HITSP Emergency Responder – Electronic Health Record Use Case Requirements, Design and Standards Selection

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FIGURES AND TABLES

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1.0 INTRODUCTION

As an introduction to the HITSP Emergency Responder – Electronic Heath Record Use Case Requirements, Design and Standards Selection, this section describes the purpose of the document, the intended audience for the technical content of the document, and how to use this document. It acknowledges the copyright protections that pertain, provides Internet links to the HITSP Acronyms List and an explanation of the conventions we use to convey the full descriptions and usage of standards. If you are already familiar with this information, proceed to Section 2.0 Requirements Analysis.

1.1 PURPOSE

The Requirements, Design and Standards Selection document is used to define the requirements for the Use Case and the detailed HITSP Interoperability Specification design map of existing standards and specifications that will be used to meet the stated requirements. It is intended to describe the process by which the Use Case was analyzed, requirements were identified, candidate standards were identified and the design was developed.

1.2 AUDIENCE

The Requirements, Design and Standards Selection document is designed to be used by the HITSP Technical Committees or Work Groups to document their analysis and decisions, other analysts who need to understand and evaluate the requirements, design and selected standards, and by those intending to test the resulting Interoperability Specifications against the Use Case requirements. Understanding and using the relevant set of Interoperability Specifications is a key requirement for establishing interoperability compliance.

1.3 HOW TO USE THIS REQUIREMENTS, DESIGN AND STANDARDS SELECTION DOCUMENT

The Requirements, Design and Standards Selection document is divided into five main related sections. Each section provides background information for the Interoperability Specification. Section 1.0 provides a brief introduction to the document. Users of this document who are familiar with the content may choose to proceed to Section 2.0. In Section 2.0, the Requirements Analysis provides a general overview of the Use Case and the specific requirements of the Use Case including a mapping of the Use Case requirements to the extracted business requirements, the data requirements of the Use Case, and an identification of the scenarios, business actors, their interactions, and data elements used in those interactions. The design for the Interoperability Specification is provided in Section 3.0. This includes the scope of the design, mapping of business requirements to the specific technical requirements, actor interactions and groupings, detailed descriptions of data used by the Use Case actors, and a description of existing or new HITSP constructs that will be used by the Interoperability Specification. Section 4.0 describes the Standards Selection process, provides a table of the candidate standards, a Gaps and Overlaps discussion and plan for resolution. Section 5.0 describes the next steps in the HITSP standards harmonization process and Section 6.0 provides relevant appendix material.

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1.3.1 CONVENTIONS, ACRONYMS AND RESOURCES/REFERENCES

This section contains links to the HITSP naming conventions and acronyms, as well as any additional relevant resources or references.

The naming conventions are used to convey the full descriptions and usage of standards in the Interoperability Specification and are contained in the HITSP Conventions List.

The acronyms used in this document are contained in the HITSP Acronyms List.

The HITSP Harmonization Framework describes the current framework within which the Interoperability Specifications are built.

This specification is based upon the Emergency Responder - Electronic Health Record (ER-EHR) Detailed Use Case, December 20, 2006.

1.4 COPYRIGHT PERMISSIONS

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2.0 REQUIREMENTS ANALYSIS

This section provides a high level description of the Emergency Responder – Electronic Heath Record Use Case as well as the specific requirements that are extracted from the Use Case. It includes the following information:

- Mapping from the Use Case Requirements to the Derived Business Requirements – this table lists the requirements grouped by actor for each event and related action

- Data Element Requirements – this table further describes the data requirements for each specified business requirement and the business actor that is responsible for the data

- Business Actors – this table defines the business actors that are included for the Interoperability Specification

- High Level UML Interaction (Business Sequence) Diagrams – these diagrams are used to describe the interaction between the business actors, and the data involved in each scenario that is documented

2.1   USE CASE SYNOPSIS

This section provides a synopsis of the Emergency Responder – Electronic Heath Record (ER-EHR) Use Case, including any applicable scenarios that are part of the Use Case.

This Use Case scenario covers the use of an ER-EHR from the perspective of on-site emergency care providers and emergency care clinicians. It includes those involved in the care and treatment of emergency incident victims, medical examiner/fatality managers investigating cause of death, and public health practitioners using information contained in the ER-EHR.

The Use Case begins with the dispatch of on-site care providers to the scene of an emergency incident and follows the patient through initial treatment, the evacuation process to emergency medical treatment facilities, and ends when the emergency care information is passed to the electronic health record.

Two major concepts are described, Small Scale Incident and Large Scale Incident.

A small scale incident is one in which a moderate number of individuals are injured/ill, where the medical resources of an individual city, county or metropolitan area can handle the numbers of casualties. The ability to provide routine care is not compromised. The timescale for response is normally expected to be less than twenty-four hours. Examples may include routine incidents such as motor vehicle accidents, or less common events such as large chemical spills or the collapse of an office building.

A large scale incident is one in which the number of casualties is such that the local resources must be augmented by external resources (regional, State and/or Federal). The incident may occur across several geographic areas or it may be nationwide in scope. The ability to provide routine care will potentially be curtailed. External command and control is required to best match casualty needs to capabilities. The timescale

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for on-site response is typically greater than twenty-four hours and may extend to days, weeks or months. Communication networks may be partially or completely unavailable. It is likely that medical treatment facilities will be unable to process incoming patients as rapidly as is required, and triage decisions become critical.

Examples may include the crash of a large airliner, a large scale terrorist attack, a major military combat operation, or a large natural or man-made disaster such as Hurricane Katrina or an occurrence of pandemic disease.

2.2 USE CASE REQUIREMENTS

This section describes the Use Case requirements.

The Use Case is driven by the requirements of timely electronic access to critical health information relating to the assessment, stabilization and treatment of the victims of emergency incidents. This could range from individuals suffering from accidents or acute episodes of illness to large groups of people suffering as the result of widespread casualty incidents including natural disasters and terrorism (e.g. small and large scale incidents as described above).

It describes the role of an ER-EHR comprising at minimum, emergency contact information, demographic, medication, allergy and problem list information that can be used to support emergency and routine healthcare activities. Three perspectives are defined; on-site care, emergency care and definitive care.

On-site care providers are the initial personnel to deliver medical care at the scene of an incident. While this would typically be Emergency Medical Technicians (EMTs), they can also include medically trained fire, law enforcement, and uniformed services medical personnel and civilian disaster medical assistance teams (DMATs). They assess and stabilize the patients' medical conditions, extricate them from dangerous locations, perform triage, and evacuate them to a temporary or permanent medical treatment facility (MTF) to receive emergency care. On-site care providers usually work outside MTFs, except in the military and Public Health Service (PHS) where they may staff Battalion Aid Stations and Federal Medical Stations (FMS).

Clinical care personnel operating in a MTF provide emergency care. They usually work in an Emergency Department (ED) or equivalent military or federal facility, evaluating and or treating patients before they are discharged, admitted to an inpatient facility, or deceased. This includes emergency physicians, emergency nurses, advanced practice nurses (e.g. nurse practitioners, nurse anesthetists) physician's assistants, military corpsmen and all other clinical and ancillary personnel at the MTF.

Definitive care is given by non-ED clinical personnel providing acute, rehabilitative, or custodial care. They evaluate and treat patients in locations other than an ED, such as acute care hospitals, specialty hospitals, dialysis centers, nursing homes and other facilities. They may include physicians, nurses, respiratory therapists, technicians, and many others.

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The ER-EHR Use Case requires:

1. the deployment of standardized, widely available and secure solutions for accessing current and historical health data by those involved in the response to an emergency situation
2. the ability to document and electronically share the current episode of care
3. the ability for EHR systems to support remote consults
4. the ability of monitoring device data to be entered into an EHR
5. the ability to distribute situation reports - "situation awareness reports" can be categorized as
   a. situation centric (e.g., incident description and status)
   b. patient centric (e.g., demographics and present episode of care)
   c. resource centric, (e.g., personnel, bed, ER status) and public health centric (e.g., anonymized data)

2.2.1 MAPPING OF USE CASE REQUIREMENTS TO BUSINESS REQUIREMENTS

This section contains an extraction of business actors, required interactions and conditions/scenarios from the ER-EHR Use Case into a matrix/table. Three tables are provided, one for each scenario perspective; On Site Care, Emergency Care and Definitive Care.

Table 2.2.1-1 illustrates the mapping between the business actors and their Use Case requirements for the scenario perspective On Site Care.

Table 2.2.1-1 Mapping of Use Case Requirements to Business Requirements – On Site Care

Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
911 Call Center	Scenario Perspective 6.1 On Site Care	EVENT: 6.1.1 On-site Management and Coordination	ACTION: 6.1.1.1 On-site care providers are dispatched. Patient location information from emergency dispatch center systems will be communicated to on-site care providers. Emergency medical operations personnel coordinate response deployment.	DATA: Patient's name, location, chief complaint For small scale incidents, basic information such as patient's name, location, and chief complaint are gathered by the 911 communicator from the individual making the emergency call when possible. For larger scale incidents, dispatchers may gather less specific information about individual patients. Information provided by the caller on the size and nature of the incident, and characteristic injuries of the patients associated with the incident will allow the proper personnel/units/apparatus to be dispatched.	Data: 1,2,6,7,11,12 Issues: None

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
Emergency Dispatch & Ops Centers (EOC)	Scenario Perspective 6.1 On Site Care	EVENT: 6.1.1 On-site Management and Coordination	ACTION: 6.1.1.1 On-site care providers are dispatched. Patient location information from emergency dispatch center systems will be communicated to on-site care providers. Emergency medical operations personnel coordinate response deployment.	DATA: Patient's name, location, chief complaint For small scale incidents, basic information such as patient's name, location, and chief complaint are gathered by the 911 communicator from the individual making the emergency call when possible. For larger scale incidents, dispatchers may gather less specific information about individual patients. Information provided by the caller on the size and nature of the incident, and characteristic injuries of the patients associated with the incident will allow the proper personnel/units/apparatus to be dispatched.	Data: 1,2,6,7,12 Issues: None
			ACTION: 6.1.1.2 Situation Report from Dispatch/EOC to ED facility and Other Providers	Gather information to distribute to situation awareness reports keeping all involved medical entities informed of the situation This is a continuous action. Location, situation, patients, etc.	Data: 7,11,12 Issues: 3
On-site Care Providers (often EMTs) / Incident Command Post	Scenario Perspective 6.1 On Site Care	EVENT: 6.1.1 On-site Management and Coordination	ACTION: 6.1.1.3 On-site care providers assess the situation, determine the scope of required care and evacuation, notifying responding agencies of the situational assessment, and organize additional units if required.	On-site medical personnel arrive on-site and perform an assessment of the incident site to determine the scope of medical care and evacuation required. In certain incidents, care and evacuation will require multiple on-site teams. If the initial on-site team recommends that additional resources maybe required such as additional EMT teams, fire and rescue, police and other response units, they shall be able to convey this information back to the Emergency Dispatch Center. After on-site assessment and communication with the Emergency Dispatch Center, the need for an on-site triage collection point and or a medical incident command post shall be established. Until an incident command post is operational, the first team may serve as to organize subsequent arriving units. Once the command post has become operational they will assume command over the incident site and all assigned personnel.	Data: 12 Issues: 3 may apply
		EVENT: 6.1.2 Start collection of on-site care information	ACTION: 6.1.2.1 Collection of patient information is begun for each instance of care.	On-site crews use the information received from the Emergency Dispatch Center to begin collection of on-site information. This may take several forms such as an ambulance run report or a field medical card. The basic patient information is entered and verified as much as possible for accuracy. The information is verified with patient, family members, or others who may have the information at the incident scene.	Data: 13 Issues: 3, 4 may apply

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
		EVENT: 6.1.3 Access additional patient health information	ACTION: 6.1.3.1 Additional patient information may be accessed and viewed from health information repositories such as existing patient electronic health records (either from an individual healthcare entity or a health information service provider), handheld storage devices, or web-hosted personal health records. Other sources such as patient registries may be accessed to view information such as emergency contact information and prescriptions. The queries for information are secondary to the stabilization and treatment of the patients ACTION: 6.1.3.1a Information from the EHR and/or PHR is not available (this would include jurisdictions that have not yet implemented electronic on-site care information collection).	On-site care providers attempt to identify the patient. If the patient can be identified the on-site care providers send a query to receive relevant patient specific information from an emergency contact registry, the EHR or a physical PHR storage device (if available). Both the query and retrieval are auditable. If the patient can not be identified, a patient identifier is added to the on-site information. A: If information is not available from the EHR/PHR, the on-site crew will enter as much information as possible in a manual mode, on a treatment non-interference basis. The information source could be the patient, family member, or friend who has knowledge about certain basic aspects of the patient's health condition, such as allergies, past episodes of care, current medications, primary care physician, etc.	Data: 1,2,3,4,5,8,9,10 Issues: 2,3,4,7 may apply (A): Issues 3,4,9 may apply
		EVENT: 6.1.4 Assess, triage and treat patient	ACTION: 6.1.4.1 EMTs will assess the patient's condition, develop a working diagnosis, determine triage category, and treat the patient's injuries and/or illnesses in order to stabilize the patient for transportation to the designated medical treatment facility. (Note: the patient may not have sufficient injuries to require transport)	On-site care providers perform an assessment of the patient's condition and develop a working diagnosis. Based upon predetermined triage criteria, the on-site care team makes a decision regarding the level of care required (e.g. transport to the closest hospital or to a trauma center), the mode of transportation (ground or air) required by the patient, and the priority of movement (delayed, immediate, minimal or expectant). The on-site team reviews the updated on-site information to identify risks associated with the patient's pre-existing conditions, medications, allergies, and then administers basic treatment of patient injuries and/or illnesses accordingly, in order to stabilize the patient for transportation to the designated medical treatment facility. If available, they may utilize virtual consultation by a qualified clinician to assist in the assessment process.	Data: 2,6,13 Issues: 2,6 may apply

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
		EVENT: 6.1.5: Update on-site care information	ACTION: 6.1.5.1 The on-site care treatment team updates the on-site care information on the treatment provided	The patient's destination, mode of transport and priority of movement are sent by the on-site team to the emergency dispatch and emergency management systems.	Data: 2,6,13 Issues: 3,8 may apply
		EVENT: 6.1.6 Transport patient	ACTION: 6.1.6.1 Transport the patient to the designated medical treatment facility.	On-site care information is updated with any treatment rendered en-route. Any medications, changes in vital signs, etc. are updated in the on-site care information. This may include information feeds from automated medical devices such as blood pressure monitors. In many situations, the recording of the information may take place at the destination facility.	Data: 2,6,13 Issues: 2,3,9 may apply
		EVENT: 6.1.7 Provide Information	ACTION: 6.1.7.1 The on-site care information is made available to the receiving facility. ACTION: 6.1.7.1a Power or communication failures.	On-site care information is made available to the receiving facility and/or the appropriate repositories. The on-site treatment team updates the patient on-site information with treatment provided to the patient by the transportation team (if required). If the patient requires transport, the on-site treatment team transmits the updated on-site information to the designated receiving facility so that appropriate resources (including clinicians) may be available at the time of patient arrival. Appropriate information is sent to EOC systems and public health agencies that use the information to track health resources and conduct bio-surveillance respectively. The information sent to EOC systems is non-identifying or anonymized. All information exchanges are auditable.

A: A paper copy of the health record is kept for the patient, a copy of which is transferred with the patient to the staff at the receiving facility. Once power and IT communications are restored, the information can be re-entered into the electronic health record, after the fact, possibly by scanning the record. All information exchanges are auditable. | Data: 2,6,13 Issues: 1,2,3,4,8,9 may apply A: Issues 1,2,3,4,7,8,9 may apply |
| Service Providers & Other Healthcare Systems | | | | Intermediary for 6.1.3.1 and 6.1.4.1 | Intermediary for 6.1.3.1 and 6.1.4.1 |
| Facility EHR Repository | | | | Intermediary for 6.1.3.1 | Intermediary for 6.1.3.1 |

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
Emergency Contact Registry				Intermediary for 6.1.3.1	Intermediary for 6.1.3.1
Personal Health Record (PHR)				Intermediary for 6.1.3.1	Intermediary for 6.1.3.1
Emergency Care Dept. Staff				Intermediary for 6.1.6.1	Intermediary for 6.1.6.1
Public Health Agencies				Receives data for own use	Data: 2,6,13 Issues: 1,2,3,4,8,9 may apply A: Issues 1,2,3,4,7,8,9 may apply

Table 2.2.1-2 illustrates the mapping between the business actors and their use care requirements for the scenario perspective Emergency Care.

Table 2.2.1-2 Mapping of Use Case Requirements to Business Requirements – Emergency Care

Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
Emergency Dispatch & Ops Centers	Scenario Perspective 6.2 Emergency Care Perspective	EVENT: 6.2.1 Emergency care site management and coordination	ACTION: 6.2.1.1 The emergency care facility is notified by the Emergency Dispatch Center regarding the in-bound patient.	ED clinical care personnel are notified by the Emergency Dispatch Center of the in-coming patient. If information recorded during on-site care is available, ED clinical care personnel receive and review the record (emergency contact information, demographics, diagnosis, triage outcome, treatment provided) to ensure appropriate resources are available (e.g. specialists, lab tests, blood products, radiology etc) to appropriately treat the patient upon arrival. An alert may be sent to the patient's primary care physician (if applicable). All information exchanges are auditable.	Data: 1,2,6,13 Issues: 2,3,4,5,6 may apply
			ACTION:: 6.2.1.2 EOC systems send situational awareness reports to all involved medical units and systems.	As information is gathered from a number of sources, EOC systems will prepare and disseminate situational awareness reports keeping all involved medical entities informed of the situation.	Data: 12 Issues: None

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
Emergency Care Dept. Staff	Scenario Perspective 6.2 Emergency Care Perspective	EVENT: 6.2.2 Start Emergency care record	ACTION: 6.2.2.1 The patient is logged into the emergency care facility, thus starting the emergency care record for this instance of care. ACTION: 6.2.2.1a Patient is dead on arrival. ACTION: 6.2.2.1b Power or communication failures. ACTION: 6.2.2.1c Patient cannot be identified.	When the patient arrives at the ED, clinical care staff will log the patient into the system used at their facility and create a record for each patient for each encounter. Basic registration information (emergency contact information, patient demographics, employer, health insurance, etc.) is added to the clinical information derived from the on-site care record. All information exchanges are auditable. A: An emergency care record is begun for the patient. Basic registration information (emergency contact information, patient demographics, employer, health insurance, etc.) is added to the clinical information derived from the on-site care record. Once the patient is pronounced dead by a physician, the emergency care is so annotated and closed. B: A paper copy of the health record is begun for the patient. Once power and IT communications are restored, the information can be re-entered into the electronic health record, possibly by scanning the record. Additional sites at remote locations may be employed as backups for the primary repository in case of widespread communications and power outages caused by natural or man-made disasters. All information exchanges are auditable. C: A record is started with a patient identifier. If and when the patient's identity is established and validated, the emergency care record and on-site care record will be joined together under the patient's correct identity. All information exchanges are auditable.	Data: 1,2,6,14 Issues: 2,3,4,5,6 may apply A: Issues 4,5,6 may apply B: Issues 1,2,3,4,7,8 may apply C: Issues 1,2,3,4,7,8 may apply

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
		EVENT: 6.2.3 Access additional patient health information	ACTION: 6.2.3.1 Additional patient information may be accessed and viewed from health information repositories such as existing patient electronic health records (either from an individual healthcare entity or a health information service provider), handheld storage devices or web hosted personal health records. Other sources such as patient registries may be accessed to view information such as emergency contact information, prescriptions and insurance claims databases (if available). ACTION: 6.2.3.1a Patient presents without an on-site care record.	A query is sent to the Health Information System (HIS) for information on the patient. The local HIS utilizes available information exchange services to request, locate, and retrieve patient information from other sources. The on-site care information and the retrieved electronic health record are accessible to the clinical staff and should be integrated into the emergency care record. For ease of use, the information may be summarized according to the clinical staff's preferences. If available and feasible, the personal health records may also populate the emergency care record. All information exchanges are auditable. A: Patients who enter the emergency facility through a means other than on-site care, such as self-referral, brought in by family or friends, etc. will have their relevant emergency contact information, demographics, allergies, and past episodes of care captured by the ED staff who shall log them in and start a new emergency care record for the new patient encounter. A query for the patient's health information will be sent out through the HIS. The local HIS utilizes available information exchange services to request, locate, and retrieve patient information from other sources. All information exchanges are auditable.	Data: 1,2,6,14 Issues: 2,3,4,5,6,7 may apply A: Issues 2,3,4,5,6,8 may apply
		EVENT: 6.2.4 Assess, triage, perform tests and treat patient	ACTION: 6.2.4.1 The clinical staff reviews treatment provided by on-site care providers and validates their initial assessment, adding any additional observations, and determining the patient's triage category. Clinical personnel treat the patient's injuries or illness. ACTION: 6.2.4.1a Access the patient's EHR via emergency facility's IT systems integrated with EHR repositories.	Upon arrival of the patient at the treatment facility, the clinical staff reviews the emergency care record concerning treatment provided by on-site care providers and validates their initial assessment, adding any additional observations and making triage decisions as to the priority for treatment. The outcome of this activity would be a working diagnosis of the patient's conditions. If available, the clinical staff may utilize virtual specialty consultation by a qualified clinician to assist in the assessment process. The patient's injuries or illnesses are treated with the clinical staff referring to the emergency care record as part of the process. A: If the treatment facility possesses an IT infrastructure with its own EHR, the demographic and clinical information contained in the emergency care record will be uploaded into the facilities' repository and used to populate/update the patient's EHR. All information exchanges are auditable.	Data: 1,2,6,10,13,14 Issues: None A: Issues 3,4,7,8 may apply

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
		EVENT: 6.2.5 Input information in emergency care record	ACTION: 6.2.5.1 As treatment progresses, information such as the results of diagnostic tests, treatment and medications rendered, and any changes to the treatment plan are entered into the emergency care record. Information is continually sent to public health agencies for population health monitoring purposes.	Information is added to the emergency care record by the clinical care staff. This will update the working diagnosis, treatment rendered, medications given, and profiles for limits to Activities of Daily Living (ADL). Diagnostic testing results are also collected and updated into the emergency care record. This may include information feeds from automated medical devices such as blood pressure monitors. All information exchanges are auditable.	Data: 1,2,6,14 Issues: 2,3,4,8 may apply

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
		EVENT: 6.2.6 Complete disposition; Provide information	ACTION: 6.2.6.1 Once treatment is complete, the patient is directed to any follow-on care as deemed necessary. ACTION: 6.2.6.1a Patient is discharged. ACTION: 6.2.6.1b Patient is admitted to inpatient status. ACTION: 6.2.6.1c Patient is transferred to another in-patient facility. ACTION: 6.2.6.1d Patient is deceased.	Once the patient has received the needed care at the emergency facility, they are sent to the appropriate follow-on facility which can provide any additional care they may require, if any, either short or long-term. A: If the patient requires no further treatment, the appropriate notations are made in the emergency care record by the clinical care staff, closing the patient encounter. The emergency care information is sent via the HIS to the appropriate repository to be combined with the patient's electronic health record. All information exchanges are auditable. B: If the patient is admitted to the definitive care portion of the facility, the emergency care is so notated by the clinical care staff and is closed for that patient encounter. The emergency record is sent by the clinical care staff to the admissions office and the receiving ward. All information exchanges are auditable. C: If the patient is transferred to another facility, the emergency care record is so notated by the clinical care staff and the patient encounter is closed. The emergency care record will accompany the patient (in a paper copy), while a copy of the record is sent to the HIS to post in the patient's electronic health record in the appropriate repository. All information exchanges are auditable. D: If the patient dies in the emergency care facility, a notation is made in the emergency care record by the clinical care staff of the time and circumstance of the death and the record is then closed for that patient encounter. Notification is sent by the clinical care staff to the Medical Examiner (currently by telephone) of the date and cause of the patient's death.	Data: 1,2,6,14 Issues: None A: Issues 2,3,4,6,7,8 may apply B: Issues 2,3,4 may apply C: Issues 2,3,4,5,6,7,8 may apply D: Issues None

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
		EVENT: 6.2.6 Complete disposition; Provide information	ACTION:: 6.2.6.2 Once treatment is complete, information about the patient encounter will be available for other records relating to the patient, including (if they are available) any facility-based records and personal health records. It will also be available to the appropriate repositories.	Transmitted via the HIS to the appropriate repository (or repositories), the emergency care record is used to populate or update the patient's electronic health record and the PHR. Information exchanges may also occur with laboratories, pharmacies, blood banks etc. Appropriate information is sent to EOC systems and public health agencies that use the information to track health resources and conduct bio-surveillance respectively. The information sent to EOC systems is non-identifying or anonymized. All information exchanges are auditable.	Data: 1,2,6,11,14 Issues: 1,3,4,6,7,8 may apply
Emergency Contact Registry				Intermediary for 6.2.3.1	Intermediary for 6.2.3.1
Service Providers & Other Healthcare Systems				Intermediary for 6.2.3.1	Intermediary for 6.2.3.1
Personal Health Record (PHR)				Receives data for own use	Data: 1,2,3,4,5,6,8,9 Issues: 1,3,4,6,7,8 may apply
Another Facility				Receives data for own use	Data: 1,2,6,14 Issues: None A: Issues 2,3,4,6,7,8 may apply B: Issues 2,3,4 may apply C: Issues 2,3,4,5,6,7,8 may apply D: Issues None

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
Medical Examiner / fatality manager				Receives data for own use	Data: 1,3,4,5,6,8,9 Issues: None A: Issues 2,3,4,6,7,8 may apply B: Issues 2,3,4 may apply C: Issues 2,3,4,5,6,7,8 may apply D: Issues None
Public health agencies				Receives data for own use	Data: 1,3,4,5,6,8,9 Issues: 1,3,4,6,7,8 may apply
Appropriate Shared (HIS) repositories				Receives data for own use	Data: 1,3,4,5,6,8,9 Issues: None A: Issues 2,3,4,6,7,8 may apply B: Issues 2,3,4 may apply C: Issues 2,3,4,5,6,7,8 may apply D: Issues None

Table 2.2.1-3 illustrates the mapping between the business actors and their Use Case requirements for the scenario perspective Definitive Care.

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Table 2.2.1-3 Mapping of Use Case Requirements to Business Requirements – Definitive Care

Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
Clinical Staff	Scenario Perspective 6.3 Definitive Care Perspective	EVENT: 6.3.1 Access/Start (EHR (if required)	ACTION: 6.3.1.1 Access existing facility electronic health record or start a new electronic health record if one does not already exist for this patient. ACTION: 6.3.1.1a Power or communication failures. ACTION: 6.3.1.1b Patient cannot be identified.	A query is sent by the clinical care staff to the facility database for existing information on the patient. All information exchanges are auditable. A: A paper copy of the health record is begun for the patient. Once power and IT communications are restored, the information can be re-entered into the electronic health record, possibly by scanning the record. Additional sites at remote locations may be employed as backups for the primary repository in case of widespread communications and power outages caused by natural or man-made disasters. All information exchanges are auditable. B: A record is started with a patient identifier. If and when the patient's identity is established and validated, the emergency care record and on-site care record will be joined together with patient's electronic health record under the patient's correct identity. All information exchanges are auditable.	Data: 1,2,3,4,5,6,8,9, 10,15 Issues: 1,2,3,4,7,8 may apply A: Issues 1,2,3,4,7,8 may apply B: Issues 1,2,3,4,7,8 may apply
Emergency Dispatch & Ops Centers		EVENT: 6.3.1 Access/Start (EHR (if required)	ACTION: 6.3.1.2 EOC system sends situational awareness reports to all involved medical units and systems.	As information is gathered from a number of sources, EOC systems prepare and disseminate situational awareness reports keeping all involved medical entities informed of the situation.	Data: 12 Issues: None
Facility EHR Repository		EVENT: 6.3.2 Access additional patient health information	ACTION: 6.3.2.1 Access Electronic Health Record	The clinical staff send a request to the HIS for patient information which may reside within its affiliated repositories. The on-site information, emergency care record and the retrieved electric health record is accessible to the clinical staff. All information exchanges are auditable.	Data: 1,2,3,4,5,6,8,9, 10,15 Issues: 1,2,3,4,7,8 may apply
		EVENT: 6.3.2 Access additional patient health information	ACTION: 6.3.2.2 Where feasible, the emergency care record and any archival information (emergency contact (ECON), EHR, PHR) may be integrated with the facility electronic health record.	The Emergency Contact Registry, PHR/EHR information may be "view only", or if it can be integrated, it may be used by the clinical care staff to populate a patient record in the facility's patient management systems. All information exchanges are auditable.	Data: 1,2,3,4,5,6,8,9, 10,15 Issues: 1,2,3,4,7,8 may apply

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
		EVENT: 6.3.3 Assess, perform tests, treat patient	ACTION: 6.3.3.1 The clinical staff reviews treatment provided in the emergency setting, makes an assessment, adding any additional observations, performs required tests, and treats the patient's injuries or illness. ACTION: 6.3.3.1a Patient notes from emergency care have been recorded in the EHR repository and clinical staff retrieves information.	Upon arrival of the patient at the treatment facility, the clinical staff reviews the emergency care record concerning treatment provided by emergency care clinicians, adding any additional observations. The outcome of this activity would be an updated working diagnosis of the patient's conditions. The patient's injuries or illness is treated with the clinical staff referring to the electronic health record as part of the process. A: The clinical staff sends a query via the in-house system (if applicable) requesting the emergency care record health information on the patient. The information is received and the clinical staff combines this information with that from the electronic health record. All information exchanges are auditable.	Data: 1,2,3,4,5,6,8,9, 10,15 Issues: 6 may apply A: Issues 2,4,6 may apply
		EVENT: 6.3.4 Input information in EHR	ACTION: 6.3.4.1 Information related to diagnosis, tests, and treatment is recorded in the patient's EHR and PHR. Information is continually sent to public health agencies for population health monitoring purposes.	Clinical care staff update information to the electronic health record. It updates the working diagnosis, treatment rendered, medications given, and profiles for limits to ADL. Diagnostic testing results are also collected and updated into the electronic health record by the clinical care staff. This may include information feeds from automated medical devices such as blood pressure monitors. All information exchanges are auditable.	Data: 1,2,3,4,5,6,8,9, 10,15 Issues: 2,3,4,5,6,7,8 may apply

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
		EVENT: 6.3.5 Complete disposition; Provide information	ACTION: 6.3.5.1 Patient disposition occurs (i.e. discharged to home, with follow-up, to another facility, against medical advice, or deceased). ACTION: 6.3.5.1a The patient is discharged. ACTION: 6.3.5.1b The patient is transferred to inpatient status at another facility. ACTION: 6.3.5.1c The patient is discharged with outpatient follow-up. ACTION: 6.3.5.1d The patient is transferred to another facility. ACTION: 6.3.5.1e The patient is deceased. ACTION: 6.3.5.1f The patient is discharged against medical advice.	Patient care information is available for access by authorized clinical care staff in other facilities via the HIS. All information exchanges are auditable. A: If the patient requires no further treatment, the appropriate notations are made by the clinical care staff in the electronic health record, closing the patient encounter. The updated electronic health record information is sent by the clinical care staff via the HIS to the appropriate repository(ies) to be combined with the patient's electronic health record. All information exchanges are auditable. B: The electronic health record is sent directly to the receiving facility. A paper copy also accompanies the patient. It is also available to the clinical care staff via query through the HIS. All information exchanges are auditable. C: The updated electronic health record information is available to clinical care staff via query through the HIS. All information exchanges are auditable. D: The updated electronic health record information is sent directly to the receiving facility and is also available to clinical care staff through query via HIS. All information exchanges are auditable. E: If the patient dies in the definitive care facility, a notation is made in the electronic health record by clinical care staff of the time and circumstance of the death and the record is then closed for that patient encounter. Notification is sent by clinical care staff to the Medical Examiner (currently by telephone) of the date and cause of the patient's death. F: A notation by clinical care staff is made and signed in the electronic health record, closing that patient encounter.	Data: 1,2,3,4,5,6,8,9, 10,15 Issues: 2,3,4,6,7,8 may apply A: Issues 4,7,8 may apply B: Issues 1,2,3,4,5,6,7,8 may apply C: Issues 1,2,3,4,5,6,7,8 may apply D: Issues 1,2,3,4,5,6,7,8 may apply E: Issues None F: Issues None

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
		EVENT: 6.3.5 Complete disposition; Provide information	ACTION 6.3.5.2 Release of information.	Information on the patient's care for the present episode is sent by clinical care staff to the HIS where it is to be located with existing patient health information in the electronic health record. Appropriate information is sent to EOC systems and public health agencies that use the information to track health resources and conduct bio-surveillance respectively. The information sent to EOC systems is non-identifying or anonymized. All information exchanges are auditable.	Data: 1,2,3,4,5,6,8,9, 10,12,15 Issues: 1,2,3,4,7,8 may apply
Service Providers & Other Healthcare Systems				Receives data for own use	Data: 1,2,3,4,5,6,8,9, 10,12,15 Issues: None
Emergency Contact Registry (ECON)				Receives data for own use	Data: 1
Personal Health Record (PHR)				Intermediary for 6.3.2.2	Intermediary for 6.3.2.2
Appropriate Shared (HIS) repositories				Intermediary for 6.3.2.2	Intermediary for 6.3.2.2

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Perspective/ Business Actor	Scenario	Event	Action	Interoperability Requirement(s)	Data Requirement Code & Issues
Another Facility				Receives data for own use	Data: 1,2,3,4,5,6,8,9, 10,15 Issues: 2,3,4,6,7,8 may apply A: Issues 4,7,8 may apply B: Issues 1,2,3,4,5,6,7,8 may apply C: Issues 1,2,3,4,5,6,7,8 may apply D: Issues 1,2,3,4,5,6,7,8 may apply E: Issues None F: Issues None
Public health agencies				Receives data for own use	Data: 1,2,3,4,5,6,8,9, 10,15 Issues: 1,2,3,4,7,8 may apply

2.2.2 DATA AND INFORMATION REQUIREMENTS MATRIX

This section contains an extraction of data and information requirements with a listing of the actual data elements and information that meet the described data requirements.

Table 2.2.2-1 Data Element and Information Requirements

Requirement Number	Description	Scenario
Data Requirement 1	**Emergency contact information is provided, including (but not limited to):** Emergency Contact Information	1,2,3
Data Requirement 2	**Patient data are provided, including (but not limited to):** Patient Demographics	1,2,3
Data Requirement 3	**Allergy data are provided, including (but not limited to):** Allergy Information	1,2,3
Data Requirement 4	**Medication History is provided, including (but not limited to):** Medication History	1,2,3

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Requirement Number	Description	Scenario
Data Requirement 5	**Problem List is provided, including (but not limited to):** Problem List	1,2,3
Data Requirement 6	**Patient Location is provided, including (but not limited to):** Patient Location	1,2,3
Data Requirement 7	**Triage Category is provided, including (but not limited to):** Triage Category	1,2,3
Data Requirement 8	**Advance Directives information is provided, including (but not limited to):** Advance Directives	2,3
Data Requirement 9	**Previous Immunizations information is provided, including (but not limited to):** Previous Immunizations	1,2,3
Data Requirement 10	**Treatment History is provided, including (but not limited to):** Treatment Histories (previous episodes of care)	2,3
Data Requirement 11	**Resource Utilization is provided, including (but not limited to):** Resource Utilization	1,2,3
Data Requirement 12	**Situation Awareness information is provided, including (but not limited to):** Situation Awareness	1,2,3
Data Requirement 13	**Present Episode of Care – On Site information is provided, including (but not limited to):** Present Episode of Care – On Site Complaint (current problem) Assessment - Vital signs (including pain status) - Triage Category - Testing - Other Treatment - Meds Administered - Procedures - Other Outcomes Disposition/Plan of Care	1
Data Requirement 14	**Present Episode of Care – Emergency Care information is provided, including (but not limited to):** Present Episode of Care – Emergency Care Complaint (current problem) Assessment - Vital signs (including pain status) - Triage Category - Testing - Other Treatment - Meds Administered - Procedures - Other Outcomes Disposition/Plan of Care	2

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Requirement Number	Description	Scenario
Data Requirement 15	**Present Episode of Care – Definitive Care information is provided, including (but not limited to):**	3
	Present Episode of Care – Definitive Care Facility	
	Complaint (current problem) Assessment - Vital signs (including pain status) - Triage Category - Testing - Other Treatment - Meds Administered - Procedures - Other Outcomes Disposition/Plan of Care	

2.2.2.1 DATA ISSUES IDENTIFIED IN USE CASE

Inherent in the ER-EHR Use Case is the premise that some of the issues and obstacles in today's environment will be addressed through health information technology standardization and harmonization activities, policy development, and other related initiatives. This is not an all-inclusive attempt to cross reference every issue to an information flow. The goal is to point out some practical situations in which an issue or obstacle would arise.

How these issues are related to the Use Case scenario perspectives (On-Site, Emergency Care and Definitive Care) are specified in tables 2.2.1-1, 2.2.1-2 and 2.2.1-3.

Regulatory or Policy

1. Current policies and regulations are not always considerate of emergency care. As an example, the disaster response to Hurricane Katrina showed some of the policy issues that impact accessing and sharing healthcare information in an emergency. Some issues include:
- The need for the timely development of business associate or other agreements between entities wishing to share health information during an emergency can be challenging
- Variations in local and state privacy and security regulations impact the ease of cross-jurisdictional sharing of protected health information
- Having a capable, secure authentication and authorization mechanism that will allow access by all appropriate healthcare providers to necessary health information, regardless of the providers' original jurisdiction

2. Patients may have concerns about privacy if information about their care in an emergency situation is shared inappropriately. However, clinical care personnel involved in emergency care activities may need to have the capability to "break the glass" in order to gain access to patient information which has immediate relevance to the clinician's decisions about the care needed or to speed notification of immediate family and/or other

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emergency contacts who have knowledge about certain basic aspects of the patient's health, such as pre-existing conditions, allergies, past episodes of care, current medications, primary care physician, etc.

Data

3. Data exchanges may be hampered by lack of harmonization of the data sets needed to support emergency response, the underlying data definitions, the minimum data required, and inconsistent implementation of existing data standards. Likewise, existing systems currently supporting emergency responses may have practical limitations on their ability to collect, transform, and communicate some of the needed information in standard formats. This issue applies to patient information and information describing the resources available to support an emergency response effort (e.g. clinician availability, stockpile inventory, pharmacy inventory, and hospital bed availability).

4. Methodologies for identifying and unambiguously matching patients and their information may vary from system to system, potentially resulting in incomplete access to information at various points in the information exchange.

Authentication and Authorization

5. Mechanisms to verify the credentials of a clinical care provider at the scene of an incident or medical treatment facility may not be available to incident control personnel. This becomes most relevant in larger-scale incidents during which personnel from out-of-region arrive on-scene to provide medical care and need to be quickly identified and given permission to enter the scene.

6. Even if a clinical care provider has been issued authentication credentials by a local market health information service provider to access network resources, mechanisms to disseminate those authentication and authorization credentials to all health information service providers in an emergency may not be available. This is also likely to surface as an obstacle in larger-scale incidents when providers are working out-of-region.

7. Mechanisms to audit access to a specific patient's information across multiple organizations, geographic regions or health information service provider markets may not be readily available. While a local market health information service provider will have the audit data for their own market, mechanisms to create an integrated view of who has accessed the patient's information across multiple markets may be challenging without agreed upon standards for audit-related data and standards for exchanging audit information among networks. This need could emerge in larger scale incidents during which patients are transported across market boundaries.

Technology

8. There are likely to be varying levels of technical infrastructure available to those participating in an emergency response situation. This could be a consequence of the nature of the incident (e.g. electrical power failure) in

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which certain capabilities are degraded, or the absence of certain capabilities in the infrastructure supporting a specific response group (e.g. no wireless infrastructure capability).

Workflow

9. The scale and complexity of an incident may impact the ability of a provider to effectively utilize an Emergency Contact Registry, PHR and/or EHR without adversely affecting the pace of providing patient care. There could be situations in which some steps in the Use Case information flow may be difficult or even impossible to perform, resulting in the clinical care providers utilizing alternative information gathering and communication mechanisms which may not be readily integrated with an Emergency Contact Registry, PHR and/or EHR.

2.2.3 IDENTIFICATION OF BUSINESS ACTORS, INTERACTIONS, AND SCENARIOS

This section describes the business actors that need to be integrated in order to meet the interoperability requirements for each scenario. A Business Actor is a representation of a person, IT system, organization or any combination that is engaged, and benefits from the real world information interchange defined by a business Use Case. The table below describes the optionality of the actors involved and a description of the actor roles.

Table 2.2.3-1 Business Actors

Business Actor	Description	Scenario
911 Call Center	The location where emergency calls are received and initially processed.	1
Emergency Dispatch and Operations Center	An Emergency Dispatch and Operations Center (EOC) is the physical location where various organizations come together under the direction of the Emergency Operations Management (EOM) during an emergency to coordinate response and recovery actions and resources. These centers may alternatively be called command centers, situation rooms, war rooms, crisis management centers, or other similar terms.	1,2,3
On-site Care Providers / Incident Commander	On-site Care Providers: Police, Fire, Emergency Medical Technicians (EMTs), and other medically trained emergency responders who provide care while at, or in transport from, the site of an emergency. Incident Commander: The officer in charge of the overall management of an incident at the incident site. He or she is responsible for building management organization based on a span of control and incident complexity. There is only one incident commander per incident.	1,2,3
Patient ID Cross-Referencing Service	An application that references a patient data base for the purpose of identifying a particular patient based on one of many IDs or by matching patient demographics.	1,2,3

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Business Actor	Description	Scenario
Network Service Providers and Other Healthcare Systems	A network service provider that enables or oversees the access to and exchange of health information, in a secure manner, for the purpose of supporting clinician and consumer needs. Other Healthcare facilities, such as record repositories, organ recovery organizations, etc.	1,2,3
Facility EHR	The Electronic Health Record (EHR) is a secure, real-time, point-of-care, patient-centric information resource for clinicians.	1,2,3
Clinician	Healthcare providers located at a Medical Treatment Facility (MTF) with responsibility for treating emergency incident victims. This includes emergency physicians, emergency nurses, and all other clinical and ancillary personnel at the MTF.	2
Emergency Contact Registry	An organized system for the registration, storage, retrieval, and dissemination of emergency contact information for individual persons.	1,2
Emergency Care Dept. Staff	Emergency care is provided by clinical care personnel operating in a MTF. They usually work in an ED or equivalent military facility, evaluating and or treating patients before they are discharged, admitted to an inpatient facility, or deceased. They may include physicians, advanced practice nurses (e.g. nurse practitioners, nurse anesthetists), emergency nurses, physician's assistants, and military corpsmen.	1,2,3
Emergency Care (Department) Record	Record of patient care given in an ED. May be in an electronic format.	2
Public Health Agencies	Public Health Agencies: Those agencies of local, state and federal government charged with the health of their populations.	1,2,3
Appropriate Shared (HIS) repositories	"Other Health Information Providers" may include medical device manufacturers, medical registries, emergency contact registry etc.	2,3
Another Facility	"Other" medical facilities	2,3
Medical Examiner/ Fatality Manager	Medical Examiner/ Fatality Manager: Those charged with investigation of the cause of death where the death is under suspicious circumstances. Medical Examiner: A physician officially authorized by a governmental unit to ascertain the cause of death. Unlike a coroner, the medical examiner is always a physician. Medical Examiners/Fatality Managers investigate by inquest any deaths thought to be of other than natural cause. They may perform autopsies or inquests, usually in morgues. They may include Medical Examiners, Coroners, and Disaster Mortuary Operational Response Teams (DMORTs).	2

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Business Actor	Description	Scenario
Personal Health Record (PHR):	A health record that can be created, reviewed, annotated, and maintained by the patient or the care giver for a patient. The health record may include any aspect(s) of their health condition, medications, medical problems, allergies, vaccination history, visit history, or communications with their healthcare providers.	1,2,3

2.2.4   HIGH-LEVEL UML INTERACTION (BUSINESS SEQUENCE) DIAGRAM

This section contains an explanation of the relationship between the business actors and data interactions between the primary actors and alternative actors for each ER-EHR Use Case scenario perspective. The diagrams that follow illustrate each scenario with a representation of a normal sequence of exchange between the primary actors.

Figure 2.2.4-1 illustrates the UML interaction diagram from the scenario perspective On Site Care.

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Figure 2.2.4-1 On-Site Care Scenario Perspective

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Figure 2.2.4-2 illustrates the UML interaction diagram from the scenario perspective Emergency Care.

Figure 2.2.4-2 Emergency Care Scenario Perspective

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Figure 2.2.4-2 Emergency Care Scenario Perspective Continued

sd 6.2-B Emergency care interactions

Actors / lifelines (left to right):
Emergency Medical Dispatch; On-site Care Providers / Incident Commander; Emergency Contact Registry; Service Providers & Other Healthcare Systems; Clinicians; Emergency Care Dept. Staff; PID Service; Facility EHR Repository; ED Record; Public Health Agencies; Appropriate Shared (HIS) repositories; Another Facility; Medical Examiner / fatality manager; PHR

Name: 6.2-B Emergency care interactions
Author: HITSP CDTC
Version: 1.0
Created: 5/11/2007 11:01:46 AM
Updated: 5/11/2007 11:12:02 AM

6.2   SCENARIO: Emergency Care Perspective
6.2.4 EVENT: Assess, triage, perform tests and treat patient
6.2.5 EVENT: Input information in emergency care record
6.2.6 EVENT: Complete disposition; Provide information

6.2.4.1 Review of Patient Information
6.2.4.1 Virtual specialty consultation request
6.2.4.1 Add additional observations
6.2.4.1 Add triage category
6.2.4.1a Access repositories
6.2.4.1a Update EHR repository
6.2.5.1 Enter rinformation
Send 6.2.5.1 Population health monitoring information
6.2.6.1 Encounter summary for disposition
6.2.6.1a Encounter summary for discharge
6.2.6.1a Encounter summary for discharge
*6.2.6.2 Situation Report
6,2,6.1b Encounter summary for disposition
6.2.6.1c Encounter summary for transfer
6.2.6.1d Encounter summary for NOD
6.2.6.1c NOD for organ recovery
6.2.6.2 Encounter summary for PHR
6.2.6.2 Health resource information for Emergency Ops Center
6.2.6.2 Encounter summary for population health agency

PRIORITIES
RED -- Highest priority
ORANGE
YELLOW
BLUE - Lowest Priority

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Figure 2.2.4-3 illustrates the UML interaction diagram from the scenario perspective Definitive Care.

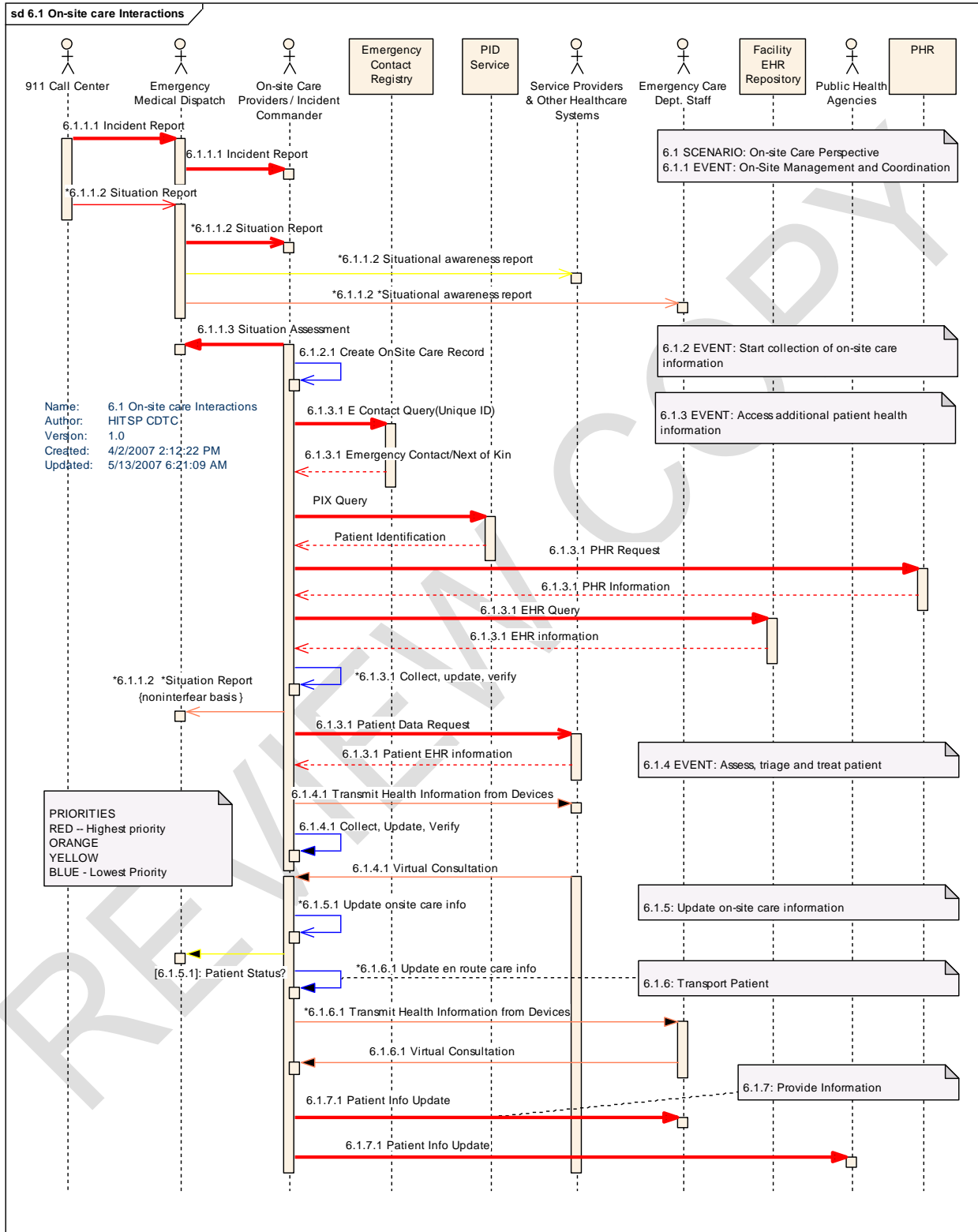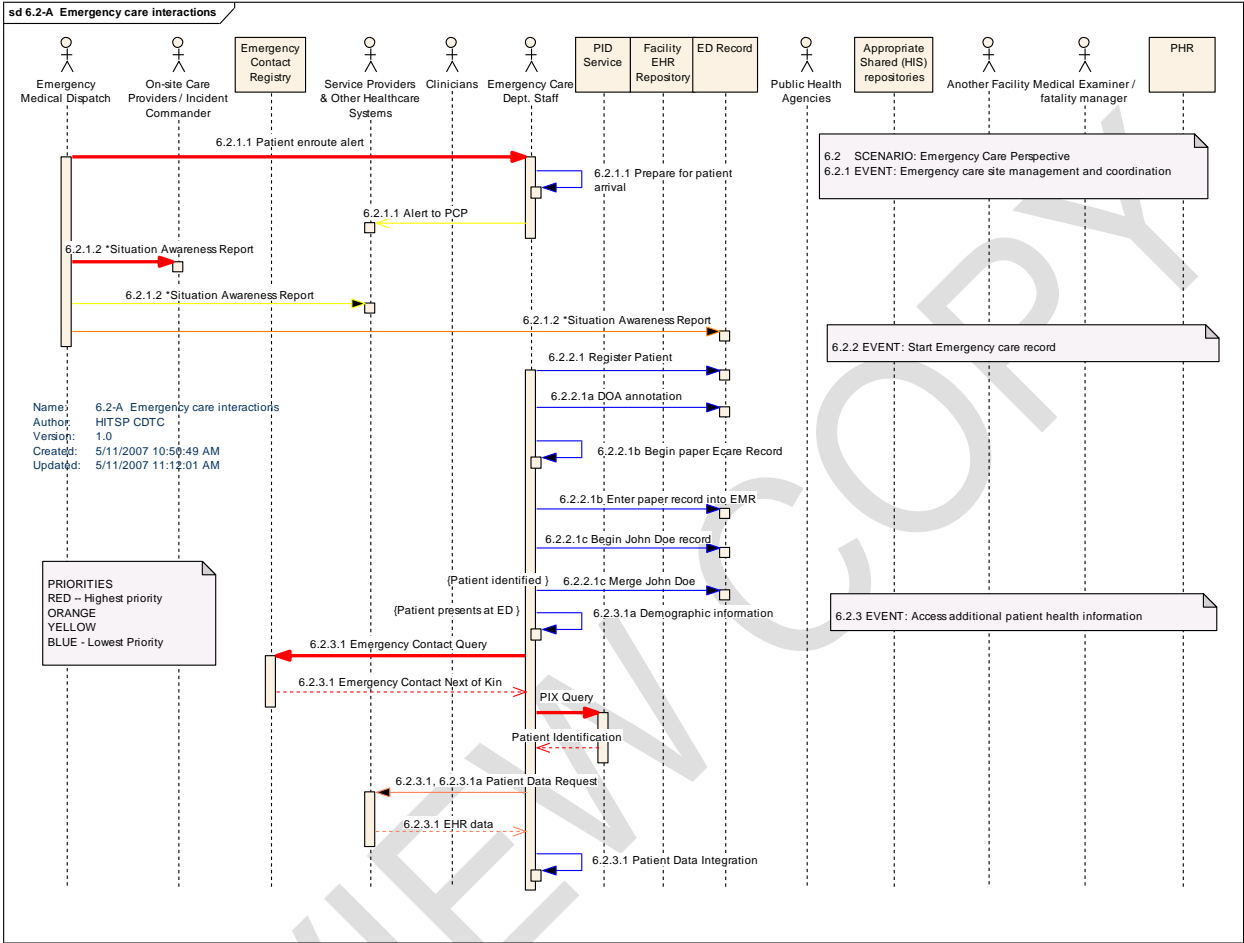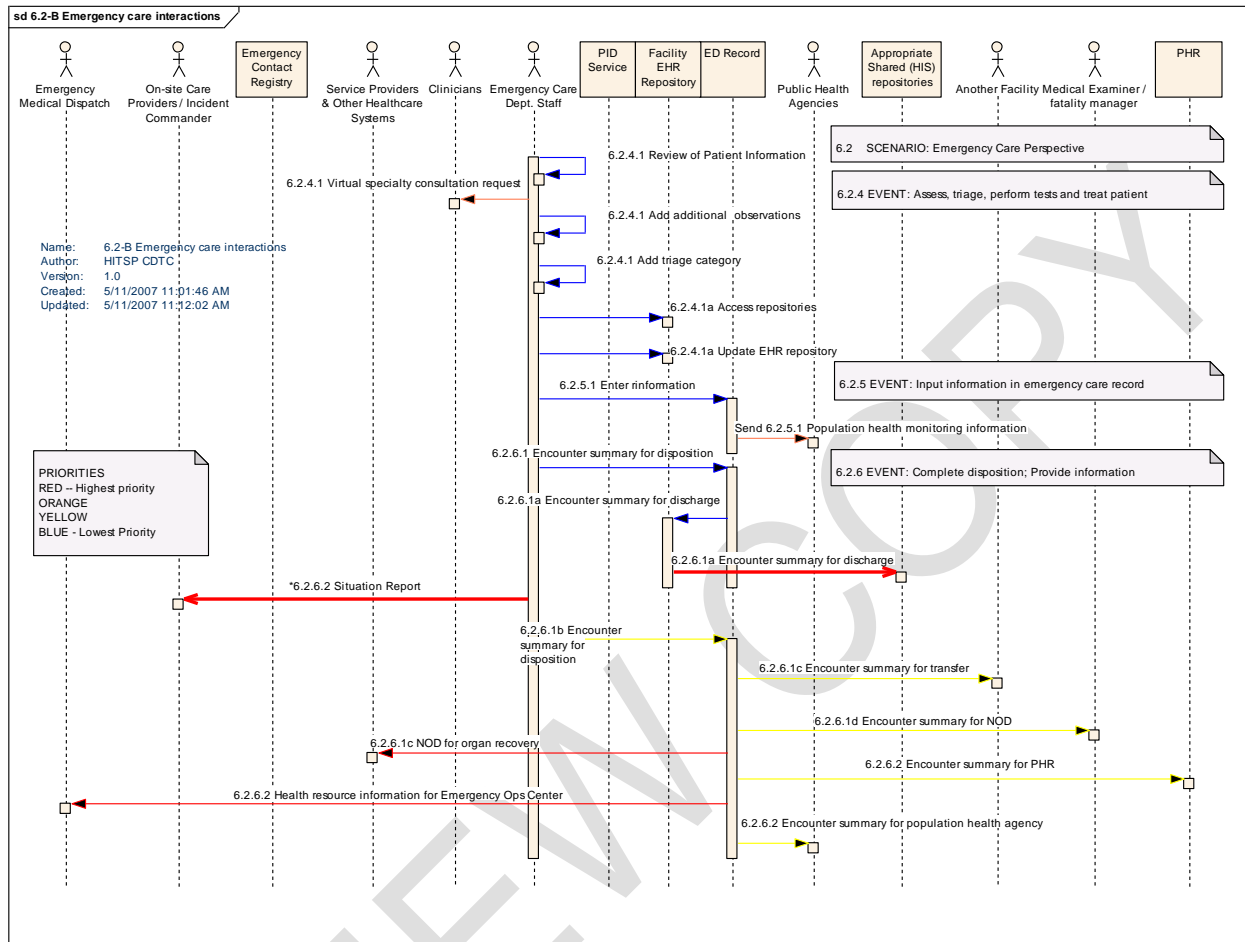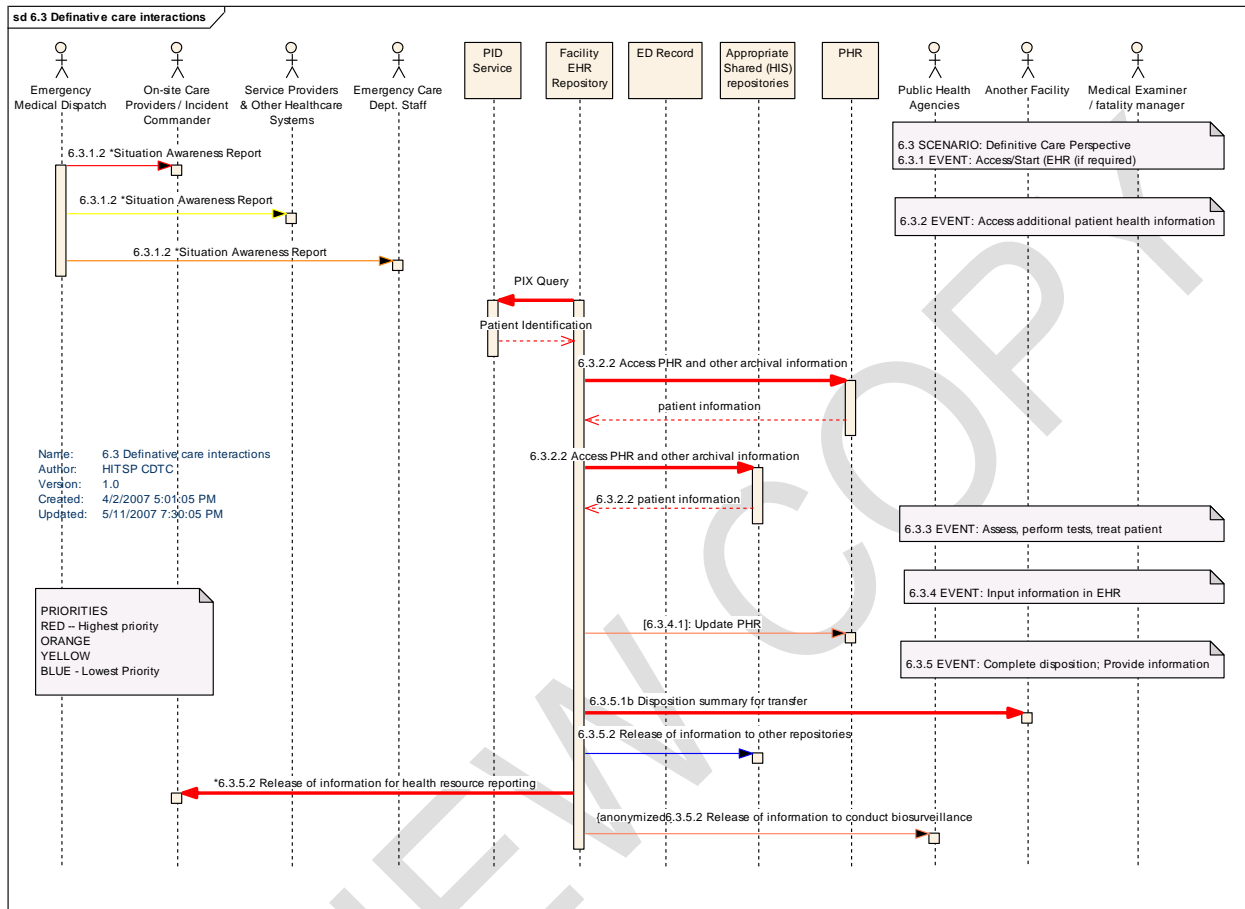**Figure 2.2.4-3 Definitive Care Scenario Perspective**

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3.0 DESIGN

The design for the ER-EHR constructs is the result of the requirements analysis and iterative standards selection process. This section describes the events and actions of the design from the specified requirements. It also provides a detailed mapping of the specified requirements to the business and technical actors, and data elements. Groupings of specific actions and actors are illustrated to further describe the relevant interactions as existing or new HITSP constructs required for interoperability.

3.1 SCOPE OF DESIGN

This section describes the scope of the design as it relates to the requirements for this Use Case that were identified in Section 2.2 above. The scope identifies the assumptions that provide the boundaries for the specification, and the constraints that limit the use of the specification. In addition, any pre-conditions, post-conditions and triggers that underlie the interactions between the various actors, data and transactions are provided.

The Care Delivery Technical Committee has identified 8 key capabilities (potential new or modified HITSP constructs) that are necessary to support the ER-EHR requirements of the current Use Cases. These capabilities have been identified out of the pool of considerations as the minimum necessary to effectively support the listed perspectives and events of the Use Cases.

3.1.1 ASSUMPTIONS

This section provides an overview of the assumptions, including the circumstances, actors, policies and/or technologies that need to be in place for the design to be completed as specified. Assumptions are different from constraints which are specifically used to narrow the definition, or indicate limitations of the specified interactions.

Table 3.1.1-1 Assumptions

Assumption	Scenario
Assumptions for each of the ER-EHR constructs will be identified during their detailed development.	1,2,3

3.1.2 CONSTRAINTS

This section describes the constraints that limit the use of the Requirements and Design, or to which the design must conform in order to be used within the described context. A constraint describes a rule that limits the use of the actors, actions or data within the given context, or to which the interactions must conform to be used within the described scenario. It is a description of the limits and scope of the interactions and can describe actions or events that are not part of the initial definition for the Use Case scenario.

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Table 3.1.2-1 Constraints

Constraint	Scenario
Constraints for each of the ER-EHR constructs will be identified during their detailed development.	1,2,3

3.1.3   PRE-CONDITIONS

This section describes the necessary conditions that must be in place prior to the start of each scenario. The preconditions are used to convey any conditions that must be true at the outset of a scenario. It describes the context that must be established before the scenario is executed. They are not however the triggers that initiate a Use Case. Where one or more preconditions are not met, the behavior of the Use Case should be considered uncertain.

Table 3.1.3-1 Pre-conditions

Pre-condition	Scenario
Pre-conditions for ER-EHR constructs will be identified during their detailed development.	1,2,3

3.1.4   POST-CONDITIONS

This section provides an overview of the conditions or results that must occur at the end of each scenario in order for the scenario to be deemed successfully completed. This includes any required outputs from the scenario, or specific actor states.

Table 3.1.4-1 Post-conditions

Post-condition	Scenario
Post-conditions for ER-EHR constructs will be identified during their detailed development.	1,2,3

3.1.5   PROCESS TRIGGERS

This section describes the triggers, including actors and/or processes, which are necessary to start any scenarios, actions or events. It can be an automatic or manual process or result that in turn starts off another scenario, action or event. A trigger is not the same as a pre-condition that describes a context that needs to be in place at the start of the event.

Table 3.1.5-1 Process Triggers

Trigger	Scenario
Triggers for ER-EHR constructs will be identified during their detailed development.	1,2,3

3.2   DESIGN

This section will provide a detailed description of the technical design, along with an analysis of the main interactions and decisions between all actors, actions and data in support of the specific requirements for each

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scenario of the Use Case. In addition, this section provides the data element details and an overview of the planned constructs used to meet the business and technical requirements for this Use Case. Opportunities for reuse of existing HITSP constructs are outlined, along with a description of any necessary updates to existing constructs.

3.2.1   MAPPING OF BUSINESS ACTORS TO TECHNICAL ACTORS

This section contains a mapping of business actors to technical actors that need to be integrated in order to meet the interoperability requirements for each scenario. A Business Actor is a representation of a person, IT system, organization or any combination that is engaged, and benefits from the real world information interchange defined by a business Use Case, while a Technical Actor represents an entity internal to a software application, which is engaged in one or more specific transactions to support a specific aspect of a real world information interchange (e.g. set of message exchanges).

The table below does not include the technical actors needed for privacy and security requirements. These will be considered by the HITSP Security and Privacy TC, as well as by the Care Delivery TC when creating the ER-EHR constructs.

Table 3.2.1-1 Mapping of Business Actor(s) to Technical Actor(s)

Business Actor	Scenario	Technical Actor(s)	Req/Opt	Actor Role
911 Call Center	1	No Technical Actors Defined		
Emergency Dispatch and Operations Center	1,2,3	No Technical Actors Known - GAP		Need to transfer information with or without a Patient ID such as location, chief complaint, and incident severity data
On-site Care Providers / Incident Command Post	1,2,3	Document Source	R	The Document Source Actor is the producer and publisher of documents. It is responsible for sending documents to a Document Repository Actor. It also supplies metadata to the Document Repository Actor for subsequent registration of the documents with the Document Registry Actor.
		Document Consumer	R	The Document Consumer Actor queries a Document Registry Actor for documents meeting certain criteria, and retrieves selected documents from one or more Document Repository Actors.
		Patient Identifier Cross Reference (PIX) Consumer	R	This actor allows a system in a Patient Identifier Domain to determine the identification of a patient in a different Patient Identifier Domain by using the services of a Patient Identifier Cross-Reference Manager Actor.
	1	Patient Demographics Consumer	R	The Patient Demographics Consumer queries the Patient Demographics Supplier to obtain patient demographic data. It may receive matches for one or more patients that enable the selection of the desired patient.
Emergency Contact Registry	1,2	Patient Demographics Supplier	R	Receives patient registration and update messages from other systems in the enterprise (e.g., ADT Patient Registration systems), which may or may not represent different Patient ID Domains. It responds to queries for information.
Patient ID Cross-Referencing Service	1,2,3	Patient Identifier Cross Reference Manager	R	Responsible for creating, maintaining and providing lists of identifiers that are aliases of one another across different Patient Identifier Domains.

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Business Actor	Scenario	Technical Actor(s)	Req/Opt	Actor Role
Service Providers and Other Healthcare Systems	1,2,3	Document Consumer	R	The Document Consumer Actor queries a Document Registry Actor for documents meeting certain criteria, and retrieves selected documents from one or more Document Repository Actors.
	1,2	Patient Identity Source	O	The Patient Identity Source Actor assigns a provider-unique identifier for each patient and maintains a collection of identity traits. Each Patient Identifier Domain requires this Actor to assign patient identities and to notify other Actors (e.g. a Patient Identifier Cross-Reference Manager or a Registry Actor) of all events related to patient identification (creation, update, merge, etc.).
		Patient Demographics Supplier	R	Receives patient registration and update messages from other systems in the enterprise (e.g., ADT Patient Registration systems), which may or may not represent different Patient ID Domains. It responds to queries for information.
Facility EHR Repository	1	Patient Identity Source	O	The Patient Identity Source Actor assigns a provider-unique identifier for each patient and maintains a collection of identity traits. Each Patient Identifier Domain requires this Actor to assign patient identities and to notify other Actors (e.g. a Patient Identifier Cross-Reference Manager or a Registry Actor) of all events related to patient identification (creation, update, merge, etc.).
		Patient Demographics Supplier	R	Receives patient registration and update messages from other systems in the enterprise (e.g., ADT Patient Registration systems), which may or may not represent different Patient ID Domains. It responds to queries for information.
	2,3	Document Source	R	The Document Source Actor is the producer and publisher of documents. It is responsible for sending documents to a Document Repository Actor. It also supplies metadata to the Document Repository Actor for subsequent registration of the documents with the Document Registry Actor.
		Document Consumer	R	The Document Consumer Actor queries a Document Registry Actor for documents meeting certain criteria, and retrieves selected documents from one or more Document Repository Actors.
		Patient Identifier Cross Reference (PIX) Consumer	R	This actor allows a system in a Patient Identifier Domain to determine the identification of a patient in a different Patient Identifier Domain by using the services of a Patient Identifier Cross-Reference Manager Actor.
Clinician	2	No Technical Actors Defined		
Emergency Care Dept. Staff	1,2,3	Document Consumer	R	The Document Consumer Actor queries a Document Registry Actor for documents meeting certain criteria, and retrieves selected documents from one or more Document Repository Actors.
		Patient Identifier Cross Reference (PIX) Consumer	R	This actor allows a system in a Patient Identifier Domain to determine the identification of a patient in a different Patient Identifier Domain by using the services of a Patient Identifier Cross-Reference Manager Actor.
	2	Patient Identity Source	O	The Patient Identity Source Actor assigns a provider-unique identifier for each patient and maintains a collection of identity traits. Each Patient Identifier Domain requires this Actor to assign patient identities and to notify other Actors (e.g. a Patient Identifier Cross-Reference Manager or a Registry Actor) of all events related to patient identification (creation, update, merge, etc.).

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Business Actor	Scenario	Technical Actor(s)	Req/Opt	Actor Role
		Patient Demographics Consumer	R	The Patient Demographics Consumer queries the Patient Demographics Supplier to obtain patient demographic data. It may receive matches for one or more patients that enable the selection of the desired patient.
		Document Source	R	The Document Source Actor is the producer and publisher of documents. It is responsible for sending documents to a Document Repository Actor. It also supplies metadata to the Document Repository Actor for subsequent registration of the documents with the Document Registry Actor.
Emergency Care (Department) Record	2	Document Consumer	R	The Document Consumer Actor queries a Document Registry Actor for documents meeting certain criteria, and retrieves selected documents from one or more Document Repository Actors.
		Patient Identifier Cross Reference (PIX) Consumer	R	This Actor allows a system in a Patient Identifier Domain to determine the identification of a patient in a different Patient Identifier Domain by using the services of a Patient Identifier Cross-Reference Manager Actor.
		Document Source	R	The Document Source Actor is the producer and publisher of documents. It is responsible for sending documents to a Document Repository Actor. It also supplies metadata to the Document Repository Actor for subsequent registration of the documents with the Document Registry Actor.
		Patient Identity Source	O	The Patient Identity Source Actor assigns a provider-unique identifier for each patient and maintains a collection of identity traits. Each Patient Identifier Domain requires this Actor to assign patient identities and to notify other Actors (e.g. a Patient Identifier Cross-Reference Manager or a Registry Actor) of all events related to patient identification (creation, update, merge, etc.).
Public Health Agencies	1,2,3	Document Consumer	R	The Document Consumer Actor queries a Document Registry Actor for documents meeting certain criteria, and retrieves selected documents from one or more Document Repository Actors.
		Patient Identifier Cross Reference (PIX) Consumer	R	This Actor allows a system in a Patient Identifier Domain to determine the identification of a patient in a different Patient Identifier Domain by using the services of a Patient Identifier Cross-Reference Manager Actor.
Appropriate Shared (HIS) repositories	2,3	Document Consumer	R	The Document Consumer Actor queries a Document Registry Actor for documents meeting certain criteria, and retrieves selected documents from one or more Document Repository Actors.
		Patient Identifier Cross Reference (PIX) Consumer	R	This Actor allows a system in a Patient Identifier Domain to determine the identification of a patient in a different Patient Identifier Domain by using the services of a Patient Identifier Cross-Reference Manager Actor.
	3	Document Source	R	The Document Source Actor is the producer and publisher of documents. It is responsible for sending documents to a Document Repository Actor. It also supplies metadata to the Document Repository Actor for subsequent registration of the documents with the Document Registry Actor.

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Business Actor	Scenario	Technical Actor(s)	Req/Opt	Actor Role
		Patient Identity Source	O	The Patient Identity Source Actor assigns a provider-unique identifier for each patient and maintains a collection of identity traits. Each Patient Identifier Domain requires this Actor to assign patient identities and to notify other Actors (e.g. a Patient Identifier Cross-Reference Manager or a Registry Actor) of all events related to patient identification (creation, update, merge, etc.).
Another Facility	2,3	Document Consumer	R	The Document Consumer Actor queries a Document Registry Actor for documents meeting certain criteria, and retrieves selected documents from one or more Document Repository Actors.
		Patient Identifier Cross Reference (PIX) Consumer	R	This Actor allows a system in a Patient Identifier Domain to determine the identification of a patient in a different Patient Identifier Domain by using the services of a Patient Identifier Cross-Reference Manager Actor.
Medical Examiner/ Fatality Manager	2	Document Consumer	R	The Document Consumer Actor queries a Document Registry Actor for documents meeting certain criteria, and retrieves selected documents from one or more Document Repository Actors.
		Patient Identifier Cross Reference (PIX) Consumer	R	This Actor allows a system in a Patient Identifier Domain to determine the identification of a patient in a different Patient Identifier Domain by using the services of a Patient Identifier Cross-Reference Manager Actor.
Personal Health Record (PHR):	1,2,3	Patient Identifier Cross Reference (PIX) Consumer	R	This Actor allows a system in a Patient Identifier Domain to determine the identification of a patient in a different Patient Identifier Domain by using the services of a Patient Identifier Cross-Reference Manager Actor.
	1,3	Document Source	R	The Document Source Actor is the producer and publisher of documents. It is responsible for sending documents to a Document Repository Actor. It also supplies metadata to the Document Repository Actor for subsequent registration of the documents with the Document Registry Actor.
	2	Document Consumer	R	The Document Consumer Actor queries a Document Registry Actor for documents meeting certain criteria, and retrieves selected documents from one or more Document Repository Actors.
	1,2,3	Document Registry	O (see note below table)	The Document Registry Actor maintains metadata about each registered document in a document entry. This includes a link to the Document in the Repository where it is stored. The Document Registry responds to queries from Document Consumer actors about documents meeting specific criteria. It also enforces some healthcare specific technical policies at the time of document registration.
	1,2,3	Document Repository	O (see note below table)	The Document Repository is responsible for both the persistent storage of these documents as well as for their registration with the appropriate Document Registry. It assigns a Uniform Resource Identifier (URI) to documents for subsequent retrieval by a Document Consumer.

Note: The Document Registry and Document Repository technical actors may reside in many different real world business actors. For this table they are shown in the PHR but could reside in other business actors also (such as, EHR, RHIO, Other facilities, etc). It is not the intent of this document to illustrate the possible architecture variants, see HITSP/IS03 - Consumer Empowerment for real world examples.

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3.2.2 TECHNICAL DESIGN

The technical design incorporates the comprehensive business and technical requirements and a detailed analysis of the interactions and decisions undertaken for the primary actions in each Use Case scenario. The UML sequence diagrams used in this section expand on the earlier diagrams illustrated in the Requirements Analysis sections of this document. They incorporate the detailed data requirements for the selected standards, with the technical actors, independent transactions and groupings of dependent transactions. The independent transactions and groupings of transactions described in these more detailed interaction diagrams are used to determine which HITSP constructs are necessary for the Interoperability Specification. Diagrams show all common or independent actors, data, actions, and groupings of actions around common actors. Transactions that make use of existing HITSP constructs are shown explicitly, indicating opportunities for reuse.

This section will be completed after the standards are selected.

3.2.3 LIST OF TRANSACTIONS

This section maps the transactions described above to the Use Case Actions and Events defined in the Requirements Analysis section, as well as the applicable scenarios. The payload details for the transactions are also described in the table below. Actions and events not listed here (but which exist in the Use Case) that have been purposefully omitted are described in the Scope of Design section. Transactions are referenced in the UML diagrams shown in section 3.2.2 using a letter designation.

Table 3.2.3-1 Event/Action Codes and Related Transactions

Transaction Name	Event/Action Code	Content	Applicable Scenarios
ITI-21: Patient Demographic Query	6.1.3.1 – E Contact	Extension to PDQ for Emergency Contact Info – domain OID and ID only field – for emergency contact registries (e.g. RoadMedic, NOKR, etc.) Add to PDQ Next of Kin segment (NK1) Associated Party Information – Coordinate with Integrating the Healthcare Enterprise (IHE)	1
	6.2.3.1	Extension to PDQ for Emergency Contact Info (same as above)	2
		The PDQ transaction involves a request by a Patient Demographics Consumer for demographic information about patients whose demographic data match data contained in the query message. The request is sent as a Patient Demographics query and received by a Patient Demographics Supplier. The Patient Demographics Supplier immediately processes the query and sends a Patient Demographics response to the Patient Demographics Consumer that originated the query. This response contains a list of patient demographics for matching patients if any were found.	
ITI-9: Pix Query	6.1.3.1 – PHR/EHR, 6.1.7.1, 6.2.3.1, 6.2.6.1,c,d, 6.2.6.2, 6.3.2.1, 6.3.5.1b, 6.3.5.2	Standard PIX Query	1,2,3
		Requests for a list of patient identifiers that correspond to a patient identifier known by the consumer. The request is processed and returns a response in the form of a list of corresponding patient identifiers, if any.	

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Transaction Name	Event/Action Code	Content	Applicable Scenarios
XDS ITI-16: Query Registry	6.1.3.1, 6.2.3.1, 6.3.2.1	Standard Query Registry	1,2,3
		Query Registry is used by a document consumer to query a registry for information about documents indexed in the registry.	
XDS ITI-17: Retrieve Document	6.1.3.1	12	1
	6.2.3.1	1,2,6,14	2
	6.3.2.1	1,2,3,4,5,6,8,9,10,12,15	3
		Retrieve Document is used by a document consumer to retrieve a document from a repository	
XDS ITI-15: Provide & Register Document Set	6.1.7.1	2,6,13	1
	6.2.6.1, a,b,c,d	1,2,6,14	2
	6.2.6.2	1,2,6,11,14	2
	6.3.1.2	12	3
	6.3.4.1	1,2,6,14	3
	6.3.5.1b	1,2,3,4,5,6,8,9,10,15	3
	6.3.5.2	1,2,3,4,5,6,8,9,10,12,15	3
		Provide and Register Document Set is used to provide a set of documents to a repository, and to request that the repository store these documents and then register them with a registry.	

3.2.4 DATA DETAIL

This section details the data elements and related transactions that were extracted from the selected standards and describes any corresponding HITSP imposed constraints (e.g., required or optional). The following table lists document data elements in "categories" such as Emergency Contact Information, Allergy Information, etc. Only those data elements that are required are shown, optional data elements will be considered when developing the HITSP constructs.

R = Required, R2= Required if Available

Table 3.2.4-1 Emergency Contact Information Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Contact Name	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Contact Relationship	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Contact Address	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Contact Phone Number(s)	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

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Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Contact Role (power of attorney, medical decisions, etc)	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Start Date of Contact Role	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
End Date of Contact Role	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-2 Patient Demographics Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Patient Name	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Patient ID	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Patient Address	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Patient Phone Number(s)	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Gender	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Language	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-3 Allergy Information Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Allergen Code/Mnemonic Description	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Allergy Severity Code	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Allergy Reaction Code	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-4 Medication History Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Coded Product Name	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Coded Brand Name	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Free Text Product Name	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

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Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Free Text Brand Name	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Product Concentration	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Type of Medication	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Status of Medication	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Quantity Ordered	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Prescription Number	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Quantity Dispensed	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Free Text Comment Field	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-5 Problem List Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Problem List Code	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Problem List Text	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-6 Patient Location Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Facility Name	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Facility City	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Facility State	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Facility Phone	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Facility Address	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Address/Location of Care	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

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Table 3.2.4-7 Triage Category Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Gap, Standards in this area are not mature enough to define data elements and their constraints		Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-8 Advance Directives Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Advance Directive Free Text	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Advance Directive Type	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Effective Date	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Custodian of the Document	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-9 Previous Immunizations Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Immunizations Code	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Immunizations Text	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-10 Treatment Histories (previous episodes of care) Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
GAP – Health Level Seven (HL7) (Structured Doc TC) is a candidate working this issue. Not aware of others.		Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-11 Resource Utilization Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Facility Identifier	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Facility Name	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Facility Location	R	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

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Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Number of Facility Beds	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Number of Licensed Beds	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Hospital Status	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Organization Information	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Emergency Department Status	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Hospital Bed Capacity Status	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Service Coverage Status	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Hospital Facility Status	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition
Hospital Resource Status	R2	Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-12 Situation Awareness Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
See Note Below		Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Note: The area of situation awareness reporting is an area where standards harmonization efforts are ongoing. Situation awareness reporting is categorized by on-site, emergency care, definitive care, patient centric, resource centric and situation centric reporting. The research in this area has not been completely performed, as there are many standards and a clear lack of one defined "template" for preparing and sending a situational awareness report. During the next design phase we will conduct research into the various standards of situational awareness reporting and specify a core set of elements in this data category. Some examples include OASIS HAVE, NIMS, CAP, DEEDS, NEMSIS, etc.

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Table 3.2.4-13 Present Episode of Care – On Site Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Present Episode of Care – On Site includes a combination of many "Data Element Categories" Some of the categories are listed above. The TC is researching standards for the other categories. The list being researched is: Complaint (current problem) Assessment - Vital signs (including pain status) - Triage Category - Testing - Other Treatment - Meds Administered - Procedures - Other Outcomes Disposition/Plan of Care		Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

Table 3.2.4-14 Present Episode of Care – Emergency Care Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
Present Episode of Care – Emergency Care includes a combination of many "Data Element Categories" Some of the categories are listed above. The TC is researching standards for the other categories. The list being researched is: Complaint (current problem) Assessment - Vital signs (including pain status) - Triage Category - Testing - Other - Treatment - Meds Administered - Procedures - Other Outcomes Disposition/Plan of Care		Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

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Table 3.2.4-15 EHR Summary from Definitive Care Data Element Constraints

Data Element Name	Req	Constraint	Constraint Type (Pre-condition, post-condition, general)	Purpose (Reason for this constraint)
EHR Summary from Definitive Care includes a combination of many "Data Element Categories" Some of the categories are listed above. The TC is researching standards for the other categories. The list being researched is: Complaint (current problem) Assessment - Vital signs (including pain status) - Triage Category - Testing - Other - Treatment - Meds Administered - Procedures - Other Outcomes Disposition/Plan of Care		Will be determined during construct definition	Will be determined during construct definition	Will be determined during construct definition

3.2.5   PLANNED HITSP CONSTRUCTS

This section describes the HITSP constructs (including Interoperability Specifications, Transaction Packages, Transactions and Components) that are expected to be used for the Use Case.

3.2.5.1 NEW HITSP CONSTRUCTS

The table below provides a description of the new HITSP constructs that will be created for this Use Case.

Table 3.2.5.1-1 Potential New HITSP Constructs

New Construct	Construct Description	Common Actors	Requirement
ER-EHR Interoperability Specification	Key Functionality: Interoperability specification to satisfy requirements of the ER-EHR Use Case	See Table 3.2.1-1	See table 2.2.1-1, 2.2.1-2, 2.2.1-3
Situation Awareness Report	Key Functionality: Patient, Resource, Situation, and/or Location centric Expect Gaps, but may be able to address subsets (such as OASIS HAVE, NIMS, CAP, DEEDS, NEMSIS, etc.)	Not Defined	Gather information to distribute to situation awareness reports keeping all involved medical entities informed of the situation This is a continuous action.
Patient Health Summary Record Document	Key Functionality: Summary of patient record This document is needed and expected to be C32 or use another subset of CCD	Document Source Document Consumer	Summary of the Patient's record

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New Construct	Construct Description	Common Actors	Requirement
Patient Information Update	Key Functionality: Create proper subset of CCD to represent Patient Information Summary	Document Source Document Consumer	Update patient record with information related to this emergency encounter Comment: This construct may be combined with Encounter Summary and Disposition
Encounter Summary	Key Functionality: Create proper subset of CCD to represent Encounter Summary, look at TP48 Is described by CHI Clinical Encounter Summary or CCD	Document Source Document Consumer	Update patient record with encounter summary related to this emergency encounter
Disposition Summary	Key Functionality: Create proper subset of CCD to represent Disposition Summary	Document Source Document Consumer	Update patient record with disposition summary to this emergency encounter

3.2.5.2 EXISTING HITSP CONSTRUCTS

The table below provides a description of the existing HITSP constructs that will be used for this Use Case. It also specifies whether the construct will require modification based on the new sets of requirements that are being satisfied by the construct.

Table 3.2.5.2-1 Existing HITSP Constructs

Existing Construct	Construct Description	Common Actors	Requirement	Requires Modification
HITSP/TP13	Manage Sharing of Documents Transaction Package	Document Consumer Document Source		N
HITSP/TP22	Patient ID Cross-Referencing Transaction Package	Patient Identifier Cross-Reference Consumer Patient Identifier Cross-Reference Manager Patient Identity Source		N
HITSP/T23	Patient Demographics Query Transaction	Patient Demographics Consumer Patient Demographics Supplier	Update PDQ to query for IDs (such as a medical bracelet). Need to add NK1 segment to obtain Association Party Information HITSP will ask IHE to update PDQ to accommodate this additional requirement	Yes
HITSP/C32	Registration and Medication History Document Component	Component		N
HITSP/C48	Encounter Document Component	Component		N

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3.2.5.3 CONSTRUCT ROADMAP FOR THE IS

Each Interoperability Specification (IS) comprises of a suite of constructs that, taken as a whole, provide a detailed map to existing standards and specifications that will satisfy the requirements imposed by a given Use Case. The Interoperability Specification identifies and constrains standards where necessary, and creates groupings of specific actions and actors to further describe the relevant contexts using Transaction Packages, Transactions, and Components depicted in the diagram below. The most effective way to see the construct breakdown for any Interoperability Specification is to begin with the document indicated at the top of the diagram. The roadmap diagrams which show how each of the ER-EHR constructs is used by the HITSP constructs will be provided in the next phase of the design process.

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4.0 CANDIDATE STANDARDS

This section presents the candidate standards that may support the major Use Case events described in the requirements analysis. In the next phase, the Care Delivery Technical Committee will select the standards based on the following process:

- Evaluation: The Technical Committee evaluates the standards using the Tier 2 Readiness Criteria. The Tier 2 worksheets used to evaluate the list of standards are linked in the Appendix. Standards considered for use may include Provisional or 'to be named' standards

- Selection: Based on the Tier 2 evaluations, named standards are selected and listed in Table 4.1-1. It is important to understand that the standards selected here are within the context of the specific Use Case requirements and do not necessarily reflect selection in other contexts. During the actual construction of HITSP set of ER-EHR constructs, the Technical Committee may need to refine this listing based on detailed analysis

- Gap and Overlap Analysis and Recommendations: The Technical Committee also identifies and analyzes gaps and overlaps within the standards industry as they relate to the specific Use Case. The TC will provide a description of the gaps, including missing or incomplete standards, provide a description of all overlaps, or competition among standards for the relevant Use Cases, and recommendations for resolving these gaps and overlaps

Thus the following section lists a summary of the candidate standards that will be further refined in the next phase of design work.

4.1   TABLE OF CANDIDATE STANDARDS

This section presents the candidate standards that may support the Use Case events described in the requirements analysis. As used by HITSP, the term "standard" refers, but is not limited to Specifications, Implementation Guides, Code Sets, Terminologies, and Integration Profiles. A standard should be produced through a well-defined approach that supports a business process and
1. has been agreed upon by a group of experts
2. has been publicly vetted
3. provides rules, guidelines, or characteristics
4. helps to ensure that materials, products, processes, and services are fit for their intended purpose
5. is available in an accessible format
6. is subject to an ongoing review and revision process

Table 4.1-2 shows the candidate standard and the key capability which it may support. It is important to understand that the candidate standards shown here are within the context of the specific Use Case requirements and do not necessarily reflect selection in other contexts. The legend relating key

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capabilities/potential construct names to identification numbers is shown in Table 4.1-1. During the next phase of design, the standards listed here will be further refined using the Tier 2 Criteria.

At the time of the release of this document, not all data elements categories have been researched (i.e. the complete set of attributes are not defined). This will be accomplished in the next design phase, therefore, we expect additional standards will be identified in the future.

Table 4.1-1 Legend for Table 4.1-2: Mapping of Key Capability/Potential Construct Numbers to Names

Key Capability/Potential Construct Number	Key Capability/Potential Construct Name
1	ER-EHR Interoperability Specification (not included below)
2	Situation Awareness Report
3	Patient Health Summary Record Document
4	HITSP/TP23 (PDQ being updated for Emergency Contact)
5	Patient Information Update
6	Encounter Summary
7	Disposition Summary

Table 4.1-2 Candidate Standards Linked to Requirements

Standards Organization	Standard Name	Key Capability/Potential Construct Number						Comment/ Notes
		2	3	4	5	6	7	
HL7	Health Level Seven (HL7) Version 2.5[1]			x				
HL7	Health Level Seven (HL7) Version 3.0 Continuity of Care Document (CCD)		x		x	x	x	
	Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity		x		x	x	x	Managed by CDC (Center for Disease Control)
IHE	Integrating the Healthcare Enterprise (IHE) IT Infrastructure Technical Framework (ITI-TF) Revision 3.0 (specifically PIX (ITI-9), XDS Query Registry (ITI-16), XDS Retrieve Document (ITI-17), and PDQ (ITI-21))			x				
SNOMED	College of American Pathologists Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT®)		x		x	x	x	
NLM	National Library of Medicine (NLM) Unified Medical Language System (UMLS) RxNorm		x		x	x	x	
FDA/VA/NLM	Federal Medication Terminologies		x		x	x	x	
LOINC	Logical Observation Identifiers Names and Codes (LOINC®)		x		x	x	x	

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[1] HITSP references HL7 2.5.1 messaging for lab results reporting and HL7 2.5 for other messages. Future maintenance work will move toward referencing a single HL7 version across HITSP documents.

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Standards Organization	Standard Name	Key Capability/Potential Construct Number						Comment/ Notes
		2	3	4	5	6	7	
OASIS	Organization for the Advancement of Structured Information Standards (OASIS) Emergency Data Exchange Language (EDXL) Distribution Element (DE)	x						
OASIS	Organization for the Advancement of Structured Information Standards (OASIS) Emergency Data Exchange Language (EDXL) Hospital Availability Exchange (HAVE)	x						
OASIS	OASIS/EDXL DE V1.0 Emergency Data Exchange Language Common Alerting Protocol CAP	x						
Department of Commerce	FIPS 5.2 Codes for the Identification of the States, the District of Columbia and the Outlying Areas of the United States, and Associated Areas	x						
Department of Commerce	FIPS 10.4 Countries, Dependencies, Areas of Special Sovereignty, and Their Principal Administrative Divisions	x						
ISO	International Organization for Standardization (ISO) Electronic business eXtensible Markup Language (ebXML), Technical Specification # 15000 -- Part 4: Registry services specification (ebRS), May, 2004			x				
HL7	HL7 CVX (clinical vaccine formulation) HL7 2.3.1		x		x	x	x	
HL7	HL7 v 2.3 MVX Manufacturer codes		x		x	x	x	
	Emergency Severity Index, Version 4	x	x		x	x	x	Designed by AHRQ (Agency for Healthcare Research and Quality), an office within the U.S. Department of Health and Human Services (HHS). AHRQ is not a standards organization

4.2   CANDIDATE GAPS WHERE THERE ARE NO STANDARDS

This section describes gaps in standards. Gaps occur in the following two cases, where HITSP has:

- Identified requirements derived from the context that have no standards that meet all tiers of HITSP criteria to merit endorsement for that context
- Identified a single standard that encompasses and singly fulfills a set of tightly-coupled standards from the given context, yet is lacking in fulfilling one or more of the tightly-coupled requirements

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The gap is only relative to the specific ER-EHR Use Case. Recommended resolutions were developed through a series of steps including the Technical Committee's initial recommendations, cross team validation of the gap, provisional recommendations and peer review by the team.

The table below identifies the Use Case events and known associated gaps, along with the recommended resolutions.

Table 4.2-1 Use Case Events and Associated Gaps

Event Code	Event Description	Identified Gaps	Recommended Resolution
		Gaps will be documented after the Tier 2 standards selection criteria has been applied Note: potential gaps have been mentioned in section 3.2.5.1 and other areas of this document.	

4.3   CANDIDATE STANDARD OVERLAPS

This section describes the instances where there are overlaps among standards for the Use Case. The overlap is only relative to the specific Use Case event. Overlaps refer to instances where some of the requirements are met by multiple standards. The overlap is only relative to the specific ER-EHR Use Case event. Recommended resolutions were developed through a series of steps including the Technical Committee's initial recommendations, cross team validation of the overlap, provisional recommendations and peer review by the team.

The table below presents the identified overlaps and the respective resolution plans.

Table 4.3-1 Standard Overlaps

Event Code	Event Description	Standard Overlap	Recommended Resolution
		Standard overlaps will be documented after the Tier 2 standards selection criteria has been applied	

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5.0 NEXT STEPS

The first step in the HITSP harmonization process is requirements analysis and design. Upon completion of the Requirements, Design and Standards Selection for the Emergency Responder - Electronic Health Record Use Case, the following steps will occur:

- This document will be submitted to the HITSP Panel and interested Public for comment
- After the comment period, the Technical Committee will disposition the comments, maintaining a written log of all dispositions assigned to the TC
- Persuasive comments will be used to inform the construction of the Interoperability Specification (IS)
- Non-persuasive comments or comments that are not applicable to the construction of the IS will be deferred with reason/explanation (e.g., need additional information or further analysis during construction)
- In parallel to the steps described above, the Technical Committee will complete its selection of standards, to be published as an addendum to this document, and begin the construction of the Interoperability Specification and constructs

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6.0 APPENDIX

The following sections include relevant materials referenced throughout this document.

6.1 DESCRIPTION OF CANDIDATE STANDARDS

The following table contains descriptions of the candidate standards.

Standard Name	Description
College of American Pathologists Systematized Nomenclature of Medicine Clinical Terms (SNOMED CT®)	SNOMED CT consists of a technical design, core content architecture, and Core content. SNOMED CT Core content includes the technical specification of SNOMED CT and fully integrated multi-specialty clinical content. The Core content also includes a concepts table, description table, relationships table, history table, ICD-9-CM mapping, and Technical Reference Guide. Additionally, SNOMED CT provides a framework to manage language dialects, clinically relevant subsets, qualifiers and extensions, as well as concepts and terms unique to particular organizations or localities. Visit www.snomed.org for more information.
Emergency Severity Index, Version 4	The Emergency Severity Index (ESI) is a five-level emergency department (ED) triage algorithm that provides clinically relevant stratification of patients into five groups from 1 (most urgent) to 5 (least urgent) on the basis of acuity and resource needs. The Agency for Healthcare Research and Quality (AHRQ) funded initial work on the ESI. A well-implemented ESI program will help hospital emergency departments rapidly identify patients in need of immediate attention, better identify patients who could safely and more efficiently be seen in a fast-track or urgent care center rather than the main ED, and more accurately determine thresholds for diversion of ambulance patients from the ED.
Federal Information Processing Standards (FIPS) 10.4 Countries, Dependencies, Areas of Special Sovereignty, and Their Principal Administrative Divisions	Provides a list of the basic geopolitical entities in the world, together with the principal administrative divisions that comprise each entity. Each basic geopolitical entity is represented by a two-character, alphabetic country code. Each principal administrative division is identified by a four-character code consisting of the two-character country code followed by a two-character administrative division code. These codes are intended for use in activities associated with the mission of the Department of State and in National defense programs.
Federal Information Processing Standards (FIPS) 5.2 Codes for the Identification of the States, the District of Columbia and the Outlying Areas of the United States, and Associated Areas	Provides a set of two-digit numeric codes and a set of two-letter alphabetic codes for representing the 50 states, the District of Columbia and the outlying areas of the U.S., and associated areas such as the Federated States of Micronesia and Marshall Islands, and the trust territory of Palau.
Federal Medication Terminologies	A set of controlled terminologies and code sets developed and maintained as part of a collaboration between the Food and Drug Administration, National Library of Medicine, Veterans Health Administration, National Cancer Institute and Agency for Healthcare Research and Quality related to medications, including medication proprietary and nonproprietary names, clinical drug code (RxNorm); ingredient names and Unique Ingredient Identifiers (UNII); routes of administration, dosage forms, and units of presentation from the NCI Thesaurus (NCIt); and certain pharmacological drug classes from the National Drug File Reference Terminology (NDF-RT) . The Federal Medication Terminology leverages medication models maintained by the Food and Drug Administration (ex. UNII, NDC Codes), National Library of Medicine (RxNorm), the Veterans Health Administration (NDF-RT), and the National Cancer Institute (NCIt). Information on the Federal Medication Terminologies may be found and downloaded from the NCI Web portal terminology resources page at www.cancer.gov/cancertopics/terminologyresources/FMT

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Standard Name	Description
Health Level Seven (HL7) Version 2.5	The HL7 Version 2.5 Messaging Standard is an application protocol for electronic data exchange in healthcare. It and prior versions have widespread use in the U.S. and internationally. Both message formats and value sets / code tables (e.g., diagnosis type, gender, patient class, result status, specimen collection method, abnormal flags, observation result status codes interpretation, timestamp format) are contained in the standard. Of particular focus for HITSP Interoperability Specifications are message formats described in Chapters 2, 3, 5, and 7 including patient demographic (ADT) and lab result reporting. These are also used within composite standards from IHE for Patient Identity Cross-Referencing and Feed (PIX), Patient Demographics Query (PDQ), and Acknowledgements. Visit www.hl7.org for more information.
Health Level Seven (HL7) Version 3.0 Continuity of Care Document (CCD)	The Continuity of Care Document (CCD) constrains the HL7 Clinical Document Architecture Release 2 (CDA R2) in accordance with requirements specified in American Society for Testing and Materials (ASTM) standard E 2369-05, "Standard Specification for Continuity of Care Record (CCR)." The resulting CCD specification is developed as a collaborative effort between ASTM and HL7, and is intended as an alternate implementation to the one specified in ASTM E 2369-05 for those organizations preferring to use HL7 Clinical Document Architecture (CDA) to communicate this information. Visit www.hl7.org for more information.
HL7 CVX (clinical vaccine formulation) HL7 2.3.1	The Immunization Data Transactions, Version 2.3.1 of the HL7® Standard Protocol, Version 2.0 has been promulgated as the primary standard for immunization data transactions by CDC in the National Immunization Program (NIP), and is currently used nationally by many immunization registries, on local, state and federal levels. This standard is a mandatory functional requirement for states receiving federal matching funds. Currently, the CVX codes are utilized within the immunization and VAERS messaging standard. CDC has been designated by the HL7® organization as the "keeper" of the CVX code set.
HL7 v 2.3 MVX Manufacturer codes	The Immunization Data Transactions, Version 2.3.1 of the HL7® Standard Protocol, Version 2.0 has been promulgated as the primary standard for immunization data transactions by CDC in the National Immunization Program (NIP), and is currently used nationally by many immunization registries, on local, state and federal levels. This standard is a mandatory functional requirement for states receiving federal matching funds. Currently, the CVX codes are utilized within the immunization and VAERS messaging standard. The CDC's National Immunization Program maintains the HL7 external code set MVX. The implementation of the HL7 standard for immunization data exchange is described in Chapter 4 of the HL7 standard. The codes in HL7 Version 2.3 table 0227 represent the initial content of the external MVX code set.
Integrating the Healthcare Enterprise (IHE) IT Infrastructure Technical Framework (ITI-TF) Revision 3.0 Note: this document specifically references PIX (ITI-9), XDS Query Registry (ITI-16), XDS Retrieve Document (ITI-17), and PDQ (ITI-21).	The IHE IT Infrastructure Technical Framework defines specific implementations of established standards to achieve integration goals that promote appropriate sharing of health information to support optimal patient care. IHE Integration Profiles, offer a common language that healthcare professionals and vendors may use in communicating requirements for the integration of products. The current version of the ITI-TF, rev. 3.0 for Final Text, specifies the IHE transactions defined and implemented as of December 9, 2006. The latest version of the IHE Technical Framework is available at www.ihe.net.
International Organization for Standardization (ISO) Electronic business eXtensible Markup Language (ebXML), Technical Specification # 15000 -- Part 4: Registry services specification (ebRS), May, 2004	Describes eXtensible Markup Language (XML) and its usage characteristics. Consists of 4 parts: ebCPP, ebMS, ebRIM, and ebRS. Part 4 ebRS defines the interface between the registry and the registry clients, as well as the interaction protocols, message definitions and XML schema. Visit www.iso.org for more information.

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Standard Name	Description
Logical Observation Identifiers Names and Codes (LOINC®)	A database of universal identifiers for laboratory and other clinical observations. The laboratory portion of the LOINC database contains the usual categories of chemistry, hematology, serology, microbiology (including parasitology and virology), and toxicology; as well as categories for drugs and the cell counts typically reported on a complete blood count or a cerebrospinal fluid cell count. Antibiotic susceptibilities are a separate category. The clinical portion of the LOINC database includes entries for vital signs, hemodynamics, intake/output, EKG, obstetric ultrasound, cardiac echo, urologic imaging, gastroendoscopic procedures, pulmonary ventilator management, selected survey instruments, and other clinical observations. Visit www.loinc.org for more information.
National Library of Medicine (NLM) Unified Medical Language System (UMLS) RxNorm	Provides standard names for (1) clinical drugs and (2) drug dose forms as administered to a patient. Also provides links from clinical drugs, both branded and generic, to their active ingredients, drug components (active ingredient + strength), and related brand names. Food and Drug Administration (FDA) National Drug Codes (NDCs) for specific drug products and many of the drug vocabularies commonly used in pharmacy management and drug interaction software are additionally linked to RxNorm. Visit www.nlm.nih.gov for more information.
OASIS/EDXL DE V1.0 Emergency Data Exchange Language CAP	The Common Alerting Protocol (CAP) provides an open, non-proprietary digital message format for all types of alerts and notifications. It does not address any particular application or telecommunications method. The CAP format is compatible with emerging techniques, such as Web services, as well as existing formats including the Specific Area Message Encoding (SAME) used for the United States' National Oceanic and Atmospheric Administration (NOAA) Weather Radio and the Emergency Alert System (EAS), while offering enhanced capabilities that include: - Flexible geographic targeting using latitude/longitude shapes and other geospatial representations in three dimensions - Multilingual and multi-audience messaging - Phased and delayed effective times and expirations - Enhanced message update and cancellation features - Template support for framing complete and effective warning messages - Compatible with digital encryption and signature capability - Facility for digital images and audio
Organization for the Advancement of Structured Information Standards (OASIS) Emergency Data Exchange Language (EDXL) Distribution Element (DE)	Describes a standard message distribution framework for data sharing among emergency information systems using the XML-based EDXL. This format may be used over any data transmission system. DE is initially intended for use in disaster or emergency situations. Visit www.oasis-open.org for more information.
Organization for the Advancement of Structured Information Standards (OASIS) Emergency Data Exchange Language (EDXL) Hospital Availability Exchange (HAVE)	Specifies an XML-formatted document that allows healthcare provider organizations to communicate specific utilization information and status of a facility (e.g., hospital, trauma center, nursing home) and its resources; including bed capacity and availability, emergency department status, the available service coverage, and the status of a hospital's facility and operations. HAVE is initially intended for use in disaster or emergency situations. Visit www.oasis-open.org for more information.
Revisions to the Standards for the Classification of Federal Data on Race and Ethnicity	This classification provides a minimum standard for maintaining, collecting, and presenting data on race and ethnicity for all Federal-reporting purposes. The categories in this classification are social-political constructs and should not be interpreted as being scientific or anthropological in nature. The standards have been developed to provide a common language for uniformity and comparability in the collection and use of data on race and ethnicity by Federal agencies. Visit www.census.gov/population/www/socdemo/race/Ombdir15.html for more information.

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