

Integrating the Healthcare Enterprise



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**IHE Patient Care Device (PCD) Technical
Framework Supplement 2008-2009**

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**Point-of-Care Infusion Verification
(PIV)**

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**Draft for Trial Implementation
August 22, 2008**

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1 Foreword

Integrating the Healthcare Enterprise (IHE) is an initiative designed to stimulate the integration of the information systems that support modern healthcare institutions. Its fundamental objective is to ensure that in the care of patients all required information for medical decisions is both
25 correct and available to healthcare professionals. The IHE initiative is both a process and a forum for encouraging integration efforts. It defines a technical framework for the implementation of established messaging standards to achieve specific clinical goals. It includes a rigorous testing process for the implementation of this framework. And it organizes educational sessions and exhibits at major meetings of medical professionals to demonstrate the benefits of this
30 framework and encourage its adoption by industry and users.

The approach employed in the IHE initiative is not to define new integration standards, but rather to support the use of existing standards, HL7, DICOM, IETF, and others, as appropriate in their respective domains in an integrated manner, defining configuration choices when necessary. IHE maintain formal relationships with several standards bodies including HL7, DICOM and
35 refers recommendations to them when clarifications or extensions to existing standards are necessary.

This initiative has numerous sponsors and supporting organizations in different medical specialty domains and geographical regions. In North America the primary sponsors are the Healthcare Information and Management Systems Society (HIMSS) and the Radiological Society of North
40 America (RSNA). IHE Canada has also been formed. IHE Europe (IHE-EUR) is supported by a large coalition of organizations including the European Association of Radiology (EAR) and European Congress of Radiologists (ECR), the Coordination Committee of the Radiological and Electromedical Industries (COCIR), Deutsche Röntgengesellschaft (DRG), the EuroPACS Association, Groupement pour la Modernisation du Système d'Information Hospitalier
45 (GMSIH), Société Française de Radiologie (SFR), Società Italiana di Radiologia Medica (SIRM), the European Institute for health Records (EuroRec), and the European Society of Cardiology (ESC). In Japan IHE-J is sponsored by the Ministry of Economy, Trade, and Industry (METI); the Ministry of Health, Labor, and Welfare; and MEDIS-DC; cooperating organizations include the Japan Industries Association of Radiological Systems (JIRA), the
50 Japan Association of Healthcare Information Systems Industry (JAHIS), Japan Radiological Society (JRS), Japan Society of Radiological Technology (JSRT), and the Japan Association of Medical Informatics (JAMI). Other organizations representing healthcare professionals are invited to join in the expansion of the IHE process across disciplinary and geographic boundaries.

The IHE Technical Frameworks for the various domains (IT Infrastructure, Cardiology, Laboratory, Radiology, etc.) defines specific implementations of established standards to achieve integration goals that promote appropriate sharing of medical information to support optimal patient care. It is expanded annually, after a period of public review, and maintained regularly through the identification and correction of errata. The current version for these Technical
60 Frameworks may be found at www.ihe.net/Technical_Framework.

65 The IHE Technical Framework identifies a subset of the functional components of the healthcare enterprise, called IHE Actors, and specifies their interactions in terms of a set of coordinated, standards-based transactions. It describes this body of transactions in progressively greater depth. The volume I provides a high-level view of IHE functionality, showing the transactions organized into functional units called Integration Profiles that highlight their capacity to address specific clinical needs. The subsequent volumes provide detailed technical descriptions of each IHE transaction.

This Supplement is submitted for Public Comment through May 2009.

70 **Comments and change proposals may be submitted to: <http://forums.rsna.org>
under the “IHE” forum
Select the sub-forum
*“Patient Care Device Supplements 2008-2009 for Trial Implementation”***

75 **The IHE Patient Care Device (PCD) Technical Committee will address comments resulting from implementation, Connectathon testing and demonstrations (such as HIMSS 09 IHE Showcase). Final text expected to be published in June 2009, dependant upon results of IHE validation process.**

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2 Introduction

95 The PCD-03 Communicate Infusion Order transaction utilizes the HL7 RGV^O15^RGV_O15 message, which in turn uses several segments which are new to the PCD Technical Framework, such as ORC (Order Control), RXG (Pharmacy/Treatment Give), and RXR (Pharmacy/Treatment Route). In addition, the same message is used as a response to notify the Bedside Computer-assisted Medication Administration (BCMA) system of the precise values of the parameters used to program the pump.

100 2.1 Open Issues and Questions

1. Support for the following infusion devices is out of scope for Year 3:
 - Patient-controlled analgesia (PCA) devices
 - Syringe pump devices
- 105 2. Support for the following therapies, modes, and methods of operation is out of scope for Year 3:
 - Bolus, loading dose, multi-step, or multi-dose therapies
 - Delayed start mode
 - Concurrent or sequenced infusions on more than one pump channel
- 110 3. The use case defined involves starting a new infusion or container. Titrations and rate changes on a running infusion are not supported.
4. All of the information specified in the PCD-03 Communicate Infusion Order transaction may not necessarily be used to program the pump.

3 Profile Abstract

Add the following to Section 3 Profile Abstract:

115 The Point-of-Care Infusion Verification profile supports the electronic transfer of infusion parameters from a Bedside Computer-assisted Medication Administration (BCMA) system to a general-purpose infusion pump. This capability will reduce errors by eliminating keystroke errors and by increasing the use of automatic dosage checking facilitated by the onboard drug libraries in “smart pump” systems.. In addition to the reduction of medication administration
120 errors, this integration may also increase caregiver productivity and provide more contextual information regarding infusion data.

Electronic transfer of infusion status information from a pump to a clinical information system can be accomplished using the PCD-01 (Communicate PCD Data) or PCD-02 (Subscribe to PCD Data) transactions of the IHE-PCD Device Enterprise Communication profile.

125 The goal of the proposed integration is to bring infusion systems into the electronic medication delivery process.

4 GLOSSARY

Add the following to section 4 Glossary:

130 **BCMA:** Bedside Computer-assisted Medication Administration system

eMAR: electronic Medication Administration Record

General purpose infusion pump: a pump used to infuse fluids intravenously in a wide variety of clinical settings. Differentiated from specialty infusion pumps, which are used for a specific purpose or in a specific setting, such as PCA (patient-controlled analgesia) or syringe pumps.

135 **Safety Infusion System (Smart Pump System):** infusion devices designed to reduce the error rates associated with infusions through the use of one or more of the following “smart” features:

- Ability to check programmed doses against pre-configured limits in an onboard drug library
- Ability to read infusion parameters from RFID tags or barcodes

140

- Ability to send and receive infusion parameters via a wired or wireless network

- Ability to communicate through a server or gateway

Volume I – Integration Profiles

145 *This section describes the changes required in Volume I of the Technical Framework that result from including this Integration Profile.*

History of Annual Changes

Add the following bullet to the end of the bullet list in section 1.7

150 Added the **Point-of-Care Infusion Verification (PIV)** Profile, which supports the electronic transfer of infusion parameters from a Bedside Computer-assisted Medication Administration (BCMA) system to an infusion pump.

Add the following section to Table 2-1 Integration Profiles Dependencies in section 2.1

Point-of-Care Infusion Verification (PIV)	Consistent Time	Each actor implementing PIV shall be grouped with the Time Client Actor	Required for consistent time-stamping of messages and data
---	-----------------	---	--

Add the following section to section 2.2

2.2.X Point-of-Care Infusion Verification (PIV)

155 The goal of the proposed integration is to bring infusion systems into the electronic medication administration process. The following primary steps comprise this process:

- Order medication
- Verify order for inclusion in the eMAR
- Prepare and dispense medication
- 160 • Administer medication

While medication errors can occur at each point in this process, this proposal is concerned with the “Administer medication” step, where half of the errors made by clinicians involve infusions. These errors usually involve a breach of one of the 5 Rights of Medication Administration:

- Right Patient
- 165 • Right Drug
- Right Dose
- Right Route
- Right Time

170 It is the caregiver’s responsibility to ensure that these rights are reviewed prior to administering each drug or starting each infusion.

Because manual programming of the pump may still result in administration errors, this profile was developed to support automated programming the pump, thereby closing the loop between

the clinician who uses a BCMA system to verify the 5 Rights and the actual programming of the pump.

- 175 The Point-of-Care Infusion Verification profile supports the electronic transfer of infusion parameters from a Bedside Computer-assisted Medication Administration (BCMA) system to an infusion pump. This capability will reduce errors by eliminating keystroke errors and by increasing the use of automatic dosage checking facilitated by the onboard drug libraries in “smart pump” systems. In addition to the reduction of medication administration errors, this
- 180 integration may also increase caregiver productivity and provide more contextual information regarding infusion data.

Electronic transfer of infusion status information from an infusion pump to a clinical information system can be accomplished using the PCD-01 (Communicate PCD Data) or PCD-02 (Subscribe to PCD Data) transactions of the IHE-PCD Device Enterprise Communication profile.

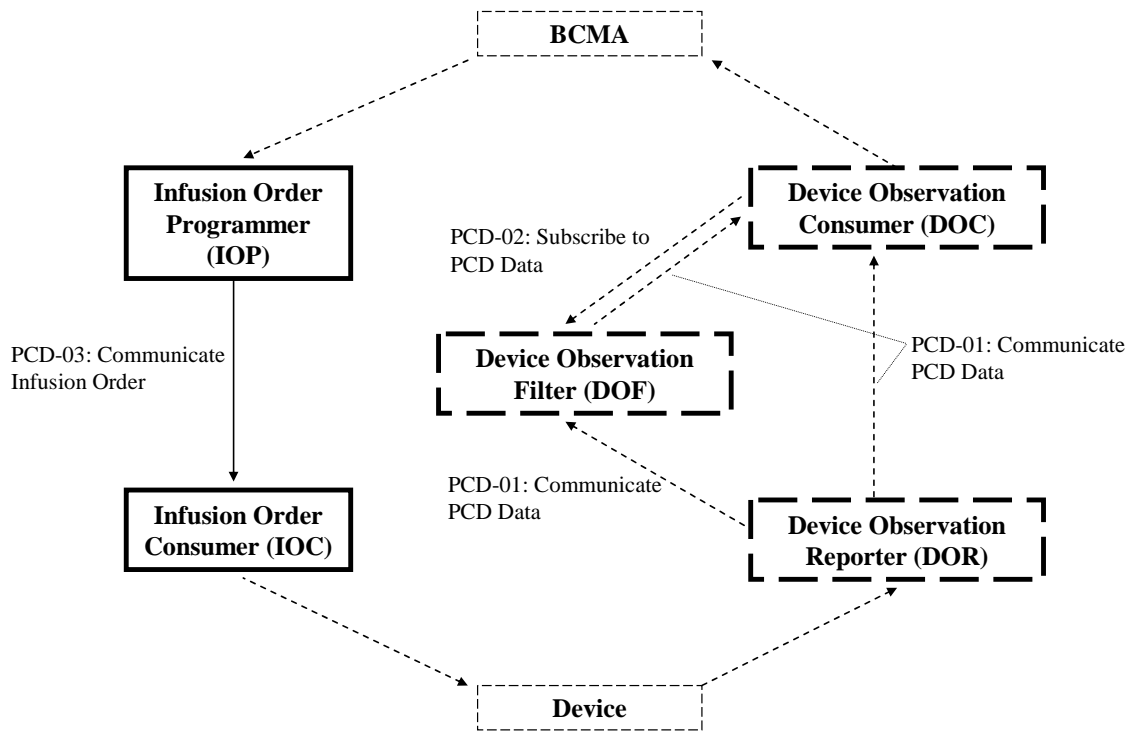
- 185 The use case addressed in this profile includes the following steps (note that the workflow supported by the BCMA application may not necessarily occur in the order specified):

- Clinician uses BCMA to administer an IV
 - Clinician identifies self, medication, patient, pump
 - Clinician confirms or edits infusion parameters for an IV medication order using the
- 190 BCMA
- Infusion parameters are transmitted to pump
 - Clinician confirms settings directly on pump and starts infusion

The section shall be added to Vol 1

195 **X.1 Actors/ Transactions**

Figure X.1-1 shows the actors involved in the Point-of-Care Infusion Verification Integration Profile and the relevant transactions between them. Actors that are optional are shown with borders comprised of heavy dotted lines.



200

Figure X.1-1. Point-of-Care Infusion Verification Actor Diagram

Table X.1-1 lists the transactions for each actor directly involved in the Point-of-Care Infusion Verification Profile. In order to claim support of this Integration Profile, an implementation must perform the required transactions (labeled “R”). Transactions labeled “O” involve actors from other profiles and are optional. A complete list of options defined by this Integration Profile and that implementations may choose to support is listed in Volume I, Section X.2.

205

Table X.1-1. Point-of-Care Infusion Verification Integration Profile - Actors and Transactions

Actors	Transactions	Optionality	Section in Vol. 2
Infusion Order Programmer	Communicate Infusion Order	R	3.3.2
Infusion Order Programmer	Maintain Time	R	(ITI-TF)
Infusion Order Consumer	Communicate Infusion Order	R	3.3.2
Infusion Order Consumer	Maintain Time	R	(ITI-TF)
Device Observation Reporter	Communicate PCD Data	O	3.1
Device Observation Filter	Subscribe to PCD Data	O	3.2
	Communicate PCD Data	O	3.1

X.2 Point-of-Care Infusion Verification Integration Profile Options

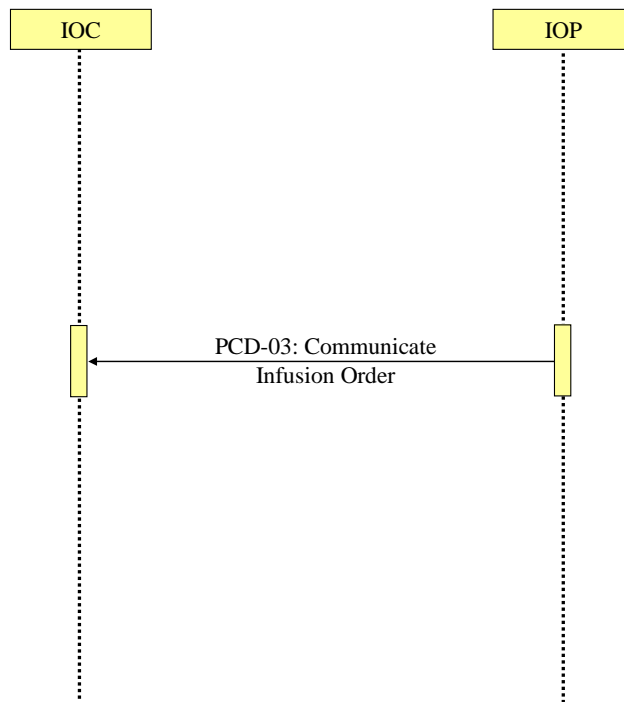
- 210 Options that may be selected for this Integration Profile are listed in the table X.2-1 along with the Actors to which they apply. Dependencies between options when applicable are specified in notes.

Table X.2-1 Evidence Documents - Actors and Options

Actor	Options	Vol & Section
Infusion Order Programmer	<i>No options defined</i>	--
Infusion Order Consumer	<i>No options defined</i>	--

215 X.3 Point-of-Care Infusion Verification Integration Profile Process Flow

Figure X.3-1 shows the sequence diagram for this profile. The use case is described in section 2.2.X above.



220 **Figure X.3-1. Basic Process Flow in Point-of-Care Infusion Verification Profile**

X.4 Point-of-Care Infusion Verification Integration Profile Security Considerations

225 This profile relies on the BCMA system to verify the clinician and patient, as well as the correct medication and infusion parameters, prior to initiating the Communicate Infusion Order transaction.

Although the profile provides infusion settings for an infusion pump, the infusion is not started automatically. The clinician must always verify all settings and start the infusion directly on the pump.

<Appendix A> Actor Summary Definitions

230 **Infusion Order Programmer** – The Infusion Order Programmer (IOP) actor sends the information comprising an order to the Infusion Order Consumer (IOC). The mechanism by which the IOP obtains the order information is outside the scope of this profile.

235 **Infusion Order Consumer** – The Infusion Order Consumer (IOC) actor receives the order information from the IOP actor and in turn programs the pump. The mechanism by which the IOC programs the pump with the received information is outside the scope of this profile.

<Appendix B> Transaction Summary Definitions

Communicate Infusion Order – This transaction contains the information from the Infusion Order Programmer, such as caregiver, patient, and pump identification, medication, volume, and rate for the infusion being programmed.

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Volume 2 - Transactions

Add sections 3.3

3.3 PCD-03 Communicate Infusion Order

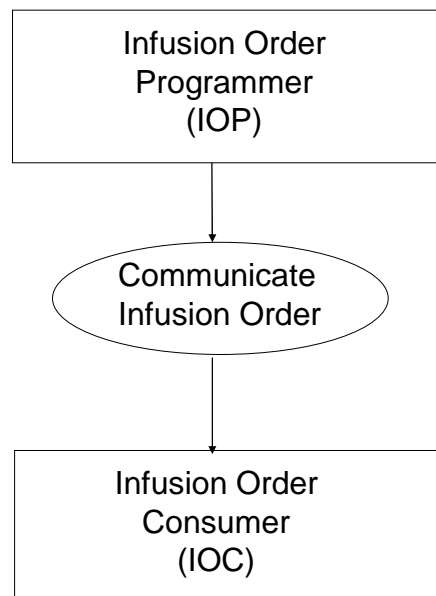
245

This section corresponds to Transaction PCD-03 of the IHE Patient Care Device Technical Framework. Transaction PCD-03 is used by the Infusion Order Programmer and Infusion Order Consumer actors.

3.3.1 Scope

This transaction is used to communicate infusion order parameters from an Infusion Order Programmer (IOP) to an Infusion Order Consumer (IOC).

3.3.2 Use Case Roles



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Actor: Infusion Order Programmer

Role: Sends infusion order parameters to IOC

Actor: Infusion Order Consumer

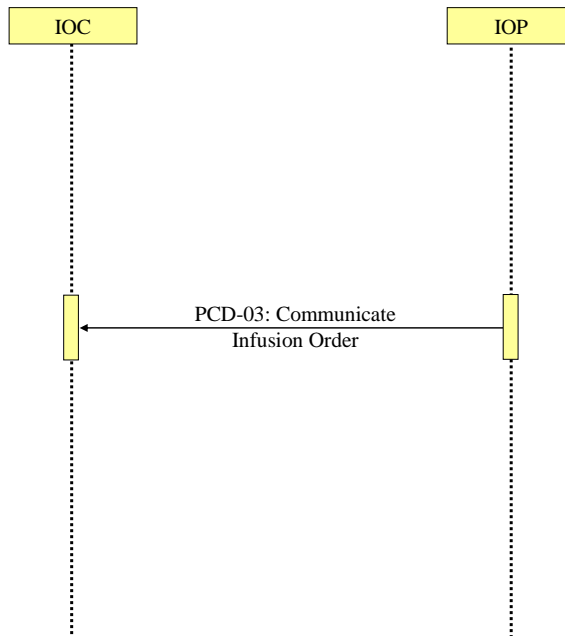
Role: Receives infusion order parameters from IOP and in turn programs the pump

255 **3.3.3 Referenced Standard**

- HL7 - Health Level 7 Version 2.5 Ch4 Order Entry
- ISO/IEEE 11073-10101 Nomenclature

3.3.4 Interaction Diagram

The following interaction diagram illustrates the implementation.



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3.3.5 PCD-03 Communicate Infusion Order (RGV^O15^RGV_O15) static definition

The PCD-03 Communicate Infusion Order message is used to communicate infusion data from an Infusion Order Programmer (IOP) to an Infusion Order Consumer (IOC).

All HL7 segments used in the PCD-03 transaction are defined within this document.

265 New Data Types for the PCD-03 transaction are defined in Appendix A Common Data Types in this document.

Existing data types in the PCD Technical Framework are defined in Appendix C of the Patient Care Device Technical Framework.

270 RGV^O15^RGV_O15 Pharmacy/Treatment Give Message

Segment	Meaning	Usage	Card	HL7 Chapter
MSH	Message Header	R	[1..1]	2
[[SFT]]	Software	X		2
[[NTE]]	Notes and Comments (for Header)	X		2
[	--- PATIENT begin			
PID	Patient Identification	R	[1..1]	3
[[NTE]]	Notes and Comments (for PID)	X		2
[[AL1]]	Allergy Information	X		2
[	--- PATIENT_VISIT begin			
PV1	Patient Visit	X		3
[PV2]	Patient Visit – Additional Info	X		3
]	--- PATIENT_VISIT end			
]	--- PATIENT end			
{	--- ORDER begin			
ORC	Common Order	R	[1..1]	4
[[	--- TIMING begin			
TQ1	Timing/Quantity	X		4
[[TQ2]]	Timing/Quantity Order Sequence	X		4
]]	--- TIMING end			
[	--- ORDER_DETAIL begin			
RXO	Pharmacy /Treatment Order	X		4
[	--- ORDER_DETAIL_SUPPLEMENT begin			
{ NTE }	Notes and Comments (for RXO)	X		2
{ RXR }	Pharmacy/Treatment Route	X		4
[[	--- COMPONENTS begin			
RXC	Pharmacy/Treatment Component	X		4
[[NTE]]	Notes and Comments (for each RXC)	X		2
]]	--- COMPONENTS end			
]	--- ORDER_DETAIL_SUPPLEMENT end			
]	--- ORDER_DETAIL end			
[	--- ENCODING begin			
RXE	Pharmacy/Treatment Encoded Order	X		4
{	--- TIMING_ENCODED begin			
TQ1	Timing/Quantity	X		4
[[TQ2]]	Timing/Quantity Order Sequence	X		4
}	--- TIMING_ENCODED end			
{ RXR }	Pharmacy/Treatment Route	X		4
[[RXC]]	Pharmacy/Treatment Component	X		4

Segment	Meaning	Usage	Card	HL7 Chapter
]	--- ENCODING end			
{	--- GIVE begin			
RXG	Pharmacy/Treatment Give	R	[1..1]	4
{	--- TIMING_GIVE begin			
TQ1	Timing/Quantity	X		4
{{ TQ2 }}	Timing/Quantity Order Sequence	X		4
}	--- TIMING_GIVE end			
{ RXR }	Pharmacy/Treatment Route	R	[1..1]	4
{{ RXC }}	Pharmacy/Treatment Component	X		4
{	--- OBSERVATION begin			
[OBX]	Observation/Results	R	[1..3]	7
{{ NTE }}	Notes and Comments (for OBX)	X		2
}	--- OBSERVATION end			
}	--- GIVE end			
}	--- ORDER end			

3.3.5.1 Trigger Events

The RGV^O15^RGV_O15 message is generated by the Infusion Order Programmer when the caregiver initiates an action to administer a medication using an IV pump.

275 3.3.5.2 Message Semantics

Refer to the HL7 standard for the RGV message in HL7 2.5 Chapter 4 for the general message semantics.

3.3.5.2.1 MSH

See HL7 v2.5: chapter 2 (2.15 Message control)

280 This segment defines the intent, source, destination, and some specifics of the syntax of a message.

Table 9 MSH - Message Header

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	1	ST	R	[1..1]		00001	Field Separator
2	4	ST	R	[1..1]		00002	Encoding Characters
3	227	HD	R	[1..1]	0361	00003	Sending Application
4	227	HD	RE	[0..1]	0362	00004	Sending Facility
5	227	HD	RE	[0..1]	0361	00005	Receiving Application
6	227	HD	RE	[0..1]	0362	00006	Receiving Facility
7	26	TS	R	[1..1]		00007	Date/Time of Message
8	40	ST	X	[0..0]		00008	Security

9	15	MSG	R	[1..1]		00009	Message Type
10	20	ST	R	[1..1]		00010	Message Control Id
11	3	PT	R	[1..1]		00011	Processing Id
12	60	VID	R	[1..1]		00012	Version ID
13	15	NM	RE	[1..1]		00013	Sequence Number
14	180	ST	X	[0..0]		00014	Continuation Pointer
15	2	ID	X	[0..0]	0155	00015	Accept Acknowledgement Type
16	2	ID	X	[0..0]	0155	00016	Application Acknowledgement Type
17	3	ID	RE	[0..1]	0399	00017	Country Code
18	16	ID	RE	[0..1]	0211	00692	Character Set
19	250	CE	RE	[0..1]		00693	Principal Language of Message
20	20	ID	X	[0..0]	0356	01317	Alternate Character Set Handling Scheme
21	427	EI	R	[1..1]		01598	Message Profile Identifier

MSH-1 Field Separator (ST), required:

285 The IHE PCD Technical Framework requires that applications support HL7-recommended value that is | (ASCII 124).

MSH-2 Encoding Characters (ST), required:

290 This field contains the four characters in the following order: the component separator, repetition separator, escape character, and subcomponent separator. The IHE PCD Technical Framework requires that applications support HL7-recommended values ^~\& (ASCII 94, 126, 92, and 38, respectively).

MSH-3 Sending Application (HD), required:

Components: <Namespace ID (IS)> ^ <Universal ID (ST)> ^ <Universal ID Type (ID)>

First component (optional): Namespace ID. Locally unique name for application implementing PCD actor(s).

295 Second component (required): Universal ID expressed as string of hexadecimal digits. Implementations of PCD actors shall use an EUI 64 identifier. The IEEE defined 64-bit extended unique identifier (EUI-64) is a concatenation of the 24-bit company_id value by the IEEE Registration Authority and a 40-bit extension identifier assigned by the organization with that company_id assignment.

300 Third component (required): EUI-64.

MSH-4 Sending Facility (HD), required but may be empty:

Components: <Namespace ID (IS)> ^ <Universal ID (ST)> ^ <Universal ID Type (ID)>

For the IHE PCD Technical Framework, when populated, this field shall be implemented as:

305 First component (required): Namespace ID. The name of the organizational entity responsible for the sending application.

Second component (optional): The URI (OID) of the organizational entity responsible for the sending application.

310 Third component (optional): The type of identification URI provided in the second component of this field. The codification of these three components is entirely site-defined. It may be detailed in the national extensions of this framework.

MSH-5 Receiving Application (HD), required but may be empty:

Components: <Namespace ID (IS)> ^ <Universal ID (ST)> ^ <Universal ID Type (ID)>

For the IHE PCD Technical Framework, when populated, this field shall be implemented as:

315 First component (required): Namespace ID. The name of the organizational entity responsible for the receiving application.

Second component (optional): The URI (OID) of the organizational entity responsible for the receiving application.

320 Third component (optional): The type of identification URI provided in the second component of this field. The codification of these three components is entirely site-defined. It may be detailed in the national extensions of this framework.

MSH-6 Receiving Facility (HD), required but may be empty:

Components: <Namespace ID (IS)> ^ <Universal ID (ST)> ^ <Universal ID Type (ID)>

For the IHE PCD Technical Framework, when populated, this field shall be implemented as:

325 First component (required): Namespace ID. The name of the organizational entity responsible for the receiving application.

Second component (optional): The URI (e.g. OID) of the organizational entity responsible for the receiving application.

330 Third component (optional): The type of identification URI provided in the second component of this field. The codification of these three components is entirely site-defined. It may be detailed in the national extensions of this framework.

MSH-7 Date/Time of Message (TS), required:

The IHE PCD Technical Framework requires this field be populated with:

For the IHE PCD Technical Framework, when populated, this field shall be implemented as:

Format: YYYY[MM[DD[HH[MM[SS]]]]][+/-ZZZZ]

335 Time zone qualification of the date/time is required.

MSH-7 shall be used only to provide message created time.

MSH-9 Message Type (MSG), required:

Components: <Message Code (ID)> ^ <Trigger Event (ID)> ^ <Message Structure (ID)>

340 Definition: This field contains the message type, trigger event, and the message structure ID for the message. All three components are required.

The PCD PIV profile requires that this field be valued as RGV^O15^RGV_O15.

MSH-10 Message Control Id (ST), required:

345 Definition: This field contains a number or other identifier that uniquely identifies the message. Each message should be given a unique identifier by the sending system. The receiving system shall echo this ID back to the sending system in the Message Acknowledgment segment (MSA). The combination of this identifier and the name of the sending application (MSH-3) shall be unique across the Healthcare Enterprise.

MSH-11 Processing ID (PT), required:

Components: <Processing ID (ID)> ^ <Processing Mode (ID)>

350 Definition: This data type indicates whether to process a message as defined in HL7 Application (level 7) processing rules.

The IHE PCD Technical Framework requires the first component Processing ID be valued based on HL7 Table 0103. Use of the second component Processing Mode is optional but if used is based on HL7 Table 0207.

355 **MSH-12 Version ID (VID), required:**

Components: <Version ID (ID)> ^ <Internationalisation Code (CE)> ^ <International Version ID (CE)>

Definition: This field is matched by the receiving system to its own version to be sure the message will be interpreted correctly.

360 The PCD Technical Framework is based on HL7 V2.5. Where specific elements of V2.6 are required they have been used and their usage flagged.

Although HL7 allows international affiliate versions to be specified the IHE PCD-TF uses only the core version.

MSH-13 Sequence Number (NM), required but may be empty:

365 Definition: A non-null value in this field implies that the sequence number protocol is in use. This numeric field is incremented by one for each subsequent value.

MSH-17 Country Code (ID), required but may be empty:

370 Definition: This field contains the country of origin for the message. It will be used primarily to specify default elements, such as currency denominations. The values to be used are those of ISO 3166,.5. The ISO 3166 table has three separate forms of the country code: HL7 specifies that the 3-character (alphabetic) form be used for the country code.

MSH-18 Character Set (ID), required but may be empty:

Definition: This field contains the character set for the entire message. Refer to HL7 Table 0211 - Alternate character sets for valid values.

375 An HL7 message uses field MSH-18-character set to specify the character set(s) in use. Valid values for this field are specified in HL7 Table 0211, "Alternate Character Sets". MSH-18-character set may be left blank, or may contain a single value. If the field is left blank, the character set in use is understood to be the 7-bit ASCII set, decimal 0 through decimal 127 (hex 00 through hex 7F). This default value may also be explicitly specified as ASCII.

380 Any encoding system, single-byte or multi-byte, may be specified as the default character encoding in MSH-18-character set. If the default encoding is other than 7-bit ASCII, sites shall document this usage in the dynamic conformance profile or other implementation agreement. This is particularly effective in promoting interoperability between nations belonging to different HL7 Affiliates, while limiting the amount of testing required to determine the encoding of a message.

385 By using built-in language functions for string and character manipulation, parsers and applications need not be concerned whether a single or double byte character set is in use, provided it is applied to the entire message. Using a built in function to extract the fourth CHARACTER will always yield the field separator character, regardless of coding set. On
390 the other hand, if the parser looks at the fourth BYTE, it is then limited to single byte character sets, since the fourth byte would contain the low order 8 bits of the character S in a double-byte system.

See HL7 V2.5 for the semantics for alphabetic languages other than English (2.15.9.18.1) and for non-alphabetic languages (2.15.9.18.2)

395 The PCD TF requires this field to be valued if the character set is other than ASCII. If the character set is ASCII the field may be null or have the value of ASCII. A single character set is required for a given message.

MSH-19 Principal Language of Message (CE), required but may be empty:

400 Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^ <Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding System (ID)>

Definition: This field contains the principal language of the message. Codes come from ISO 639.

The PCD uses a default of EN^English^ISO659 if the field is empty.

MSH-21 Message Profile Identifier (EI), required:

405 Components: <Entity Identifier (ST)> ^ <Namespace ID (IS)> ^ <Universal ID (ST)> ^ <Universal ID Type (ID)>

410 For PCD TF, this field is required. It is proposed that PCD message profiles be registered with HL7 and that the appropriate ID be used here in conformant messages. When multiple message profiles are listed in this field they should be (vendor specific, country specific) constraints of the PCD Profile. *Note that the overriding of PCD Profile constraints is only allowed in national extensions to this framework.*

The PCD PIV profile requires that this field be valued as IHE_PCD_PIV_001.

3.3.5.2.2 PID - Patient Identification segment

HL7 v2.5 : chapter 3 (3.4.2)

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The PID segment is used by all applications as the primary means of communicating patient identification information. This segment contains permanent patient identifying and demographic information that, for the most part, is not likely to change frequently.

Table 14 PID - Patient Identification segment

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	4	SI	X	[0..0]		00104	Set ID - PID
2	20	CX	X	[0..0]		00105	Patient ID
3	250	CX	R	[1..6]		00106	Patient Identifier List
4	20	CX	X	[0..0]		00107	Alternate Patient ID - PID
5	250	XPN	R	[1..6]		00108	Patient Name
6	250	XPN	RE	[0..1]		00109	Mother's Maiden Name
7	26	TS	RE	[0..1]		00110	Date/Time of Birth
8	1	IS	RE	[0..1]	0001	00111	Administrative Sex
9	250	XPN	X	[0..0]		00112	Patient Alias
10	250	CE	RE	[0..1]	0005	00113	Race
11	250	XAD	RE	[0..1]		00114	Patient Address
12	4	IS	RE	[0..1]	0289	00115	County Code
13	250	XTN	RE	[0..2]		00116	Phone Number - Home
14	250	XTN	X	[0..0]		00117	Phone Number - Business
15	250	CE	RE	[0..1]	0296	00118	Primary Language
16	250	CE	RE	[0..1]	0002	00119	Marital Status
17	250	CE	RE	[0..1]	0006	00120	Religion
18	250	CX	RE	[0..1]		00121	Patient Account Number
19	16	ST	X	[0..0]		00122	SSN Number - Patient
20	25	DLN	RE	[0..1]		00123	Driver's License Number - Patient
21	250	CX	RE	[0..1]		00124	Mother's Identifier
22	250	CE	RE	[0..1]	0189	00125	Ethnic Group
23	250	ST	RE	[0..1]		00126	Birth Place
24	1	ID	RE	[0..1]	0136	00127	Multiple Birth Indicator
25	2	NM	RE	[0..1]		00128	Birth Order
26	250	CE	RE	[0..1]	0171	00129	Citizenship
27	250	CE	RE	[0..1]	0172	00130	Veterans Military Status
28	250	CE	RE	[0..1]	0212	00739	Nationality
29	26	TS	RE	[0..1]		00740	Patient Death Date and Time
30	1	ID	RE	[0..1]	0136	00741	Patient Death Indicator
31	1	ID	RE	[0..1]	0136	01535	Identity Unknown Indicator

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
32	20	IS	RE	[0..1]	0445	01536	Identity Reliability Code
33	26	TS	RE	[0..1]		01537	Last Update Date/Time
34	241	HD	RE	[0..1]		01538	Last Update Facility
35	250	CE	RE	[0..1]	0446	01539	Species Code
36	250	CE	C	[0..1]	0447	01540	Breed Code
37	80	ST	C	[0..1]		01541	Strain
38	250	CE	RE	[0..2]	0429	01542	Production Class Code
39	250	CWE	RE	[0..1]	0171	01840	Tribal Citizenship

420 The following describes the IHE PCD usage of those fields which have a usage other than X in the above table.

PID-3 Patient Identifier List (CX), required:

425 Definition: This field contains the list of identifiers (one or more) used by the healthcare facility to uniquely identify a patient (e.g., medical record number, billing number, birth registry, national unique individual identifier, etc.). In Canada, the Canadian Provincial Healthcare Number shall be sent in this field.

Subfields CX-1 “ID number”, CX-4 “Assigning authority”, and CX-5 “Identifier Type Code” are required for each identifier. See Appendix C.2 CX Data Type for further details.

PID-5 Patient Name (XPN), required:

430 Definition: This field contains the names of the patient, the primary or legal name of the patient is reported first. Therefore, the name type code in this field should be “L - Legal”. Refer to Table 36 HL7 Table 0200 – Name Type below for valid values. Note that “last name prefix” is synonymous to “own family name prefix” of previous versions of HL7, as is “second and further given names or initials thereof” to “middle initial or name”. Multiple
435 given names and/or initials are separated by spaces.

For animals, if a Name Type of “R” is used, use “Name Context” to identify the authority with which the animal’s name is registered.

See Appendix C.7 XPN Data Type for further information.

Table 15 HL7 Table 0200 - Name Type

Value	Description	Comment
A	Alias Name	
B	Name at Birth	
C	Adopted Name	
D	Display Name	
I	Licensing Name	
L	Legal Name	
M	Maiden Name	
N	Nickname /"Call me" Name/Street Name	

P	Name of Partner/Spouse - obsolete	Deprecated in V2.4
R	Registered Name (animals only)	
S	Coded Pseudo-Name to ensure anonymity	
T	Indigenous/Tribal/Community Name	
U	Unspecified	

440 **PID-6 Mother’s Maiden Name (XPN), required but may be empty:**

Definition: This field contains the family name under which the mother was born (i.e., before marriage). It is used to distinguish between patients with the same last name.

See Appendix C.7 XPN Data Type for further information.

PID-7 Date/Time of Birth (TS), required but may be empty:

445 For the IHE PCD TF, when populated, this field shall be implemented as:

Format: YYYY[MM[DD[HH[MM[SS]]]]][+/-ZZZZ]

See Appendix C.6 TS Data Type for further information.

PID-8: Administrative Sex (IS), required but may be empty:

450 Definition: This field contains the patient’s sex. Refer to HL7 User-defined Table 0001 - Administrative Sex for suggested values.

Table 16 HL7 User Defined Table 0001 - Administrative Sex

Value	Description	Comment
F	Female	
M	Male	
O	Other	
A	Ambiguous	
N	Not applicable	

PID-10: Race (CE), required but may be empty:

455 Definition: This field refers to the patient’s race. Refer to User-defined Table 0005 - Race for suggested values. The second triplet of the CE data type for race (alternate identifier, alternate text, and name of alternate coding system) is reserved for governmentally assigned codes.

Table 17 HL7 User Defined Table 0005 - Race

Value	Description	Comment
1002-5	American Indian of Alaska Native	
2028-9	Asian	
2054-5	Black or African American	
2076-8	Native Hawaiian of Other Pacific Islander	
2106-3	White	
2131-1	Other Race	

PID-11: Patient Address (XAD), required but may be empty:

460 Components: <Street Address (SAD)> ^ <Other Designation (ST)> ^ <City (ST)> ^ <State or Province (ST)> ^ <Zip or Postal Code (ST)> ^ <Country (ID)> ^ <Address Type (ID)> ^ <Other Geographic Designation (ST)> ^ <County/Parish Code (IS)> ^ <Census Tract (IS)> ^ <Address Representation Code (ID)> ^ <Address Validity Range (DR)> ^ <Effective Date (TS)> ^ <Expiration Date (TS)>

465 Subcomponents for Street Address (SAD): <Street or Mailing Address (ST)> & <Street Name (ST)> & <Dwelling Number (ST)>

Subcomponents for Address Validity Range (DR): <Range Start Date/Time (TS)> & <Range End Date/Time (TS)>

Subcomponents for Range Start Date/Time (TS): <Time (DTM)> & <Degree of Precision (ID)>

470 Subcomponents for Range End Date/Time (TS): <Time (DTM)> & <Degree of Precision (ID)>

Subcomponents for Effective Date (TS): <Time (DTM)> & <Degree of Precision (ID)>

Subcomponents for Expiration Date (TS): <Time (DTM)> & <Degree of Precision (ID)>

475 Definition: This field contains the mailing address of the patient. Address type codes are defined by HL7 Table 0190 - Address Type. The PCD only requires the first, third, fourth, and fifth components to be valued with the mailing address and the Address Type to be valued as M.

PID-12: County Code (IS), required but may be empty:

480 Definition: From V2.3, this field has been retained for backward compatibility. This field contains the patient's county code. The county can now be supported in the county/parish code component of the XAD data type (PID-11 - Patient Address). Refer to User-defined Table 0289 - County/Parish for suggested values.

PID-13: Phone Number – Home (XTN), required but may be empty:

485 Definition: This field contains the patient's personal phone numbers. This data type is usually in a repeatable field, to allow a list of numbers. The PCD requires the sequence to be the primary number (for backward compatibility). The PCD constrains this field to 2 repetitions to allow for a phone number and an email address.

See Appendix C.8 XTN Data Type for further information.

PID-15: Primary Language (CE), required but may be empty:

490 See HL7 V2.5 Section 3.4.2.15 for details. The PCD TF requires the use of ISO639 for the codes.

PID-16: Marital Status (CE), required but may be empty:

See HL7 V2.5 Section 3.4.2.16 for details. The PCD TF does not further constrain this field.

PID-17: Religion (CE), required but may be empty:

495 See HL7 V2.5 Section 3.4.2.17 for details. The PCD TF does not further constrain this field.

PID-18: Patient Account Number (CX), required but may be empty:

See HL7 V2.5 Section 3.4.2.18 for details. The PCD TF does not further constrain this field. Additional requirements may be documented in Regional or National appendices to the IHE PCD TF.

500 **PID-20: Driver's License Number – Patient (DLN), required but may be empty:**

See HL7 V2.5 Section 3.4.2.20 for details. The PCD TF does not further constrain this field.

PID-21: Mother's Identifier (CX), required but may be empty:

See HL7 V2.5 Section 3.4.2.21 for details. The PCD TF does not further constrain this field.

PID-22: Ethnic Group (CE), required but may be empty:

505 See HL7 V2.5 Section 3.4.2.22 for details. The PCD TF does not further constrain this field.

PID-23: Birth Place (ST), required but may be empty:

See HL7 V2.5 Section 3.4.2.23 for details. The PCD TF does not further constrain this field.

PID-24: Multiple Birth Indicator (ID), required but may be empty:

See HL7 V2.5 Section 3.4.2.24 for details. The PCD TF does not further constrain this field.

510 **PID-25: Birth Order (NM), required but may be empty:**

See HL7 V2.5 Section 3.4.2.25 for details. The PCD TF does not further constrain this field.

PID-26: Citizenship (CE), required but may be empty:

See HL7 V2.5 Section 3.4.2.26 for details. The PCD TF does not further constrain this field.

PID-27: Veterans Military Status (CE), required but may be empty:

515 See HL7 V2.5 Section 3.4.2.27 for details. The PCD TF does not further constrain this field.

PID-28: Nationality (CE), required but may be empty:

See HL7 V2.5 Section 3.4.2.28 for details. The PCD TF does not further constrain this field.

PID-29: Patient Death Date and Time (TS), required but may be empty:

Definition: This field contains the date and time at which the patient death occurred.

520 See Appendix C.6 TS Data Type for PCD constraints.

PID-30: Patient Death Indicator (ID), required but may be empty:

See HL7 V2.5 Section 3.4.2.30 for details. The PCD TF does not further constrain this field.

PID-31: Identity Unknown Indicator (ID), required but may be empty:

See HL7 V2.5 Section 3.4.2.31 for details. The PCD TF does not further constrain this field.

525 **PID-32: Identity Reliability Code (IS), required but may be empty:**

See HL7 V2.5 Section 3.4.2.32 for details. The PCD TF does not further constrain this field.

PID-33: Last Update Date/Time (TS), required but may be empty:

530 Definition: This field contains the last update date and time for the patient's/person's identifying and demographic data, as defined in the PID segment. Receiving systems will use this field to determine how to apply the transaction to their systems. If the receiving system (such as an enterprise master patient index) already has a record for the person with a later last update date/time, then the EMPI receiving system could decide not to apply the patient's/person's demographic and identifying data from this transaction.

See Appendix C.6 TS Data Type for PCD constraints.

535 **PID-34: Last Update Facility (HD), required but may be empty:**

See HL7 V2.5 Section 3.4.2.34 for details. The PCD TF does not further constrain this field.

PID-35: Species Code (CE), required but may be empty:

See HL7 V2.5 Section 3.4.2.35 for details. The PCD TF does not further constrain this field.

PID-36: Breed Code (CE), conditional.

540 See HL7 V2.5 Section 3.4.2.36 for details. The PCD TF does not further constrain this field.

PID-37: Strain (ST), conditional.

See HL7 V2.5 Section 3.4.2.37 for details. The PCD TF does not further constrain this field.

PID-38: Production Class Code (CE), required but may be empty:

See HL7 V2.5 Section 3.4.2.38 for details. The PCD TF does not further constrain this field.

545 **PID-39: Tribal Citizenship (CWE), required but may be empty:**

See HL7 V2.5 Section 3.4.2.39 for details. The PCD TF does not further constrain this field

3.3.5.2.3 ORC - Common Order Segment

550 The Common Order segment (ORC) is used to transmit fields that are common to all orders (all types of services that are requested).

HL7 Attribute Table – ORC – Common Order

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	ELEMENT NAME
1	2	ID	R	[1..1]	0119	00215	Order Control
2	22	EI	R	[1..1]		00216	Placer Order Number
3	22	EI	RE	[0..1]		00217	Filler Order Number
4	22	EI	RE	[0..1]		00218	Placer Group Number
5	2	ID	RE	[0..1]	0038	00219	Order Status
6	1	ID	RE	[0..1]	0121	00220	Response Flag

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	ELEMENT NAME
7	200	TQ	X	[0..0]		00221	Quantity/Timing
8	200	EIP	RE	[0..1]		00222	Parent
9	26	TS	RE	[0..1]		00223	Date/Time of Transaction
10	250	XCN	RE	[0..*]		00224	Entered By
11	250	XCN	RE	[0..*]		00225	Verified By
12	250	XCN	RE	[0..*]		00226	Ordering Provider
13	80	PL	RE	[0..1]		00227	Enterer's Location
14	250	XTN	RE	[0..2]		00228	Call Back Phone Number
15	26	TS	RE	[0..1]		00229	Order Effective Date/Time
16	250	CE	RE	[0..1]		00230	Order Control Code Reason
17	250	CE	RE	[0..1]		00231	Entering Organization
18	250	CE	RE	[0..1]		00232	Entering Device
19	250	XCN	R	[1..1]		00233	Action By
20	250	CE	RE	[0..1]	0339	01310	Advanced Beneficiary Notice Code
21	250	XON	RE	[0..*]		01311	Ordering Facility Name
22	250	XAD	RE	[0..*]		01312	Ordering Facility Address
23	250	XTN	RE	[0..*]		01313	Ordering Facility Phone Number
24	250	XAD	RE	[0..*]		01314	Ordering Provider Address
25	250	CWE	RE	[0..1]		01473	Order Status Modifier
26	60	CWE	RE	[0..1]	0552	01641	Advanced Beneficiary Notice Override Reason
27	26	TS	RE	[0..1]		01642	Filler's Expected Availability Date/Time
28	250	CWE	RE	[0..1]	0177	00615	Confidentiality Code
29	250	CWE	RE	[0..1]	0482	01643	Order Type
30	250	CNE	RE	[0..1]	0483	01644	Enterer Authorization Mode

The following describes the IHE PCD usage of those fields which have a usage other than X in the above table.

555 ORC-1 Order Control (ID), required

Definition: Determines the function of the order segment. The PCD TF requires that this field be valued as RE when the RGV^O15^RGV_O15 Pharmacy/Treatment Give Message is used to send information from the Infusion Order Programmer (IOP) to the Infusion Order Consumer (IOC). When used to send information from the IOC back to the IOP, the value can be either RE or XX. A value of RE indicates that no settings were modified for use by the pump, while a value of XX indicates that one or more values were modified. See Section 3.3.5.3 (Expected Actions) for more information.

560

ORC-2 Placer Order Number (EI), required

ORC-13 Enterer's Location (PL), required but may be empty:

See HL7 V2.5 Section 4.5.1.13 for details. The PCD TF does not further constrain this field.

ORC-14 Call Back Phone Number (XTN), required but may be empty:

600 See HL7 V2.5 Section 4.5.1.14 for details. The PCD TF does not further constrain this field.

ORC-15 Order Effective Date/Time (TS), required but may be empty:

See HL7 V2.5 Section 4.5.1.15 for details. The PCD TF does not further constrain this field.

605 **ORC-16 Order Control Code Reason (CE), required but may be empty:**

See HL7 V2.5 Section 4.5.1.16 for details. The PCD TF does not further constrain this field.

ORC-17 Entering Organization (CE), required but may be empty:

610 See HL7 V2.5 Section 4.5.1.17 for details. The PCD TF does not further constrain this field.

ORC-18 Entering Device (CE), required but may be empty

See HL7 V2.5 Section 4.5.1.18 for details. The PCD TF does not further constrain this field.

ORC-19 Action By (XCN), required:

615 Components: <ID Number (ST)> ^ <Family Name (FN)> ^ <Given Name (ST)> ^
<Second and Further Given Names or Initials Thereof (ST)> ^ <Suffix (e.g., JR or III)
(ST)> ^ <Prefix (e.g., DR) (ST)> ^ <DEPRECATED-Degree (e.g., MD) (IS)> ^ <Source
620 Table (IS)> ^ <Assigning Authority (HD)> ^ <Name Type Code (ID)> ^ <Identifier
Check Digit (ST)> ^ <Check Digit Scheme (ID)> ^ <Identifier Type Code (ID)> ^
<Assigning Facility (HD)> ^ <Name Representation Code (ID)> ^ <Name Context
(CE)> ^ <DEPRECATED-Name Validity Range (DR)> ^ <Name Assembly Order (ID)>
^ <Effective Date (TS)> ^ <Expiration Date (TS)> ^ <Professional Suffix (ST)> ^
<Assigning Jurisdiction (CWE)> ^ <Assigning Agency or Department (CWE)>

Definition: This field contains the identity of the caregiver who initiated the event.

625 Subfield XCN-1 "ID number" is required..

ORC-20 Advanced Beneficiary Notice Code (CE), required but may be empty:

See HL7 V2.5 Section 4.5.1.20 for details. The PCD TF does not further constrain this field.

ORC-21 Ordering Facility Name (XON), required but may be empty:

630 See HL7 V2.5 Section 4.5.1.21 for details. The PCD TF does not further constrain this field.

ORC-22 Ordering Facility Address (XAD), required but may be empty:

See HL7 V2.5 Section 4.5.1.22 for details. The PCD TF does not further constrain this field.

635 **ORC-23 Ordering Facility Phone Number (XTN), required but may be empty:**

See HL7 V2.5 Section 4.5.1.23 for details. The PCD TF does not further constrain this field.

ORC-24 Ordering Provider Address (XAD), required but may be empty:

640 See HL7 V2.5 Section 4.5.1.24 for details. The PCD TF does not further constrain this field.

ORC-25 Order Status Modifier (CWE), required but may be empty:

See HL7 V2.5 Section 4.5.1.25 for details. The PCD TF does not further constrain this field.

645 **ORC-26 Advanced Beneficiary Notice Override Reason (CWE), required but may be empty:**

See HL7 V2.5 Section 4.5.1.26 for details. The PCD TF does not further constrain this field.

ORC-27 Filler's Expected Availability Date/Time (TS), required but may be empty:

650 See HL7 V2.5 Section 4.5.1.27 for details. The PCD TF does not further constrain this field.

ORC-28 Confidentiality Code (CWE), required but may be empty:

See HL7 V2.5 Section 4.5.1.28 for details. The PCD TF does not further constrain this field.

ORC-29 Order Type (CWE), required but may be empty:

655 See HL7 V2.5 Section 4.5.1.29 for details. The PCD TF does not further constrain this field.

ORC-30 Enterer Authorization Mode (CNE), required but may be empty:

660 See HL7 V2.5 Section 4.5.1.30 for details. The PCD TF does not further constrain this field.

3.3.5.2.4 RXG - Pharmacy/Treatment Give Segment

HL7 Attribute Table – RXG – Pharmacy/Treatment Give

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM #	ELEMENT NAME
1	4	NM	RE	[0..1]		00342	Give Sub-ID Counter
2	4	NM	RE	[0..1]		00334	Dispense Sub-ID Counter
3	200	TQ	X	[0..0]		00221	Quantity/Timing
4	250	CE	R	[1..1]	0292	00317	Give Code
5	20	NM	R	[1..1]		00318	Give Amount - Minimum
6	20	NM	RE	[0..1]		00319	Give Amount - Maximum
7	250	CE	R	[1..1]		00320	Give Units
8	250	CE	RE	[0..1]		00321	Give Dosage Form
9	250	CE	RE	[0..*]		00351	Administration Notes
10	1	ID	RE	[0..1]	0167	00322	Substitution Status
11	200	LA2	RE	[0..1]		01303	Dispense-To Location
12	1	ID	RE	[0..1]	0136	00307	Needs Human Review
13	250	CE	RE	[0..*]		00343	Pharmacy/Treatment Supplier's Special Administration Instructions
14	20	ST	RE	[0..1]		00331	Give Per (Time Unit)
15	6	ST	R	[1..1]		00332	Give Rate Amount
16	250	CE	R	[1..1]		00333	Give Rate Units
17	20	NM	RE	[0..1]		01126	Give Strength
18	250	CE	RE	[0..1]		01127	Give Strength Units
19	20	ST	RE	[0..*]		01129	Substance Lot Number
20	26	TS	RE	[0..*]		01130	Substance Expiration Date
21	250	CE	RE	[0..*]	0227	01131	Substance Manufacturer Name
22	250	CE	RE	[0..*]		01123	Indication
23	5	NM	RE	[0..1]		01692	Give Drug Strength Volume
24	250	CWE	RE	[0..1]		01693	Give Drug Strength Volume Units
25	60	CWE	RE	[0..1]		01694	Give Barcode Identifier
26	1	ID	RE	[0..1]	0480	01695	Pharmacy Order Type

665 The following describes the IHE PCD usage of those fields which have a usage other than X in the above table.

RXG-1 Give Sub-ID Counter (NM), required but may be empty

See HL7 V2.5 Section 4.14.6.1 for details. The PCD TF does not further constrain this field.

RXG-2 Dispense Sub-ID Counter (NM), required but may be empty

670 See HL7 V2.5 Section 4.14.6.2 for details. The PCD TF does not further constrain this field.

RXG-4 Give Code (CE), required

675 Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^
<Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate
Coding System (ID)>

Definition: This field is the identifier of the primary additive or principal ingredient of the IV medication to be administered to the patient. The information in RXG-4 is used to match the ordered medication to the pump’s onboard drug library.

680 Subfields CE-1 “Identifier” and CE-2 “Text” are required. Example usage: “Identifier” could be populated with a value such as an NDC or another value known to both the Infusion Order Programmer and the Infusion Order Consumer, while “Text” could be populated with the name of the medication.

RXG-5 Give Amount – Minimum (NM), required

685 Definition: This field contains the volume of fluid to be administered (VTBI). This volume is the actual fluid volume that the clinician intends to administer (not necessarily the volume of the bag).

RXG-6 Give Amount - Maximum (NM), required but may be empty

See HL7 V2.5 Section 4.14.6.6 for details. The PCD TF does not further constrain this field.

690 **RXG-7 Give Units (CE), required**

Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^
<Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding
System (ID)>

695 Definition: This field contains the UCUM and MDC coded units for the give amount. The PCD TF requires that this field be valued as:

1618^mL^UCUM^263762^MDC_DIM_MILLI_L^MDC

RXG-8 Give Dosage Form (CE), required but may be empty

See HL7 V2.5 Section 4.14.6.8 for details. The PCD TF does not further constrain this field.

700 **RXG-9 Administration Notes (CE), required but may be empty**

See HL7 V2.5 Section 4.14.6.9 for details. The PCD TF does not further constrain this field.

RXG-10 Substitution Status (ID), required but may be empty

705 See HL7 V2.5 Section 4.14.6.10 for details. The PCD TF does not further constrain this field.

RXG-11 Dispense-to Location (LA2), required but may be empty

See HL7 V2.5 Section 4.14.6.11 for details. The PCD TF does not further constrain this field.

RXG-12 Needs Human Review (ID), required but may be empty

710 See HL7 V2.5 Section 4.14.6.12 for details. The PCD TF does not further constrain this field.

RXG-13 Pharmacy/Treatment Supplier's Special Administration Instructions (CE), required but may be empty

715 See HL7 V2.5 Section 4.14.6.13 for details. The PCD TF does not further constrain this field.

RXG-14 Give Per (Time Unit) (ST), required but may be empty

See HL7 V2.5 Section 4.14.6.14 for details. The PCD TF does not further constrain this field.

RXG-15 Give Rate Amount (ST), required

720 Definition: This field contains the numeric portion of the rate or dose to be administered. If the infusion requires a dosed value, such as dopamine at 5 mcg/kg/min, this field contains the dose value amount (e.g. “5”). If it does not, such as normal saline at 75 mL/hr, then this field contains the rate value (e.g. “75”).

RXG-16 Give Rate Units (CE), required

725 Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^ <Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding System (ID)>

730 Definition: This field contains the UCUM and/or MDC coded version of the units portion of the rate or dose to be administered. If the infusion requires a dosed value, such as dopamine at 5 mcg/kg/min, this field represents the dose units (e.g. “mcg/kg/min”). If it does not, such as normal saline at 75 mL/hr, then this field represents the rate units (e.g. “mL/hr”).

Examples:

735 3122^mL/h^UCUM^265266^MDC_DIM_MILLI_L_PER_HR^MDC
3475^ug/kg/min^UCUM^265619^MDC_DIM_MICRO_G_PER_KG_PER_MIN^MDC

RXG-17 Give Strength (NM), required but may be empty

740 Definition: This field contains the quantity of the main ingredient in the infusion; e.g., for dopamine 800 mg in 250 mL D5W, the field would contain the value “800”.

RXG-18 Give Strength Units (CE), required but may be empty

Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^
<Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding
System (ID)>

745 This field contains the UCUM and/or MDC coded version of the units portion of the main ingredient in the infusion; e.g., for dopamine 800 mg in 250 mL D5W, the field would represent ‘mg’.

Example:

1746^mg^UCUM^263890^MDC_DIM_MILLI_G^MDC

750 **RXG-19 Substance Lot Number (ST), required but may be empty**

See HL7 V2.5 Section 4.14.6.19 for details. The PCD TF does not further constrain this field.

RXG-20 Substance Expiration Date (TS), required but may be empty

755 See HL7 V2.5 Section 4.14.6.20 for details. The PCD TF does not further constrain this field.

RXG-21 Substance Manufacturer Name (CE), required but may be empty

See HL7 V2.5 Section 4.14.6.21 for details. The PCD TF does not further constrain this field.

RXG-22 Indication (CE), required but may be empty

760 See HL7 V2.5 Section 4.14.6.22 for details. The PCD TF does not further constrain this field.

RXG-23 Give Drug Strength Volume (NM), required but may be empty

765 Definition: This field contains the quantity of the diluent or base fluid ingredient(s) in the infusion; e.g., for dopamine 800 mg in 250 mL D5W, the field would contain the value “250”.

RXG-24 Give Drug Strength Volume Units (CWE), required but may be empty

770 Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^
<Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding
System (ID)> ^ <Coding System Version ID (ST)> ^ <Alternate Coding System Version
ID (ST)> ^ <Original Text (ST)>

Definition: This field contains the UCUM and MDC coded units for the Give Drug Strength Volume. The PCD TF requires that this field be valued as:

1618^mL^UCUM^263762^MDC_DIM_MILLI_L^MDC

RXG-25 Give Barcode Identifier (CWE), required but may be empty

775 See HL7 V2.5 Section 4.14.6.25 for details. The PCD TF does not further constrain this field.

RXG-26 Pharmacy Order Type (ID), required but may be empty

See HL7 V2.5 Section 4.14.6.26 for details. The PCD TF does not further constrain this field.

780

3.3.5.2.5 RXR - Pharmacy/Treatment Route Segment

The Pharmacy/Treatment Route segment contains the alternative combination of route, site, administration device, and administration method that are prescribed.

HL7 Attribute Table – RXR – Pharmacy/Treatment Route

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM #	ELEMENT NAME
1	250	CE	R	[1..1]	0162	00309	Route
2	250	CWE	RE	[0..1]	0163	00310	Administration Site
3	250	CE	R	[1..1]	0164	00311	Administration Device
4	250	CWE	RE	[0..1]	0165	00312	Administration Method
5	250	CE	RE	[0..1]		01315	Routing Instruction
6	250	CWE	RE	[0..1]	0495	01670	Administration Site Modifier

785 The following describes the IHE PCD usage of the fields in the above table.

RXR-1 Route (CE), required

Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^ <Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding System (ID)>

790 Definition: This field is the route of administration. The PCD TF requires that this field be valued as IV.

RXR-2 Administration Site (CWE), required but may be empty

See HL7 V2.5 Section 4.14.2.2 for details. The PCD TF does not further constrain this field.

795 **RXR-3 Administration Device (CE), required**

Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^ <Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding System (ID)>

800 Definition: This field contains the mechanical device used to aid in the administration of the drug or other treatment. The PCD TF requires that this field be valued as IVP.

RXR-4 Administration Method (CWE), required but may be empty

805 Components: <Identifier (ST)> ^ <Text (ST)> ^ <Name of Coding System (ID)> ^ <Alternate Identifier (ST)> ^ <Alternate Text (ST)> ^ <Name of Alternate Coding System (ID)> ^ <Coding System Version ID (ST)> ^ <Alternate Coding System Version ID (ST)> ^ <Original Text (ST)>

Definition: This field identifies whether the infusion is to be administered as an IV piggyback or secondary infusion. When this is the case, the TF requires that this field be valued as IVPB.

RXR-5 Routing Instruction (CE), required but may be empty

810 See HL7 V2.5 Section 4.14.2.5 for details. The PCD TF does not further constrain this field.

RXR-6 Administration Site Modifier (CWE), required but may be empty

815 See HL7 V2.5 Section 4.14.2.6 for details. The PCD TF does not further constrain this field.

3.3.5.2.6 OBX - Observation/Result segment

Refer to HL7 v2.5: Section 7.4.2

820 The HL7 OBX segment is used to transmit a single observation or observation fragment. In the Point-of-Care Infusion Verification Profile the usage is limited to (1) providing the Device ID that will be used by the Infusion Order Consumer and (2) providing patient height and weight information from the Infusion Order Programmer to the Infusion Order Consumer.

One OBX segment containing the Device ID must always be present. One or two additional OBX segments containing the patient height and/or patient weight may optionally follow.

825 Note that the definition of the OBX segment in this profile is constrained from the definition used in the PCD Observation/Result Message to reflect this limited usage. The broader definition can be found in section 3.1.7 of the PCD Technical Framework (PCD-01 Communicate PCD Data (ORU^R01^ORU_R01) static definition).

830 **Table 21 OBX segment**

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	4	SI	R	[1..1]		00569	Set ID – OBX
2	2	ID	CE	[0..1]	0125	00570	Value Type
3	250	CE	R	[1..1]		00571	Observation Identifier
4	20	ST	RE	[0..1]		00572	Observation Sub-ID
5	5	NM	CE	[0..1]		00573	Observation Value
6	250	CE	CE	[0..1]		00574	Units
7	60	ST	RE	[0..1]		00575	References Range

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
8	5	IS	RE	[0..1]	0078	00576	Abnormal Flags
9	5	NM	X	[0..0]		00577	Probability
10	2	ID	RE	[0..1]	0080	00578	Nature of Abnormal Test
11	1	ID	RE	[0..1]	0085	00579	Observation Result Status
12	26	TS	X	[0..0]		00580	Effective Date of Reference Range
13	20	ST	X	[0..0]		00581	User Defined Access Checks
14	26	TS	RE	[0..1]		00582	Date/Time of the Observation
15	250	CE	RE	[0..1]		00583	Producer's ID
16	250	XCN	RE	[0..1]		00584	Responsible Observer
17	250	CE	RE	[0..1]		00936	Observation Method
k	22	EI	CE	[0..1]		01479	Equipment Instance Identifier
19	26	TS	RE	[0..1]		01480	Date/Time of the Analysis
20	705	CWE	RE	[0..*]	0163	02179	Observation Site

The following describes the IHE PCD PIV profile's usage of those fields which have a usage other than X in the above table.

OBX-1 Set ID - OBX (SI), required:

835 This field contains the sequence number of the OBX in this message; i.e. 1st OBX Set ID = 1, 2nd OBX set_ID = 2, etc., regardless of whether the OBX refers to a device or a metric value.

OBX-2 Value Type (ID), conditional but may be empty:

The PCD PIV profile restricts this value to NM if OBX-3 refers to weight or height, or empty if OBX-3 refers to a pump ID.

840 **OBX-3 Observation Identifier (CE), required:**

The PCD PIV profile constrains the value of this field to one of the following:

845 68063^MDC_ATTR_PT_WEIGHT^MDC
68060^MDC_ATTR_PT_HEIGHT^MDC
69986^MDC_DEV_PUMP_INFUS_VMD^MDC

OBX-4 Observation Sub-ID (ST), required but may be empty:

The PCD PIV profile does not further constrain this field.

OBX-5 Observation Value (NM), conditional but may be empty:

850 If OBX-3 refers to weight or height, then this field contains the weight or height value, respectively. If OBX-3 refers to the pump ID, this field must be empty.

OBX-6 Units (CE), conditional but may be empty:

The PCD PIV profile constrains the value of this field to one of the following:

If OBX-3 refers to weight:

855 1728^g^UCUM^263872^MDC_DIM_X_G^MDC
1731^kg^UCUM^263875^MDC_DIM_X_KILO_G^MDC
If OBX-3 refers to height:
1297^cm^UCUM^263441^MDC_DIM_CENTI_M^MDC
If OBX-3 refers to a pump ID, this field must be empty.

OBX-7 References Range (ST), required but may be empty:

860 The PCD PIV profile does not further constrain this field.

OBX-8 Abnormal Flags (IS), required but may be empty:

The PCD PIV profile does not further constrain this field.

OBX-10 Nature of Abnormal Test (ID), required but may be empty:

The PCD PIV profile does not further constrain this field.

865 **OBX-11 Observation Result Status (ID), required but may be empty:**

The PCD PIV profile does not further constrain this field.

OBX-14 Date/Time of the Observation (TS), required but may be empty:

The PCD PIV profile does not further constrain this field.

OBX-15 Producer's ID (CE), required but may be empty:

870 The PCD PIV profile does not further constrain this field.

OBX-16 Responsible Observer (XCN), required but may be empty:

The PCD PIV profile does not further constrain this field.

OBX-17 Observation Method (CE), required but may be empty:

The PCD PIV profile does not further constrain this field.

875 **OBX-18 Equipment Instance Identifier (EI), conditional but may be empty:**

If OBX-3 refers to the pump ID, the ID is placed in the 'Universal ID' component (EI-3), and the device or manufacturer name is placed in the 'Universal ID Type' component (EI-4). The pump ID is a unique identifier that includes the pump channel, if applicable. The format of the identifier is vendor-specific. A typical value could be a serial number for a single-channel pump, or a serial number followed by the channel number or letter for a multi-channel pump.

880

If OBX-3 refers to weight or height, this field must be empty.

OBX-19 Date/Time of the Analysis (TS), required but may be empty:

The PCD PIV profile does not further constrain this field.

885 **OBX-20 Observation Site (CWE), required but may be empty:**

The PCD PIV profile does not further constrain this field.

3.3.5.3 Expected Actions

890 The Pharmacy/Treatment Give Message (RGV^O15^RGV_O15) is sent from the Infusion Order Programmer to the Infusion Order Consumer. Upon receipt, the Infusion Order Consumer validates the message and responds with a Pharmacy/Treatment Give Acknowledgment Message (RRG^O16^RRG_O16).

If the message from the Infusion Order Programmer is accepted, the acknowledgment will contain the value AA in MSA-1.

895 In addition, the Infusion Order Consumer must also send back a Pharmacy/Treatment Give Message (RGV^O15^RGV_O15) to the Infusion Order Programmer. This message will contain the actual parameters consumed by the infuser, which may differ from those provided by the Infusion Order Programmer (see scenario described below). As specified in Section 3.3.5.2.3 (ORC - Common Order Segment), ORC-1 will contain a value of RE if no parameters were modified, or a value of XX if one or more parameters were modified.

900 The Infusion Order Programmer will then respond to the Pharmacy/Treatment Give Message (RGV^O15^RGV_O15) with a Pharmacy/Treatment Give Acknowledgment Message (RRG^O16^RRG_O16). (A sample transaction [Example 1] is provided in the Appendix.)

905 **Scenario:** The precision of a value to be programmed is not supported by the pump. In this case, the acknowledgement will contain the actual parameters sent to the pump. For example, if the rate provided is 13.33 mL/hr but the infuser supports only 13.3 mL/hr, the RGV message sent from the IOC to the IOP will contain the value 13.3 in RXG-15. (A sample transaction [Example 2] is provided in the Appendix.)

910 If the message from the Infusion Order Programmer is rejected, the acknowledgment will contain the value AR in MSA-1. The reason for rejection is provided the ERR segment.

Scenario: A value is greater than what the pump can support. For example, the rate provided is 2000 mL/hr, but the pump's maximum rate is 1000 mL/hr.

915 Once the programming information is received by the pump, the clinician may choose to (1) confirm the settings on the pump and then start the infusion, (2) modify the settings and then start the infusion, or (3) cancel the settings altogether. The current state of the infusion can be obtained using the optional PCD-01 (Communicate PCD Data) or PCD-02 (Subscribe to PCD Data) transactions.

920 RRG^O16^RRG_O16 Pharmacy/Treatment Give Acknowledgement Message

<u>Segment</u>	<u>Meaning</u>	<u>Usage</u>	<u>Card</u>	<u>HL7 Chapter</u>
MSH	Message Header	R	[1..1]	2
MSA	Message Acknowledgment	R	[1..1]	2
[{ ERR }]	Error	C	[0..1]	2

<u>Segment</u>	<u>Meaning</u>	<u>Usage</u>	<u>Card</u>	<u>HL7 Chapter</u>
[{ SFT }]	Software	X		2
[{ NTE }]	Notes and Comments (for Header)	X		2
[	--- RESPONSE begin			
[	--- PATIENT begin			
PID	Patient Identification	X		3
[{ NTE }]	Notes and Comments (for PID)	X		2
]	--- PATIENT end			
{	--- ORDER begin			
ORC	Common Order	X		4
[{	--- TIMING begin			
TQ1	Timing/Quantity	X		4
[{ TQ2 }]	Timing/Quantity Order Sequence	X		4
}]	--- TIMING end			
[	--- GIVE begin			
RXG	Pharmacy/Treatment Give	X		4
{	--- TIMING_GIVE begin			
TQ1	Timing/Quantity	X		4
[{ TQ2 }]	Timing/Quantity Order Sequence	X		4
}	--- TIMING_GIVE end			
{ RXR }	Pharmacy/Treatment Route	X		4
[{ RXC }]	Pharmacy/Treatment Component	X		4
]	--- GIVE end			
}	--- ORDER end			
]	--- RESPONSE end			

MSH – Message Header Segment

The MSH segment is defined in section 3.3.5.2.1.

925 MSA - Message Acknowledgement segment

See HL7 v2.5: chapter 2 (2.15 Message control)

This segment contains information sent while acknowledging another message.

Table 10 MSA - Message Acknowledgement

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	2	ID	R	[1..1]	0008	00018	Acknowledgement code
2	20	ST	R	[1..1]		00010	Message Control Id
3	80	ST	X	[0..0]		00020	Text Message
5	1	ID	X	[0..0]		00022	Delayed Acknowledgment Type
6	250	CE	X	[0..0]	0357	00023	Error Condition

930 **MSA-1 Acknowledgment Code (ID), required:**

The IHE PCD PIV profile authorizes the two values below, taken from HL7 table 0008 - Acknowledgement code:

Table 11: HL7 table 0008 - Acknowledgement code

Value	Description	Comment
AA	Original mode: Application Accept	The message has been accepted and integrated by the receiving application
AR	Original mode: Application Reject	The message has been rejected by the receiving application

935 **MSA-2 Message Control ID (ST), required:**

Definition: This field contains the message control ID from the MSH-10 - Message Control ID of the incoming message for which the acknowledgement is sent.

MSA-3 Text Message (ST), not supported:

See the ERR segment.

940

ERR - Error segment

See HL7 v2.5 : chapter 2 (2.15 Message control)

This segment is used to add error comments to acknowledgment messages.

Table 12 ERR - Error segment

SEQ	LEN	DT	Usage	Card.	TBL#	ITEM#	Element name
1	493	ELD	RE	[0..1]		00024	Error Code and Location
3	705	CWE	R	[1..1]	0357	01813	HL7 Error Code
4	2	ID	R	[1..1]	0516	01814	Severity

945

Notes: ERR-1 is included in HL7 v2.5 for backward compatibility only. Within the context of IHE PCD, this field shall not be used.

ERR-3 and ERR-4 are required by HL7 v2.5

APPENDIX A - Common Data Types

950 This section describes PCD constraints of commonly used HL7 data types.

Add the following to Appendix C of the TF

CWE – coded with exceptions

HL7 Component Table - CWE – Coded with Exceptions

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS	SEC.REF.
1	20	ST	O		Identifier		2.A.74
2	199	ST	O		Text		2.A.74
3	20	ID	O	0396	Name of Coding System		2.A.35
4	20	ST	O		Alternate Identifier		2.A.74
5	199	ST	O		Alternate Text		2.A.74
6	20	ID	O	0396	Name of Alternate Coding System		2.A.35
7	10	ST	C		Coding System Version ID		2.A.74
8	10	ST	O		Alternate Coding System Version ID		2.A.74
9	199	ST	O		Original Text		2.A.74

955 Definition: Specifies a coded element and its associated detail. The CWE data type is used when 1) more than one table may be applicable **or** 2) the specified HL7 or externally defined table may be extended with local values **or** 3) when text is in place, the code may be omitted.

Maximum Length: 705

Usage Notes: This is a field that is generally sent using a code, but where the code may be omitted in exceptional instances or by site agreement. Exceptional instances arise when the coding system being used does not have a code to describe the concept in the text.

960

XCN - extended composite ID number and name for persons

HL7 Component Table - XCN – Extended Composite ID Number and Name for Persons

SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS	SEC.REF.
1	15	ST	O		ID Number		2.A.74
2	194	FN	O		Family Name		2.A.30
3	30	ST	O		Given Name		2.A.74
4	30	ST	O		Second and Further Given Names or Initials Thereof		2.A.74
5	20	ST	O		Suffix (e.g., JR or III)		2.A.74
6	20	ST	O		Prefix (e.g., DR)		2.A.74
7	5	IS	B	0360	Degree (e.g., MD)	deprecated as of v 2.5	2.A.36
8	4	IS	C	0297	Source Table		2.A.36
9	227	HD	O	0363	Assigning Authority		2.A.33

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SEQ	LEN	DT	OPT	TBL#	COMPONENT NAME	COMMENTS	SEC.REF.
10	1	ID	O	0200	Name Type Code		2.A.35
11	1	ST	O		Identifier Check Digit		2.A.74
12	3	ID	C	0061	Check Digit Scheme		2.A.35
13	5	ID	O	0203	Identifier Type Code		2.A.35
14	227	HD	O		Assigning Facility		2.A.33
15	1	ID	O	0465	Name Representation Code		2.A.35
16	483	CE	O	0448	Name Context		2.A.6
17	53	DR	B		Name Validity Range		2.A.20
18	1	ID	O	0444	Name Assembly Order		2.A.35
19	26	TS	O		Effective Date		2.A.77
20	26	TS	O		Expiration Date		2.A.77
21	199	ST	O		Professional Suffix		2.A.74
22	705	CWE	O		Assigning Jurisdiction		2.A.13
23	705	CWE	O		Assigning Agency or Department		2.A.13

Maximum Length: 3002

965

Note: Replaces CN data type as of v 2.3.

This data type is used extensively appearing in the PV1, ORC, RXO, RXE, OBR and SCH segments, as well as others, where there is a need to specify the ID number and name of a person.

APPENDIX: Examples of messages

970 **A.1: Example of transaction PCD-03: Communicate Infusion Order**

This example illustrates the use of PCD-03.

A.1.1: Storyboard

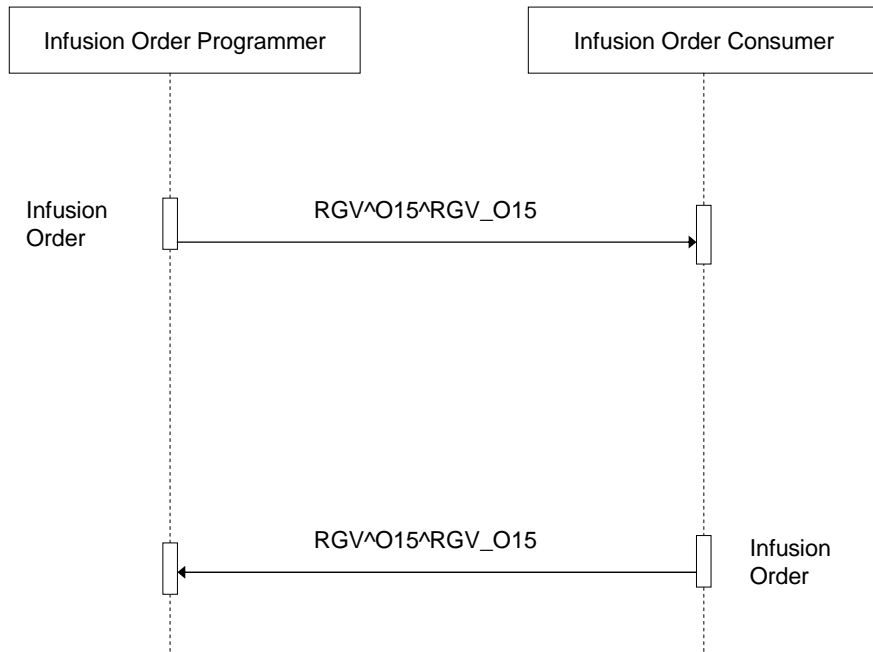
Nurse Jane Adams uses a Bedside Computer-assisted Medication Administration (BCMA) system to initiate programming an IV pump for a medication on patient John Doe.

975

Objects	Attributes	
Patient	Legal Name: John Doe ID: 98765 Sex: M Date of birth: January 1, 1966 Weight: 85.0 kg	
Nurse	Jane Adams ID: N0001	
Medication	Example 1 Name: Dopamine Volume to be infused: 250 mL Concentration: 400 mg / 250 mL Dose: 10 mcg/kg/min	Example 2 Name: Normal Saline Volume to be infused: 500 mL Rate: 13.33 mL/hr
Pump	ID: A0001	

A.1.2: Interaction Diagram

980 The following diagram illustrates the interactions used in this example. The acknowledgement messages are not shown.



A.1.3: Messages

Example 1

985 Order #12345 for Patient ID 98765 (John Doe), Dopamine, volume to be infused 250 ml at 10 mcg/kg/min, concentration of 400 mg in 250 ml, patient weight 85.0 kg, Pump ID A0001, administered by nurse N0001. The IOC response indicates that all values were accepted.

Communicate Infusion Order (IOP to IOC)

```

990 MSH|^~\&|IOPVENDOR^1234560000000001^EUI-
64|IOPVENDOR|IOCVENDOR^6543210000000001^EUI-64|IOCVENDOR|20080101123456-
0600||RGV^O15^RGV_O15|1|P|2.5|||ASCII|EN^English^ISO659||IHE_PCD_PIV_001
995 PID||98765^^^IHE^PI|Doe^John^^^^^L||19660101000000-0600|M
ORC|RE|12345|||N0001
RXG|||^Dopamine|250||1618^mL^UCUM^263762^MDC_DIM_MILLI_L^MDC|||10|3475^
ug/kg/min^UCUM^265619^MDC_DIM_MICRO_G_PER_KG_PER_MIN^MDC|400|1746^mg^UCUM^263
890^MDC_DIM_MILLI_G^MDC|||250|1618^mL^UCUM^263762^MDC_DIM_MILLI_L^MDC
RXR|IV||IVP
OBX|1||69985^MDC_DEV_PUMP_INFUS_MDS^MDC|||X|^A0001^PUMPVENDOR
OBX|2|NM|68063^MDC_ATTR_PT_WEIGHT^MDC||85.0|1731^kg^UCUM^263875^MDC_DIM_X_KIL
O_G^MDC
    
```

1000 Acknowledgment

```
MSH|^~\&|IOCVENDOR^6543210000000001^EUI-  
64|IOCVENDOR|IOPVENDOR^1234560000000001^EUI-64|IOPVENDOR|20080101123456-  
0600||RRG^O16^RRG_O16|100|P|2.5|||ASCII|EN^English^ISO659||IHE_PCD_PIV_001  
MSA|AA|1
```

1005 **Communicate Infusion Order (IOC to IOP)**

```
MSH|^~\&|IOCVENDOR^6543210000000001^EUI-
64|IOCVENDOR|IOPVENDOR^1234560000000001^EUI-64|IOPVENDOR|20080101123456-
0600||RGV^O15^RGV_O15|101|P|2.5|||ASCII|EN^English^ISO659||IHE_PCD_PIV_001
PID||98765^^^IHE^PI|Doe^John^^^^^L||19660101000000-0600|M
1010 ORC|RE|12345|||N0001
RXG|||^Dopamine|250||1618^mL^UCUM^263762^MDC_DIM_MILLI_L^MDC|||10|3475^
ug/kg/min^UCUM^265619^MDC_DIM_MICRO_G_PER_KG_PER_MIN^MDC|400|1746^mg^UCUM^263
890^MDC_DIM_MILLI_G^MDC|||250|1618^mL^UCUM^263762^MDC_DIM_MILLI_L^MDC
RXR|IV||IVP
1015 OBX|1||69985^MDC_DEV_PUMP_INFUS_MDS^MDC|||X|||^A0001^PUMPVENDOR
```

Acknowledgment

```
MSH|^~\&|IOPVENDOR^1234560000000001^EUI-
64|IOPVENDOR|IOCVENDOR^6543210000000001^EUI-64|IOCVENDOR|20080101123456-
0600||RRG^O16^RRG_O16|2|P|2.5|||ASCII|EN^English^ISO659||IHE_PCD_PIV_001
1020 MSA|AA|101
```

Example 2

Order #12345 for Patient ID 98765 (John Doe), Normal Saline, volume to be infused 500 ml at rate of 13.33 ml/hr, Pump ID A0001, administered by nurse N0001. The IOC response indicates that the actual rate used will be 13.3 ml/hr.

1025

Communicate Infusion Order (IOP to IOC)

```
MSH|^~\&|IOPVENDOR^1234560000000001^EUI-
64|IOPVENDOR|IOCVENDOR^6543210000000001^EUI-64|IOCVENDOR|20080101123456-
0600||RGV^O15^RGV_O15|3|P|2.5|||ASCII|EN^English^ISO659||IHE_PCD_PIV_001
1030 PID||98765^^^IHE^PI|Doe^John^^^^^L||19660101000000-0600|M
ORC|RE|12345|||N0001
RXG|||^Normal
Saline|500||1618^mL^UCUM^263762^MDC_DIM_MILLI_L^MDC|||13.33|3122^mL/h^UC
UM^265266^MDC_DIM_MILLI_L_PER_HR^MDC
1035 RXR|IV||IVP
OBX|1||69985^MDC_DEV_PUMP_INFUS_MDS^MDC|||X|||^A0001^PUMPVENDOR
```

Acknowledgment

```
MSH|^~\&|IOCVENDOR^6543210000000001^EUI-
64|IOCVENDOR|IOPVENDOR^1234560000000001^EUI-64|IOPVENDOR|20080101123456-
0600||RRG^O16^RRG_O16|102|P|2.5|||ASCII|EN^English^ISO659||IHE_PCD_PIV_001
1040 MSA|AA|3
```

Communicate Infusion Order (IOC to IOP) with actual rate used

```
MSH|^~\&|IOCVENDOR^6543210000000001^EUI-
64|IOCVENDOR|IOPVENDOR^1234560000000001^EUI-64|IOPVENDOR|20080101123456-
0600||RGV^O15^RGV_O15|103|P|2.5|||ASCII|EN^English^ISO659||IHE_PCD_PIV_001
1045 PID||98765^^^IHE^PI|Doe^John^^^^^L||19660101000000-0600|M
ORC|XX|12345|||N0001
RXG|||^Normal
Saline|500||1618^mL^UCUM^263762^MDC_DIM_MILLI_L^MDC|||13.3|3122^mL/h^UCU
M^265266^MDC_DIM_MILLI_L_PER_HR^MDC
1050
```

```
RXR|IV||IVP
OBX|1||69985^MDC_DEV_PUMP_INFUS_MDS^MDC|||||||X|||||||^A0001^PUMPVENDOR
```

Acknowledgment

1055

```
MSH|^~\&|IOPVENDOR^1234560000000001^EUI-
64|IOPVENDOR|IOCVENDOR^6543210000000001^EUI-64|IOCVENDOR|20080101123456-
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