

Update PCD-03 message definition and examples to clarify PCA/Programmed Intermittent Bolus programming

# IHE Change Proposal

## Tracking information:

IHE Domain	Devices (DEV)
Change Proposal ID:	CP-DEV-022
Change Proposal Status:	Draft
Date of last update:	2026-03-04
Person assigned:	Kurt Elliason

## Change Proposal Summary information:

<b>Update PCD-03 message definition and examples to clarify PCA/Programmed Intermittent Bolus programming.</b>	
Submitter's Name(s) and e-mail address(es):	Kurt Elliason kurt.elliason@gmail.com
Submission Date:	2025-04-22
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
<p>Rationale for Change:</p> <p>Change Proposal to achieve PCA PIV messaging consistency by adopting a new RXG segment-based approach for different PCA modes, like loading, continuous, and PCA dose, to align with multi-step infusions, while also considering continued support for the existing OBX-based autoprogramming method. The motivation for the RXG approach, is to resolve the confusion of the current OBX method, which necessitates zero values in the RXG segment when only a PCA or clinician bolus is present, and to overcome the existing method's limitation in specifying both a rate and a dose amount. New terms like "PCA bolus" and "intermittent bolus" will need to be added to order type enumerations for the proposed RXG approach.</p>	

### **Vol 2, page 26 RXG-15 Give Rate Amount**

Update line 639 to: Required for LVP and Syringe; Optional for PCA. If present for PCA, contains the basal or continuous rate value.

### **Vol 2, page 35 OBX-3 Observation Identifier**

Starting at line 883, create a table for pump programming parameters with MDC terms and descriptions. Group terms so related terms for PCA, Clinician Dose, Loading Dose, Intermittent Dose and multi step are listed together for easier reference. Add the following new terms and descriptions as shown below.

```

MDC_NUM_DOSE_PROG
MDC_DOSE_LOADING
MDC_INFUS_ORDER_STEP_TYPE
MDC_TIME_PD_DOSE_START_INTERVAL

MDCX_TIME_PD_DOSE_PCA
    
```

Update PCD-03 message definition and examples to clarify PCA/Programmed Intermittent Bolus programming

MDCX\_TIME\_PD\_DOSE\_LOADING  
MDCX\_TIME\_PD\_DOSE\_CLINICIAN  
MDCX\_TIME\_PD\_CLINICIAN\_DOSE\_LOCKOUT\_INTERVAL  
MDCX\_RATE\_DOSE\_INTERMITTENT  
MDCX\_TIME\_PD\_DOSE\_INTERMITTENT

Pump programming parameter

<b>Code</b>	<b>Text</b>	<b>Example</b>
<b>90xx</b>		

**Vol 2, page 146 ORC-1 Order Control**

Update description of XO to include PCA parameters and be valid for PCA

ORC-1 Value	Use
RE	Start of a new bag, bottle, or container
XO	Change of dose or rate on a currently programmed infusion. (not valid for PCA)
CH	Program a bolus from an existing infusion

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

Add a new section:

**E.2.5 PCA/Intermittent Bolus Messages**

When sending an order that contains multiple delivery mode to an infusion pump, multiple RXG segments can be used for the different delivery modes.

Each RXG segment contains an OBX with a unique *MDC\_INFUS\_ORDER\_TYPE* identifying the delivery mode.

- continuous
- pca-dose
- loading-dose
- clinician-dose
- intermittent-dose

The first RXG segment must contain the pump identifier in the VMD (MDC\_DEV\_PUMP\_INFUS\_VMD) and the patient specific details such as weight, height, BSA etc.

A PCA dose segment will also include an OBX for MDC\_TIME\_PCA\_LOCKOUT  
It may also include OBX's for MDC\_TIME\_PD\_PCA\_DOSE\_LIMIT and MDC\_DOSE\_PCA\_LIMIT if there is a time based delivery limit or MDC\_RATE\_PCA\_MAX\_PATIENT\_DOSES\_PER\_HOUR if there is a limit on the number of PCA doses allowed.

## Update PCD-03 message definition and examples to clarify PCA/Programmed Intermittent Bolus programming

An intermittent dose segment must contain OBX's for MDC\_TIME\_PD\_DOSE\_START\_INTERVAL and MDC\_TIME\_PROG\_NEXT\_DOSE.

### Example 1

Order #12345 for Patient ID 98765 (John Doe), premixed Ropivacaine 2%, to be infused using multiple delivery modes, Pump ID A0001, administered by nurse N0001.

1. Loading dose (initial bolus)
2. Patient dose (PCA dose, patient bolus)
3. Lockout interval (lockout time)
4. Dose limit (PCA doses per hour)
5. Zero Continuous rate (basal rate)

```
MSH|^~\&|IOPVENDOR^1234560000000001^EUI-64|IOPVENDOR|IOCVENTOR^654321000000000
1^EUI-64|IOCVENTOR|200801011234560600||RGV^O15^RGV_O15|1|P|2.8|||AL|AL||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^ROPivacaine
0.2%^Rx|5||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM|||175|265266^MDC_DIM_MIL
LI_L_PER_HR^MDC^mL/hr^mL/hr^UCUM|||
|||||100|263762^MDC_DIM_MILLI_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^^654321000
000001^EUI-64
OBX|2|NM|68063^MDC_ATTR_PT_WEIGHT^MDC|0.1.1.1|81.6|263875^MDC_DIM_KILO_G^MDC||
||F
OBX|3|NM|68060^MDC_ATTR_PT_HEIGHT^MDC|0.1.1.2|200|263441^MDC_DIM_CENTI_M^MDC||
||F
OBX|4|NM|188744^MDC_AREA_BODY_SURF_ACTUAL^MDC|0.1.1.3|2.13|263616^MDC_DIM SQ_X_
M^MDC|||F
OBX|5|ST|158038^MDC_INFUS_ORDER_TYPE^MDC|0.1.1.4|loading-dose

RXG|2||1234^ROPivacaine 0.2%^Rx|||
|||||100|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|6|ST|158038^MDC_INFUS_ORDER_TYPE^MDC|0.1.2.1|continuous

RXG|3||1234^ROPivacaine
0.2%^Rx|5||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM|||175|265266^MDC_DIM_MIL
LI_L_PER_HR^MDC^mL/hr^mL/hr^UCUM|||
|||||100|263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM
RXR|^IV^HL70162||^IVP^HL70164|^IV^HL70165
OBX|7|ST|158038^MDC_INFUS_ORDER_TYPE^MDC|0.1.3.1|pca-dose
OBX|8|NM|157989^MDC_TIME_PCA_LOCKOUT^MDC|0.1.3.4|30|264352^MDC_DIM_MIN^MDC|||
F
OBX|9|NM|157988^MDC_RATE_PCA_MAX_PATIENT_DOSES_PER_HOUR^MDC|0.1.3.5|2|264704^MD
C_DIM_PER_HR^MDC|||F
```

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### Example 2

Order #12345 for Patient ID 98765 (John Doe), premixed Ropivacaine 2%, to be infused using multiple delivery modes, Pump ID A0001, administered by nurse N0001.

1. Clinician dose (predefined clinician bolus)
2. Patient dose (PCA dose, patient bolus)
  - 2a. Lockout interval (lockout time)
  - 2b. Dose limit (Delivery limit per x hours)
3. Continuous rate (basal rate)
4. Programmed Intermittent Bolus

```
MSH|^~\&|IOPVENDOR^1234560000000001^EUI-64|IOPVENDOR|IOCVENDOR^6543210000000000
1^EUI-64|IOCVENDOR|200801011234560600||RGV^O15^RGV_O15|1|P|2.8|||AL|AL||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^ROPivacaine
0.2%^Rx|5||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM||175|265266^MDC_DIM_MIL
LI_L_PER_HR^MDC^mL/hr^mL/hr^UCUM||
||||100|263762^MDC_DIM_MILLI_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^^654321000
000001^EUI-64
OBX|2|NM|68063^MDC_ATTR_PT_WEIGHT^MDC|0.1.1.1|81.6|263875^MDC_DIM_KILO_G^MDC|
|F
OBX|3|NM|68060^MDC_ATTR_PT_HEIGHT^MDC|0.1.1.2|200|263441^MDC_DIM_CENTI_M^MDC|
|F
OBX|4|NM|188744^MDC_AREA_BODY_SURF_ACTUAL^MDC|0.1.1.3|2.13|263616^MDC_DIM_SQ_X_
M^MDC|F
OBX|5|ST|158038^MDC_INFUS_ORDER_TYPE^MDC|0.1.1.4|clinician-dose

RXG|2||1234^ROPivacaine 0.2%^Rx||
||||100|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|6|ST|158038^MDC_INFUS_ORDER_TYPE^MDC|0.1.2.1|continuous

RXG|3||1234^ROPivacaine
0.2%^Rx|5||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM||175|265266^MDC_DIM_MIL
LI_L_PER_HR^MDC^mL/hr^mL/hr^UCUM||
||||100|263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM
RXR|^IV^HL70162|^IVP^HL70164|^IV^HL70165
OBX|7|ST|158038^MDC_INFUS_ORDER_TYPE^MDC|0.1.3.1|pca-dose
OBX|8|NM|157989^MDC_TIME_PCA_LOCKOUT^MDC|0.1.3.4|30|264352^MDC_DIM_MIN^MDC|
F
OBX|9|NM|157987^MDC_TIME_PD_PCA_DOSE_LIMIT^MDC|0.1.3.2|1|264384^MDC_DIM_HR^MDC|
|F
OBX|10|NM|157985^MDC_DOSE_PCA_LIMIT^MDC|0.1.3.3|14|263762^MDC_DIM_MILLI_L^MDC|
|F|
```

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```
RXG|4|||1234^ROpivacaine
0.2%^Rx|4||263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM|||||175|265266^MDC_DIM_MIL
LI_L_PER_HR^MDC^mL/hr^mL/hr^UCUM|||||
|||||100|263762^MDC_DIM_MILLI_L^MDC^mL^mL^UCUM
RXR|^IV^HL70162|^IVP^HL70164|^IV^HL70165
OBX|12|ST|158038^MDC_INFUS_ORDER_TYPE^MDC|0.1.4.1|intermittent-dose
OBX|13|NM|157998^MDC_TIME_PD_DOSE_START_INTERVAL^MDC|0.1.4.4|60|264352^MDC_DIM_
MIN^MDC||||F
OBX|14|NM|158025^MDC_TIME_PROG_NEXT_DOSE^MDC|0.1.4.3|10|264352^MDC_DIM_MIN^MDC|
||||F
```