



# INDIANA STATE DEPARTMENT OF HEALTH

## SYNDROMIC SURVEILLANCE: EMERGENCY DEPARTMENT, URGENT CARE

HL7 version 2.5.1 Message Structure Reference Guide  
Version 1.2

Indiana State Department of Health reserves the right to change requirements  
and/or update the contents of this implementation guide at any time

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## 1. INTRODUCTION

This implementation guide is intended to supply guidance for the filename, message format, and message content which may help health care organizations develop complete and accurate syndromic surveillance messages (Public Health Electronic Surveillance System) for transmitting to the Indiana State Department of Health (ISDH). This guide should be used in addition to:

- The Public Health Information Network (PHIN) messaging guide for Syndromic Surveillance: Emergency Department, Urgent Care, Inpatient and Ambulatory Care settings version 2.0, [http://www.cdc.gov/nssp/documents/guides/syndrsurvmessaguide2\\_messagingguide\\_phn.pdf](http://www.cdc.gov/nssp/documents/guides/syndrsurvmessaguide2_messagingguide_phn.pdf)
- The PHIN Vocabulary Access and Distribution System, <https://phinvads.cdc.gov/vads/ViewView.action?name=Syndromic%20Surveillance#>
- The Indiana Administrative Code, Title 410 Indiana State Department of Health, Article 1 for Communicable Disease Control can be located at [http://www.in.gov/legislative/iac/iac\\_title?iact=410](http://www.in.gov/legislative/iac/iac_title?iact=410).
- More information may be found on the Indiana State Department of Health Meaningful Use website, under Syndromic Surveillance Reporting [www.meaningfuluse.isdh.in.gov](http://www.meaningfuluse.isdh.in.gov)

## 2. THE FILENAME

The filename needs to adhere to a naming standard. The filename tells our application who is sending the file and whether it is a verified sender. Please use the following:

### TEST ENVIRONMENT

- If you send data for only one facility within the file:  
SS + “\_TEST\_” + MSH-4.1 Value + “\_” + PV1-3.4 Value + “\_” + control id + .hl7  
Ex. SS\_TEST\_ MY-HOSPITAL\_MYHOSP\_20160928073317.hl7
- If you send data for more than one facility within the file:  
SS + “\_TEST\_” + MSH-4.1 Value + “\_” + “combined” + “\_” + control id + .hl7  
Ex. SS\_TEST\_ MY-HOSPITAL\_ combined\_20160928073317.hl7

### PRODUCTION ENVIRONMENT

- If you send data for only one facility within the file:  
SS + “\_” + MSH-4.1 Value + “\_” + PV1-3.4 Value + “\_” + control id + .hl7  
Ex. SS\_MY-HOSPITAL\_MYHOSP\_20160928073317.hl7
- If you send data for more than one facility within the file:  
SS + “\_” + MSH-4.1 Value + “\_” + “combined” + “\_” + control id + .hl7  
Ex. SS\_ MY-HOSPITAL\_ combined\_20160928073317.hl7

MSH-4.1 is your facility identifier

PV1-3.4 may be identical to MSH-4.1 but doesn't have to be

Control id may be a sequence number or date time stamp

### 3. THE MESSAGE

The HL7 message that the ISDH receives from customers must adhere to HL7 standards for creating syndromic surveillance messages for Meaningful Use. The PHIN messaging guide for Syndromic Surveillance: Emergency Department, Urgent Care, Inpatient and Ambulatory Care settings version 2.0, [http://www.cdc.gov/nssp/documents/guides/syndrsurvmessagguid2\\_messagingguide\\_phn.pdf](http://www.cdc.gov/nssp/documents/guides/syndrsurvmessagguid2_messagingguide_phn.pdf), is the standard to follow. Per the standard, there are segments and fields that are required in order to be in compliance for Meaningful Use.

The ISDH also expects to see the following information that is required by the State of Indiana in order to conduct proper surveillance. The Indiana Administrative Code, Title 410 Indiana State Department of Health, Article 1 for Communicable Disease Control can be located at [http://www.in.gov/legislative/iac/iac\\_title?iact=410](http://www.in.gov/legislative/iac/iac_title?iact=410). Please provide this information in the ADT messages that you send to us. The data types are not shown below but will be found in the messaging guide referred to in the above paragraph.

More information may be found on the Indiana State Department of Health Meaningful Use website, under Syndromic Surveillance Reporting [www.meaningfuluse.isdh.in.gov](http://www.meaningfuluse.isdh.in.gov)

#### 3.1 REQUIREMENTS PER 410 IAC

The following is a consolidated summary of the requirements laid out in the 410 IAC Emergency department visit. The full rule can be found at [http://www.in.gov/legislative/iac/iac\\_title?iact=410](http://www.in.gov/legislative/iac/iac_title?iact=410), Article 1.

410 IAC 1-2.4-8 Emergency department visit data reporting requirements (*subset shown here*)  
Sec. 8.

(b) Hospitals with emergency departments shall report all of the emergency department visits at that hospital to the department or the departments designated agent as follows:

(1) Through electronic transfer by HL7 messaging or file transfer protocol. Electronic transfer shall occur immediately at the time of the emergency department visit if feasible, but not later than twenty-four (24) hours from the time of the visit.

(c) The information that shall be provided to the department or to the department's designated agent under subsection (b) includes the following:

- (1) The name of the hospital or a unique identifier for the hospital approved by the department.
- (2) The patient's name and medical record number.
- (3) The patient's date of birth.
- (4) The patient's sex.
- (5) The street address of the patient's residence.
- (6) The patient's city of residence.
- (7) The patient's state of residence.
- (8) The zip code of the patient's residence.
- (9) The patient's county of residence.
- (10) The date and time of the emergency department visit.
- (11) The patient's chief complaint or complaints.

### 3.2 REQUIRED DATA ELEMENTS IN HL7 MESSAGE

Required data elements for Syndromic Surveillance messages sent to the ISDH include a combination of what is required by the Indiana Administrative Code Title 410 Indiana State Department of Health, and what is required for Meaningful Use per the PHIN messaging guide for Syndromic Surveillance: Emergency Department, Urgent Care, Inpatient and Ambulatory Care settings version 2.0 . Appendix A contains examples of HL7 messages for Public Health Electronic Surveillance System reporting.

Category	Data Element	Segment Text Description	Message Segment	Usage
Sending Facility	Name / Unique ID for Hospital	Sending Facility Namespace ID	MSH - 4.1	R
	NPI Number	Universal ID	MSH - 4.2	R
	NPI	Universal ID type	MSH - 4.3	R
Sending Facility	Name / Unique ID for Hospital	Sending Facility Namespace ID	EVN-7.1	R
	NPI Number or CLIA	Unique Identifier	EVN- 7.2	R
	NPI Number or CLIA	Unique Identifier Type	EVN-7.3	R

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Category	Data Element	Segment Text Description	Message Segment	Usage
<b>Patient Data</b>	Patient Identifier List	ID Number (Medical record number)	PID -3.1	R
	Name	Patient Last Name	PID - 5.1	R
		Patient First name	PID - 5.2	R
	DOB	Date of Birth	PID-7	R
	Gender	Gender of patient (Sex)	PID-8	R
	Race	Race of patient	PID-10	RE
	Street Address	Patient Address	PID-11.1	R
	City of Residence	Patient Address	PID-11.3	R
	State	Patient Address	PID-11.4	R
	Zip code	Patient Address	PID-11.5	R
	Country	Patient Address	PID-11.6	RE
	County Code	Patient County Code	PID-11.9	R
	Telephone Number	Patient phone number - area code	PID-13.6	RE
	Telephone Number	Patient phone number	PID-13.7	RE
	Ethnicity	Ethnicity of patient	PID-22	RE
<b>Visit</b>	Admit reason	Patient admission reason	PV2 - 3.2	RE
	Assigned Patient Location	Facility Namespace ID	PV1 - 3.4	R
	Visit Number ID	Unique identifier for each visit	PV1 - 19.1	R
	Discharge disposition	Patient's anticipated location or status following ED visit	PV1 - 36	RE
	Admit Date/Time	Date/Time of patient visit to ED	PV1 - 44	R
	Discharge Date/Time	Date and time of disposition	PV1 - 45	O
	Observation Identifier	Identifies the field sent in OBX-5	OBX - 3	R
		Chief Complaint (LOINC)	OBX - 3.1	R
	Observation Value	Chief Complaint/Reason for visit (Text)	OBX - 5.1	R
		Initial Temperature	OBX - 5	RE
		Initial Pulse Oximetry	OBX - 5	RE
		Triage Notes	OBX - 5	RE
		Date of onset	OBX - 5	RE
<b>Diagnosis</b>	Set ID - DG1	Set ID	DG1- 1.1	R
	Diagnosis Code - DG1	Identifier	DG1- 3.1	R
		Text	DG1- 3.2	RE
		Name of Coding System	DG1- 3.3	R
	Diagnosis Type	Diagnosis Type	DG1- 6.1	R

**PHIN Usage**

R = Required

RE = Required but may be empty

O = Optional

### 3.3 HL7 MESSAGE TYPE AND TEST REQUIREMENTS

- ISDH will only accept ADT messages from hospitals and immediate or urgent care facilities that provide emergency care (ED/ER). We do not accept messages from physician's offices or clinics that do not provide emergency care services.
- The ISDH accepts the following four HL7 Admit-Discharge-Transfer (ADT) message types:
  1. ADT^A01 Admit / Visit Notification  
A patient is undergoing the admission process which assigns the patient to a bed for inpatient care. It signals the beginning of a patient's stay in a healthcare facility.
  2. ADT^A03 Discharge / End Visit  
An A03 event signals the end of a patient's stay in a healthcare facility. It signals that the patient's status has changed to "discharged" and that a discharge date has been recorded. The patient is no longer in the facility.
  3. ADT^A04 Register a Patient  
An A04 event is used when a patient has arrived or checked in. This includes one-time and recurring patients.
  4. ADT^A08 Update Patient Information  
An A08 event is triggered when a change is made to any of the pertinent data elements
- We require three of the four event types above per patient:
  - ADT^A01 Admit / Visit Notification *or* ADT^A04 Register a Patient
  - ADT^A08 Update Patient Information
  - ADT^A03 Discharge / End Visit
- ISDH requires at least three test cases/patient with the above event types for testing.
- Must have at least one DG1 segment for a patient visit (PV1-19.1). DG1 may be present on any of the ADT^A01/A03/A04/A08 messages.
- PV1-19.1 Visit Number must be the same for all messages (A01, A03, A04, and A08) for a single patient's visit.

### 3.4 MESSAGE SEGMENTS

This section contains tables showing the message segment components of interest to ISDH, data elements, usage requirements, and examples. Sample segments are shown at the end of each message segment table, and full HL7 messages are shown at the end of this section. Please see Appendix A for IAC 410 rules, Appendix B for program area data mapping to message segments, and Appendix C for definitions and data type explanations. If the links for the data code sets does not

connect you to the appropriate code set on the PHIN VADS site, please send an email requesting the code set information to [phintech@cdc.gov](mailto:phintech@cdc.gov).

#### Message Header Segment: MSH

The MSH Segment is used to define the intent, source, destination, and some specifics of the syntax of the message. This segment includes identification of message delimiters, sender, receiver, message type, timestamp, etc.

MSH Sequence	Required/Pref/Opt	Data Element	Description	Will look similar to
1	R	Field separator	Field separator	
2	R	Encoding Characters	Encoding Characters	^~\&
4.1-3	R	Sending Facility	Your Facility National Provider Identifier (NPI)	DownTownProcessing^2231237890^NPI
7	R	Date/Time of Message	Timestamp of when the message was created by sending facility	201408171230
9.1-3	R	Message Type	Type of HL7 message being sent	ADT^A01^ADT_A01 <i>or</i> ADT^A04^ADT_A01 <i>or</i> ADT^A08^ADT_A01 <i>or</i> ADT^A03^ADT_A03
10	R	Message Control ID	Number uniquely identifying the message	NIST-SS-001.12
12.1	R	Version ID	The version of HL7 message being sent	2.5.1

Example:

```
MSH|^~\&||DownTownProcessing^2231237890^NPI|||201408071400||ADT^A01^ADT_A01|NIST-SS-001.12|P|2.5.1|||||PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO
```



### Event Type Segment: EVN

The EVN segment is used to communicate trigger event information to receiving applications.

EVN	Required/ Pref/Opt	Data Element	Description	Will look similar to
7.1-3	R	Sending Facility	Your Facility National Provider Identifier ( <b>NPI</b> ) or CLIA	DownTownProcessing^2231237890^NPI Or DownTownProcessing^14D0000000^CLIA

Example:

EVN|||||DownTownProcessing^2231237890^NPI|

### Patient Information Segment: PID

The PID Segment is used as the primary means of communicating patient identification information. This segment contains pertinent patient identifying and demographic information.

PID Sequence	Required/ Pref/Opt	Data Element	Description	Will look similar to
1	R	Identifier	Literal	1
3.1	R	ID Number	Patient Identifier List (Medical Record Number)	MR101100001 <i>or</i> 95101100001
3.5*	R	Identifier Type Code	The identifier type code defines which type of ID number is reported in PID 3.1	PHVS_IdentifierType_SyndromicSurv eillance See code set below table
5.1-5	R	Patient Name	Last name, First Name, etc.	Last Name^First Name^Middle initial or name^Patient Suffix^Patient Prefix^^L~^^^^^^S
7	R	Date/Time of Birth	Date of Birth	20050602
8	R	Gender	Gender of patient (Sex)	F <i>or</i> M <i>or</i> U
10.1-3	RE	Race	Race of patient	Standardized code for patient race category: <a href="#">Codes</a> Value Set Code PHVS_RaceCategory_CDC  <b>Example:</b> 2106-3^White^CDCREC
11.1-2	R	Patient Address	Street Address	2222 A Street^Apt 1
11.3	R	Patient Address	City	Indianapolis

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11.4	R	Patient Address	USPS State Code	Value Set Code: PHVS_State_FIPS_5-2 <a href="#">Code</a>  <b>Example:</b> 18
11.5	R	Patient Address	Zip Code	46173
11.6	RE	Patient Address	Country Code	USA  Value set: <a href="#">Codes</a>
11.9	R	Patient Address	County Code	18097  Value set: <a href="#">Codes</a>
13	RE	Telephone Number	Patient Phone number	
13.6	RE	Telephone Number	Area Code	317
13.7	RE	Telephone Number	Local Phone	5551000
22.1-3	RE	Ethnicity	Ethnicity of patient	2186-5^Not Hispanic or Latino^CDCREC  Value set: <a href="#">Code</a>

### 3.5 Patient Identifier Type Code

IDENTIFIER TYPE CODE	DESCRIPTION	
MR	Medical record number	Required
PI	Patient internal identifier	Optional
PT	Patient external identifier	Optional
WIC	WIC identifier	Optional

Example:

PID|1||2222^^^GreaterMedCtr&4356012945&NPI^MR||Last Name^First Name^Middle initial or name^Patient Suffix^Patient Prefix^^L~^^^^^^S |||F||2106-3^White^CDCREC|2222 A Street^Apt 1^Rushville^18^46173^USA^M^^18139|||||100221223^^GreaterMedCtr&4356012945&NPI^AN||| |2135-2^Hispanic or Latino^CDCREC|||||20140826202100|Y

### Patient Visit Information Segment: PV1

The PV1 segment is used by Registration/Patient Administration applications to communicate information on a visit-specific basis.

PV1 Sequence	Required/ Pref/Opt	Data Element	Description	Will look similar to
2	R	Patient Class	Patient classification within facility	PV1 for an Emergency Department patient: PV1-2 Patient Class = E (Emergency)
3.4*	R	Assigned Patient Location	Assigned Patient Location/Facility;  Specific if sending multiple facilities in one feed	^^^DownTownProcessing
19	R	Unique Visiting ID	Unique identifier for each visit	1200222^^^^VN VN = visit number
36	R (A03) RE (A08)	Discharge Disposition	Discharge disposition	Example: 05 Value set: <a href="#">Code</a>  Notes: This field shall not be populated in an Admission message (A01). This field shall not be populated in a Registration message (A04).
44	R	Admit Date/Time	Date/Time of patient presentation to ED	201609280901
45	R	Discharge Date/Time	Date and time of disposition	201609281202

PV1-3.4 - The patient's location prior to discharge should be entered in *PV1-3 - Assigned Patient Location* on a Discharge (A03) message.

Example:

PV1|1|E|^^^HospitalLTC|||||||1200222^^^^VN|||||||05|||||201401061949|20140106203000

#### Patient Visit - Additional Information Segment: PV2

The PV2 segment is a continuation of visit-specific information and is the segment where the Admit Reason is passed.

PV2 Sequence	Required/ Pref/Opt	Data Element	Description	Will look similar to
3.2	RE	Admit Reason	Patient admission reason – Text; This is not the same as	Example: Acute bronchiolitis

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			Chief Complaint or Triage Note	
--	--	--	--------------------------------	--

Examples:

PV2||J21^ACUTE BRONCHIOLITIS^I10<

Observation/Result Segment: OBX

The OBX Segment in the ADT Message is used to transmit observations related to the patient and visit.

NOTE: ISDH ONLY REQUIRES CHIEF COMPLAINT

OBX Sequence	Required/Pref/Opt	Data Element	Description	Will look similar to
1	R	Set ID	Sequence number	1 <i>or</i> 2 <i>or</i> 3 ...
2	R	Value Type	Format/Data type of OBX-5	NM <i>or</i> TS <i>or</i> TX
3.1	R	Observation Identifier	Chief Complaint (Loinc)	8661-1^CHIEF COMPLAINT – REPORTED^LN
5.1	R	Observation Value	Chief Complaint/Reason for visit (Text)	STOMACH ACHE THAT HAS LASTED 2 DAYS; NAUSEA AND VOMITING; MAYBE A FEVER

Observation Identifier OBX-3 identifies data to be received in observation value OBX.5. Options for this field are below:

Concept Code	Concept Name
8661-1	CHIEF COMPLAINT – REPORTED
11289-6	BODY TEMPERATURE
59408-5	OXYGEN SATURATION IN ARTERIAL BLOOD BY PULSE OXIMETRY
11368-8	ILLNESS OR INJURY ONSET DATE
54094-8	EMERGENCY DEPARTMENT TRIAGE NOTE

Example:

OBX|1|TX|8661-1^CHIEF COMPLAINT – REPORTED^LN|STOMACH ACHE THAT HAS LASTED 2 DAYS; NAUSEA AND VOMITING; MAYBE A FEVER||||F||201102171531

OBX|2|NM|11289-6^BODY TEMPERATURE^LN||100.1|[degF]^FARENHEIT^UCUM||||F||20110217

OBX|3|NM|59408-5^OXYGEN SATURATION IN ARTERIAL BLOOD BY PULSE  
OXIMETRY^LN||91|%^PERCENT^UCUM|A||F||20110217145139

OBX|4|TS|11368-8^ILLNESS OR INJURY ONSET DATE^LN||20110215||||F

OBX|5|TX|54094-8^EMERGENCY DEPARTMENT TRIAGE NOTE^LN||Pain a recurrent cramping  
sensation.||||F||201102091114

Note: Only one Chief Complaint segment should be sent. If multiple complaints, concatenate.

OBX-3: Must have LOINC code in OBX-3.1

### Diagnosis Segment: DG1

The DG1 segment contains patient diagnosis information of various types. Syndromic surveillance supports Admitting, Working and Final Diagnosis types.

DG1 Sequence	Required/ Pref/Opt	Data Element	Description	Will look similar to
1.1	R	Set ID - DG1	Set ID	1 <i>or</i> 2 etc.
3.1-3	R	Diagnosis Code - DG1	Diagnosis code; send all diagnoses here.	R11^NAUSEA AND VOMITING^I10 <i>or</i> 16932000^NAUSEA AND VOMITING^SCT  Value set: <a href="#">Code</a>
6.1	R	Diagnosis Type	This field contains a code that identifies the type of diagnosis being sent.	A <i>or</i> F <i>or</i> W  Literal values: <b>A</b> for Admitting diagnosis, <b>W</b> for Working diagnosis or <b>F</b> for Final diagnosis.  Value set: <a href="#">Code</a>

Must have at least one DG1 for a patient visit (PV1-19.1). DG1 may be present on any of the ADT^A01/A03/A04/A08 messages.

Example:

DG1|1||N19^Unspecified kidney failure^I10||F  
DG1|2||M54.2^Cervicalgia^I10||F  
DG1|3||16932000^NAUSEA AND VOMITING^SCT||W  
DG1|4||R55^Syncope and collapse^I10||F  
DG1|5||J90^Pleural effusion, not elsewhere classified^I10||F  
DG1|6||R09.89^Other specified symptoms and signs involving the circulatory and respiratory systems^I10||F  
DG1|7||J18.9^Pneumonia, unspecified organism^I10||W

## FAQ: FREQUENTLY ASKED QUESTIONS

**Q:** I just sent you some test messages. When are you going to respond with feedback?

**A:** Before you send us messages, the ISDH would like to see error free NIST reports to move to next round of testing (content validation). Please send us a few downloaded NIST reports with zero errors. We don't get the ISDH resources involved for some preliminary feedback until you have a minimal number of NIST errors (less than three errors on Syndromic Surveillance messages).

**Q:** Do you accept inpatient, ambulatory care provider syndromic surveillance data?

**A:** Only hospital with ED and urgent/immediate care data will be accepted at this time. If you are not one of those you will need to claim an exclusion. Please download the letter on the ISDH MU portal <https://gateway.isdh.in.gov/MUSSE/Guidance.aspx?program=syndromic>

**Q:** Do you accept HL7 v2.3.1 messages?

**A:** No, we accept only HL7 2.5.1 message format.

**Q:** Are variables marked with an "R" required?

**A:** Yes. See page 5.

## APPENDIX A: SYNDROMIC SURVEILLANCE MESSAGING EXAMPLE

### Example Message:

```
MSH|^~\&||SwCrnrHsp^7549321000^NPI|||201012271715||ADT^A08^ADT_A01|NIST-SS-
003.23|P|2.5.1|||PH_SS-NoAck^SS Sender^2.16.840.1.114222.4.10.3^ISO
EVN||201012271700|||SwCrnrHsp^7549321000^NPI
PID|1||33333^MR||Test^Test^L~^S||19510415|F||2106-3^White^CDCREC|123 B
St^Rushville^18^46173^USA^18139||^317^5551000|||2135-2^Hispanic or
Latino^CDCREC
PV1|1|E|^SwCrnrHsp|||33333001^VN|||05|||2010122715
30|201012271630
PV2|||^Sore Throat
OBX|1|CWE|SS003^PHINQUESTION||261QE0002X^Emergency Care^NUCC||||F
OBX|2|NM|21612-7^LN||10|a^UCUM||||F
OBX|3|TX|8661-1^Chief complaint^LN||fever, cough and difficulty breathing||||F
DG1|1||R06.02^Shortness of breath^I10||W
```

## APPENDIX B: DATA ELEMENTS AND SEGMENT TYPES IN HL7 MESSAGE

### DATA ELEMENTS

BASIC HL7 TERMS	
TERM	DEFENITION

Message	A message is the entire unit of data transferred between systems in a single transmission. It is a series of segments in a defined sequence, with a message type and a trigger event.
Segment	A segment is a logical grouping of data fields. Segments within a defined message may be required or optional and may occur only once or may be allowed to repeat. Each segment is named and is identified by a segment ID, a unique three-character code. Examples of this include: MSH, OBX, PV1
Field	A field is a string of characters delimited by field characters (See delimiters). Each field has an element name. The segment it is in and its sequence within the segment identify each field.
Component	A component is one of a logical grouping of items that comprise the contents of a coded or composite field. Within a field having several components, not all components are necessarily required to be populated, but leading empty components must be represented with a delimiter ( ^ABC ).
Data type	A data type restricts the contents and format of the data field. Data types are given a two- or three-letter code. Some data types are coded or composite types with several components. The applicable HL7 data type is listed in each field definition.
Delimiters	The delimiter values are defined in MSH-1 and MSH-2 and are used throughout the message. The default delimiters are:        Field Separator ^      Component Separator &      Sub-Component Separator ~      Repetition Separator \      Escape Character

## SEGMENTS

SEGMENT	NAME	DESCRIPTION
MSH	Message Header	Information explaining how to parse and process the message. Information includes identification of message delimiters, sender, receiver, message type, timestamp, etc.
EVN	Event Type	Trigger event information for receiving application
PID	Patient Identification	Patient identifying and demographic information
PV1	Patient Visit	Information related to this visit at this facility including the nature of the visit, critical timing information and a unique visit identifier.

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PV2	Patient Visit Additional Information	Admit Reason information.
OBX	Observation / Result	Information regarding chief complaint, age, temperature, and other information
DG1	Diagnosis	Admitting Diagnosis and, optionally, Working and Final Diagnosis information