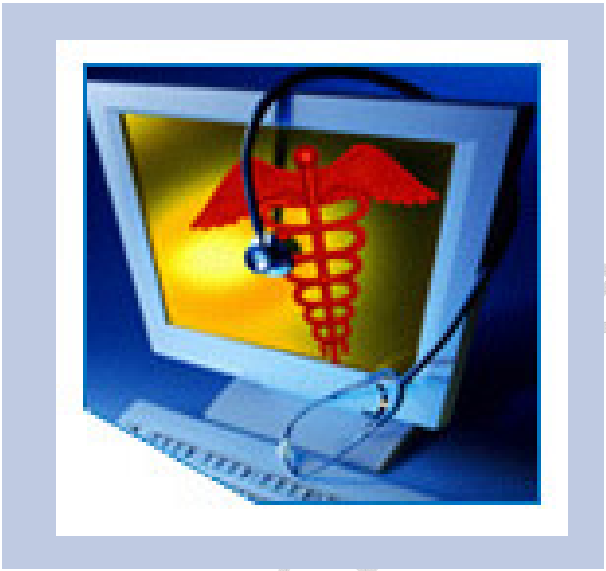
August 18, 2006
Version 1.0

HITSP Interoperability Specification: Encounter Message Component

HITSP/ISC -39



Submitted to:

Healthcare Information Technology Standards Panel

Submitted by:

Biosurveillance Technical Committee

DOCUMENT CHANGE HISTORY

Version Number	Description of Change	Name of Author	Date Published
1.0	Final Draft	Biosurveillance Technical Committee	8/18/2006

1.0 FOREWORD

Healthcare Information Technology Standards Panel (HITSP) is a multi-stakeholder coordinating body designed to provide the process within which affected parties can identify, select, and harmonize standards for communicating healthcare information throughout the healthcare spectrum. HITSP functions as a partnership of the public and private sectors and operates with a neutral and inclusive governance model administered by the American National Standards Institute. The goal of the Panel is to:

- Facilitate the development of harmonized interoperability specifications and information policies, including SDO work products (e.g. standards, technical reports). These policies, profiles and work products are essential for establishing privacy, security and interoperability among healthcare software applications.
- Coordinate, as appropriate, with other national, regional and international groups addressing healthcare informatics to ensure that the resulting standards are globally relevant.
- Be use-case driven, utilize information from stakeholders and base its decisions on industry needs.

The HITSP shall serve the public good by working to ensure that the combined work of various healthcare information standards organizations supports interoperability, accurate use, access, privacy and security of shared health information.

In order to advance the goal of expanding harmonized interoperability specifications and information policies, HITSP was tasked with developing interoperability specifications for three main use case "breakthroughs areas" in which specific, near term value to the health care consumer could be realized. The harmonized use case areas are:

1.	Biosurveillance	Transmit essential ambulatory care and emergency department visit, utilization, and lab result data from electronically enabled health care delivery and public health systems in standardized and anonymized format to authorized Public Health Agencies with less than one day lag time.
2.	Consumer Empowerment	Allow consumers to establish and manage permissions access rights and informed consent for authorized and secure exchange, viewing, and querying of their linked patient registration summaries and medication histories between designated caregivers and other health professionals.
3.	Electronic Health Record	Allow ordering clinicians to electronically access laboratory results, and allow non-ordering authorized clinicians to electronically access historical and other laboratory results for clinical care.

The interoperability specification provides a detailed mapping of existing standards and specifications such as implementation guides, integration profiles to actions and actors that satisfy the requirements imposed by the relevant use cases. It identifies and constrains standards where necessary, and creates

groupings of specific actions and actors to further describe the relevant contexts. Where gaps and overlaps are identified, the interoperability specification provides recommendations and a roadmap for corrections to be made.

2.0 INTRODUCTION

The introduction is to give specific information or commentary about the technical content of the document, and about the reasons prompting its preparation. It shall not contain requirements. Include information regarding the objectives of the document and the problem that prompted the creation of the specification. Information for this section will probably mostly be derived from the Use Case Specification. Describe the objectives for this document – its use, and its place in the general framework for health information exchange.

2.1 OVERVIEW

The Interoperability Specification focuses on a set of constrained standards for information interchange that address the core requirements of the Use Case described herein. It does not define all functions, constructs and standards necessary to implement a conforming system in a real world environment. In particular, an implementer must provide the technical infrastructure and security framework necessary to support operations in accordance with law, regulation, best practices and business agreements.

2.2 AUDIENCE

The interoperability specification is designed to be used by analysts who need to understand the interoperability requirements for the described use case, and by implementers working to develop interoperable applications. Understanding and using the relevant interoperability set of specifications is a key requirement for establishing interoperability compliance.

2.3 TERMS AND DEFINITIONS

The definitions used for the purposes of this document can be found in the glossary. Refer to glossary in the appendix.

2.4 CONVENTIONS

This specification uses the following to convey the full descriptions and usage of standards:

UML sequence and activity diagrams

In these diagrams, the actors and transactions are highlighted within the framework of the specific scenario or context. The actors involved in the specified use-scenario or context are mapped out, and the interactions between each action and actor for a particular context, and the flow of data are provided through the use of arrows. Diagrams are named according to the section in which they reside, and will use the following naming convention:

Figure <section number>-<consecutive number for the diagram, e.g. 1, 2, 3, etc.>. <Short name/description of diagram>. For example, a diagram residing in section 3.1.3 showing the Actor Interactions for the Send Lab Results transaction package is named:
Figure 3.1.3-1. Send Lab Results Transaction Package

Tables

Tables are used to indicate standards categorizations, as well as dependencies and constraints between constructs. Tables are named according to the section in which they reside, and will use the following naming convention:
Table <section number>-<consecutive number for the table, e.g. 1, 2, 3, etc.>. <Short name/description of table>. For example, a table residing in section 2.7.1 showing the Dependencies between the transactions for the Send Lab Results transaction package is named:
Table 2.7.1-1. Send Lab Results Transaction Package dependencies

References

When references are made to another section within an Interoperability Specification a section number is used by itself. When references are made to other constructs that are related to the Interoperability Specification, such as Transaction Packages, Components or Composite Standards, the HITSP document short name and section number are displayed as follows:

<HITSP Document short name or Composite Standard Short Name>-<Volume Number>: <section number>

where:
<HITSP document short name> is a short designator for the construct (e.g. HITSP/ISTP-013)
<Composite Standard Short Name> is a short designator for the composite standard (e.g. IHE-ITI TF)
<Volume Number> is the applicable volume within the given composite standard (e.g. 1)
<section number> is the applicable section number (e.g. 3.1)

For example: HITSP/ISTP-013: 3.1 refers to Section 3.1 in the Interoperability Specification for a Transaction Package, IHE-ITI TF-2: 4.33 refers to Section 4.33 in volume 2 of the IHE IT Infrastructure Technical Framework.

Reproductions

Where large sections of composite standards or base standards are reproduced within a HITSP specification, the reproduced sections are cited with introductory text containing the reference information for the composite or base standard. In addition, the beginning and ending of the reproduced text are respectively shown using a beginning statement:

The text for the <composite or base standard name> specification begins here:

And an ending statement:

The text for the <composite or base standard name> ends here.

2.5 COMMENTS

To submit comments for this interoperability specification, please download the Comment Submission sheet from the HITSP site at www.hitsp.org and provide all relevant information, and then email the completed document to hitspcomments@ansi.org. Comments are consolidated periodically and sent to the Technical Committees for review.

2.6 COPYRIGHT PERMISSIONS

3.0 STANDARDS REFERENCES

3.1 LIST OF BASE STANDARDS

Context Standards	
Standard	Description/Reason for selection/Reference
None	
Information Interchange Standards	
Standard	Description/Reason for selection/Reference
HL7 ADT Messages	Description: HL7 ADT messages will be used to send Encounter-level information from a Biosurveillance information source to the Biosurveillance system Reasoning: HL7 is pervasively used in hospitals and other clinical settings that are the source of Biosurveillance information. Reference: HL7 v2.5-2003 ADT messages, Chapter 3
Terminology Standards	
Standard	Description/Reason for selection/Reference
SNOMED CT	Description: Systemized Nomenclature of Medicine Clinical Terms Reasoning: SNOMED CT was selected by the Consolidated Health Information Initiate (CHI) as appropriate terminology for data elements that are part of the Biosurveillance data set. Reference: http://www.snomed.org/

Terminology Standards	
ICD-9 CM	Description: International Classification of Diseases Version 9 Clinical Modifications Reasoning: These are the codes that are in use by Healthcare organizations and ICD-9 was selected by the Consolidated Health Information Initiate (CHI) as appropriate terminology for diagnosis information. Reference: http://www.cdc.gov/nchs/icd9.htm
Unified Code for Units of Measure (UCUM)	Description: Unified Units of Measure from the Regenstrief Institute Reasoning: Commonly used within HL7 messages to express units of measure. Reference: http://aurora.regenstrief.org/UCUM/
FIPS 5-2 State Codes	Description: Federal Information Process standard 5-2 which list 2 character state codes. Reasoning: These are the state codes that are in routine use by healthcare organizations and is recommended by CHI. Reference: http://www.itl.nist.gov/fipspubs/fip5-2.htm
Universal Billing Codes (UB-92)	Description: Universal Billing Codes for Field 22, Discharge Disposition Reasoning: CHI adopted HL7 v2.4 and higher for the Clinical Encounter Domains. UB-92 codes have been selected by HL7 as the appropriate terminology for Discharge Disposition Reference: http://www.hipaanet.com/hisb_ub92.htm
Patient Class HL7 Version 2.5	Description: Patient classes define by HL7 version 2.5 Reasoning: CHI has recommended using HL7 v2.4 and higher terminology for patient class. Reference: See table HL0004 in the HL7 V2.5 standard, Chapter 3

Terminology Standards	
Gender HL7 Version 2.5	Description: Gender defined by HL7 version 2.5 Reasoning: CHI has recommended using HL7 V2.4 and higher terminology for patient demographic information. CHI recommended restricting to Male, Female and Unknown. Reference: See table HL0001 in the HL7 V2.5 standard, Chapter 3
Diagnosis Type HL7 Version 2.5	Description: Diagnosis type from HL7 V2.5 Reasoning: HL7 diagnosis types are commonly used in HL7 messages Reference: See table HL0052 in the HL7 V2.5 standard, Chapter 6
Clinical Care Classification (Nursing)	Description: The Clinical Care Classification (CCC) is standardized coded framework for documenting, coding, and tracking of patient care by nurses and other clinical professionals in any health care setting. Reasoning: Nursing terminology with atomic-level concepts and therefore that meets criteria for a standardized terminology. Reference: www.sabacare.com http://www.ushik.org/registry/x/model_CCC.html
Security Standards	
Standard	Description/Reason for selection/Reference
None	
Identifier Standards	
Standard	Description/Reason for selection/Reference
None	
Functionality and Process/Process and Workflow Standards	
Standard	Description/Reason for selection/Reference
None	
Legislative Standards	
Standard	Description/Reason for selection/Reference
None	

Other Standards	
Standard	Description/Reason for selection/Reference
None	

3.2 LIST OF COMPOSITE STANDARDS

Not Applicable

4.0 COMPONENT

Encounter: The process of sending patient encounter data (excluding laboratory, radiology) from a Biosurveillance Message Sender to a Biosurveillance Message Receiver.

Patient encounter data is captured as part of the normal process of care performed by healthcare providers such as hospitals, emergency departments and outpatient clinics.

4.1 CONTEXTUAL OVERVIEW

4.1.1 CONTEXTUAL CONSTRAINTS

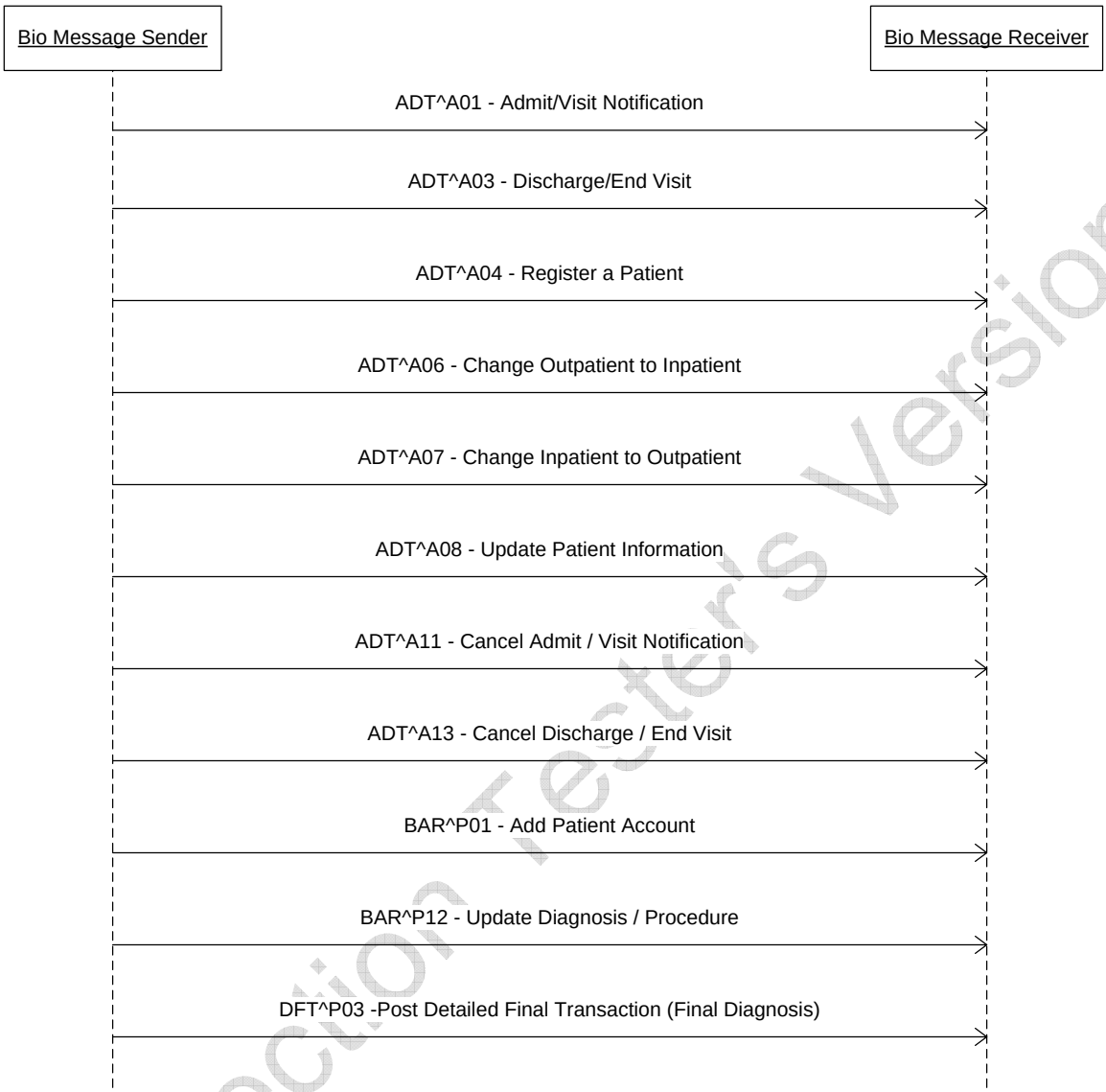
The patient encounter data must be anonymized, pseudonymized and translated to appropriate terminology standards before it is sent to the Biosurveillance system.

4.1.2 TECHNICAL ACTORS

Actor	Description
Biosurveillance Message Sender	Copy definition from other components
Biosurveillance Message Receiver	Copy definition from other components

4.2 INFORMATION INTERCHANGE COMPONENTS: RULES FOR IMPLEMENTING

The Encounter component uses HL7 V2.5 ADT messages to send Biosurveillance data to the Biosurveillance system. The Biosurveillance data source is formatted into the appropriate HL7 V2.5 ADT message (see diagram below), constrained to the AHIC defined Biosurveillance data set (see section 4.2.3.1 Minimum Data Set) and codified with the appropriate terminology (section 6.2 Appendix).



4.2.1 PROCESS PRE-CONDITIONS

It is assumed that the Biosurveillance data source will have clinical information systems for capturing the Biosurveillance data elements.

4.2.1.1 PROCESS TRIGGERS

The trigger for sending encounter-based biosurveillance data is the updating of patient-based data at the data source. In many instances the updating of data at the data source will generate a local HL7 transaction. These local HL7 transactions can be utilized to create the HL7 V2.5 ADT Biosurveillance transactions.

4.2.2 PROCESS POST-CONDITIONS

The appropriate HL7 ADT message is created with the proper format and terminology.

4.2.2.1 PROCESS OUTPUTS

The appropriate HL7 ADT message is created with the proper format and terminology. The HL7 ADT message will need to be anonymized and pseunonymized.

4.2.3 DATA STRUCTURE

The encounter-based Biosurveillance data is formatted into a HL7 V2.5 ADT data structure (see section 4.2.3.2 Data Mapping for the list of ADT messages). The segments that are used within the ADT messages are:

- Message Header (MSH)
- Event – (EVN)
- Patient Identification (PID)
- Patient Visit 1 (PV1)
- Patient Visit 2 (PV2)
- Observation (OBX)
- Diagnosis (DG1)

The tables below list the standard HL7 message triggers that may be supported at the site and that carry the Biosurveillance data elements. Each message structure is listed since the segment order may defined differently for the trigger, per HL7 Standard Abstract Message Structure.

ADT Messages Needed to Capture the AHIC Data Elements

The following trigger events are necessary to capture from the source ADT traffic because they carry the information in the AHIC minimum data set.

Type ^ Trigger	Description
ADT^A01	Admit/Visit Notification
ADT^A03	Discharge/End Visit
ADT^A04	Register a Patient
ADT^A06	Change an Outpatient to an Inpatient
ADT^A07	Change an Inpatient to an Outpatient
ADT^A08	Update Patient Information
ADT^A11	Cancel Admit / Visit Notification
ADT^A13	Cancel Discharge / End Visit
BAR^P01*	Add Patient Account (previous HL7 versions: Add/Update Patient Account)
BAR^P12*	Update Diagnosis/Procedure
DFT^P03*	Post Detailed Financial Transaction (Final Diagnosis)

ADT Messages needed to manage patient identifiers.

The management of patient identifiers in the Biosurveillance use case is performed by the Pseudonymization transaction. The following trigger events are listed because they may be relevant to the Pseudonymize transaction.

Type ^ Trigger	Description
ADT^A18	Merge Patient Information
ADT^A19	Patient Query
ADT^A24	Link Patient Information
ADT^A28	Add Person or Patient Information
ADT^A29	Delete Person Information
ADT^A30	Merge Person Information
ADT^A31	Update Person Information
ADT^A34	Merge Patient Information – Patient ID Only
ADT^A35	Merge Patient Information – Account Number Only
ADT^A36	Merge Patient Information – Patient ID & Account Number
ADT^A37	Unlink Patient Information
ADT^A39	Merge Person – Patient ID
ADT^A40	Merge Patient – Patient Identifier List
ADT^A41	Merge Account – Patient Account Number
ADT^A42	Merge Visit – Visit Number
ADT^A43	Move Patient Information – Patient Identifier List
ADT^A44	Move Account Information – Patient Account Number
ADT^A45	Move Visit Information – Visit Number
ADT^A46	Change Patient ID
ADT^A47	Change Patient Identifier List
ADT^A48	Change Alternate Patient ID
ADT^A49	Change Patient Account Number
ADT^A50	Change Visit Number
ADT^A51	Change Alternate Visit ID

5

4.2.3.1 MINIMUM DATA-SET

The Patient Data and Clinical Data listed on the tables below capture only the AHIC minimum data set. Additional data elements, as negotiated in local settings, may be included.

PATIENT DATA	
Data Element	Description
Pseudonymized Patient ID /Randomized Data Linker	An pseudonym Patient ID is created to uniquely distinguish a patient across all visits to a single institution, or across all visits to a healthcare system when a common patient identification system is used. The Biosurveillance Patient ID does not contain personally identifiable information.
Encounter Date/Time	Date/time the encounter occurred is captured upon registration or admission in the ADT system. IF an ED patient is moved to inpatient status, this field will be updated to be the admit date/time as part of the transaction.

PATIENT DATA	
Data Element	Description
Date of Birth	Patient's year and month of birth (day is not included for privacy purposes). NOTE: May not be passing DOB for age over 89 due to HIPAA requirements.
Patient Age	Patient's age as reported in an application at the source. Age may be available if DOB was not populated.
Sex	Patient sex
Zip code	Patient residence zip code
State	Patient residence – state
Date/time of Message	Date/time of message

CLINICAL DATA	
Data Element	Description
Diagnosis/Injury Code	Diagnosis or diagnoses assigned as a result of the encounter
Diagnosis Type	Type of diagnosis being sent (admitting, working, final)
Diagnosis Date/Time	Date/time the diagnosis was made
Discharge Disposition	Discharge Disposition –patient's anticipated location or status following the visit (admitted, sent home, etc.).
Patient Class	General type of patient, *e.g.*, Inpatient, Outpatient, Emergency.
Date/time of illness onset	Date and time of illness onset
Chief Complaint	Patient-reported reason for visit or admission reason. It may have been entered as text or may make use of drop-down lists to enter canned text.
Heart Rate Date/time of heart rate measurement	Heart rate measurement. Assumes beats per minute. The heart rate taken on initial assessment/triage is the vital sign of interest.
Temperature Date/time of temperature	Body temperature measurement, including the reference to Celsius or Fahrenheit. The temperature taken on initial assessment/triage is the vital sign of interest.
Blood Pressure BP Date/Time	Systolic/Diastolic blood pressure measurement and the date/time that it was performed. The BP done on initial assessment/triage is the vital sign of interest.
Pulse Oximetry Pulse Ox Date/Time	Pulse oximetry reading and the date/time that it was performed. The pulse ox reading at triage assessment time is the vital sign of interest.
Nurse/Triage Notes	Provider notes documented in the process of sorting patients based on need for or likely benefit from immediate medical treatment.

4.2.3.2 DATA MAPPING

SEGMENTS AND FIELD DESCRIPTOINS

This section contains descriptions of the segments used to build the messages above. Within each segment, the supported fields are detailed. The fields are populated if available in the source transaction, regardless of message type.

Constrained Message Formats

The HL7 message formats sent to the Biosurveillance system will be constrained versions of the HL7 V2.5 abstract message formats. Only the segments necessary for carrying the BioSense data, and certain structural message segments, are included in the messages that are sent to the CDC. The constrained message specifications are defined below.

Note: Message segments in brackets [] indicate optional segments. Message segments in braces {} indicate segments that may repeat.

ADT^A01 Admit/Visit Notification

ADT^A01 ADMIT/VISIT NOTIFICATION	
ADT^A01^ADT_A01	ADT Message
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit
[PV2]	Patient Visit - Additional Info
[{ OBX }]	Observation/Result
[{ DG1 }]	Diagnosis Information

ADT^A03 Discharge/End Visit

ADT^A03 DISCHARGE/END VISIT	
ADT^A03^ADT_A03	ADT Message
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit
[PV2]	Patient Visit - Additional Info.
[{ DG1 }]	Diagnosis Information
[{ OBX }]	Observation/Result

ADT^A04 Register a Patient

ADT^A04 REGISTER A PATIENT	
ADT^A04^ADT_A01	ADT Message
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit
[PV2]	Patient Visit - Additional Info.
[{ OBX }]	Observation/Result
[{ DG1 }]	Diagnosis Information

ADT^A06 Change an Outpatient to an Inpatient

ADT^A06 CHANGE AN OUTPATIENT TO AN INPATIENT	
ADT^A06^ADT_A06	ADT Message
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit
[PV2]	Patient Visit - Additional Info.
[{ OBX }]	Observation/Result
[{ DG1 }]	Diagnosis Information

5 ADT^A07 Change an Inpatient to an Outpatient

ADT^A07 CHANGE AN INPATIENT TO AN OUTPATIENT	
ADT^A07^ADT_A06	ADT Message
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit
[PV2]	Patient Visit - Additional Info.
[{ OBX }]	Observation/Result
[{ DG1 }]	Diagnosis Information

ADT^A08 Update Patient Information

ADT^A08 UPDATE PATIENT INFORMATION	
ADT^A08^ADT_A01	ADT Message
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit
[PV2]	Patient Visit - Additional Info.
[{ OBX }]	Observation/Result
[{ DG1 }]	Diagnosis Information

10

ADT^A11 Update Patient Information

ADT^A11 - CANCEL ADMIT / VISIT NOTIFICATION	
ADT^A11^ADT_A09	ADT Message
MSH	Message Header
EVN	Event Type

ADT^A11 - CANCEL ADMIT / VISIT NOTIFICATION	
ADT^A11^ADT_A09	ADT Message
PID	Patient Identification
PV1	Patient Visit
[PV2]	Patient Visit - Additional Info.
[{ OBX }]	Observation/Result
[{ DG1 }]	Diagnosis Information

ADT^A13 Update Patient Information

ADT^A13 CANCEL DISCHARGE / END VISIT	
ADT^A13^ADT_A01	ADT Message
MSH	Message Header
EVN	Event Type
PID	Patient Identification
PV1	Patient Visit
[PV2]	Patient Visit - Additional Info.
[{ OBX }]	Observation/Result
[{ DG1 }]	Diagnosis Information

5 HL7 SEGMENT AND FIELD DESCRIPTIONS

This section contains descriptions of the segments used. Within each segment, the supported fields are briefly described. For more information on segments and fields, refer to the HL7 Standard.

Segment Attribute Table Abbreviations

The abbreviated terms and their definitions as used in the segment table headings, are as follows:

SEGMENT ATTRIBUTES	
Abbreviation	Definition
Seq	Sequence of the elements as they are numbered in the HL7 segment.
Len	Maximum length of the element. Length of an element is calculated using the following rules: • Field length = (Sum of all supported component lengths) + (component number of the last supported component) – 1. • Component length = (Sum of all supported sub-component lengths) + (sub-component number of the last supported component) – 1. Lengths should be considered recommendations, not absolutes. The receiver may truncate fields, components, and sub-components longer than the recommended length. The receiver should not fail to process a message simply because fields, components, or sub-components are too long.
DT	Data type used for HL7 element.
Usage	Usage of the field for Biosurveillance messaging. Indicates if the field is required, optional, or conditional in a segment.
Repeats	A Y indicates that the element may appear more than once in the field. A number indicates the maximum number of instances.
Value Set	Pre-coordinated tables used in Biosurveillance messages.

SEGMENT ATTRIBUTES	
Abbreviation	Definition
HL7 Element Name	HL7 descriptor of the element in the segment.
Description/Comments	Context and usage for the element.

MSH – Message Header Segment

The Message Header Segment (MSH) is necessary to support the functionality described in the Control/Query chapter of the HL7 standard. MSH is used to define the intent, source, destination, and some specifics of the syntax of a message. The message header is mandatory for every message.

MESSAGE HEADER SEG`MENT (MSH)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/Comments
1	1	ST	R			Field Separator	Character to be used as the field separator for the rest of the message. The supported value is |, ASCII (124).
2	4	ST	R			Encoding Characters	Field that always contains the following four characters, in the same order: |^~\&|.
3	227	HD	R			Sending Application	Field used to uniquely identify the sending application for messaging purposes.
3.1	20	IS	O			Namespace ID	Sending application short name may be included for readability.
3.2	199	ST	R			Universal ID	This may be an OID.
3.3	6	ID	R			Universal ID Type	If OID used as universal id, this field contains the literal value 'ISO'.
4	227	HD	R			Sending Facility	Unique identifier of the facility that sends the message.
4.1	20	IS	O			Namespace ID	Facility short name may be included for readability.
4.2	199	ST	R			Universal ID	This may be an OID.
4.3	6	ID	R			Universal ID Type	If OID used as universal id, this field contains the literal value 'ISO'.
5	227	HD	R			Receiving Application	Field used to uniquely identify the receiving application for messaging purposes.
5.1	20	IS	O			Namespace ID	Application short name may be included for readability.
5.2	199	ST	R			Universal ID	This may be an OID.
5.3	6	ID	R			Universal ID Type	If OID used as universal id, this field contains the literal value 'ISO'.
6	227	HD	R			Receiving Facility	Unique identifier of the facility that is to receive the message.
6.1	20	IS	O			Namespace ID	Facility short name may be included for readability.
6.2	199	ST	R			Universal ID	This may be an OID.
6.3	6	ID	R			Universal ID Type	If OID used as universal id, this field contains the literal value 'ISO'.

MESSAGE HEADER SEG`MENT (MSH)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/Comments
7	24	TS	R			Date/Time Of Message	Date/time the sending system created the message.
7.1	24	DTM	R			Time	YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]][+/-ZZZZ], where at least the first fourteen digits are used to specify to a precision of "second." The time zone (+/-ZZZZ) is represented as +/-HHMM offset from Coordinated Universal Time (UTC) (formerly Greenwich Mean Time [GMT]), where +0000 or -0000 both represent UTC (without offset). Note that if the time zone is not included, the time zone is understood to be the local time zone of the sender.
9	15	MSG	R			Message Type	Field containing the message type, trigger event, and the message structure ID for the message. For the Encounter message, the value in this field will an HL7 ADT trigger event in the format 'ADT^Axx^ADT_Axx'.
9.1	3	ID	R			Message Code	Literal value: 'ADT'.
9.2	3	ID	R			Trigger Event	Literal value: 'Axx'.
9.3	7	ID	R			Message Structure	Literal value: 'ADT_Axx'.
10	20	ST	R			Message Control ID	String that uniquely identifies the message instance from the sending application.
11	3	PT	R			Processing ID	Field that indicates the intent for processing the message, such as "Testing," "Development," or "Production."
11.1	1	ID	R			Processing ID	
11.2	1	ID	O			Processing Mode	Processing mode is understood to be "Current," if not explicitly sent in the message.
12	5	VID	R			Version ID	HL7 version number used to interpret format and content of the message.
12.1	5	ID	R			Version ID	Literal value: '2.5'.
21	411	EI	O			Message Profile Identifier	Field used to reference or assert adherence to a message profile. Message profiles contain detailed explanations of grammar, syntax, and usage for a particular message or set of messages.
21.1	199	ST	O			Entity Identifier	
21.2	4	IS	O			Namespace ID	
21.3	199	ST	O			Universal ID	
21.4	6	ID	O			Universal ID Type	

EVN – Event Segment

The following table portrays the EVN segment constrained for use with the AHIC minimum data set. It is included because it is an HL7-mandatory segment for every ADT message.

5

EVENT SEGMENT (EVN)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
1	3	ID	B		0003	Event Type Code	This field contains the events corresponding to the trigger events described in this section, e.g., admission, transfer, or registration.
2	26	TS	R			Recorded Date/Time	Date/time when the transaction was entered.

PID – Patient Identification Segment

The following table portrays the PID segment constrained to capture the patient demographic elements in the AHIC minimum data set.

PATIENT IDENTIFICATION SEGMENT (PID)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
1	4	SI	O			Set ID - PID	Only one patient/one PID segment per message is supported for this interface. The field null or it may contain a '1'.
3	250	CX	R			Patient Identifier List	This may be a pseudonymized identifier.
3.1	15	ST	R			ID Number	Please check LEN fields
3.2	1	ST	X			Check Digit	
3.3	3	ID	X			Check Digit Scheme	
3.4	227	HD	R			Assigning Authority	
3.4.1	20	IS	O			Namespace ID	
3.4.2	199	ST	R			Universal ID	
3.4.3	6	ID	R			Universal ID Type	
5						Patient Name	Patient names are not passed as part of the BIO minimum data set.
5.1						Family Name	
5.1.1	50	ST	C			Surname	Required field for the PID segment, containing the literal value |""| for patient de-identification purposes. Any other value in this field should be considered an error.
7	26	TS	O			Date/Time of Birth	Patient's birth date in YYYYMM format. Only the year and month will be passed in this field.
8	1	IS	O	0001		Administrative Sex	Patient's sex.
11	250	XAD	O			Patient Address	Residence address of the patient. For de-identification purposes, only the state and zip code components are passed.
11.4	50	ST	O			State or Province	
11.5	12	ST	O			Zip or Postal Code	

5

PV1 – Patient Visit Segment

The following table portrays the PV1 segment constrained to pass the patient class and encounter (admit) date/time from the AHIC minimum data set.

PATIENT VISIT SEGMENT (PV1)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
1	4	SI	O			Set ID - PV1	May be null or contain a 1. Only one PV1 segment is expected in this message set.
2	1	IS	R		0004	Patient Class	This field is used by systems to categorize patients by site. It does not have a consistent industry-wide definition and is subject to site-specific variations
44	26	TS	O			Admit Date/Time	This field contains the admit date/time. This field is also used to reflect the date/time of an outpatient/emergency patient registration.

PV2 – Patient Visit Additional Segment

This table portrays the use of the PV2 segment constrained to pass the Chief Complaint information for Biosurveillance.

PATIENT VISIT SEGMENT (PV2)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
3	250	CE	O			Admit Reason	This field contains the short description of the reason for patient admission. It may also contain Chief Complaint or Visit Reason, depending on the patient class context.
3.1	20	ST	O			Identifier	Standardized Code.
3.2	199	ST	O			Text	Standardized Description.
3.3	20	ID	O			Name of Coding System	Coding System.
3.4	20	ST	O			Alternate Identifier	Local Code.
3.5	199	ST	O			Alternate Text	Local Description – if there is no ICD-9 in use and the chief complaint is being passed as text, use this component.
3.6	20	ID	O			Name of Coding System	Local Coding System.

DG1 – Diagnosis Segment

This table portrays the use of the DG1 – Diagnosis segment constrained to pass the AHIC minimum data set diagnosis information for Biosurveillance.

DIAGNOSIS SEGMENT (DG1)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
1	4	SI	R			Set ID - DG1	This field contains the number that identifies this transaction. For the first occurrence of the segment the sequence number shall be 1, for the second occurrence it shall be 2, etc.

DIAGNOSIS SEGMENT (DG1)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
3	250	CE	R		0051	Diagnosis Code - DG1	Note that the Standard attribute table lists this attribute as Optional, but if the DG1 is used, this field is mandatory.
3.1	20	ST	R			Identifier	Standardized Code.
3.2	199	ST	R			Text	Standardized Description.
3.3	20	ID	R			Name of Coding System	Coding System.
3.4	20	ST	O			Alternate Identifier	Local Code.
3.5	199	ST	O			Alternate Text	Local Description.
3.6	20	ID	O			Name of Coding System	Local Coding System.
5	26	TS	O			Diagnosis Date/Time	Field that may contain the date/time the diagnosis was identified.
6	2	IS	R		0052	Diagnosis Type	Identifier of the type of diagnosis being sent. This is a site-defined field.

OBX – Observation Result Segment

The Observation Result Segment (OBX) is used to convey observations in both ADT and result messages.

5

OBSERVATION/RESULT SEGMENT (OBX)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
1	4	SI	O			Set ID – OBX	Field that contains the sequence number of the OBX, which increments up by one for each observation segment in the group.
2	2	ID	C		0125	Value Type	Format of the observation value expressed in OBX-5. The expected value types for this interface are ST, TX, TS, SN, or CE. See breakdown for each data type in OBX-5 below.
3	250	CE	R			Observation Identifier	Observations that may be captured with this component are assigned a LOINC code that is used to identify the observation being passed.
3.1	20	ST	R			Identifier	LOINC code.
3.2	199	ST	R			Text	LOINC Description.
3.3	20	ID	R			Name of Coding System	LOINC Code system identifier.
3.4	20	ST	O			Alternate Identifier	Local Code.
3.5	199	ST	O			Alternate Text	Local Description.
3.6	20	ID	O			Name of Coding System	Local Coding System.

OBSERVATION/RESULT SEGMENT (OBX)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
4	20	ST	C			Observation Sub-ID	This field may be used to group OBX segments where OBX-3 Observation Identifier is the same value.
5	999991	varies	C	Y2		Observation Value	The length and format of the Observation Value changes depending on the value in OBX-2 Value Type.
BREAKDOWN FOR ST (STRING) DATATYPE							
5.1	199	ST	R			String Data	String data is left-justified with trailing blanks optional. It may be any displayable (printable) ACSII characters (hexadecimal values between 20 and 7E, inclusive, or ASCII decimal values between 32 and 126), except the defined escape characters and defined delimiter characters.
BREAKDOWN FOR SN (STRUCTURED NUMERIC) DATATYPE							
5.1	2	ST	O			Comparator	Defined as greater than, less than, greater than or equal, less than or equal, equal, and not equal, respectively (= ">" or "<" or ">=" or "<=" or "=" or "<>". If this component is not valued, it is assumed to be equal ("="). This field is preferred over the use of the NM datatype which must often be passed as a string, since it may be a mixture of an operator character and numeric data.
5.2	15	NM	R			Num1	First number.
5.3	1	ST	O			Separator/Suffix	"-" or "+" or "/" or "." or ":".
5.4	15	NM	O			Num2	Second number.
BREAKDOWN FOR TS (TIMESTAMP) DATATYPE							

OBSERVATION/RESULT SEGMENT (OBX)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
5.1	24	DTM	R	[1..1]		Time	YYYY[MM[DD[HH[MM[SS[.S[S[S[S]]]]]]]]][+/-ZZZZ] where: the first four specify a precision of "year" the first six are used to specify a precision of "month" the first eight are used to specify a precision of "day" the first ten are used to specify a precision of "hour" the first twelve are used to specify a precision of "minute" the first fourteen are used to specify a precision of "second" the first sixteen are used to specify a precision of "one tenth of a second" the first nineteen are used to specify a precision of "one ten thousandths of a second." The time zone (+/-ZZZZ) is represented as +/-HHMM offset from Coordinated Universal Time (UTC) (formerly Greenwich Mean Time [GMT]), where +0000 or -0000 both represent UTC (without offset). Note that if the time zone is not included, the time zone defaults to that of the local time zone of the sender.
5.2	1	ID	X	0529		Degree of Precision	
BREAKDOWN FOR TX (TEXT) DATATYPE							
5.1	no limit	TX	R			Text Data	String data meant for user display (on a terminal or printer). Such data would not necessarily be left-justified, since leading spaces may contribute greatly to the clarity of the presentation to the user. Because this type of data is intended for display, it may contain certain escape character sequences designed to control the display. Escape sequence formatting is defined in Section 2.7 of the *HL7 2.5 Standard Use of Escape Sequences in Text Fields*. Leading spaces should be included. Trailing spaces should be removed.
6	250	CE	O			Units	Units of measure that put the observation value expressed in OBX-5 into context. Units are used for age, blood pressure and temperature observations, as well as the units of measure for quantitative laboratory results.
6.1	20	ST	R			Identifier	UCUM identifier
6.2	199	ST	R			Text	UCUM Description.
6.3	20	ID	R			Name of Coding System	UCUM Code system identifier
6.4	20	ST	O			Alternate Identifier	Local Code.
6.5	199	ST	O			Alternate Text	Local Description.

OBSERVATION/RESULT SEGMENT (OBX)							
SEQ	LEN	DT	OPT	RPT/#	TBL #	HL7 Element Name	Description/ Comments
6.6	20	ID	O			Name of Coding System	Local Coding System.
11	1	ID	R		0085	Observation Result Status	For purposes of this interface, literal value 'F' may be used to meet the mandatory use of this field.
14	26	TS	O			Date/Time of the Observation	Date/time the observation identified in OBX-3 was performed.

5.0 CONSTRAINTS FOR REUSE

There are no constraints for reuse for this component.

6.0 APPENDIX

6.1 GLOSSARY

Included is the common interoperability glossary that is used for all the Use Cases. This is the HITSP glossary that spans all the interoperability specifications, which can be found in the following folder on the HITSP site:
http://publicaa.ansi.org/sites/apdl/Documents/Forms/AllItems.aspx?RootFolder=http%3a%2f%2fpublicaa%2eansi%2eorg%2fsites%2fapdl%2fDocuments%2fStandards%20Activities%2fHealthcare%20Informatics%20Technology%20Standards%20Panel

6.2 APPENDIX – AHIC Minimum Data Set Cross-Reference

6.2.1 Cross-Reference Table Key

DATA ELEMENTS CROSS REFERENCE	
Data Element	Definition
Data Element	Data element name/identifier.
Description	Biosurveillance data element description.
Source	Source of the data element – where the data was created.
Limit/Range / Vocabulary	Expected data values if data element has finite values. Pre-coordinated vocabulary value set name or coding system from which values may be drawn.
Destination / HL7 Context	Segment and field where the data element appears in the HL7 message and other context as required.
HL7 Data Type	HL7 data type for the data element – indicates format and processing requirements.
Conditions for Use	Describe all the prevailing conditions that are assumed to be in place to be able to use the data. State the need for a particular actor if one is involved.

6.2.2 Encounter Message Data Set

The AHIC Biosurveillance Data Minimum and Target Data Elements are used by this component are cross-referenced below to the HL7 context in which the element would be expressed in the messages being sent.

PATIENT DATA						
Data Element	Description	Source	Limit/Range/ Vocabulary	Destination/ HL7 Message Context	HL7 Data Type	Conditions for Use
Pseudonymized Patient ID /Randomized Data Linker	An pseudonym Patient ID is created to uniquely distinguish a patient across all visits to a single institution, or across all visits to a healthcare system when a common patient identification system is used. The Biosurveillance Patient ID does not contain personally identifiable information. It is used by the healthcare facility to associate Biosurveillance patient data to the patient's medical record.	PID-3 Patient ID/MRN used to create the randomized linker patient ID		PID-3 Patient Identifier List.	CX	Required in every message
Encounter Date/Time	Date/time the encounter occurred is captured upon registration or admission in the ADT system. IF an ED patient is moved to inpatient status, this field will be updated to be the admit date/time as part of the transaction.	PV1-44 Admit/Register Date/time		PV1-44 Admit/Register Date/time	TS	
Date of Birth	Patient's year and month of birth (day is not included for privacy purposes). NOTE: May not be passing DOB for age over 89 due to HIPAA requirements.	Most ADT carry the date of birth in PID-7		PID-7 Date of Birth in YYYYMM format	TS	
Patient Age	Patient's age as reported in an application at the source. Age may be available if DOB was not populated.	Not an HL7 attribute in any segment – may exist as a piece of data	UCUM Age Units	Created OBX segment OBX-5 is the number OBX-6 is the units	SN	
Sex	Patient sex	Most ADT messages carry Sex in PID-8	HL7 2.5 Administrative Sex Codes	PID-8 Administrative Sex	IS	
Zip code	Patient residence zip code			PID-11 Patient Address Component 5 Zip or Postal Code	String component of XAD data type	
State	Patient residence – state		State_FIPS_5-2, 2-character alpha	PID-11 Patient Address Component 4 State or Province	String component of XAD data type	
Date/time of Message	Date/time of message			MSH-7 Message Creation Date/Time	TS	

CLINICAL DATA						
Data Element	Description	Source	Limit/Range /Vocabulary	Destination/ HL7 Message Context	HL7 Data Type	Conditions for Use
Diagnosis/ Injury Code	Diagnosis or diagnoses assigned as a result of the encounter	Most ADT messages may contain them; BAR (financial) messages often carry the final diagnosis.	ICD-9/10 CM Or SNOMED CT	DG1-3 Diagnosis Code - DG	CE	Expecting mostly ICD-9 diagnosis codes, but SNOMED CT or other vocabulary may be used.
Diagnosis Type	Type of diagnosis being sent (admitting, working, final)	Diagnosis Type is specific to DG1 use and a required element for the DG1 segment.	HL7 2.5 Diagnosis Type Codes	DG1-6 Diagnosis Type		Site-defined - Candidate terms: Referral (i.e. sent to Ed with "r/o appendicitis") Working "pain consistent with appendicitis - get Xrays and observe" Presumptive overlaps all of the above Admitting Final/Discharge e.g. "IBS"
Diagnosis Date/Time	Date/time the diagnosis was made	Diagnosis Date/Time is an optional attribute on the DG1 segment.				Not useful? Remove?
Discharge Disposition	Discharge Disposition –patient's anticipated location or status following the visit (admitted, sent home, etc.).	PV1-36 in A03 Discharge messages	Universal Billing codes (UB-92)	PV1-36 Discharge Disposition		
Patient Class	General type of patient, *e.g.*, Inpatient, Outpatient, Emergency.	required for all PV1 usage, so	HL7 2.5 Patient Class Codes constrained to EIO	PV1-2 Patient Class		consider constraining to E, I, O look at the document for the VA
Date/time of illness onset	Date and time of illness onset	no HL7 attribute; captured as an observation at source				There is a gap because illness onset date and time is not currently captured in a consistent manner at data sources.
Chief Complaint	Patient-reported reason for visit or admission reason. It may have been entered as text or may make use of drop-down lists to enter canned text.	ADT^A04 for outpatient/ED ADT^A01 for inpatient	SNOMED-CT and/or Clinical Care Classification recommended for codifying of free-form text	PV2-3.2 for text Admit Reason PV2-3.1 for coded Admit Reason	CE	

CLINICAL DATA						
Data Element	Description	Source	Limit/Range /Vocabulary	Destination/ HL7 Message Context	HL7 Data Type	Conditions for Use
Heart Rate Date/time of heart rate measurement	Heart rate measurement. Assumes beats per minute. The heart rate taken on initial assessment/triage is the vital sign of interest.	Clinical system		OBX-2 Value = SN OBX-3 Observation Identifier = 18708-8^HEART BEAT INITIAL ASSESSMENT^LN OBX-5= ^number OBX-11 = 'F' OBX-14 Date/Time of Observation		
Temperature Date/time of temperature	Body temperature measurement, including the reference to Celsius or Fahrenheit. The temperature taken on initial assessment/triage is the vital sign of interest.	Clinical system	UCUM Temperature units	OBX-2 Value = SN OBX-3 Observation Identifier = 8310-5^ BODY TEMPERATURE^ LN OBX-5= ^real number OBX-6 units OBX-11 = 'F' OBX-14 Date/Time of Observation		
Blood Pressure BP Date/Time	Systolic/Diastolic blood pressure measurement and the date/time that it was performed. The BP done on initial assessment/triage is the vital sign of interest.	Clinical system	UCUM Blood Pressure Unit Code	OBX-2 = SN OBX-3 Value Type ='35094-2^ BLOOD PRESSURE PANEL^LN' OBX-5= |^Systolic number^/^Diastolic number| OBX-6= 'mm[Hg]6^Millimeters of Mercury ^UCUM OBX-11 = 'F' OBX-14 Date/Time of observation	SN	Note: not supporting BP Method/Position, as that would require the need for different LOINC codes to be passed
Pulse Oximetry Pulse Ox Date/Time	Pulse oximetry reading and the date/time that it was performed. The pulse ox reading at triage assessment time is the vital sign of interest.	Clinical system		OBX-2 = SN OBX-3 Value Type =19960-4^PULSE OXIMETRY^LN OBX-5= ^number OBX-11 = 'F' OBX-14 Date/Time of observation	SN	
Nurse/Triage Notes	Provider notes documented in the process of sorting patients based on need for or likely benefit from immediate medical treatment.	Clinical system	SNOMED-CT and/or Clinical Care Classification recommended for codifying of free-form text	OBX-2 Value = TX OBX-3 Observation Identifier = 34120-6^INITIAL EVALUATION NOTE^LN OBX-5= Triage Notes OBX-11 = 'F'	TX	