completion of each task. **Description**: In order to reduce the risk of errors during the care process due to missed tasks, the provider is able to view and track un-disposed tasks, current work lists, the status of each task, unassigned tasks or other tasks where a risk of omission exists. The timeliness of certain tasks can be tracked, and backlogs identified. For example, a the provider responsible for obtaining ECGs is presented with a list of patients requiring an ECG. Ideally this list should be available to all providers working in the ED so that other provider are able to assist when backlogs occur.	**E**	1. The system **SHALL** provide the ability to track the status of tasks. 2. The system **SHALL** provide the ability to notify providers of the status of tasks. 3. The system **SHOULD** provide the ability to sort clinical tasks by status. 4. The system **SHOULD** provide the ability to present current clinical tasks as work lists. 5. The system **SHOULD** provide the ability to define the presentation of clinical task lists. 6. *The system **SHALL** track creation, acknowledgment, and completion of tasks.* *7. The system **SHOULD** display, by provider or role, an up to date list of tasks to be done.* *8. The system **SHALL** display, by patient, an up to date list of tasks to be done.* *9. The system **MAY** notify the tasking or requesting provider when clinical tasks are complete.* *10. The system **SHOULD** support time limits on particular tasks and display tasks which are overdue.* *11. The system **SHALL** flag tasks that have not been completed at the time of disposition.* *12. The system **SHOULD** flag tasks that are not yet complete, but that are not expected to be complete prior to the end of the ED visit, as requiring follow up.*
DC.3.2	**H**	**Support Clinical Communication**	**Statement**: Manage and Support Communication between Providers. **Description**: ED care requires secure communications among	**E**	

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			various providers: doctors, nurses, pharmacy and laboratory personnel, consultants, etc. An effective EDIS should support communication by all participants (outside of the scope of order or task fulfillment) to provide automatic tracking and reporting of this communication. The list of communication participants is determined by the care setting and may change over time. Because of concerns about scalability of the specification over time, communication participants are not enumerated here because it would limit the possibilities available to each care setting and implementation. However, communication between providers and between patients and providers will be supported in all appropriate care settings and across care settings. Implementation of an EDIS enables new and more effective channels of communication, significantly improving efficiency and patient care. The communication functions of the EDIS will eventually change the way participants collaborate and distribute the work of patient care.		
DC.3.2.1	**F**	**Support for Inter-Provider Communication**	**Statement**: Support exchange of information between providers as part of the patient care process, and the appropriate documentation of such exchanges. Support secure communication to protect the privacy of information as required by federal or jurisdictional law. **Description**: Communication among providers involved in the care process can range from real time communication (for example, fulfillment of an injection while the patient is in the exam room), to asynchronous communication (for example, consult reports between physicians). The system should provide for both verbal and written communication. These exchanges would include but not limited to discussions with primary care physicians, other care providers, or the communication from one ED provider to another that a task has been completed.	**E**	1. The system **SHALL** provide the ability to document in the patient record verbal/telephone communication between providers. 2. The system **SHALL** provide the ability to incorporate scanned documents from external providers into the patient record. 3. The system **MAY** provide the ability to communicate using real-time messaging. 4. The system **MAY** provide the ability to communicate clinical information (e.g. referrals) via email or other electronic means. 5. The system **MAY** provide the ability to transmit electronic multi-media data types representing pictures, sound clips, or video as part of the patient record.
DC.3.2.1.1	***F***	***Manage Consultation Requests and Responses***	***Statement:*** *Provide a means to capture and maintain requests for consultation and responses.* ***Description:*** *The EDIS should have an easy means to document and note calls made to consultants, as well as their responses. This includes the time of the initial and any subsequent pages or calls, the time and method whereby the consultant responded, as well as the final disposition of the consultation.*	***E***	*1. The system **SHALL** provide a means to record consultations by providers other than the emergency physician.* *2. The system **SHALL** provide a means to document time paged, time responded, and time arrived, as well as final disposition and recommendation.* *3. The system **SHOULD** capture the details of consultation request and responses as discrete data, including timestamps, sufficient for reporting.*

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					*4. The system **MAY** provide a means to page and initiate calls from within the application.* *5. The system **SHOULD** display consultations which are pending.* *6. The system **MAY** notify the consulting provider of the completion of consultations.* *7. The system **MAY** display estimated time of arrival of consultants.*
DC.3.2.2	**F**	**Support for Provider - Pharmacy Communication**	**Statement**: Provide features to enable secure bidirectional communication of information electronically between practitioners and pharmacies or between practitioner and intended recipient of pharmacy orders. **Description**: When a medication is prescribed, the order is routed to the pharmacy or other intended recipient of pharmacy orders. This information is used to avoid transcription errors and facilitate detection of potential adverse reactions. If there is a question from the pharmacy, that communication can be presented to the provider with their other tasks. The transmission of prescription data between systems should conform to realm acceptable messaging standards. As an example, specific standards in the United States include the most recent versions of criteria from Health Level 7 (HL7), X12N, and/or the National Council for Prescription Drug Programs (NCPDP); and those of the National Electronic Claims Standard (NeCST) in Canada. It is anticipated that other realms may list other acceptable messaging standards.	**EF 10**	1. The system **SHALL** electronically communicate orders between the prescriber, provider and pharmacy, as necessary, to initiate, change, or renew a medication order. 2. The system **SHALL** receive any acknowledgements, prior authorizations, renewals, inquiries and fill notifications provided by the pharmacy or other participants in the electronic prescription and make it available for entry in the patient record.
DC.3.2.4	**F**	**Patient, Family and Care Giver Education**	**Statement**: Facilitate access to educational or support resources pertinent to and usable by the patient or patient representative. **Description**: The provider or patient is presented with a library of educational materials. Material may be made available in the language or dialect understood by the patient or representative. Material should be at the level of the patient or representative's level of understanding and sensory capability. Special needs are documented. Material may be disseminated via a mode available to and acceptable by the patient e.g., printed, electronically or otherwise. The review of material between a provider and the patient, and the patient's understanding of the review, is documented.	**E**	1. The system **SHALL** provide the ability to access to a library of educational material for health concerns, conditions, and/or diagnosis. 2. The system **SHALL** provide the ability to communicate applicable educational materials to the patients and/or patient representative. 3. The system **SHOULD** provide the ability to deliver multilingual educational material. 4. The system **MAY** provide the ability to deliver patient educational materials using alternative modes to accommodate patient sensory capabilities. 5. The system **SHOULD** provide the ability to use rules-based support to identify the most pertinent educational material, based on the patient health status, condition

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					and/or diagnosis. 7. The system **SHOULD** provide the ability to document who received the educational material provided, the patient, or the patient representative. 8. The system **SHALL** provide the ability to document that the educational material was reviewed with the patient and/or patient representative and their comprehension of the material. 10. The system **MAY** provide the ability to identify age appropriate and/or reading-ability appropriate educational materials for the patient and/or patient representative. 11. The system **SHALL** conform to function IN.1.4 (Patient Access Management). 12. IF the system is used to enter, modify, or exchange data, THEN the system **SHALL** conform to IN.1.5 (Non-repudiation) to guarantee that the sources and receivers of data cannot deny that they entered/sent/received the data.
DC.3.2.5	**F**	**Communication with Medical Devices**	**Statement**: Support communication and presentation of data captured from medical devices. **Description**: Communication with medical devices is supported. Examples include: vital signs, pulse-oximetry, telemetry, ventilators, point of care testing devices, and bar code facilitated artifacts (patient IDs, medications, demographics, billing codes, history, and identification, etc).	**O**	1. The system **SHALL** provide the ability to collect accurate electronic data from medical devices according to realm specific applicable regulations and/or requirements. 2. The system **SHOULD** provide the ability to present information collected from medical devices as part of the medical record. *3. The system **SHOULD** present data captured from medical devices for verification by a provider.* *4. The system **SHOULD** display data from medical devices as coming from the device and verified by the verifying provider.*

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Supportive					
S.1	**H**	**Clinical Support**		**E**	
S.1.1	**F**	**Registry Notification**	**Statement:** Enable the automated transfer of formatted demographic and clinical information to and from local disease specific registries (and other notifiable registries) for patient monitoring and subsequent epidemiological analysis. **Description:** The user can export personal health information to disease specific registries, other notifiable registries such as immunization registries, through standard data transfer protocols or messages. The user can update and configure communication for new registries.	**EF 10**	1. The system **SHALL** automatically transfer formatted demographic and clinical information to local disease specific registries (and other notifiable registries). 2. The system **MAY** provide the ability to automate the retrieval of formatted demographic and clinical information from local disease specific registries (and other notifiable registries). 3. The system **SHOULD** provide the ability to add, change, or remove access to registries.
S.1.3	**H**	**Provider Information**	**Statement:** Maintain, or provide access to, current provider information. **Description:** *An EDIS must provide the ability to manage multiple registries of personnel, including ED staff, other users of the system, and providers both internal and external to the ED and healthcare organization for the purposes facilitating communication, referral, and follow up on patients. Examples include on-call lists, primary care or specialty referral lists, as well as other healthcare facilities that may send or receive patients from the host ED.*	**E**	
S.1.3.1	**F**	**Provider Access Levels**	**Statement**: Provide a current registry or directory of practitioners that contains data needed to determine levels of access required by the system. **Description:** Provider information may include any credentials, certifications, or any other information that may be used to verify that a practitioner is permitted to use or access authorized data.	**E**	1. The system **SHALL** provide a registry or directory of all personnel who currently use or access the system. 2. For licensed practitioners the directory **SHOULD** contain realm-specific legal identifiers required for care delivery such as the practitioners' license number. 3. The system **SHOULD** provide the ability to add, update, and inactivate entries in the directory so that it is current. 4. The directory **SHOULD** contain the information necessary to determine levels of access required by the system security functionality. 5. The system **SHALL** provide a directory of clinical personnel that are not users of the system to facilitate documentation, communication, and information exchange. *6. The system **SHALL** provide a means for designated providers to create new users at the point of care, and assign appropriate access permissions, in cases of emergency.*

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S.1.3.2	**F**	**Provider's Location Within Facility**	**Statement**: Provide provider location or contact information on a facility's premises. **Description**: The identification of provider's location within a facility may facilitate the handling of critical care situations. This may include the location of on site practitioners by name or immediate required specialty. A real-time tracking system may provide automatic update of such information.	**O**	1. The system **SHALL** provide the ability to input or create information on provider location or contact information on a facility's premises. 2. The system **SHOULD** provide the ability to add, update, or inactivate information on provider's location or contact information on a facility's premises, so that it is current.
S.1.3.3	**F**	**Provider's On-Call Location**	**Statement**: Provide provider location or contact information when on call. **Description**: The provider immediate contact information. This may include on call practitioners on a facility's premises as well as on call contact information after scheduled working hours.	**O**	1. The system **SHALL** provide the ability to input or create information on provider location or contact information when on call. 2. The system **SHOULD** provide the ability to add, update, or obsolete information on a provider's on call location or contact information, so that it is current.
S.1.3.4	**F**	**Provider's Location(s) or Office(s)**	**Statement**: Provide locations or contact information for the provider in order to direct patients or queries. **Description**: Providers may have multiple locations or offices where they practice. The system should maintain information on the primary location, any secondary locations, as well as the scheduled hours at each location. Information maintained may include web sites, maps, office locations, etc.	**E**	1. The system **SHALL** contain information necessary to identify primary and secondary practice locations or office of providers to support communication and access. 2. The system **SHOULD** provide the ability to add, update and obsolete information on the provider's primary and secondary practice locations or offices.
S.1.4	**H**	**Patient Directory**	**Statement**: Provide a current directory of patient information in accordance with relevant privacy and other applicable laws, regulations, and conventions. **Description**: The patient directory may capture information including but not limited to, full name, address or physical location, alternate contact person, primary phone number, and relevant health status information. The view of this information may vary based on purpose. Several specific directory views are described in the following functions.	**E**	
S.1.4.1	**F**	**Patient Demographics**	**Statement**: Support interactions with other systems, applications, and modules to enable the maintenance of updated demographic information in accordance with realm-specific recordkeeping requirements. **Description**: The minimum demographic data set must include the data required by realm-specific laws governing health care transactions and reporting. For example, this may include data input of death status information, or may include support to identify multiple names, such as updating from Baby Girl Doe, to neonate's given name.	**E**	1. The system **SHALL** add and update patient demographic information through interaction with other systems, applications and modules. 2. The system **MAY** accept and retrieve patient demographic information as required by realm specific laws governing health care transactions and reporting.

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S.1.4.2	**F**	**Patient's Location Within a Facility**	**Statement:** Provide the patient's location information within a facility's premises. **Description:** This function is intended to support maintaining and/or providing access to information on the patient's location during an episode of care. This function can be a as simple as displaying the assigned bed for a patient (i.e. "Room 3" or "Hallway 4"). It can also be a function that supports real-time information on the patient location as they receive ancillary services in other parts of a facility (i.e. "Radiology"). Patients who have not consented to share information still need to be tracked and treated, and provisions should be available to manage these patients within the system.	**E**	1. IF the patient has an assigned location, THEN system **SHALL** provide the ability to identify and display/view the patient's assigned location. 2. The system **SHOULD** support consents as they apply to the release of patient location information according to scope of practice, organization policy, or jurisdictional laws. *3. The system **SHOULD** display the patients who have not consented to release of information in a de-identified manner without any supporting information.* 4. The system **SHALL** provide the ability to identify the patient's current, real-time location, unambiguously, within a facility.
S.1.4.2.1	***F***	***Patient's Location Within the Emergency Department***	***Statement:** Manually or automatically (i.e. passively) track patient physical location throughout the ED visit.* ***Description:** It is imperative to identify the current location of patient and to record the history of the patient's movement through the ED visit. Milestones or benchmarks of ED throughput (i.e. triage time, registration time, in-room time, disposition time, and departure time) should be automatically captured based on business logic behind location and room types whenever possible, and not require additional input from the user. Patient physical location and progress through the encounter are not necessarily related. For instance, a patient may be placed in a hallway chair instead of a room, however this placement would be recorded as the time the patient entered the treatment area (aka "In Room Time").*	***E***	*1. The system **SHALL** provide a means to identify the current physical location of a patient in the ED.* *2. The system **SHALL** provide a means to update the current location of a patient.* *3. The system **SHALL** record the movement of patients through the ED.* *4. The system **SHALL** capture the time when the patient first enters the treatment area.* *5. The system **SHOULD** provide a means to display the prior locations of a patient while still in the ED.* *6. The system **SHOULD** provide means to hold patients in EDIS for unique reasons, including out of department, other departments, etc.* *7. The system **SHALL** allow multiple patients to be in a single room.* *8. The system **SHALL** allow for the management of hallway patients.* *9. The system **SHOULD** provide a means to indicate patients requiring special bed assignments within the ED.*

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S.1.4.2.2	**F**	***Department Modeling and Room Management***	***Statement:*** *Provide means to describe the ED physically and organizationally including, but not limited to multiple departments (adult, pediatric), multiple treatment areas (acute, non-acute, fast track), treatment room names, holding areas, and areas outside the ED (radiology, special procedures, dialysis unit) and to and manage locations, descriptions, and rules.* ***Description:*** *In order to manage the process of describing the patient's physical location in the ED, and to track and report patient flow, it is necessary to manage the description and business logic behind ED layout, configuration, and description. Unique views of the department, waiting room, and other areas for which status is of importance is required to facilitate relevant communication and to administratively report and manage patient flow and maximize ED throughput.* *Larger EDs may have multiple departments, locations, areas and waiting rooms. The system must be able to accurately represent each department in which it is deployed.* *ED Flow is dependent on readying new rooms, changing linen, and making the room availability known. Providers should have a means to flag rooms as reserved, clean, dirty, or unavailable for other reasons.* *In cases of mass casualty or significant surge, he system should allow for the management of patients in hallways, as well as the creation, dissolution of beds or other areas in hallways and other "temporary" locations.*	**E**	*1. The system **SHALL** allow for Department, Area, and Room Management.* *2. The system **SHOULD** allow for the management of holding areas.* *3. The system **SHOULD** provide for the management of rooms containing multiple patients.* *4. The system **SHOULD** display room availability.* *5. The system **SHALL** provide for the management of patient placement.* *6. The system **SHOULD** provide a means to flag room status as reserved, in need of cleaning, biohazard, or other status.* *7. The system **SHOULD** provide a means to allow or prohibit multiple patients in single room.* *8. The system **MAY** provide a means to create holding areas as needed to accommodate surge.*
S.1.4.4	**F**	**Patient Bed Assignment**	**Statement**: Support interactions with other systems, applications, and modules to ensure that the patient's bed assignments within the facility optimize care and minimize risks e.g. of exposure to contagious patients. **Description**: Access to a list of available beds is important to safely manage the care of patients whose bed requirements may change based on change in condition or risk factors. For example, a patient may need a room with special equipment or to be close to the nursing station or to be in a private room.	**EF 10**	1. The system **SHALL** support interactions as required to support patient bed assignment internal or external to the system. 2. The system **SHOULD** provide patient information to an external system to facilitate bed assignment that optimizes care and minimizes risk.
S.1.6	**F**	**Scheduling**	**Statement:** Support interactions with other systems, applications, and modules to provide the necessary data to a scheduling system for optimal efficiency in the scheduling of patient care, for either the patient or a resource/device. **Description:** The system may support user access to scheduling systems as required. Relevant clinical or demographic information required in the scheduling process	**EF 11**	1. The system **SHALL** provide the ability to access scheduling features, either internal or external to the system, for patient care resources. 2. The system **MAY** provide the ability to access external scheduling systems for the establishment of patient follow-up. 3. The system **MAY** incorporate relevant clinical or

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Supportive					
			could be linked to the task.		demographic information in the scheduling process. 4. The system **MAY** pass relevant clinical or demographic information to support efficient scheduling with other system.
S.1.7	**F**	**Healthcare Resource Availability**	**Statement:** Support the collection and distribution of local healthcare resource information, through interactions with other systems, applications, and modules, to enable planning and response to extraordinary events such as local or national emergencies. **Description:** In times of identified local or national emergencies and upon request from authorized bodies, provide current status of healthcare resources including, but not limited to, available beds, providers, support personnel, ancillary care areas and devices, operating theaters, medical supplies, vaccines, and pharmaceuticals. The intent is to enable the authorized body to distribute or re-distribute either resources or patient load to maximize efficient healthcare delivery. In addition, these functions may also be used for internal assessment and planning purposes by facility administrators.	**EF 10**	*1. The system **SHALL** aggregate and format information on ED resource availability and publish this information in a format suitable for use by other systems and agencies.* 2. The system **SHOULD** collect information on healthcare resource availability through interactions with other systems, applications, and modules. *3. The system **SHOULD** display data on inbound EMS patients if provided by the local or regional EMS system.* 4. The system **SHOULD** provide the ability to access information on healthcare resource availability for internal assessment and planning purposes. Healthcare resources may include, but is not limited to available beds, providers, support personnel, ancillary care areas and devices, operating theaters, medical supplies, vaccines, and pharmaceuticals.
S.1.8	**F**	**Information View**	**Statement:** Support user-defined information views. **Description:** Views of the information can be tailored for or by the user (or department or "job classification") for their presentation preferences, within local or facility established rules. For example, a nursing supervisor may elect or prefer to see summary data on all patients as the default view. However, it is unproven whether customized views are advantageous to overall ED operations. For example, a view of the ED that does not include the waiting room may not alert providers that a backlog exists.	**O**	1. The system **SHALL** provide authorized administrators the ability to tailor the presentation of information for preferences of the user, department/area or user type. 2. The system **MAY** provide authorized users the capability to tailor their presentation of information for their preferences Tailored views by administrators or users.
S.2	**H**	**Measurement, Analysis, Research and Reports**		**E**	
S.2.1	**H**	**Measurement, Monitoring and Analysis**	**Statement:** Support measurement and monitoring of care for relevant purposes. **Description:**	**E**	
S.2.1.1	**F**	**Outcome Measures and Analysis**	**Statement:** Support the capture and subsequently export or retrieval of data necessary for the reporting on patient outcome of care by population, facility, provider or community. **Description:** Many regions require regular reporting on the healthcare provided to individuals and populations. The system needs to provide the report generating capability to easily create these reports or provide for the export of data to	**E**	1. The system **SHALL** provide the ability to export or retrieve data required to evaluate patient outcomes. 2. The system **SHALL** provide the ability to define prompts in the clinical care setting that would request information needed to comply with regional requirements when specific triggers are met.

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Supportive					
			external report generating software. The system should also provide the functionality to prompt for the collection of necessary information at the appropriate time in a patient encounter if such collection need can be properly defined in a supportive workflow. For instance, the collection of data such as pain scores as required by regulatory agencies.		3. The system **SHOULD** provide data detailed by physician, facility, facility subsection, or other selection criteria. 4. The system **SHOULD** provide the ability to define outcome measures for specific patient diagnosis. 5. The system **MAY** provide the ability to define outcome measures to meet various regional requirements. 6. The system **MAY** provide for the acceptance and retrieval of unique outcome data defined to meet regional requirements. 7. The system **SHOULD** provide the ability to define report formats for the export of data. This formatted data could be viewed, transmitted electronically or printed. 8. The system **MAY** export data or provide a limited query access to data through a secure data service.
S.2.1.2	**F**	**Performance and Accountability Measures**	**Statement:** Support the capture and subsequent export or retrieval of data necessary to provide quality, performance, and accountability measurements which providers, facilities, delivery systems, and communities are held accountable. **Description:** Many regions require regular reporting on the healthcare provided to individuals and populations. These reports may include measures related to process, outcomes, costs of care, may be used in 'pay for performance' monitoring and adherence to best practice guidelines. The system needs to provide the report generating capability to easily create these reports or provide for the export of data to external report generating software.	**E**	1. The system **SHALL** provide the ability to export or retrieve data required to assess health care quality, performance and accountability. 2. The system **SHOULD** provide the ability to define multiple data sets required for performance and accountability measures. 3. The system **MAY** provide the data export in a report format that could be displayed, transmitted electronically or printed. 4. The system **MAY** export data or provide a limited query access to data through a secure data service.
S.2.2	**H**	**Report Generation**	**Statement:** Support the export of data or access to data necessary for report generation and ad hoc analysis. **Description:** Providers and administrators need access to data in the EDIS for the generation of both standard and ad hoc reports. These reports may be needed for clinical, administrative, and financial decision-making, as well as for patient use. Reports may be based on structured data and/or unstructured text from the patient's health record.	**E**	
S.2.2.1	**F**	**Heath Record Output**	**Statement:** Support the definition of the formal health record, a partial record for referral purposes, or sets of records for other necessary disclosure purposes. **Description:** Provide hardcopy and electronic output that fully chronicles the healthcare process, supports selection of specific sections of the health record, and allows healthcare	**E**	1. The system **SHALL** provide the ability to generate reports consisting of all and part of an individual patient's record. 2. The system **SHALL** provide the ability to define the record or reports that is considered the formal health record for disclosure purposes.

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Supportive					
			organizations to define the report and/or documents that will comprise the formal health record for disclosure purposes. A mechanism should be provided for both chronological and specified record element output. This may include defined reporting groups (i.e. print sets). For example: Print Set A = Patient Demographics, History & Physical, Consultation Reports, and Discharge Summaries. Print Set B = all information created by one caregiver. Print Set C = all information from a specified encounter.		*3. The system **SHALL** have the ability to specify patient record reports as preliminary vs. final or signed vs. unsigned.* 4. The system **SHOULD** provide the ability to generate reports in both chronological and specified record elements order. 5. The system **SHOULD** provide the ability to create hardcopy and electronic report summary information (procedures, medications, labs, immunizations, allergies, vital signs). 6. The system **SHALL** include patient identifying information on each page of reports generated. 7. The system **SHOULD** have the ability to customize reports to match mandated formats.
S.2.2.2	**F**	**Standard Report Generation**	**Statement:** Provide report generation features using tools internal or external to the system, for the generation of standard reports. **Description:** Providers and administrators need access to data in the EDIS for clinical, administrative, financial decision-making, audit trail and metadata reporting, as well as to create reports for patients. Systems may use internal or external reporting tools to accomplish this (i.e. Crystal Reports). Reports may be based on structured data and/or unstructured text from the patient's health record. Users need to be able to sort and/or filter reports. For example, the user may wish to view only male patients over 35 with a complaint of chest pain.	**E**	1. The system **SHALL** provide the ability to generate reports of structured clinical and administrative data using either internal or external reporting tools. 2. The system **MAY** provide the ability to include information extracted from unstructured clinical and administrative data in the report generation process, using internal or external tools. 3. The system **SHALL** be capable of exporting reports generated. 4. The system **SHOULD** provide the ability to specify report parameters, based on patient demographic and/or clinical data, which would allow sorting and/or filtering of the data. 5. The system (or an external application, using data from the system) **SHOULD** provide the ability to save report parameters for generating subsequent reports. 6. The system (or an external application, using data from the system) **MAY** provide the ability to modify one or more parameters of a saved report specification when generating a report using that specification.
S.2.2.2.1	***F***	***ED Benchmarking Reports***	***Statement:** Create reports of ED throughput and efficiency based upon key milestones (points of time) captured of during the ED visit.* ***Description:** Key point of time include arrival time; treatment area entrance time, MD contact time; decision to admit, discharge or transfer time; and departure (left ED) time. Important intervals include, but are not limited to the "door to doctor time", "doctor to diction time", "admission to bed availability or departure" as well as overall length of stay.*	***E***	*1. The system **SHALL** provide the ability to access key ED benchmarking times and reports.* *2. The system **SHALL** provide the ability to view, sort, and display key ED benchmarking times and reports according to need, and analytic purpose.* *3. The system **SHALL** restrict particular or sensitive ED benchmarking reports to authorized entities.*

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Supportive					
			Other measures of ED performance include the numbers of patients who leave without being seen or before treatment is completed. *These reports are central to ED function and need to be available in a focused fashion.*		*4. The system **SHALL** be able to generate reports for the entire ED, specific areas of the ED (i.e. fast-track), particular patients (those requiring laboratory tests or radiography), and by individual provider.* *5. The system **SHALL** be able to report ED benchmarking data over any prescribed period for which data is available.*
S.2.2.3	**F**	**Ad-Hoc Query and Report Generation**	**Statement:** Provide support for ad hoc query and report generation using tools internal or external to the system. **Description:** Providers and administrators need to respond quickly to new requirements for data measurement and analysis. This may be as a result of new regulatory requirements or internal requirements. This requires that users be able to define their own query parameters and retain them. The data may be found in both structured and unstructured data. Providers and administrators also need to query for the absence of specific clinical or administrative data. For example, the Quality Control department may be reviewing whether or not the protocol for antibiotic administration within four hours of arrival in patients with community acquired pneumonia has been followed. To be accurate, the report would need to identify all patients with an admission diagnosis of pneumonia, whether or not they received an antibiotic in the ED, and the time to antibiotic administration—if any.	**E**	1. The system **SHALL** provide the ability to generate ad hoc query and reports of structured clinical and administrative data through either internal or external reporting tools. 2. The system **MAY** provide the ability to include information extracted from unstructured clinical and administrative data in the report generation process, using internal or external tools. 3. The system **SHOULD** be capable of exporting reports generated. 4. The system **SHOULD** provide the ability to specify report parameters, based on patient demographic and/or clinical data, which would allow sorting and/or filtering of the data. 5. The system **MAY** provide the ability to save report parameters for generating subsequent reports. 6. The system **MAY** provide the ability to modify one or more parameters of a saved report specification when generating a report using that specification. 7. The system **MAY** provide the ability to produce reports, using internal or external reporting tools, based on the absence of a clinical data element (e.g., a lab test has not been performed in the last year).
S.3	**H**	**Administrative and Financial**		**E**	
S.3.1	**H**	**Encounter/Episode of Care Management**	**Statement:** Support the definition of “Manage” and document the health care needed and delivered during an encounter/episode of care. **Description:** Using data standards and technologies that support interoperability, encounter management promotes patient centered care and enables real time, immediate point of service, point of care by facilitating efficient work flow and operations performance to ensure the integrity of: (1) The health record, (2) Public health, financial and administrative reporting, and (3) The healthcare delivery process.	**E**	

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Supportive					
			This support is necessary for direct care functionality that relies on providing user interaction and workflows, which are configured according to clinical protocols and business rules based on encounter specific values such as care setting, encounter type (inpatient, outpatient, home health, etcetera), provider type, patient's EHR, health status, demographics, and the initial purpose of the encounter.		
S.3.1.3	**F**	**Automatic Generation of Administrative and Financial Data from Clinical Record**	**Statement:** Provide patients clinical data to support administrative and financial reporting. **Description:** A user can generate a bill based on health record data. Maximizing the extent to which administrative and financial data can be derived or developed from clinical data will lessen provider reporting burdens and the time it takes to complete administrative and financial processes such as claim reimbursement. This may be implemented by mapping of clinical terminologies in use to administrative and financial terminologies.	**E**	1. The system **SHALL** export appropriate data to administrative and financial systems. 2. The system **SHOULD** provide the ability to define the data required for each external administrative and financial system.
S.3.1.5	**F**	**Other Encounter and Episode of Care Support**	**Statement:** Where not covered above, provide the means to manage and organize the documentation of the health care needed and delivered during an encounter/episode of care. **Description:** *The creation of a record of care in the ED is a time-critical and essential component of an EDIS. EDs and EDIS vary widely in their methods for documenting the content of an encounter. Changes in technology may make this documentation easier, and in certain EDs, the labor of documentation may be passed to scribes or other assistants. Regardless of how captured, each piece of record content is the responsibility of a particular provider, and the record must reflect this fact.*	**E**	1. The system **SHALL** provide the ability to organize patient data by encounter. 2. The system **SHOULD** accept and append patient encounter data from external systems, such as diagnostic tests and reports. 3. The system **SHALL** provide the ability to create encounter documentation by one or more of the following means: direct keyboard entry of text; structured data entry utilizing templates, forms, pick lists or macro substitution; dictation with subsequent transcription of voice to text, either manually or via voice recognition system.
S.3.2	**H**	**Information Access for Supplemental Use**	**Statement:** Support extraction, transformation and linkage of information from structured data and unstructured text in the patient's health record for care management, financial, administrative, and public health purposes. **Description:** *Using data standards and technologies that support interoperability, information access functionalities serve a number of roles whereby information gathered from the encounter is used to support additional uses. These uses may include physician and facility financial coding and billing.*	**E**	
S.3.2.1	**F**	**Rules-Driven Clinical Coding Assistance**	**Statement:** Make available all pertinent patient information needed to support coding of diagnoses, procedures and outcomes. **Description:** The user is assisted in coding information for	**E**	1. The system **SHALL** provide the ability to access all pertinent patient information needed to support coding of diagnosis, procedures and outcomes. 2. The system **SHOULD** assist with the coding of diagnoses,

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Supportive					
			clinical reporting reasons. For example, a professional coder may have to code the principal diagnosis in the current, applicable ICD as a basis for hospital funding. All diagnoses and procedures during the episode may be presented to the coder, as well as the applicable ICD hierarchy containing these codes.		procedures and outcomes based on provider specialty, care setting and other information that may be entered into the system during the encounter.
S.3.2.2	**F**	**Rules-Driven Financial and Administrative Coding Assistance**	**Statement:** Provide financial and administrative coding assistance based on the structured data and unstructured text available in the encounter documentation. **Description:** The user is assisted in coding information for billing or administrative reasons. For example, the HIPAA 837 Professional claim requires the date of the last menstrual cycle for claims involving pregnancy. To support the generation of this transaction, the provider would need to be prompted to enter this date when the patient is first determined to be pregnant, then making this information available for the billing process.	**O**	1. The system **SHALL** maintain financial and administrative codes. 2. The system **SHOULD** provide the ability to retrieve data from the electronic health record as required to simplify the coding of financial and administrative documentation. 3. The system **SHOULD** support rules driven prompts to facilitate the collection of data in the clinical workflow that is required for administrative and financial coding. 4. The system **SHOULD** assist with the coding of required administrative and financial documents based on provider specialty, care setting and other information that may be entered into the system during the encounter. 5. The system **MAY** internally generate internal administrative and financial coding such as place of service, type of facility, tax rates, etc.
S.3.2.3	**F**	**Integrate Cost/Financial Information**	**Statement:** Support interactions with other systems, applications, and modules to enable the use of cost management information required to guide users and workflows. **Description:** The provider is alerted or presented with the most cost-effective services, referrals, devices and etcetera, to recommend to the patient. This may be tailored to the patient's health insurance/plan coverage rules. Medications may be presented in order of cost, or the cost of specific interventions may be presented at the time of ordering.	**EF 11**	1. The system **SHALL** provide the ability to retrieve formularies, preferred providers, and other information, from internal or external sources, that are associated with a patient's health care plan and coverage so that the provider can offer cost effective alternatives to patients. 2. The system **MAY** provide the ability to retrieve or request information about exemptions on coverage limitations and guidelines. 3. The system **MAY** provide the ability to retrieve and provide expected patient out-of- pocket cost information for medications, diagnostic testing, and procedures, from internal or external sources, that are associated with a patients health care plan and coverage. 4. The system **MAY** alert the provider of care where formularies, preferred provider and other information indicate the health plan requires an alternative.
S.3.3	**H**	**Administrative Transaction Processing**	**Statement:** Support the creation (including using external data sources, if necessary), electronic interchange, and processing of transactions listed below that may be necessary for	**EF**	

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Supportive					
			encounter management during an episode of care. **Description:** The EDIS should capture the patient health-related information needed for administrative and financial purposes including reimbursement. This information should be captured to pass to administrative or financial processes as by-product of interactions such as order entry, result entry, documentation entry, medication administration charting. As a byproduct of care delivery and documentation: capture and present all patient information needed to support coding. Ideally performs coding based on documentation. Clinical information needed for billing is available on the date of service, reducing revenue cycle time. However, physicians or other providers should not perform additional data entry / tasks exclusively to support administrative or financial processes. For instance, an RN should not be required to manually code procedures that have otherwise been documented.		
S.3.3.2	**F**	**Eligibility Verification and Determination of Coverage**	**Statement:** Support interactions with other systems, applications, and modules to enable eligibility verification for health insurance and special programs, including verification of benefits and pre-determination of coverage. **Description:** Real-time eligibility checking has become more common in the ambulatory care environment. In the ED, this eligibility checking more restricted. However, two places where eligibility checking at the point of care would be helpful to ED providers is in prescribing and in the establishment of follow-up care. In the future, other areas of eligibility checking may become important or relevant to ED care. Since real time eligibility checking is currently employed in some EHR-S, this function should be considered optional. However, the committee believes this function should be considered essential some time in the future.	**O**	1. The system **SHALL** provide the ability to access information received through electronic prescription eligibility checking. 2. The system **MAY** provide the ability to access information received through provider eligibility checking.
S.3.3.4	**F**	**Support of Service Requests and Claims**	**Statement:** Support interactions with other systems, applications, and modules to support the creation of health care attachments for submitting additional clinical information in support of service requests and claims. **Description:** Retrieves structured and unstructured data, including but not limited to lab data, imaging data, device monitoring data, and text based data, based on rules or requests for additional clinical information, in support of service requests or claims, at the appropriate juncture in the encounter workflow.	**EF 09**	1. The system **SHALL** provide the ability to view available, applicable clinical information to support service requests. 2. The system **SHALL** provide the ability to view available, applicable clinical information to support claims. 3. The system **MAY** provide available, applicable clinical information to support service requests in a computer readable format. 4. The system **MAY** provide available, applicable clinical information to support claims in computer readable formats.
S.3.3.5	**F**	**Claims and Encounter Reports for Reimbursement**	**Statement:** Support interactions with other systems, applications, and modules to enable the creation of claims and encounter reports for reimbursement.	**EF 10**	1. The system **SHALL** provide the ability to view available, applicable information needed to enable the creation of claims and encounter reports for reimbursement.

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Supportive					
			Description: Retrieves information needed to support claims and encounter reporting. This reporting occurs at the appropriate juncture in the encounter workflow in a manual or automated fashion. For example this could occur at an initial, interim or final billing. The system may also present the information that is provided for audit and review by local authorities.		2. The system **SHALL** provide the ability to provide available, applicable data as required by local authority for audit and review. 3. The system **MAY** provide available, applicable data in a computer readable form when needed to enable the creation of claims and encounter reports for reimbursement.
S.3.3.6	**F**	**Health Service Reports at the Conclusion of an Episode of Care.**	**Statement:** Support the creation of health service reports at the conclusion of an episode of care. Support the creation of health service reports to authorized health entities, for example public health, such as notifiable condition reports, immunization, cancer registry and discharge data that a provider may be required to generate at the conclusion of an episode of care. **Description:** Effective use of this function means that providers do not perform additional data entry to support health management programs and reporting.	**E**	1. The system **SHALL** create service reports at the completion of an episode of care such as but not limited to; discharge summaries, public health reports, etc. using data collected during the encounter. 2. The system **SHOULD** prompt providers for data needed for end of care reporting during the continuum of care to reduce the need for end of care data collection. *3. The system **SHALL** produce a comprehensive ED encounter record including all documentation by all providers during an encounter.* *4. The system **SHOULD** provide a means to customize summaries, excerpts or abstracts of the ED encounter record for distribution to different audiences.* *5. The system **SHOULD** provide a means to capture if transmitted health service reports have been received.*
S.3.6	**F**	**Acuity and Severity**	**Statement:** Provide the data necessary to support and manage patient acuity/severity for illness/risk-based adjustment of resources. **Description:** Research has been done on staffing and patient outcomes which indicates that staffing has a definite and measurable impact on patient outcomes, medical errors, length of stay, nurse turnover, and patient mortality. Acuity data helps determine what is, indeed, appropriate staffing. Also, acuity and severity data is routinely the evidential basis most frequently cited by staff when recommending clinical staffing changes.	**E**	1. The system **SHALL** provide the ability to collect appropriate existing data to support the patient acuity/severity processes for illness/risk-based adjustment of resources. 2. The system **MAY** provide the ability to export appropriate data to support the patient acuity/severity processes for illness/risk-based adjustment of resources. 3. The system **MAY** prompt the user to provide key data needed to support acuity/severity processes.
S.3.7	**F**	**Supportive Function Maintenance**	**Statement:** Update EHR supportive content using a manual or automated process. **Description:** EDIS content such as discharge instructions, clinical guidelines, formularies, and other knowledge bases should be maintainable and updatable independent of a particular encounter. *For large databases, automated updates*	**E**	

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Supportive					
			should be possible. For example, addition, deletion or update of discharge instructions could be a manual process. However, replacement of an entire discharge instruction set should be automatic. Addition of a particular therapy to a clinical guideline or order set could be a manual process, but removal of a recalled medication from all order sets should be an automated process.		
S.3.7.1	**F**	**Clinical Decision Support System Guidelines Update**	**Statement:** Facilitate and/or perform updates of clinical decision support system guidelines and associated reference material. **Description:** Clinical decision support rules may be applied to the system using a manual process. As standards are developed to represent these rules, an automated update will be recommended. Any process to update decision support rules should include the verification of the appropriateness of the rules to the system. This may include but not be limited to authenticity of the source, the currency of the version, and any necessary approvals before updates can take place.	**E**	1. The system **SHALL** provide the ability to update the clinical content or rules utilized to generate clinical decision support reminders and alerts. 2. The system **SHOULD** validate that the most applicable version is utilized for the update, and capture the date of update. 3. The system **MAY** track and retain the version used when guidelines are provided in a patient encounter
S.3.7.2	**F**	**Patient Education Material Updates**	**Statement:** Receive and validate formatted inbound communications to facilitate and/or perform updating of patient education material. **Description:** Materials may include information about a diagnosis, recommended diets, associated patient health organizations, or web links to similar educational information. These materials may be provided electronically and may require validation prior to inclusion in the system.	**O**	1. The system **SHALL** support the capture and update of material that may be printed and provided to the patient at the point of care. 2. The system **MAY** provide the ability to validate the material prior to update.
S.3.7.4	**F**	**Public Health Related Updates**	**Statement:** Receive and validate formatted inbound communications to facilitate updating of public health reporting guidelines. **Description:** Information and reporting requirements from outside groups, such as public health organizations, may be made available to patient care providers. Examples may include requirements to report on new disease types, or changes to reporting guidelines. The information in these public health updates may be applied to the system so that appropriate data can be collected and reported to comply with requirements.	**O**	1. The system **SHALL** support the capture and update of public health reporting guidelines. 2. The system **MAY** provide the ability to validate the material prior to update.

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Information Infrastructure					
IN.1	**H**	**Security**	**Statement:** Secure the access to an EHR-S and EHR information. Manage the sets of access control permissions granted within an EHR-S. Prevent unauthorized use of data, data loss, tampering and destruction. **Description:** To enforce security, all EHR-S applications must adhere to the rules established to control access and protect the privacy of EHR information. Security measures assist in preventing unauthorized use of data and protect against loss, tampering and destruction. An EHR-S must be capable of including or interfacing with standards-conformant security services to ensure that any Principal (user, organization, device , application, component, or object) accessing the system or its data is appropriately authenticated, authorized and audited in conformance with local and/or jurisdictional policies. An EHR-S should support Chains of Trust in respect of authentication, authorization, and privilege management, either intrinsically or by interfacing with relevant external services.	**E**	
IN.1.1	**F**	**Entity Authentication**	**Statement:** Authenticate EHR-S users and/or entities before allowing access to an EHR-S. **Description:** Both users and applications are subject to authentication. The EHR-S must provide mechanisms for users and applications to be authenticated. Users will have to be authenticated when they attempt to use the application, the applications must authenticate themselves before accessing EHR information managed by other applications or remote EHR-S'. In order for authentication to be established a Chain of Trust agreement may need to be in place. Examples of entity authentication include: Username/ password; Digital certificate; Secure token; Biometrics.	**E**	1. The system **SHALL** authenticate principals prior to accessing an EHR-S application or EHR-S data. 2. The system **SHALL** prevent access to EHR-S applications or EHR-S data to all non-authenticated principals. 3. The system **SHOULD** provide the ability to implement a Chain of Trust agreement. 4. IF other appropriate authentication mechanisms are absent, THEN the system **SHALL** authenticate principals using at least one of the following authentication mechanisms: username/password, digital certificate, secure token or biometrics.
IN.1.2	**F**	**Entity Authorization**	**Statement:** Manage the sets of access control permissions granted to entities that use an EHR-S (EHR-S Users). Enable EHR-S security administrators to grant authorizations to users, for roles, and within contexts. A combination of these authorization categories may be applied to control access to EHR-S functions or data within an EHR-S, including at the application or the operating system level. **Description:** EHR-S Users are authorized to use the components of an EHR-S according to their identity, role, work-assignment, location and/or the patient's present condition and the EHR-S User's scope of practice within a legal jurisdiction.	**E**	1. The system **SHALL** provide the ability to create and update of sets of access-control permissions granted to principals. 2. The system **SHALL** conform to function IN.2.2 (Auditable Records) for the purpose of recording all authorization actions. 3. The system **SHALL** provide EHR-S security administrators with the ability to grant authorizations to principals according to scope of practice, organizational policy, or jurisdictional law. 4. The system **SHALL** provide EHR-S security administrators with the ability to grant authorizations for roles according to scope of practice, organizational policy, or jurisdictional law.

ID#	Type	Name	Statement and Description	Priority	Conformance Criteria
Information Infrastructure					
			• User based authorization refers to the permissions granted or denied based on the identity of an individual. An example of User based authorization is a patient defined denial of access to all or part of a record to a particular party for privacy related reasons. Another user based authorization is for a tele-monitor device or robotic access to an EHR-S for prescribed directions and other input. • Role based authorization refers to the responsibility or function performed in a particular operation or process. Example roles include: an application or device (tele-monitor or robotic); or a nurse, dietician, administrator, legal guardian, and auditor. • Context-based Authorization is defined by ISO 10181-3 Technical Framework for Access Control Standard as security relevant properties of the context in which an access request occurs, explicitly time, location, route of access, and quality of authentication. For example, an EHR-S might only allow supervising providers' context authorization to attest to entries proposed by residents under their supervision. In addition to the ISO standard, context authorization for an EHR-S is extended to satisfy special circumstances such as, work assignment, patient consents and authorizations, or other healthcare-related factors. A context-based example is a patient-granted authorization to a specific third party for a limited period to view specific EHR records. Another example is a right granted for a limited period to view those, and only those, EHR records connected to a specific topic of investigation.		5. The system **SHALL** provide EHR-S security administrators with the ability to grant authorizations within contexts according to scope of practice, organizational policy, or jurisdictional law. 6. The system **MAY** provide the ability to define context for the purpose of principal authorization based on identity, role, work assignment, present condition, location, patient consent, or patient's present condition. 7. The system **MAY** provide the ability to define context based on legal requirements or disaster conditions.
IN.1.3	**F**	**Entity Access Control**	**Statement:** Verify and enforce access control to all EHR-S components, EHR information and functions for end-users, applications, sites, etc., to prevent unauthorized use of a resource. **Description:** Entity Access Control is a fundamental function of an EHR-S. To ensure that access is controlled, an EHR-S must perform authentication and authorization of users or applications for any operation that requires it and enforce the system and information access rules that have been defined.	**E**	1. The system **SHALL** conform to function IN.1.1 (Entity Authentication). 2. The system **SHALL** conform to function IN.1.2 (Entity Authorization). 3. The system **SHALL** provide the ability to define system and data access rules. 4. The system **SHALL** enforce system and data access rules for all EHR-S resources (at component, application, or user level, either local or remote).
IN.1.4	**F**	**Patient Access Management**	**Statement:** Enable a healthcare delivery organization to allow and manage a patient's access to the patient's personal health information. **Description:** A healthcare delivery organization will be able to manage a patient's ability to view his or her EHR based on scope of practice, organization policy or jurisdictional law.	**E**	1. The system **SHALL** conform to function IN.1.3 (Entity Access Control) in order for a healthcare delivery organization to manage a patient's access to his or her healthcare information. 2. *The system **SHALL** conform to IN.1.2 and IN.1.3 in order to assure that patients are not extended user access controls or*

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			Typically, a patient has the right to view his or her EHR and the right to place restrictions on who can view parts or the whole of that EHR. For example, in some jurisdictions, minors have the right to restrict access to their data by parents/guardians. One example of managing a patient's access to his or her data is by extending user access controls to patients.		*access to healthcare information in the normal ED temporal and physical scope of practice and setting, unless specifically authorized due to unusual circumstances, or as appropriate to organizational policy, or jurisdictional law .*
IN.1.5	**F**	**Non-repudiation**	**Statement:** Limit an EHR-S user's ability to deny (repudiate) the origination, receipt, or authorization of a data exchange by that user. **Description:** An EHR-S allows data entry and data access to a patient's electronic health record and it can be a sender or receiver of healthcare information. Non repudiation guarantees that the source of the data record can not later deny that it is the source; that the sender or receiver of a message cannot later deny having sent or received the message. An EHR-S allows data entry and data access to a patient's electronic health record, and it can be a sender of healthcare information, and a receiver of healthcare information. Non-repudiation is a way to guarantee that the source of data/record can not later deny that fact, that the sender of a message cannot later deny having sent the message, and that the recipient cannot deny having received the message. For example, non-repudiation may be achieved through the use of a: • Digital signature, which serves as a unique identifier for an individual (much like a written signature on a paper document). • Confirmation service, which utilizes a message transfer agent to create a digital receipt (providing confirmation that a message was sent and/or received) and • Timestamp, which proves that a document existed at a certain date and time.	**E**	1. The system **SHALL** time stamp initial entry, modification, or exchange of data, and identify the actor/principal taking the action as required by users' scope of practice, organizational policy, or jurisdictional law. 2. The system **SHALL** provide additional non-repudiation functionality where required by users' scope of practice, organizational policy, or jurisdictional law. 3. The system **SHOULD** conform to function IN.2.2 (Auditable Records) to prevent repudiation of data origination, receipt, or access. 4. The system **SHOULD** conform to function IN.1.8 (Information Attestation) to ensure the integrity of data exchange and thus prevent repudiation of data origination or receipt.
IN.1.6	**F**	**Secure Data Exchange**	**Statement:** Secure all modes of EHR data exchange. **Description:** Whenever an exchange of EHR information occurs, it requires appropriate security and privacy considerations, including data obfuscation as well as both destination and source authentication when necessary. For example, it may be necessary to encrypt data sent to remote or external destinations. A secure data exchange requires that there is an overall coordination regarding the information coordination regarding the information that is exchanged between EHR-S entities and how that exchange is expected to occur. The policies applied at different locations must be consistent or compatible with each other in order to ensure that the information is protected when it crosses entity boundaries	**E**	1. The system **SHALL** secure all modes of EHR data exchange. 2. The system **SHOULD** conform to function IN.1.7 (Secure Data Routing). 3. The system **MAY** provide the ability to obfuscate data. 4. The system **SHALL** encrypt and decrypt EHR data that is exchanged over a non-secure link. 5. The system **SHALL** support standards-based encryption mechanisms when encryption is used for secure data exchange.

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			within an EHR-S or external to an EHR-S.		
IN.1.7	**F**	**Secure Data Routing**	**Statement:** Route electronically exchanged EHR data only to/from known, registered, and authenticated destinations/sources (according to applicable healthcare-specific rules and relevant standards). **Description:** An EHR-S needs to ensure that it is exchanging EHR information with the entities (applications, institutions, directories) it expects. This function depends on entity authorization and authentication to be available in the system. For example, a physician practice management application in an EHR-S might send claim attachment information to an external entity. To accomplish this, the application must use a secure routing method, which ensures that both the sender and receiving sides are authorized to engage in the information exchange. Known sources and destinations can be established in a static setup or they can be dynamically determined. Examples of a static setup are recordings of IP addresses or recordings of DNS names. For dynamic determination of known sources and destinations systems can use authentication mechanisms as described in IN.1.1. For example, the sending of a lab order from the EHR-S to a lab system within the same organization usually uses a simple static setup for routing. In contrast sending a lab order to a reference lab outside of the organization will involve some kind of authentication process. In general, when the underlying network infrastructure is secure (e.g. secure LAN or VPN) the simple static setup is used.	**E**	1. The system **SHALL** automatically route electronically exchanged EHR data only from and to known sources and destinations and only over secure networks. 2. The system **SHOULD** route electronically exchanged EHR data only to and from authenticated sources and destinations (conform to function IN.1.1 (Entity Authentication). 3. The system **SHOULD** conform to function IN.2.2 (Auditable Records) to provide audit information about additions and changes to the status of destinations and sources.
IN.1.8	**F**	**Information Attestation**	**Statement:** Manage electronic attestation of information including the retention of the signature of attestation (or certificate of authenticity) associated with incoming or outgoing information. **Description:** The purpose of attestation is to show authorship and assign responsibility for an act, event, condition, opinion, or diagnosis. Every entry in the health record must be identified with the author and should not be made or signed by someone other than the author. (Note: A transcriptionist may transcribe an author's notes and a senior clinician may attest to the accuracy of another's statement of events.) Attestation is required for (paper or electronic) entries such as narrative or progress notes, assessments, flow sheets, and orders. Digital signatures may be used to implement document attestation. For an incoming document, the record of attestation is retained	**E**	1. The system **SHALL** conform to function IN.1.1 (Entity Authentication) to provide authentication capabilities. 2. The system **SHALL** conform to function IN.1.2 (Entity Authorization) to provide authorization capabilities. 3. The system **SHALL** provide the ability to associate any attestable content added or changed to an EHR with the content's author (for example by conforming to function IN.2.2 (Auditable Records)). 4. The system **SHALL** provide the ability for attestation of attestable EHR content by the content's author. 5. The system **SHALL** indicate the status of attestable data which has not been attested.

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			if included. Attestation functionality must meet applicable legal, regulatory and other applicable standards or requirements.		6. The system **MAY** provide the ability for attestation of EHR content by properly authenticated and authorized users different from the author as required by users' scope of practice, organizational policy, or jurisdictional law. 7. The system **MAY** provide the ability to use digital signatures as the means for attestation.
IN.1.9	**F**	**Patient Privacy and Confidentiality**	**Statement:** Enable the enforcement of the applicable jurisdictional and organizational patient privacy rules as they apply to various parts of an EHR-S through the implementation of security mechanisms. **Description:** Patients' privacy and the confidentiality of EHRs are violated if access to EHRs occurs without authorization. Violations or potential violations can impose tangible economic or social losses on affected patients *and providers,* as well as less tangible feelings of vulnerability and pain. Fear of potential violations discourages patients from revealing sensitive personal information that may be relevant to diagnostic and treatment services. Rules for the protection of privacy and confidentiality may vary depending upon the vulnerability of patients and the sensitivity of records. Strongest protections should apply to the records of minors and the records of patients with stigmatized conditions. Authorization to access the most sensitive parts of an EHR is most definitive if made by the explicit and specific consent of the patient.	**E**	1. The system **SHALL** provide the ability to fully comply with the requirements for patient privacy and confidentiality in accordance with a user's scope of practice, organizational policy, or jurisdictional law. 2. The system **SHALL** conform to function IN.1.1 (Entity Authentication). 3. The system **SHALL** conform to function IN.1.2 (Entity Authorization). 4. The system **SHALL** conform to function IN.1.3 (Entity Access Control). 5. The system **SHOULD** conform to function IN.1.5 (Non-Repudiation). 6. The system **SHALL** conform to function IN.1.6 (Secure Data Exchange). 7. The system **SHOULD** conform to function IN.2.2 (Auditable Records) 8. The system **SHALL** provide the ability to maintain varying levels of confidentiality in accordance with users' scope of practice, organizational policy, or jurisdictional law.
IN.1.9.1	***F***	***Redact patient identifying information.***	***Statement:*** *Keep patient identities and conditions invisible to the public and other providers who do not have "need to know" on public tracking screens.* ***Description:*** *A number of systems implementation large tracking screens, common displays or dashboards to support workflows. In these applications, there is a need to create de-identified views for broadcast in common areas.*	***E***	*1. The system **SHALL** provide a means to protect patient identities from other patients, patient visitors, and non participating healthcare providers.*
IN.1.9.2	***F***	***Protect individual patient identity.***	***Statement:*** *Flag patient identity as confidential to others.* ***Description:*** *Create a flag to indicate to all providers caring for the patient, as well as administrative staff who may receive*	***E***	*1. The system **SHALL** provide a means to flag patients who require protection of their identity from others, including family, visitors, and non participating healthcare providers.*

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			phone calls from family members or others, the need to protect the identity of patients at risk of harm, or requesting similar anonymity. Despite best efforts of confidentiality, display should identify patients at particular risk of harm during stay (e.g. domestic violence).		
IN.2	**H**	**Health Record Information and Management**	**Statement:** Manage EHR information across EHR-S applications by ensuring that clinical information entered by providers is a valid representation of clinical notes; and is accurate and complete according to clinical rules and tracking amendments to clinical documents. Ensure that information entered by or on behalf of the patient is accurately represented. **Description:** Since EHR information will typically be available on a variety of EHRS applications, an EHR-S must provide the ability to access, manage and verify accuracy and completeness of EHR information, maintain the integrity and reliability of the data, and provide the ability to audit the use of and access to EHR information.	**E**	
IN.2.1	**F**	**Data Retention Availability and Destruction**	**Statement:** Retain, ensure availability, and destroy health record information according to scope of practice, organizational policy, or jurisdictional law. This includes: -Retaining all EHR-S data and clinical documents for the time period designated by policy or legal requirement; -Retaining inbound documents as originally received (unaltered); -Ensuring availability of information for the legally prescribed period of time to users and patients; and -Providing the ability to destroy EHR data/records in a systematic way according to policy and after the legally prescribed retention period. **Description:** Discrete and structured EHR-S data, records and reports must be: -Made available to users in a timely fashion; -Stored and retrieved in a semantically intelligent and useful manner (for example, chronologically, retrospectively per a given disease or event, or in accordance with business requirements, local policies, or legal requirements); -Retained for a legally prescribed period of time; and -Destroyed in a systematic manner in relation to the applicable retention period. An EHR-S must also allow an organization to identify data/records to be destroyed, and to review and approve destruction before it occurs. In such a case it should pass along record destruction date info along with the data when providing records to another entity	**E**	1. The system **SHALL** provide the ability to store and retrieve health record data and clinical documents for the legally prescribed time. 2. The system **SHALL** provide the ability to retain inbound data or documents (related to health records) as originally received (unaltered, inclusive of the method in which they were received) for the legally organizationally prescribed time in accordance with users' scope of practice, organizational policy, or jurisdictional law. 3. The system **SHALL** retain the content of inbound data (related to health records) as originally received for the legally prescribed time. 4. The system **SHOULD** provide the ability to retrieve both the information and business context data within which that information was obtained. 5. The system **SHALL** provide the ability to retrieve all the elements included in the definition of a legal medical record. 6. The system **MAY** provide the ability to identify specific EHR data/records for destruction,-review and confirm destruction before it occurs and implement function IN.2.2 (Auditable Records). 7. The system **MAY** provide the ability to destroy EHR data/records so that all traces are irrecoverably removed

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					according to policy and legal retentions periods. 8. The system **MAY** pass along record destruction date information (if any) along with existing data when providing records to another entity.
IN.2.2	**F**	**Auditable Records**	**Statement:** Provide audit capabilities for system access and usage indicating the author, the modification (where pertinent), and the date and time at which a record was created, modified, viewed, extracted, or deleted. Auditable records extend to information exchange, to audit of consent status management (to support DC.1.3.3) and to entity authentication attempts. Audit functionality includes the ability to generate audit reports and to interactively generate audit reports and to interactively view change history for individual health records or for an EHR-S **Description:** Audit functionality extends to security audits, data audits, audits of data exchange, and the ability to generate audit reports. Audit capability settings should be configurable to meet the needs of local policies. Examples of audited areas include: • Security audit, which logs access attempts and resource usage including user login, file access, other various activities, and whether any actual or attempted security violations occurred; • Data audit, which records who, when, and by which system an EHR record was created, updated, translated, viewed, extracted, or (if local policy permits) deleted. Audit-data may refer to system setup data or to clinical and patient management data; • Information exchange audit, which records data exchanges between EHR-S applications (for example, sending application; the nature, history, and content of the information exchanged); and information about data transformations (for example, vocabulary translations, reception event details, etc.). Audit reports should be flexible and address various users' needs. For example, a legal authority may want to know how many patients a given healthcare provider treated while the provider's license was suspended. Similarly, in some cases a report detailing all those who modified or viewed a certain patient record Security audit trails and data audit trails are used to verify enforcement of business, data integrity, security, and access-control rules.	**E**	1. The system **SHALL** provide audit capabilities for recording access and usage of systems, data, and organizational resources. 2. The system **SHALL** conform to function IN.1.1 (Entity Authentication). 3. The system **SHALL** provide audit capabilities indicating the time stamp for an object or data creation. 4. The system **SHALL** provide audit capabilities indicating the time stamp for an object or data modification in accordance with users' scope of practice, organizational policy, or jurisdictional law. 5. The system **SHALL** provide audit capabilities indicating the time stamp for an object or data extraction in accordance with users' scope of practice, organizational policy, or jurisdictional law. 6. The system **SHALL** provide audit capabilities indicating the time stamp for an object or data exchange. 7. The system **SHOULD** provide audit capabilities indicating the time stamp for an object or data view. 8. The system **SHALL** provide audit capabilities indicating the time stamp for an object or data deletion in accordance with users' scope of practice, organizational policy, or jurisdictional law. 9. The system **SHALL** provide audit capabilities indicating the author of a change in accordance with users' scope of practice, organizational policy, or jurisdictional law. 10. The system **SHOULD** provide audit capabilities indicating the viewer of a data set. 11. The system **MAY** provide audit capabilities indicating the data value before a change. 12. The system **MAY** provide audit capabilities to capture system events at the hardware and software architecture level. 13. The system **SHALL** conform to function IN.1.3 (Entity

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			There is a requirement for system audit trails for the following events: • Loading new versions of, or changes to, the clinical system; Loading new versions of codes and knowledge bases; >Taking and restoring of backup; • Changing the date and time where the clinical system allows this to be done; >Archiving any data; • Re-activating of an archived patient record; • Entry to and exiting from the clinical system; • Remote access connections including those for system support and maintenance activities		Access Control) to limit access to audit record information to appropriate entities in accordance with users' scope of practice, organizational policy, or jurisdictional law. 14. The system **SHALL** provide the ability to generate an audit report 15. The system **SHALL** provide the ability to view change history for a particular record or data set in accordance with users' scope of practice, organizational policy, or jurisdictional law. 16. The system **SHOULD** provide the ability to record system maintenance events for loading new versions of, or changes to, the clinical system. 17. The system **SHOULD** provide the ability to record system maintenance events for loading new versions of codes and knowledge bases. 18. The system **SHOULD** provide the ability to record changing the date and time where the clinical system allows this to be done. 19. The system **SHOULD** provide the ability to record system maintenance events for creating and restoring of backup. 20. The system **SHOULD** provide the ability to record system maintenance events for archiving any data. 21. The system **SHOULD** provide the ability to record system maintenance events for re-activating of an archived patient record. 22. The system **SHOULD** provide the ability to record system maintenance events for entry to and exit from the EHR system. 23. The system **SHOULD** provide the ability to record system maintenance events for remote access connections including those for system support and maintenance activities. 24. The system **SHOULD** utilize standardized time keeping (for example using the IHE consistent time profile). 25. The system **SHOULD** provide the ability to record and report upon audit information using a standards-based audit record format.

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IN.2.3	**F**	**Synchronization**	**Statement:** Maintain synchronization involving: -Interaction with entity directories; -Linkage of received data with existing entity records; -Location of each health record component; and -Communication of changes between key systems. **Description:** An EHR-S may consist of a set of components or applications; each application manages a subset of the health information. Therefore it is important that, through various interoperability mechanisms, an EHR-S maintains all the relevant information regarding the health record in synchrony. For example, if a physician orders an MRI, a set of diagnostic images and a radiology report will be created. The patient demographics, the order for MRI, the diagnostic images associated with the order, and the report associated with the study must all be synchronized in order for the clinicians to view the complete record.	**E**	1. The system **SHALL** conform to function IN.5.1 (Interchange Standards). 2. The system **SHOULD** conform to function IN.3 (Registry and Directory Services) to enable the use of registries and directories. 3. The system **SHOULD** provide the ability to link entities to external information. 4. The system **SHOULD** store the location of each known health record component in order to enable authorized access to a complete logical health record if the EHR is distributed among several applications within the EHR-S.
IN.2.4	**F**	**Extraction of Health Record Information**	**Statement:** Manage data extraction in accordance with analysis and reporting requirements. The extracted data may require use of more than one application and it may be pre-processed (for example, by being de-identified) before transmission. Data extractions may be used to exchange data and provide reports for primary and ancillary purposes. **Description:** An EHR-S enables an authorized user, such as a clinician, to access and aggregate the distributed information, which corresponds to the health record or records that are needed for viewing, reporting, disclosure, etc. An EHR-S must support data extraction operations across the complete data set that constitutes the health record of an individual and provide an output that fully chronicles the healthcare process. Data extractions are used as input to patient care coordination between facilities, organizations and settings. In addition, data extractions can be used for administrative, financial, research, quality analysis, and public health purposes.	**E**	1. The system **SHALL** provide the ability to extract health record information. 2. The system **SHOULD** conform to function IN.1.6 (Secure Data Exchange) to provide secure data exchange capabilities. 3. The system **SHOULD** provide the ability to de-identify extracted information. 4. The system **SHOULD** conform to function IN.5.1 (Interchange Standards) to enable data extraction in standard-based formats. 5. The system **SHOULD** provide the ability to perform extraction operations across the complete data set that constitutes the health record of an individual within the system. 6. The system **MAY** provide the ability to perform extraction operations whose output fully chronicles the healthcare process. 7. The system **SHOULD** provide the ability to extract data for administrative purposes. 8. The system **SHOULD** provide the ability to extract data for financial purposes. 9. The system **MAY** provide the ability to extract data for research purposes. 10. The system **MAY** provide the ability to extract data for quality analysis purposes.

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					11. The system **SHOULD** provide the ability to extract data for public health purposes.
IN.2.5	**H**	**Store and Manage Health Record Information**	**Statement:** Store and manage health record information as structured and unstructured data **Description:** Unstructured health record information is information that is not divided into discrete fields AND not represented as numeric, enumerated or codified data. General examples of unstructured health record information include: - text - word processing document - image - multimedia Specific examples include: - text message to physician - patient photo - letter from family - scanned image of insurance card - dictated report (voice recording) Structured health record information is divided into discrete fields, and may be enumerated, numeric or codified. Examples of structured health information include: - patient address (non-codified, but discrete field) - diastolic blood pressure (numeric) - coded result observation - coded diagnosis - patient risk assessment questionnaire with multiple-choice answers Context may determine whether or not data are unstructured, e.g., a progress note might be standardized and structured in some EHR-S (e.g., Subjective/Objective/Assessment/Plan) but unstructured in others. Managing healthcare data includes capture, retrieval, deletion, correction, amendment, and augmentation. Augmentation refers to providing additional information regarding the healthcare data, which is not part of the data itself, e.g. linking patient consents or authorizations to the healthcare data of the patient.	**E**	

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IN.2.5.1	**F**	**Store and Manage Unstructured Health Record Information**	**Statement:** Create, capture, and maintain unstructured health record information **Description:** A number of documents are created that are unstructured such as signed consent or DNR forms. These forms must be managed with the patient's record including identifying updates, or when a document is superseded by another.	**E**	1. The system **SHALL** capture unstructured health record information as part of the patient EHR. 2. The system **SHALL** retrieve unstructured health record information as part of the patient EHR. 3. The system **SHALL** provide the ability to update unstructured health record information. 4. The system **SHALL** conform to function IN.2.1 (Data Retention, Availability and Destruction) to provide the ability to inactivate, obsolete, or destroy unstructured health record information. 5. The system **SHOULD** provide the ability to report unstructured health record information. 6. The system **MAY** track unstructured health record information over time. 7. The system **SHALL** provide the ability append corrected unstructured health record information to the original unstructured health record information. A specific type of implementation is not implied. 8. The system **SHALL** provide the ability to append unstructured health record information to the original unstructured health record information. A specific type of implementation is not implied. 9. The system **SHALL** provide the ability append augmented unstructured health record information to the original unstructured health record information. A specific type of implementation is not implied.
IN.2.5.2	**F**	**Store and Manage Structured Health Record Information**	**Statement:** Create, capture, and maintain structured health record information **Description:** Clinical information has value beyond the immediate presentation in the ED as many problems are acute on chronic events or involve multiple care-givers in disparate settings. Additionally, analysis of performance is better made when using structured documentation.	**E**	1. The system **SHALL** capture structured health record information as part of the patient EHR. 2. The system **SHALL** retrieve structured health record information as part of the patient EHR. 3. The system **SHALL** provide the ability to update structured health record information. 4. The system **SHALL** conform to function IN.2.1 (Data Retention, Availability and Destruction) to provide the ability to inactivate, obsolete, or destroy structured health record information. 5. The system **SHOULD** provide the ability to report structured health record information.

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					6. The system **MAY** track structured health record information over time. 7. The system **SHOULD** provide the ability to retrieve each item of structured health record information discretely within patient context. 8. The system **SHALL** provide the ability to append corrected structured health record information to the original structured health record information. A specific type of implementation is not implied. 9. The system **SHALL** provide the ability to append structured health record information to the original structured health record information. A specific type of implementation is not implied. 10. The system **SHALL** provide the ability to append augmented structured health record information to the original structured health record information. A specific type of implementation is not implied.
IN.3	**H**	**Registry and Directory Services**	**Statement:** Enable the use of registry services and directories to uniquely identify, locate and supply links for retrieval of information related to: retrieval of information related to: - patients and providers for healthcare purposes; - payers, health plans, sponsors, and employers for administrative and financial purposes; - public health agencies for healthcare purposes, and - healthcare resources and devices for resource management purposes. **Description:** Registry and directory service functions are critical to successfully managing the security, interoperability, and the consistency of the health record data across an EHR-S. These services enable the linking of relevant information across multiple information sources within, or external to, an EHR-S for use within an application. Directories and registries support communication between EHR Systems and may be organized hierarchically or in a federated fashion. For example, a patient being treated by a primary care physician for a chronic condition may become ill while out of town. The new provider's EHR-S interrogates a local, regional, or national registry to find the patient's previous records. From the primary care record, a remote EHR-S retrieves relevant information in conformance with applicable patient privacy and confidentiality rules. An example of local registry usage is an EHR-S application sending a query message to the Hospital Information System to retrieve a patient's demographic data.	**E**	1. The system **SHALL** provide the ability to use registry services and directories. 2. The system **SHALL** provide the ability to securely use registry services and directories. 3. The system **SHALL** conform to function IN.5.1 (Interchange Standards) to provide standard data interchange capabilities IN. for using registry services and directories. 4. The system **SHOULD** communicate with local registry services through standardized interfaces. 5. The system **SHOULD** communicate with non-local registry services (that is, to registry services that are external to an EHR-S) through standardized interfaces. 6. The system **SHOULD** provide the ability to use registries or directories to uniquely identify patients for the provision of care. 7. The system **SHOULD** provide the ability to use registries or directories to uniquely identify providers for the provision of care. 8. The system **MAY** provide the ability to use registries or directories to retrieve links to relevant healthcare information

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					regarding a patient. 9. The system **MAY** provide the ability to use registries to supply links to relevant healthcare information regarding a patient. 10. The system **MAY** provide the ability to use registries or directories to identify payers, health plans, and sponsors for administrative and financial purposes. 11. The system **MAY** provide the ability to use registries or directories to identify employers for administrative and financial purposes. 12. The system **MAY** provide the ability to use registries or directories to identify public health agencies for healthcare purposes. 13. The system **MAY** provide the ability to use registries or directories to identify healthcare resources and devices for resource management purposes.
IN.4	**H**	**Standard Terminologies and Terminology Services**	**Statement:** Support semantic interoperability through the use of standard terminologies, standard terminology models and standard terminology services. **Description:** The purpose of supporting terminology standards and services is to enable semantic interoperability. Interoperability is demonstrated by the consistency of human and machine interpretation of shared data and reports. It includes the capture and support of consistent data for templates and decision support logic. Terminology standards pertain to concepts, representations, synonyms, relationships and computable (machine-readable) definitions. Terminology services provide a common way for managing and retrieving these items.	**E**	
IN.4.1	**F**	**Standard Terminologies and Terminology Models**	**Statement:** Employ standard terminologies to ensure data correctness and to enable semantic interoperability (both within an enterprise and externally). Support a formal standard terminology model. **Description:** Semantic interoperability requires standard terminologies combined with a formal standard information model. An example of an information model is the HL7 Reference Information model. Examples of terminologies that an EHR-S may support include: LOINC, SNOMED, ICD-9, ICD-10, and CPT-4. A terminology provides semantic and computable identity to its concepts. Terminologies are use-case dependent and may or may not be realm dependent. For	**E**	1. The system **SHALL** provide the ability to use standard terminologies to communicate with other systems (internal or external to the EHR-S). 2. The system **SHALL** provide the ability to validate that clinical terms and coded clinical data exists in a current standard terminology. 3. The system **SHOULD** provide the ability to exchange healthcare data using formal standard information models and standard terminologies. 4. The system **SHOULD** provide the ability to use a formal

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			example, terminologies for public health interoperability may differ from those for healthcare quality, administrative reporting, research, etc. Formal standard terminology models enable common semantic representations by describing relationships that exist between concepts within a terminology or in different terminologies, such as exemplified in the model descriptions contained in the HL7 Common Terminology Services specification. The clinical use of standard terminologies is greatly enhanced with the ability to perform hierarchical inference searches across coded concepts. Hierarchical Inference enables searches to be conducted across sets of coded concepts stored in an EHR-S. Relationships between concepts in the terminology are between concepts in the terminology are used in the search to recognize child concepts of a common parent. For example, there may be a parent concept, "penicillin containing preparations" which has numerous child concepts, each of which represents a preparation containing a specific form of penicillin (Penicillin V, Penicillin G, etc). Therefore, a search may be conducted to find all patients taking any form of penicillin preparation. Clinical and other terminologies may be provided through a terminology service internal or external to an EHR-S. An example of a terminology service is described in the HL7 Common Terminology Services specification.		standard terminology model. 5. The system **SHOULD** provide the ability to use hierarchical inference searches e.g., subsumption-across coded terminology concepts, that were expressed using standard terminology models. 6. The system **SHOULD** provide the ability to use a terminology service (internal or external to the EHR-S). 7. Where there is no standard terminology model available, then the system **MAY** provide a formal explicit terminology model.
IN.4.2	**F**	**Maintenance and Versioning of Standard Terminologies**	**Statement:** Enable version control according to customized policies to ensure maintenance of utilized standards. This includes the ability to accommodate changes to terminology sets as the source terminology undergoes its natural update process (new codes, retired codes, redirected codes). Such changes need to be cascaded to clinical content embedded in templates, custom formularies, etc., as determined by local policy **Description:** Version control allows for multiple sets or versions of the same terminology to exist and be distinctly recognized over time. Terminology standards are usually periodically updated, and concurrent use of different versions may be required. Since the meaning of a concept can change over time, it is important that retrospective analysis and research maintains the ability to relate changing conceptual meanings. If the terminology encoding for a concept changes over time, it is also important that retrospective analysis and research can correlate the different encodings to ensure the (permanence of the concept. It should be possible to retire deprecated versions when applicable business cycles are completed while maintaining obsolescent code sets. An example use of this is for possible claims adjustment throughout the claim's lifecycle.	**E**	1. The system **SHALL** provide the ability to use different versions of terminology standards. 2. The system **SHALL** provide the ability to update terminology standards. 3. The system **MAY** relate modified concepts in the different versions of a terminology standard to allow preservation of interpretations over time. 4. The system **SHOULD** provide the ability to interoperate with systems that use known different versions of a terminology standard. 5. The system **SHOULD** provide the ability to deprecate terminologies. 6. The system **MAY** provide the ability to deprecate individual codes within a terminology. 7. The system **SHALL** provide the ability to cascade terminology changes where coded terminology content is embedded in clinical models (for example, templates and custom formularies) when the cascaded terminology changes can be accomplished unambiguously.

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					8. Changes in terminology **SHALL** be applied to all new clinical content (via templates, custom formularies, etc.).
IN.4.3	**F**	**Terminology Mapping**	**Statement:** Map or translate one terminology to another as needed by local, regional, national, or international interoperability requirements **Description:** The ability to map or translate one terminology to another is fundamental to an organization in an environment where several terminologies are in play with overlapping concepts. It is a common occurrence that data is captured using one terminology, but is shared using another terminology. For example, within a healthcare organization there may be a need to map overlapping terminology concepts (e.g. between an EHR-S and an external laboratory system, ore between an EHR-S and a billing system). Realm specific (including local, regional, national or international) interoperability requirements can also determine the need for terminology mapping, and in many cases terminology mapping services can be used to satisfy these requirements.	**E**	1. The system **SHALL** provide the ability to use a terminology map 2. The system **SHOULD** provide the ability to use standard terminology services for the purposes of mapping terminologies 3. The system **MAY** provide the ability for a user to validate a mapping 4. The system **MAY** provide the ability to create a terminology map.
IN.5	**H**	**Standards-based Interoperability**	**Statement:** Provide automated health care delivery processes and seamless exchange of clinical, administrative, and financial information through standards- based solutions **Description:** Interoperability standards enable an EDIS to operate as a set of applications. This results in a unified view of the system where the reality is that several disparate systems may be coming together. Interoperability standards also enable the sharing of information between EHR systems, including the participation in regional, national, or international information exchanges. Timely and efficient access to information and capture of information is promoted with minimal impact to the user.	**E**	
IN.5.1	**F**	**Interchange Standards**	**Statement:** Support the ability to operate seamlessly with other systems, either internal or external, that adhere to recognized interchange standards. “Other systems” include other EHR Systems, applications within an EHR-S, or other authorized entities that interact with an EHR-S. **Description:** An organization typically uses a number of interchange standards to meet its external and internal interoperability requirements. It is fundamental that there be a common understanding of rules regarding connectivity, information structures, formats and semantics. These are known as “interoperability or interchange standards”. Data exchange which may be between internal systems or modules, or external to the organization, is to occur in a manner which is	**E**	1. The system **SHALL** provide the ability to use interchange standards as required by realm specific and/or local profiles. 2. The system **SHALL** provide the ability to seamlessly perform interchange operations with other systems that adhere to recognized interchange standards. 3. The system **SHALL** conform to functions under header IN.4 (Standard Terminologies and Terminology Services) to support terminology standards in accordance with a users' scope of practice, organizational policy, or jurisdictional law. 4. If there is no standard information model available then the system **MAY** provide a formal explicit information model in

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			seamless to the user. For example, if data interchange involves double entry, or manual cut-and paste steps by the user, it is not considered seamless. Representation of EHR content is transmitted in a variety of interchange formats such as: HL7 Messages, Clinical Document Architecture (CDA) and other HL7 Structured Documents, X12N healthcare transactions, and Digital Imaging and Communication in Medicine (DICOM) format. Support for multiple interaction modes is needed to respond to differing levels of immediacy and types of exchange. For example, messaging is effective for many near-real time, asynchronous data exchange scenarios but may not be appropriate if the end-user is requesting an immediate response from a remote application. A variety of interaction modes are typically supported such as: • Unsolicited Notifications, e.g. a patient has arrived for a clinic appointment -Query/Response e.g., Is Adam Everyman known to the system? Yes, MRN is 12345678. • Service Request and Response, e.g., Laboratory Order for "Fasting Blood Sugar" and a response containing the results of the test. -Information Interchange between organizations (e.g. in a RHIO, or in a organizations (e.g. in a RHIO, or in a 171 146 National Health System) • Structured/discrete clinical documents, e.g., Clinical Note - Unstructured clinical document, e.g., dictated surgical note Standard terminology is a fundamental part of interoperability and is described in section IN.4. Using a formal explicit information model further optimizes interoperability. An example of an information model is the HL7 Reference Information Model (RIM). Organizations typically need to deal with more than one information model and may need to develop a mapping or a meta-model.		order to support the ability to operate seamlessly with other systems. 5. The system **SHOULD** provide the ability to exchange data using an explicit and formal information model and standard, coded terminology.
IN.5.1.1	***F***	***Structured Documents***	***Statement:*** *Support the management of structured documents in support of emergency department operations.* ***Description:*** *Structured documents represent an important method to facilitate the transfer of information to support care. Structured documents are also used to facilitate care transfers across domains, and to support patient care in RHIO environments. Structured documents have been purposed for the purposes of ED referral, transfer of care between EMS and ED systems, and transfers of care from ED to inpatient providers as well as back to ambulatory providers. Structured medical documents (including medical summaries) may reside in information systems external to the hospital enterprise.*	***EF 09***	*1. The system **SHALL** manage structured documents.* *2. The system **SHALL** support S.3.3.6 Health Service Reports at the Conclusion of an Episode of Care and be able to output the ED encounter record and other reports as structured documents.* *3. The system **SHALL** be able to retrieve, format and display structured documents from external sources.*

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			These documents are often sent from primary care physicians or clinics.		
IN.5.2	**F**	**Interchange Standards Versioning and Maintenance**	**Statement:** Enable version control according to local policies to ensure maintenance of utilized interchange standards. Version control of an interchange standard implementation includes the ability to accommodate changes as the source interchange standard undergoes its natural update process **Description:** The life cycle of any given standard results in changes to its requirements. It is critical that an organization know the version of any given standard it uses and what its requirements and capabilities are. For example, if the organization migrates to an HL7 v2.5 messaging standard, it may choose to take advantage of new capabilities such as specimen or blood bank information. The organization may find that certain fields have been retained have been retained for backwards compatibility only or withdrawn altogether. The EHR-S needs to be able to handle all of these possibilities. Standards typically evolve in such a way as to protect backwards compatibility. On the other hand, sometimes there is little, or no, backwards compatibility when an organization may need to replace an entire standard with a new methodology. An example of this is migrating from HL7 v2 to HL7 v3. Interchange standards that are backward compatible support exchange among senders and receivers who are using different versions. Version control ensures that those sending information in a later version of a standard consider the difference in information content that can be interchanged effectively with receivers, be interchanged effectively with receivers, who are capable of processing only earlier versions. That is, senders need to be aware of the information that receivers are unable to capture and adjust their business processes accordingly. Version control enables multiple versions of the same interchange standard to exist and be distinctly recognized over time. Since interchange standards are usually periodically updated, concurrent use of different versions may be required. Large (and/or federated) organizations typically need to use different versions of an interchange standard to meet internal organizational interoperability requirements. For example, the enterprise-wide standard might use HL7 v2.5 for Lab messages, but some regions of the enterprise might be at a lower level. It should be possible to retire deprecated interchange standards versions when interchange standards versions when applicable business cycles are completed while	**E**	1. The system **SHALL** provide the ability to use different versions of interchange standards. 2. The system **SHALL** provide the ability to change (reconfigure) the way that data is transmitted as an interchange standard evolves over time and in accordance with business needs. 3. The system **SHOULD** provide the ability to deprecate an interchange standard. 4. The system **SHOULD** provide the ability to interoperate with other systems that use known earlier versions of an interoperability standard.

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			maintaining obsolete versions. An example use of this is for possible claims adjustment throughout the claim's life cycle. When interchange standards change over time, it is important that retrospective analysis and research correlate and note gaps between the different versions' information structures to support the permanence of concepts over time. An example use of this is the calculation of outcome or performance measures from persisted data stores where one version of a relevant interchange standard, e.g., CDA Release 1 captures the relevant data, e.g., discharge.		
IN.5.3	**F**	**Standards-based Application Integration**	**Statement:** Enable standards-based application integration with other systems **Description:** When an organization wishes to integrate its applications, they must use standardized methods. Standards-based application integration may be achieved in a variety of ways. For example: • Desktop visual integration may be achieved via HL7 Clinical Context Object Workgroup (CCOW) standards • Workflow functions may be integrated via The Workflow Management Coalition (WfMC) standards • EHR-S may be integrated in an Enterprise Information System Architecture via Service Oriented Architecture (SOA) standards Architecture (SOA) standards. It is recognized that these examples are very disparate and used for very different purposes. The method used depends on the organization's approach to application integration. An organization could conceivably use multiple integration approaches.	**E**	1. The system **SHALL** provide the ability to support standards-based application integration. *2. The system **SHOULD** provide the ability to support CCOW standards for purposes of application integration.* *3. The system **MAY** provide the ability to support WfMC standards for purposes of application integration.* *4. The system **MAY** provide the ability to support SOA standards for purposes of application integration.*
IN.5.4	**F**	**Interchange Agreements**	**Statement:** Support interactions with entity directories to determine the address, profile and data exchange requirements of known and/or potential partners. Use the rules of interaction specified in the partner's interchange agreement when exchanging information. **Description:** Systems that wish to communicate with each other, must agree on the parameters associated with that information exchange. Interchange Agreements allow an EHR-S to describe those parameters/criteria. An EHR-S can use the entity registries to determine the security, addressing, and reliability requirements between partners. An EHR-S can use this information to define how data will be exchanged between the sender and the receiver. Discovery of interchange services and capabilities can be automatic. For example: - A new application can automatically determine a patient demographics source using a Universal Description and	**E**	1. The system **SHALL** use interchange agreement descriptions standards when exchanging information with partners. 2. The system **SHOULD** use interchange agreement description standards (when available). 3. The system **MAY** conform to function IN.3 (Registry and Directory Services) to interact with entity directories to determine the address, profile and data exchange requirements of known and/or potential partners. 4. The system **MAY** provide the ability to automatically discover interchange services and capabilities.

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			Discovery Integration (UDDI) for source discovery, and retrieve the Web Services Description Language (WSDL) specification for binding details. - Good Health Hospital is a member of AnyCounty LabNet, for sharing laboratory results with other partners. Good Health Hospital periodically queries LabNet's directory (UDDI) to determine if additional information providers have joined LabNet. When new information providers are discovered, the Good Health IT establishes the appropriate service connections based upon the Service Description (WSDL).		
IN.5.5	***H***	***EDIS Interoperability***	***Statement:*** *Support EDIS integration, using available and developing interoperability solutions, for the importation and exportation of information to support care delivery and ED operations.* ***Description:*** *ED care requires access to and sharing of substantial amounts of information. When deploying an EDIS, certain types of integration need to be supported, based upon the unique needs of the institution. For example, one hospital may elect to integrate the EDIS with the hospital order entry system for all outbound lab, radiology, and pharmacy orders. Others may need to interface to these systems directly. Regardless of how this integration is carried out, certain heuristics of these different order types need to be considered. Data may be imported into the system to plan care and may be exported to other providers. Documents may be structured or unstructured.*	***E***	*1. The system **SHALL** support integration with hospital systems sufficient to integrate patient registration, laboratory, diagnostic radiology, and pharmacy departments in the ED care process.* *2. The system **SHALL conform to*** DC.2.3.2 (Support for Medication and Immunization Administration) and *integrate with medical dispensing equipment including drug delivery systems and point of care devices to support the electronic medication administration process.* *3. The system **SHOULD** support dynamic query to enterprise or federated data repositories to retrieve problem lists, medications, and allergies.* *4. The system **SHOULD** provide a means to browse documents in a Clinical Document Repository.* *5. The system SHOULD support integration with PACS systems.* *6. The system MAY provide a means to integrate with materials management systems.*
IN.5.5.1	***F***	***Bed Board Interface***	***Statement****: Interface with bed management information system.* ***Description****: Hospital bed management systems are becoming more prevalent. The system should communicate with bed request system to support the hospital admission process. Bed allocation for admitted patients involves identifying the bed type needed (such as ICU, telemetry, isolation, private or patient's gender). The announcement of bed type needed mobilizes a series of hospital processes.*	***EF 10***	*1. The system **SHALL** interface with the bed-board system to support bed requests.* *2. The system **SHOULD** be able to receive messages from the bed management system that a bed is available or will be available at a scheduled time.*
IN.5.5.2	***F***	***Electronic Prescribing Interface***	***Statement****: Interface with external pharmacy systems.* ***Description****: The system should support the electronic transfer of prescriptions to outpatient pharmacies. This workflow includes initial transmission of the prescription,*	***EF 10***	*1. The system **SHALL** support electronic transmission of prescriptions.* *2. The system **SHOULD** provide a means to receive messages from external pharmacies about prescription problems,*

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			verification of receipt and prescription filling. Bas		*interactions, suggested substitutions and other issues that relate to prescription filing* *3. The system **MAY** provide a mechanism to receive messages from outpatient pharmacies about potential prescription abuse or use.*
IN.5.5.3	***F***	***Billing Interface***	***Statement:** Interface with billing information systems* ***Description**: Provide means to send messages to billing systems to support the generation bills for facility, medication, supply and physician services. Frequently, external contractors provide billing services for physician and hospital organizations. Provide a means to send messages to external billing systems to support the generation bills for facility, medication, supply and physician services.*	***O***	*1. The system **SHALL** support interfaces to billing systems to allow sending information needed to construct bills for facility, supply, medication and physician services* *2. The system **SHOULD** provide a means for receiving confirmations of messages received by the enterprise billing system.*
IN.6	**F**	**Business Rules Management**	**Statement:** Manage the ability to create, update, delete, view, and version business rules including institutional preferences. Apply business rules from necessary points within an EHR-S to control system behavior. An EHR-S audits changes made to business rules, as well as compliance to and overrides of applied business rules. **Description:** EHR-S business rule implementation functions include: decision support, diagnostic support, workflow control, and access privileges, as well as system and user defaults and preferences. An EHR-S supports the ability of providers and institutions to customize decision support components such as triggers, rules, or algorithms, as well as the wording of alerts and advice to meet realm specific requirements and preferences. Examples of applied business rules include: - Suggesting diagnosis based on the combination of symptoms (flu-like symptoms combined with widened mediastinum suggesting anthrax); - Classifying a pregnant patient as high risk due to factors such as age, health status, and prior pregnancy outcomes; - Sending an update to an immunization registry when a vaccination is administered; - Limiting access to mental health information to authorized providers; - Establishing system level defaults such as for vocabulary data sets to be implemented.; and - Establishing user level preferences such as allowing the use of health information for research purposes.	**E**	1. The system **SHALL** provide the ability to manage business rules. 2. The system **SHOULD** provide the ability to create, import, or access decision support rules to guide system behavior. 3. The system **SHOULD** provide the ability to update decision support rules. 4. The system **SHOULD** provide the ability to customize decision support rules and their components. 5. The system **SHOULD** provide the ability to inactivate, obsolete, or destroy decision support rules. 6. The system **SHOULD** conform to function IN.2.2 (Auditable Records) to audit all changes to decision support rules. 7. The system **SHOULD** provide the ability to create diagnostic support rules to guide system behavior. 8. The system **SHOULD** provide the ability to update diagnostic support rules. 9. The system **MAY** provide the ability to customize diagnostic support rules and their components. 10. The system **SHOULD** provide the ability to inactivate, obsolete, or destroy diagnostic support rules. 11. The system **SHOULD** conform to function IN.2.2 (Auditable Records) to audit all changes to diagnostic support rules.

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					12. The system **SHALL** provide the ability to manage workflow control rules to guide system behavior. 13. The system **SHOULD** provide the ability to update workflow control rules. 14. The system **MAY** provide the ability to customize workflow control rules and their components. 15. The system **SHOULD** provide the ability to inactivate, obsolete, or destroy workflow control rules. 16. The system **SHOULD** conform to function IN.2.2 (Auditable Records) to audit all changes to workflow control rules. 17. The system **MAY** provide the ability to create access privilege rules to guide system behavior. 18. The system **MAY** provide the ability to update access privilege rules. 19. The system **MAY** provide the ability to customize access privilege rules and their components. 20. The system **MAY** provide the ability to inactivate, obsolete, or destroy access privilege rules. 21. The system **MAY** conform to function IN.2.2 (Auditable Records) to audit all changes to access privilege rules. 22. The system **SHOULD** conform to function IN.2.2 (Auditable Records) to audit all changes to other business rules. 23. The system **SHOULD** support the ability to selectively export business rules.
IN.7	**F**	**Workflow Management**	**Statement:** Support workflow management functions including both the management and set up of work queues, personnel lists, and system interfaces as well as the implementation functions that use workflow-related business rules to direct the flow of work assignments. **Description:** Workflow management functions that an EHR-S supports include: -Distribution of information to and from internal and external parties; -Support for task-management as well as parallel and serial task distribution; -Support for notification and task routing based on system triggers; and -Support for task assignments, escalations and redirection in accordance with business rules. Workflow definitions and management may be implemented by a	**E**	1. The system **SHALL** use workflow-related business rules to direct the flow of work assignments. 2. The system **SHOULD** provide the ability to manage workflow (task list) queues. 3. The system **MAY** provide the ability to manage human resources (i.e., personnel lists) for workflow queues. 4. The system **MAY** use system interfaces that support the management of human resources (i.e., personnel lists) 5. The system **MAY** use system interfaces that support the management of workflow (task lists) queues

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			designated application or distributed across an EHRS. Work and information flow in the ED is naturally asynchronous and done in both parallel and serial modes. Priority of tasks can change over time and as new information is available. Additionally information used to change workflow tasking comes from multiple sources.		6. The system **MAY** provide the ability to distribute information to and from internal and external parties 7. The system **SHOULD** provide the ability to route notifications and tasks based on system triggers. 8. The system **MAY** dynamically escalate workflow according to business rules. 9. The system **MAY** dynamically redirect workflow according to business rules. 10. The system **MAY** dynamically reassign workflow according to business rules. *11. The system **SHOULD** direct and redirect information to providers to optimize workflow based on ad hoc decisions.*
IN.8	**F**	**Application Performance**	**Statement:** Performance characteristics essential to support or maintain workflow in the ED. **Description:** Speed of system response is both an implementation element and a necessity for EHR adoption. It is essential that system response speed fast enough that there are no added delays in workflows in the ED when using the system. This also includes other performance and issues including logins, application timeouts.	**E**	1. The system **SHALL** provide response to information requests from providers in sub-second times so as to not impair user attention, workflow, or patient flow in the ED practice setting. 2. The system **SHOULD** facilitate the login process by requiring only the information required to satisfy authentication. 3. The system **SHOULD** permit local setting of application timeout. 4. The system **SHOULD** log a user off a particular workstation if the user logs on to another workstation.

Appendix A: Glossary of Terms and Acronyms

Term	***Definition***
ADT	Admission, Discharge and Transfer
CPOE	Computerized Provider Order Entry
DSTU	Draft Standard for Trial Use
EDIS	Emergency Department Information System
EHR-S	Electronic health record system
Follow-up	Care scheduled or recommended for the patient discharged from the ED
Pre-arrival	The phase of ED Care when a patient is made known to ED personnel, but has not yet arrived. Pre-arrival data is obtained on a patient prior to arrival in the ED
RHIO	Regional Health Information Organization