

Update PCD-03 message definition and examples to clarify multistep programming

IHE Change Proposal

Tracking information:

IHE Domain	Devices (DEV)
Change Proposal ID:	CP-DEV-021
Change Proposal Status:	Draft
Date of last update:	2025-06-10
Person assigned:	Kurt Elliason

Change Proposal Summary information:

Update PCD-03 message definition and examples to clarify multistep programming.	
Submitter's Name(s) and e-mail address(es):	Kurt Elliason kurt.elliason@icumed.com
Submission Date:	2025-06-xx
Integration Profile(s) affected:	PCD-03
Actor(s) affected:	IOP/IOC
IHE Technical Framework or Supplement modified:	IHE_PCDTF Vol 2, dated 2024-11-04
Volume(s) and Section(s) affected:	Multiple sections in Vol 2
Rationale for Change: Update HL7 references from 2.6 to 2.8 for PCD-03 and add missing information identified when trying to implement multi-step programming. Add examples of multi-step programming messages.	

Vol 2, page 23 section 3.3.4.4.5 RXG - Pharmacy/Treatment Give Segment

Update description to reference a minimum of HL7 2.8

Update to Table include RXG-32 and RXG-33

For each description of RXG fields update the reference to HL7 from 2.6 to 2.8 and update the section reference.

For other uses see HL7 V2.6 Section 4.14.6.x for details. The DEV TF does not further constrain this field.

On line 704 change the range from 30 to 31

RXG-27 to 30

Starting after line 705 add descriptions for RXG 32 and RXG 33

RXG-32 Dispense Amount

Definition: This field contains the amount to be dispensed as encoded by the pharmacy or treatment supplier.

RXG-33 Dispense Units

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)>

Update PCD-03 message definition and examples to clarify multistep programming

Definition: This field contains the units for the dispense amount as encoded by the pharmacy or treatment supplier. This field is required if the units are not implied by the actual dispense code. This must be in simple units that reflect the actual quantity of the substance dispensed. It does not include compound units. The preferred format is an MDC value; UCUM values are also acceptable.

The DEV TF requires that the first three components of RXG-33 contain one of the following sets of values:

- 263762^MDC_DIM_MILLI_L^MDC
- mL^mL^UCUM

See section 3.3.4.4.10.3 Multistep for more information on the use of RXG-32 and RXG-33.

Vol 2, page 35 section 3.3.4.4.9 OBX - Observation/Result segment

Add 0^MDCX_INFUS_ORDER_STEP_START_CONDITION to Pump Programming Parameter list starting on line 894

Vol 2, page 39 section 3.3.4.4.10.3 Multistep

Add note about the use of RXG32/33 required only for multistep

RXG-5 Give Amount – Minimum contains volume of fluid to be administered for each step. **RXG-32 Dispense Amount and RXG-33 Dispense Units** are only required for a multistep program and contain the total volume to be delivered across all steps. These values are required to be the same in each RXG segment of the multistep program.

Vol 2, page 40 section 3.3.4.4.10.3 Multistep

At line 1035 add a new heading for step 1 and move the last two bullet points starting at line 1041 up.

Each step must contain:

- Step number in RXG-1 (values are 1...n)
- An OBX segment to indicate the type of the current step
 - OBX-3 = MDC_INFUS_ORDER_STEP_TYPE
 - enumerations are "loading dose" or "continuous"
 - "loading dose" is optional and supported in step 1 only
- An OBX segment to indicate the total number of steps in the program
 - OBX-3 = MDC_INFUS_TOTAL_NUM_STEPS
- Additional OBX segments containing the pump ID or patient parameters (e.g., height, weight, BSA) as required

Vol 2, page 41 section 3.3.4.4.10.3 Multistep

Add row for step start condition after total number of steps

Data	Term	Location within [PCD-01] or [PCD-10] message	Required
Current step number	MDC_INFUS_ORDER_STEP_NUM	INFUSATE_SOURCE_*	Yes
Total number of steps	MDC_INFUS_TOTAL_NUM_STEPS	INFUSATE_SOURCE_*	Yes

Update PCD-03 message definition and examples to clarify multistep programming

Current step volume to be infused	MDC_VOL_STEP_TBI	INFUSATE_SOURCE_*	
Current step volume delivered	MDC_VOL_STEP_DELIV	INFUSATE_SOURCE_*	Yes
Current step volume remaining	MDC_VOL_STEP_REMAIN	INFUSATE_SOURCE_*	
Total volume infused for all steps	MDC_VOL_FLUID_DELIV_TOTAL	INFUSATE_SOURCE_*	Yes
		* indicates the appropriate source	

Update PCD-03 message definition and examples to clarify multistep programming

Vol 2, starting at page 185 E.2 Examples of transaction [PCD-03]: Communicate Infusion Order

Add a new section E.2.4 Multistep Messages

Example 1 – Cyclic TPN

See the DEV TF vol 1, Section 4.4

Medication – TPN 1000 mL

Step 1 – 25 mL/hr x 1 hr

Step 2 – 50 mL/hr x 1 hr

Step 3 – 100 mL/hr x 6 hr

Step 4 – 50 mL/hr x 1 hr

Step 5 – 25 mL/hr x 1 hr

```
MSH|^~\&|IOPVENDOR^1234560000000001^EUI-64|IOPVENDOR|IOCVENDOR^65432100000
00001^EUI-64|IOCVENDOR|20080101123456-0600||RGV^O15^RGV_O15|1|P|2.8|||AL|A
L||ASCII|EN^English^ISO659||IHE_PCD_RGV_O15^IHE
PCD^1.3.6.1.4.1.19376.1.6.1.3.1^ISO

PID|||98765^^^IHE^PI||Doe^John^^^^L||19660101000000-0600|M

ORC|RE|12345|||||||||||||||||N0001

RXG|1|||1234^TPN^Rx|25||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM|||||||25|26
5624^mL/h^UCUM^MDC_DIM_MILLI_L_PER_HR^MDC||||||||||||||1000|263762^MDC_D
IM_MILLI_L^MDC^mL^mL^UCUM

RXR|^IV^HL70162||^IVP^HL70164|^IV^HL70165

TQ1|1||||||||||60^264352&MDC_DIM_MIN&MDC

OBX|1||69986^MDC_DEV_PUMP_INFUS_VMD^MDC|0.1.1.0||||||F||||||A0001^^65432
10000000001^EUI-64

OBX|2|NM|68063^MDC_ATTR_PT_WEIGHT^MDC|0.1.1.1|70.5|263875^MDC_DIM_KILO_G^M
DC||||F

OBX|3||158033^MDC_INFUS_TOTAL_NUM_STEPS^MDC|0.1.1.2|6||||||F

OBX|4||158037^MDC_INFUS_ORDER_STEP_TYPE|0.1.1.3||continuous

OBX|5||0^MDCX_INFUS_ORDER_STEP_START_CONDITION|0.1.1.4||immediate||||

RXG|2|||1234^TPN^Rx|55||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM|||||||50|26
5624^mL/h^UCUM^MDC_DIM_MILLI_L_PER_HR^MDC||||||||||||||1000|263762^MDC_D
IM_MILLI_L^MDC^mL^mL^UCUM

RXR|^IV^HL70162||^IVP^HL70164|^IV^HL70165

TQ1|1||||||||||60^264352&MDC_DIM_MIN&MDC

OBX|6||158037^MDC_INFUS_ORDER_STEP_TYPE|0.1.2.1||continuous||||

OBX|7||0^MDCX_INFUS_ORDER_STEP_START_CONDITION|0.1.2.2||immediate||||
```

Update PCD-03 message definition and examples to clarify multistep programming

```
RXG|3|||1234^TPN^Rx|100||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM|||||100|
265624^mL/h^UCUM^MDC_DIM_MILLI_L_PER_HR^MDC|||||1000|263762^MDC
_DIM_MILLI_L^MDC^mL^mL^UCUM
RXR|^IV^HL70162||^IVP^HL70164|^IV^HL70165
TQ1|1|||||360^264352&MDC_DIM_MIN&MDC
OBX|8||158037^MDC_INFUS_ORDER_STEP_TYPE|0.1.3.1||continuous|||
OBX|9||0^MDCX_INFUS_ORDER_STEP_START_CONDITION|0.1.3.1||immediate|||
RXG|4|||1234^TPN^Rx|50||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM|||||50|26
5624^mL/h^UCUM^MDC_DIM_MILLI_L_PER_HR^MDC|||||1000|263762^MDC_D
IM_MILLI_L^MDC^mL^mL^UCUM
RXR|^IV^HL70162||^IVP^HL70164|^IV^HL70165
TQ1|1|||||60^264352&MDC_DIM_MIN&MDC
OBX|10||158037^MDC_INFUS_ORDER_STEP_TYPE|0.1.4.1||continuous|||
OBX|11||0^MDCX_INFUS_ORDER_STEP_START_CONDITION|0.1.4.2||immediate|||
RXG|5|||1234^TPN^Rx|25||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM|||||25|26
5624^mL/h^UCUM^MDC_DIM_MILLI_L_PER_HR^MDC|||||1000|263762^MDC_D
IM_MILLI_L^MDC^mL^mL^UCUM
RXR|^IV^HL70162||^IVP^HL70164|^IV^HL70165
TQ1|1|||||60^264352&MDC_DIM_MIN&MDC
OBX|12||158037^MDC_INFUS_ORDER_STEP_TYPE|0.1.5.1||continuous|||
OBX|13||0^MDCX_INFUS_ORDER_STEP_START_CONDITION|0.1.5.2||immediate|||
```

Example 2 - Initial dose followed by continuous infusion

See the DEV TF vol 1, Section 4.4

Medication – Drug A 500 mg/500 mL

Step 1 – 50 mg over 30 min (100 mg/hr)

Step 2 – 10 mg/hr

Note: Step 1 in this example is sometimes referred to as a “bolus” or “loading dose”.

```
MSH|^~\&|IOPVENDOR^1234560000000001^EUI-64|IOPVENDOR|IOCVENDOR^65432100000
00001^EUI-64|IOCVENDOR|20080101123456-0600||RGV^O15^RGV_O15|1|P|2.8|||AL|A
L||ASCII|EN^English^ISO659||IHE_PCD_RGV_O15^IHE
PCD^1.3.6.1.4.1.19376.1.6.1.3.1^ISO
PID|||98765^^^IHE^PI||Doe^John^^^^L||19660101000000-0600|M
ORC|RE|12345|||||N0001
RXG|1|||4321^Milrinone 100
mcg/mL^Rx|50||263762^MDC_DIM_MILLI_L^MDC|||||50|263890^g^UCUM^MDC_DIM_M
ILLI_G^MDC|500|263890^g^UCUM^MDC_DIM_MILLI_G^MDC|||||500|263762^MDC_DIM_MI
LLI_L^MDC|||||250|263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM
```

Example 3 - Initial dose followed by a delay and then a second dose.

Step 2: Delay 30 min VTBI = 0 mL

```
MSH|^~\&|IOPVENDOR^123456000000000001^EUI-64|IOPVENDOR|IOCVDOR^65432100000  
00001^EUI-64|IOCVDOR|20080101123456-0600||RGV^O15^RGV_O15|1|P|2.8|||AL|A  
L||ASCII|EN^English^ISO659||IHE_PCD_RGV_O15^IHE  
PCD^1.3.6.1.4.1.19376.1.6.1.3.1^ISO  
PID|||98765^^^IHE^PI||Doe^John^^^^^L||19660101000000-0600|M  
ORC|RE|12345||||||||||||N0001  
RXG|1|||1234^Immune  
Globulin^Rx|150||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM||||||75|265624^mL  
/h^UCUM^MDC_DIM_MILLI_L_PER_HR^MDC|35|263890^g^UCUM^MDC_DIM_MILLI_G^MDC||  
||350|263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM||||||350|263762^MDC_DIM_MILL  
I_L^MDC^mL^mL^UCUM  
RXR|^IV^HL70162||^IVP^HL70164|^IV^HL70165  
OBX|1||69986^MDC_DEV_PUMP_INFUS_VMD^MDC|0.1.1.0||||F|||||A0001^^65432  
10000000001^EUI-64  
OBX|2|NM|68063^MDC_ATTR_PT_WEIGHT^MDC|0.1.1.1|70.5|263875^MDC_DIM_KILO_G^M  
DC||||F  
OBX|3||158033^MDC_INFUS_TOTAL_NUM_STEPS^MDC|0.1.1.2|3||||F  
OBX|4||158037^MDC_INFUS_ORDER_STEP_TYPE^MDC|0.1.1.3|continuous|||  
OBX|5||0^MDCX_INFUS_ORDER_STEP_START_CONDITION|0.1.1.4||immediate|||  
RXG|2|||1234^Immune  
Globulin^Rx|0||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM||||||0|265624^mL/h^
```

Update PCD-03 message definition and examples to clarify multistep programming

```
UCUM^MDC_DIM_MILLI_L_PER_HR^MDC|35|263890^g^UCUM^MDC_DIM_MILLI_G^MDC||||3
50|263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM||||||350|263762^MDC_DIM_MILLI_L
^MDC^mL^mL^UCUM
TQ1|1|||||||30^264352&MDC_DIM_MIN&MDC
RXR|^IV^HL70162|^IVP^HL70164|^IV^HL70165
OBX|56||158037^MDC_INFUS_ORDER_STEP_TYPE^MDC|0.1.2.1|delay|||
OBX|7||0^MDCX_INFUS_ORDER_STEP_START_CONDITION|0.1.2.2||immediate|||
RXG|3|||1234^Immune
Globulin^Rx|200||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM||||||100|265624^m
L/h^UCUM^MDC_DIM_MILLI_L_PER_HR^MDC|35|263890^g^UCUM^MDC_DIM_MILLI_G^MDC|
|||350|263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM||||||350|263762^MDC_DIM_MIL
LI_L^MDC^mL^mL^UCUM
RXR|^IV^HL70162|^IVP^HL70164|^IV^HL70165
OBX|68||158037^MDC_INFUS_ORDER_STEP_TYPE^MDC|0.1.3.1|continuous|||
OBX|9||0^MDCX_INFUS_ORDER_STEP_START_CONDITION|0.1.3.2||immediate|||
```