ACC, HIMSS and RSNA

Integrating the Healthcare Enterprise

IHE Cardiology Technical Framework Supplement 2007-2008

Implantable Device Cardiac Observation Profile (IDCO)

Published for Trial Implementation

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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 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 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 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 American College of Cardiology (ACC), the Healthcare Information and Management Systems Society (HIMSS) and the Radiological Society of North 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 (GMSIH), Société Francaise 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 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 Frameworks may be found at www.ihe.net/Technical_Framework.

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 to the IHE Cardiology Technical Framework v2 is submitted for Trial Implementation through March 2007.

Comments arising from Trial Implementation should be submitted to:

http://forums.rsna.org

Under the "*IHE*" forum, select the "*IHE Cardiology Technical Framework Supplements 2006*" sub-forum.

The IHE Cardiology Technical Committee will address these comments and expects to publish the Final Text version in June 2007.

2 Introduction

This Supplement adds a new profile to the IHE Cardiology Technical Framework describing a means to transfer information from an interrogated implantable cardiac device to information management systems.

Cardiac electrophysiologists follow patients with implantable cardiac devices from multiple vendors. These devices are categorized as pacemakers, implantable cardioverter defibrillators, and cardiac resynchronization therapy devices. As part of patient follow-up an interrogation of a cardiac device is performed (either in-clinic or remotely from a patient's residence). Information is collected about the device such as device identification, therapy settings, device diagnostics, and device testing. These interrogations are performed by vendor proprietary equipment.

To improve workflow efficiencies Cardiology and Electro Physiology practices require the management of "key" summary implantable rhythm control device interrogation information in a central system such as an EHR or a device clinic management system.

To address this requirement, the Implantable Device Cardiac Observation (IDCO) Profile defines a standard based translation and transfer of summary device interrogation information from the interrogation system to the information management system.

2.1 Choice of Standards

The content of Implantable Device Cardiac Observation information will be represented in a standard HL7 v2.5 ORU message. Discrete data elements for an observation will be encoded using IEEE 11073 MDC_IDC nomenclature currently under development.

HL7 v3 message development is progressing for implantable cardiac devices under the Therapeutic Devices Domain. Because HL7 v3 is not broadly implemented, and is unlikely to be broadly implemented for 3 to 5 years, a HL7 v2 message structure was selected.

2.2 Open Issues and Questions

1. Get broader input concerning v2 message structure from device vendors and hopefully EMR vendors.

2.3 Closed Issues

1. Scheduling is not within scope of this profile for year 1.
2. How do we integrate the IDCO actors into the EP Workflow? This is a future issue.
3. IEEE 1073.1.1.3 ICD Terms is currently being prepared for ballot. Final specifications are not currently available for inclusion in the profile but will be referenced from the IHE site. Specifications going to ballot should be available for reference by early July.
4. This profile mandates the use of PIX for cross-referencing device identifiers to patients. Should PDQ also be referenced as another option for resolving patient IDs or should the methods of resolution be open to implementations (i.e. not specify PIX or PDQ)? No. PDQ is not appropriate for this profile. PDQ would require a query for every message received.
5. This profile mandates the use of PAM to update patient demographics in the observations stored in the Observation Repository. Is this necessary and appropriate for this profile? Yes.
6. This profile does not require the use of ATNA. There are several implementation models for this profile that do not require transmission of data over public networks including intra-institutional, VPN, etc. However, when public networks are used, ATNA is one option for secure transport over those networks. Should ATNA be required? ATNA should be required for remote follow-ups. Referencing ATNA makes defining security for the profile easy.
7. This profile specifies an HL7 Message Router actor to distribute observations to multiple recipients in an institution. Is the HL7 Message Router actor needed? What value does the HL7 Message Router actor add to the integration profile? Should the HL7 Message Router provide the PIX consumer actor to match incoming observations with local patient identifiers? The HL7 Message Router provides an approach for getting the integration

engine vendors directly involved in the IHE process. The HL7 Message Router will continue to be used. The HL7 Message Router will be grouped with PIX consumer as to provide patient identification reconciliation. With this grouping the HL7 Message Router provides a service beyond pass-through routing.

8. Patient Identity Feeds are assumed to be part of the patient / device registration process, which will be required before an Observation Repository / Processor can receive CARD-12 transactions. This profile does not specify the Patient Identity Feed transaction. If PIX is used, should the PIX Identity Source actor be specified for registration of the device with the patient? Should it be grouped with the Observation Creator / Processor / Repository? No. The Observation Creator is not positioned to participate in PIX at this time. This is a possibility for future versions of the profile.

Changes to Volume I – Integration Profiles

Add to Section 1.7

- The IDCO profile specifies a mechanism for the creation, transmission, and processing of discrete data elements and report attachments associated with cardiac device interrogations (observations).

Add to Section 2.1

Table 2-1 Integration Profile Dependencies

Integration Profile	Depends On	Dependency Type	Comments
IDCO	ITI-TF PIX Profile	The HL7 Message Router, Observation Processor, and Observation Repository are required to be grouped with the Patient Identifier Cross-Reference Consumer actor.	
	ITI-TF PAM Profile	The Observation Repository is required to be grouped with the Patient Demographic Consumer Actor.	

Add to Section 2.2

2.2.x Implantable Device Cardiac Observation Profile

The Implantable Device Cardiac Observation Integration Profile defines a mechanism for the creation, transmission, and processing of discrete data elements and report attachments associated with cardiac device interrogations (observations). It supports the uses cases for in-clinic and remote implanted cardiac device follow-ups.

Add to Section 2.3

Observation Creator - A system that creates and transmits diagnostic or therapeutic observational data.

Observation Processor - A system that receives clinical observations and further processes them for inclusion within derivative products, such as clinical reports, databases, or transcoded/reformatted results.

Observation Repository - A system that receives clinical observations and stores them for subsequent retrieval and display. The Observation Repository updates stored data with updated demographics through out the lifecycle of the data.

HL7 Message Router – A system that receives HL7 messages, routes them to one or more configured actors, and handles transport level acknowledgements. The HL7 Message Router may also provide modification of the messages in accordance with specific profiles.

Integration Profile / Actor	CATH	ECHO	ECG	ED	IDCO
Acquisition Modality	X	X		X	
ADT Patient Registration	X	X			
Department System Scheduler/Order Filler	X	X			
Evidence Creator	X	X		X	
Image Archive	X	X		X	
Image Display	X	X		X	
Image Manager	X	X		X	
Order Placer	X	X			
Performed Procedure Step Manager	X	X			
Report Creator				X	
Time Client	(note 1)				
Display			X		
Information Source			X		
Observation Creator					**X**
Observation Repository					**X**
Observation Processor					**X**
HL7 Message Router					**X**

Add to Section 2.4

Send Observations – Observations, measurements, or reports, are sent using an HL7 Observations message. [CARD-12]

Integration Profile / Transaction	CATH	ECHO	ECG	ED	IDCO
Patient Registration [RAD-1]	X	X			
Placer Order Management [RAD-2]	X	X			

Transaction \ Integration Profile	CATH	ECHO	ECG	ED	IDCO
Filler Order Management [RAD-3]	X	X			
Procedure Scheduled [RAD-4]	X	X			
Query Modality Worklist [RAD-5]	X	X			
Modality Procedure Step In Progress [CARD-1]	X	X			
Modality Procedure Step Completed [RAD-7]	X	X			
Modality Images/Evidence Stored [CARD-2]	X	X		X	
Storage Commitment [CARD-3]	X	X		X	
Patient Update [RAD-12]	X	X			
Procedure Update [RAD-13]	X	X			
Query Images [RAD-14]	X	X			
Query Evidence Documents [RAD-44]				X	
Retrieve Images/Evidence [CARD-4]	X	X			
Instance Availability Notification [RAD-49]	X	X			
Maintain Time [ITI-1]	(note 1)				
Retrieve Specific Info for Display [ITI-11]			X		
Retrieve ECG List [CARD-5]			X		
Retrieve ECG Document for Display [CARD-6]			X		
Send Observations [CARD-12]					**X**
Patient Identity Query [ITI-9]					**(note 2)**
Patient Identity Feed [ITI-30]					**(note 2)**

Notes: 1. The Maintain Time transaction is not formally part of the Cath Workflow Profile, but it is required for the Time Client actor grouped with certain actors in that Profile.

2. The Patient Identity Query and Patient Identity Feed transactions are not formally part of the Implantable Device Cardiac Observations Profile, but are required for the PIX Consumer and Patient Demographics Consumer actors grouped with certain actors in that Profile.

Add to Section 2.5

- The HL7 Message Router actor participating in the IDCO Profile shall be grouped with the Patient Identity Cross-Reference Consumer actor of the PIX Profile (ITI-TF).
- The Observation Processor actor participating in the IDCO Profile shall be grouped with the Patient Identity Cross-Reference Consumer actor of the PIX Profile (ITI-TF) when the PIX-based Reconciliation Option is supported.
- The Observation Repository actor participating in the IDCO Profile shall be grouped with the Patient Identity Cross-Reference Consumer actor of the PIX Profile (ITI-TF), and with the Patient Demographics Consumer actor of the PAM Profile (ITI-TF).

Add the following new profile section

9 Implantable Device Cardiac Observation Profile (IDCO)

Cardiac electrophysiologists follow patients with implantable cardiac devices from multiple vendors. These devices are categorized as pacemakers, implantable cardioverter defibrillators, and cardiac resynchronization therapy devices. As part of patient follow-up an interrogation of a cardiac device is performed (either in-clinic or remotely from a patient's residence). Information is collected about the device such as device identification, therapy settings, device diagnostics, and device testing. These interrogations are performed by vendor proprietary equipment.

To improve workflow efficiencies Cardiology and Electro Physiology practices require the management of "key" summary implantable rhythm control device interrogation information in a central system such as an EHR or a device clinic management system.

To address this requirement, the Implantable Device Cardiac Observation (IDCO) Profile defines a standard based translation and transfer of summary device interrogation information from the interrogation system to the information management system.

The IDCO profile specifies a mechanism for the creation, transmission, processing, and storage of discrete data elements and report attachments associated with cardiac device interrogations (observations).

9.1 Actors/ Transactions

Figures 9.1-1 and 9.1-2 show the actors and transactions directly involved in the IDCO Integration Profile with bold and with solid lines. Grouped actors are shown italicized and with dotted lines. Other actors and transactions that may be indirectly involved because of their participation in associated IHE Integration Profiles are not shown.

Note: See Appendix I for examples of grouping IDCO actors with actors of other Profiles.

Figure 9.1-1 shows a full configuration where the Observation Creator sends a CARD-12 transaction via an HL7 Message Router to an Observation Processor or Observation Repository. Figure 9.1-2 shows an alternate configuration where the Observation Creator sends the CARD-12 transaction directly to the Observation Processor and Observation Repository actors.

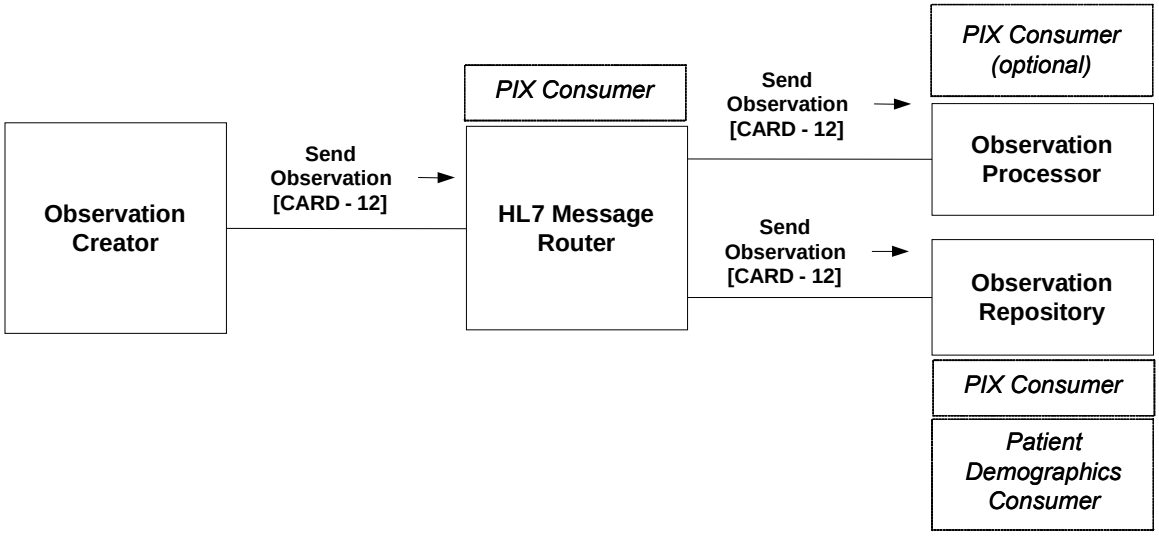


Figure 9.1-1. IDCO Actor Diagram

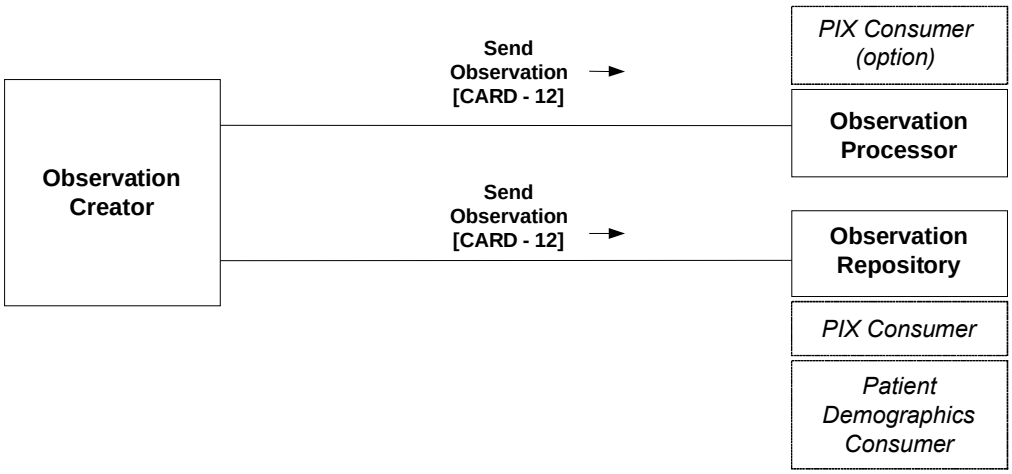


Figure 9.1-2. IDCO Actor Diagram (Alternate Configuration)

See section 9.5 Patient Identification for details concerning the grouped PIX Consumer and Patient Demographics Consumer actors.

Table 9.1-1 lists the transactions for each actor directly involved in the IDCO Profile. In order to claim support of this Integration Profile, an implementation must perform the required transactions (labeled "R"). Transactions labeled "O" are optional. A complete list of options defined by this Integration Profile that implementations may choose to support are listed in the appropriate actor profile; as specified in the Section column in the table defined below.

Table 9.1-1. Implantable Device Cardiac Observation Integration Profile - Actors and Transactions

Actors	Transactions	Optionality	Section in Vol. 2
Observation Creator	Send Observations [CARD-12]	R	CARD-TF 2: 4.12
HL7 Message Router	Send Observations [CARD-12]	R	CARD-TF 2: 4.12
Observation Repository	Send Observations [CARD-12]	R	CARD-TF 2: 4.12
Observation Processor	Send Observations [CARD-12]	R	CARD-TF 2: 4.12

9.2 IDCO Integration Profile Options

Many Actors have Options defined in order to accommodate variations in use across domains or implementations. Options that may be selected for this Integration Profile are listed in the table 9.2-1 along with the Actors to which they apply.

Table 9.2-1: IDCO - Actors and Options

Actor	Option Name	Vol & Section
Observation Creator	*None*	
Observation Repository	*None*	
Observation Processor	PIX-based Reconciliation	CARD-TF 2: 4.12.5.2.7
HL7 Message Router	*None*	

9.2.1 PIX-based Reconciliation Option

The Observation Processor is required to reconcile the Patient ID from the Observation Creator with the Patient ID used in the local domain (see Section 9.5). Observation Processor claiming this PIX-based Reconciliation Option shall be grouped with the Patient Identifier Cross-Reference Consumer actor of the IHE Patient Identifier Cross-Referencing Profile (PIX) to perform the ID mapping.

9.3 IDCO Use Cases

9.3.1 Use Case I1: Implantable Cardiac Device In-Clinic Followup

Note: This use case is identical to HL7 v3 Implantable Cardiac Device Follow-Up Storyboard (POTD_ST000001).

Clinical Context:

Adam Everyman presents at the electrophysiology (EP) follow-up clinic for his appointment. Adam will present for follow-up 7-10 days after implant and every 3-6 months thereafter, depending on the therapy protocol.

Dr. Ed Electrode, an Electrophysiologist - also referred to as a following physician, and Nancy Nightingale, an R.N., work in the electrophysiology (EP) follow-up clinic.

Note: In the area of Electrophysiology, a "programmer" is a commonly used term to describe a specialized computer that is capable of communicating with an implanted device. Programmers are used to interrogate implanted devices and "program", or make changes to, implanted cardiac device settings.

Nancy interrogates the device using the programmer and extracts the data (e.g., settings, status, events) from the device. Nancy reviews the device data and captures the "current state" device data from the programmer screen and/or prints out the settings and/or uses an information transfer mechanism (e.g., floppy disk, analog cable, etc.) to transmit device data, which is in a proprietary format, to a translator system.

If the device data has been sent to the translator system, the clinician may desire to transmit data to an electronic health record system (EHR) or device clinic management system. In this case, a necessary subset (pre-determined by the clinic and the entity responsible for the translator system) of the data that represents the device's 'summary data' is converted from the proprietary format and transmitted using HL7 messaging to the EP office EHR or device clinic management system.

These summary reports are sent as unsolicited observation events.

For example a device summary could contain the following items:

Device Diagnostics

Events Counters

Device Observations

Programmed Therapy Settings

Clinician Comments

Note: Electrocardiograms are not currently addressed in the HL7 standards. They can be sent as a PDF attachment to the HL7 message.

IHE Context:

In the use case the translator system equates to the Observation Creator actor and the EHR or device clinic management system equates to the HL7 Message Router / Observation Processor / Observation Repository actors. The HL7 formatted implanted cardiac device interrogation message is the CARD-12 transaction.

9.3.2 Use Case I2: Implantable Cardiac Device In-Clinic Followup with Networked Programmer that Translates Information

Clinical Context:

Same as in-clinic use case above with the following change. The programmer communicates directly with an electronic health record system (EHR) or device clinic management system, acting as a translator system.

IHE Context:

Same as in-clinic use case above with the following change. The programmer assumes the role the actor Observation Creator.

9.3.3 Use Case I3: Implantable Cardiac Device Remote Followup

Clinical Context:

Portions of the previous use case also apply to Adam Everyman having his device followed remotely. Adam will present to an interrogation device located outside of the clinic (e.g., in Adam's residence) which will capture the state of his implanted device and will transmit the information to a translator system. The translator system converts the data into an HL7 message and communicates the 'summary data' to the clinic's EHR.

IHE Context:

Same as in-clinic use case above. The Observation Creator, Processor, and Repository actors should be grouped with the Secure Node actor of the ATNA Profile to secure communications for remote follow-ups if data is sent across an un-trusted network.

9.3.4 Use Case I4: Third Party Value-Added Services

Clinical Context:

The translator system described in use cases I1 and I2 may be implemented as a service of a third party, e.g., the device manufacturer or a monitoring service. This system may provide various types of value-added services, such as data aggregation and analysis, trending, and statistical reports. Such additional data may be appended to the standard device observation 'summary data' message sent to the recipient system.

IHE Context:

Same as in-clinic use case above. The additional data aggregation or rendering can be sent as a PDF attachment to the HL7 message.

These types of value-added services are likely to be provided by a party that will send the results over the Internet. In this case, use of the ATNA profile on the link between the Observation Creator and the HL7 Message Router is recommended.

9.3.5 Use Case I5: Remote Monitoring of Implanted Cardiac Devices

Clinical Context:

The translator system described in use cases I1 and I2 may be implemented as a service of a third party, e.g., the device manufacturer or a monitoring service. This system may collect data

provided on a daily basis to enable early detection of trends and problems, or provide other event information. Depending on user selectable settings in the translator system, detailed information, the current status of the patient and reports may be sent to the recipient system.

IHE Context:

The same as the Remote Follow-up use case above. The additional data aggregation or rendering can be sent as a PDF attachment to the HL7 message.

These types of value-added services are likely to be provided by a party that will send the results over the Internet. In this case, use of the ATNA profile on the link between the Observation Creator and the HL7 Message Router is recommended.

9.4 IDCO Process Flow

The IDCO Profile defines a transaction to support the exchange of unsolicited observations created during an Implantable Device Cardiac Observation. The two basic process flows for the IDCO profile is shown in Figures 9.4-1 and 9.4-2, and are described below.

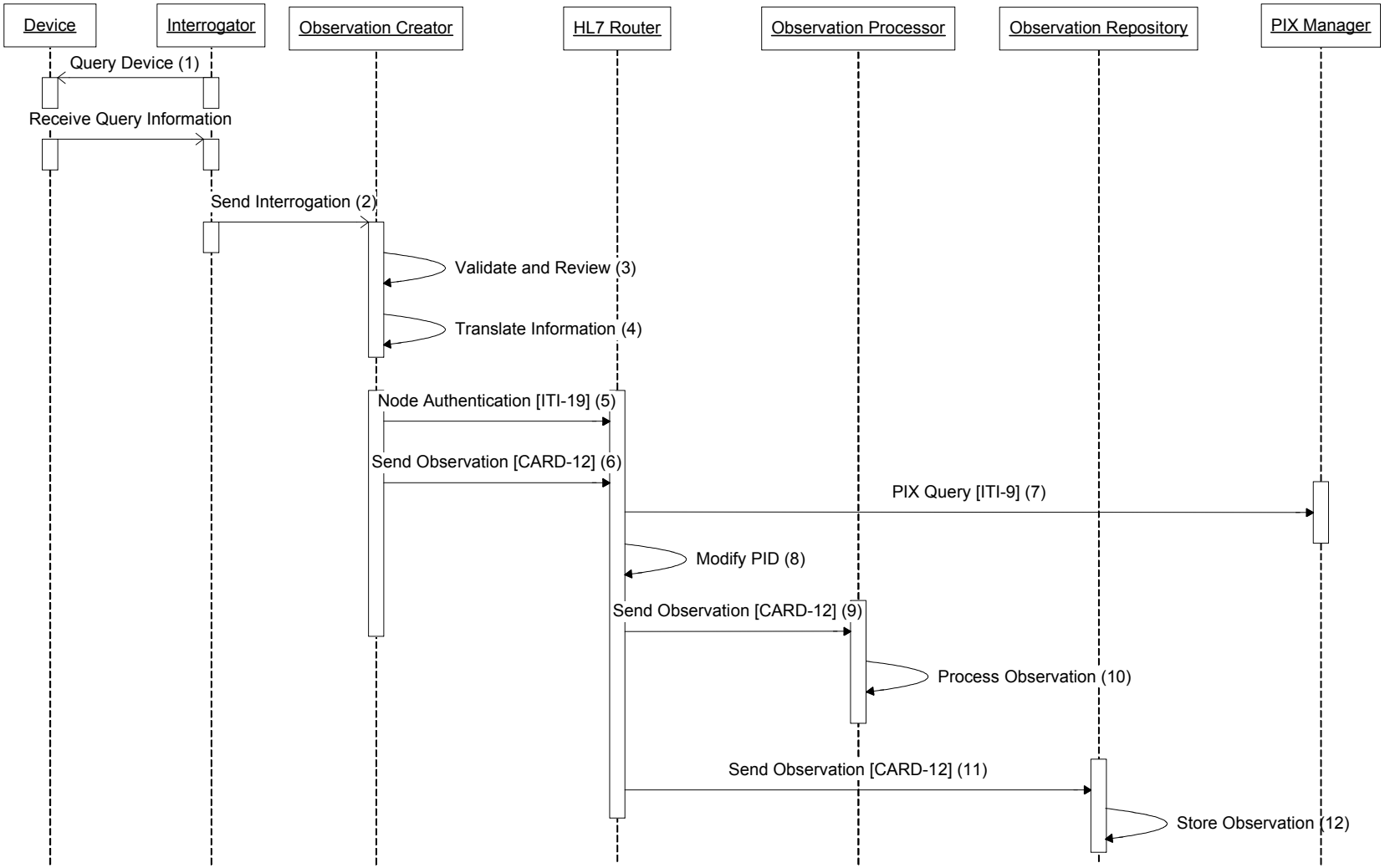


Figure 9.4-1. Basic Process Flow in IDCO Profile with HL7 Message Router and Secured Connection

Note: Device and Interrogator actors and associated transactions are outside the scope of this profile.

Process Flow Steps for Figure 9.4-1

1) Query Device - The implanted cardiac Device is interrogated in a manufacturer-proprietary manner by the Interrogator
2) Send Interrogation – The Interrogator sends information in a manufacturer-proprietary manner to the Observation Creator.
3) Validate and Review – The Observation Creator validates the information. This may include the clinician reviewing and approving the information.
4) Translate Information – The Observation Creator translates the information into the proper HL7 format.
5) Node Authentication – Security is required for transactions that traverse un-trusted networks. The ATNA Secure Node actor should be grouped with the Observation Creator and HL7 Message Router actors in these situations. The Observation Creator is authenticated by the HL7 Message Router using the ATNA Node Authentication [ITI-9] transaction. A secured network connection must be established between the secured nodes as defined by the ATNA Encryption Option.
6) Send Observation – The Observation Creator sends the device information to the HL7 Message Router using the CARD-12 transaction.
7) PIX Query – The HL7 Message Router matches the Patient ID provided by the Observation Creator to the internal Patient ID within the clinic domain using the PIX Query ITI-9 transaction.

   Note that the patient identifier used in the HL7 observation message is not the ID used by the receiving system. The interrogation system will have no knowledge of patient ID other than the serial number of the device; since the device is implanted into only one patient, it can serve as a type of patient ID. In this case, the "assigning authority" for the ID is the device manufacturer. The ID will be a combination of the manufacturer, model number, and serial number of the device. See section 9.5 for details concerning Patient ID reconciliation.
8) Modify PID – The HL7 Message Router modifies the PID segment of the CARD-12 transaction supplying the appropriate Patient ID.
9) Send Transaction – The HL7 Message Router sends the device information to the Observation Processor using the CARD-12 transaction.
10) Process Observation – The Observation Processor further processes the observation message for inclusion within derivative products, such as clinical reports, databases, or trans-coded / reformatted results.

11) Send Transaction – The HL7 Message Router sends the device information to the Observation Repository using the CARD-12 transaction.

12) Store Observation – The Observation Repository provides long-term storage of the observation, and makes it available through mechanisms beyond the scope of this profile.

    The Observation Repository must manage patient demographic updates for the life of the data. It uses the PAM Profile to interact with the Patient Demographics Source to perform this function (actors not shown on model).

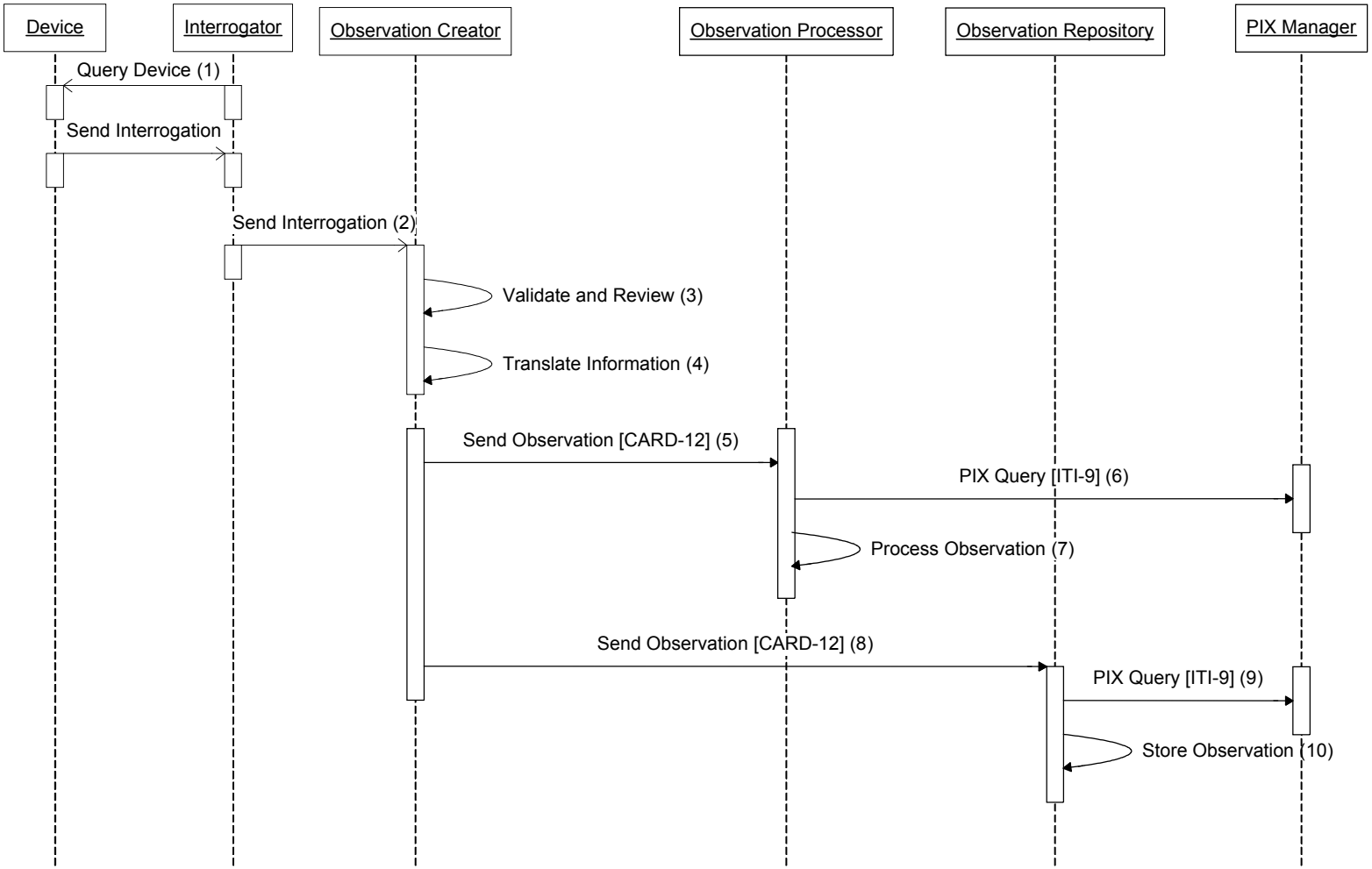


Figure 9.4-2. Basic Process Flow in IDCO Profile with No HL7 Message Router

Process Flow Steps for Figure 9.4-2

1) Query Device - The implanted cardiac Device is interrogated in a manufacturer-proprietary manner by the Interrogator
2) Send Interrogation – The Interrogator sends information in a manufacturer-proprietary manner to the Observation Creator.
3) Validate and Review – The Observation Creator validates the information. This may include the clinician reviewing and approving the information.
4) Translate Information – The Observation Creator translates the information into the proper HL7 format.
5) Send Observation – The Observation Creator sends the device information to the Observation Processor using the CARD-12 transaction.
6) PIX Query – The Observation Processor matches the Patient ID provided by the Observation Creator to the internal Patient ID within the clinic domain. It may do this using an implementation-specific ID mapping mechanism, or if it claims the PIX-based Reconciliation Option it will use the PIX Query ITI-9 transaction.
7) Process Observation – The Observation Processor further processes the observation message for inclusion within derivative products, such as clinical reports, databases, or trans-coded / reformatted results.
8) Send Transaction – The Observation Creator sends the device information to the Observation Repository using the CARD-12 transaction.
9) PIX Query – The Observation Repository matches the Patient ID provided by the Observation Creator to the internal Patient ID within the clinic domain using the PIX Query ITI-9 transaction.
10) Store Observation – The Observation Repository provides long-term storage of the observation, and makes it available through mechanisms beyond the scope of this profile.

    The Observation Repository must manage patient demographic updates for the life of the data. It uses the PAM Profile to interact with the Patient Demographics Source to perform this function (actors not shown on model).

9.5 Patient Identification

This profile specifies two actors, the Observation Repository and the Observation Processor, that are the endpoints for observation messages. These actors must cross-reference patient identifiers across the two Patient Identifier Domains: the device vendor systems providing the observations and the clinics receiving the observations.

IHE specifies the Patient Identifier Cross-Referencing Profile (PIX) as the mechanism to obtain such cross-references from a central server (the PIX Manager). The IDCO profile uses the PIX Query (ITI-9) transaction for its actors to obtain cross-referencing information. The PIX Consumer actor is grouped with the HL7 Message Router, the Observation Repository, and optionally the Observation Processor. The PIX Manager actor is not specified within this profile but is assumed to exist.

The Observation Processor may use an implementation-specific ID mapping mechanism, rather than the PIX transaction. However, the HL7 Message Router and the Observation Repository must use the PIX mechanism.

It is assumed that a Patient Identity Feed (ITI-8) transaction, or the equivalent, will occur to register the cross-referencing of the device identity with the identity of the patient having the device. The identity feed can be manual or automatic per existing patient registration policies and procedures. Configuration of the PIX Manager for matching the device identifier with the patient record is considered out-of-scope for this profile.

The PIX Consumer actor will pass to the PIX Manager the patient identifier as specified in the Send Observation (CARD-12) specification. The identifier is the concatenation of the device model number and device serial number. The identifier assigning authority is the device manufacturer. The PIX Manager returns the local patient identifier.

An alternate configuration has the HL7 Message Router actor grouped with the PIX Consumer actor. In this case the HL7 Message Router will be responsible for obtaining patient identification cross-referencing information and modifying the CARD-12 transaction appropriately. In this configuration, the Observation Repository and Observation Processor will recognize that the assigning authority for the Patient ID in the received observation matches the local domain, and will therefore not need to perform reconciliation.

The PAM Patient Demographics Consumer actor is grouped with the Observation Repository to provide support for the Patient Identity Feed (ITI-30) transaction to keep the patient demographics data up to date.

Refer to the PIX and PAM profiles within the IHE IT Infrastructure Technical Framework for more information.

Add to Appendix D Glossary

Implantable Device Cardiac (IDC): Implantable medical devices that treat heart rhythm problems. These devices are categorized as pacemakers, implantable cardioverter defibrillators, cardiac resynchronization therapy devices, and implantable monitors.

Add new Sections to Appendix H

H.5 Patient Identifier Cross-referencing Integration Profile (PIX)

The full specification of the Patient Identifier Cross-referencing Integration Profile (PIX) Integration Profile is found in **ITI-TF 1:5**.

The ***Patient Identifier Cross-referencing Integration Profile (PIX)*** is targeted at healthcare enterprises of a broad range of sizes (hospital, a clinic, a physician office, etc.). It supports the cross-referencing of patient identifiers from multiple Patient Identifier Domains via the following interactions:

- The transmission of patient identity information from an identity source to the Patient Identifier Cross-reference Manager.
- The ability to access the list(s) of cross-referenced patient identifiers either via a query/ response or via update notification.

Figure H.5-1 shows the actors and involved in this Profile and the transactions between actors.

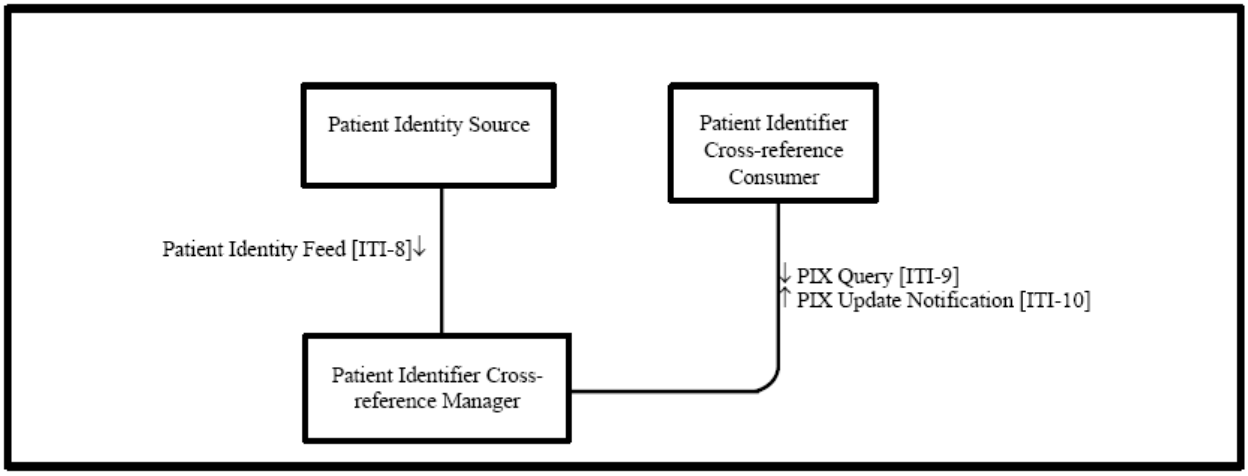


Figure H.5-1 PIX Actors and Transactions

H.5.1 Cardiology Use Case

Cardiology patients are typically seen and treated in a variety of institutional contexts, each of which may have its own Patient Identifier Domain. For effective patient care, it is required that patient identifiers across Patient Identifier Domains be cross-referenced so that patient records containing clinical observations from one context can be matched to medical records in another context.

One specific use case is the mapping of the patient identifier from an implanted cardiac device observation to the identifier used in an electronic medical record system. Certain actors within the IDCO Profile (see section 9) are required to participate in the PIX profile to support this mapping.

H.6 Audit Trail and Node Authentication (ATNA)

The full specification of the Audit Trail and Node Authentication (ATNA) Integration Profile is found in **ITI-TF 1:9**.

The Audit Trail and Node Authentication (ATNA) Integration Profile establishes security measures which, together with the Security Policy and Procedures of the enterprise, provide patient information confidentiality, data integrity and user accountability. The goals of the Audit Trail and Node Authentication Integration Profile are:

- Access and authentication controls that prevent unauthorized access to information
- Integrity controls that safeguard the integrity and reliability of protected health information
- Accountability controls that provide user accountability through audit record generation and a centralized audit repository

Figure H.6-1 shows the actors and involved in this Profile and the transactions between actors.

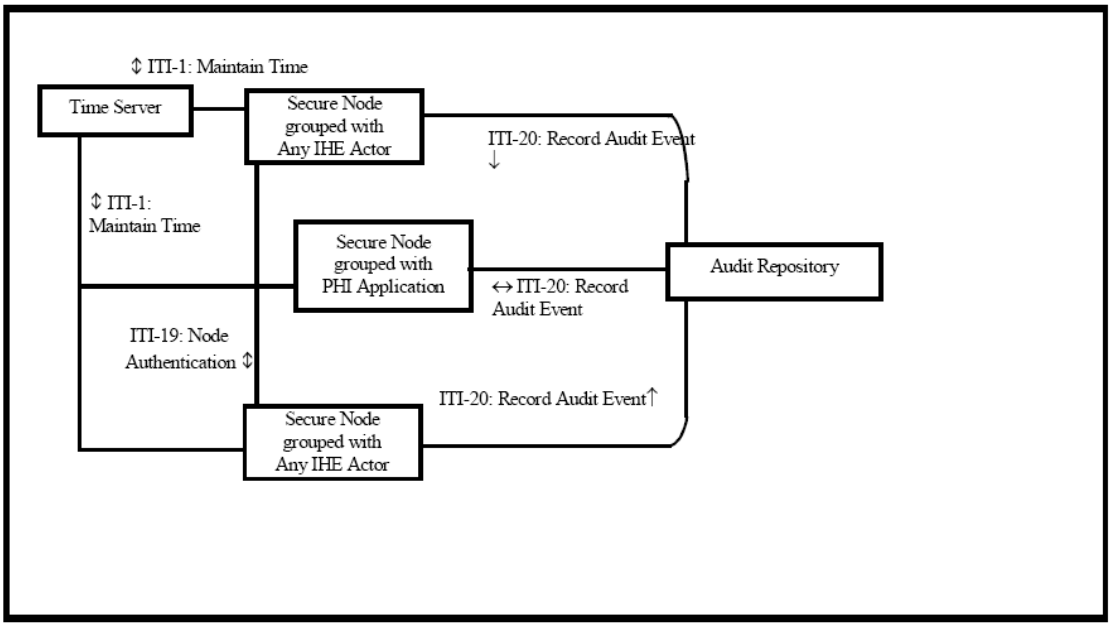


Figure H.6-1 ATNA Actors and Transactions

H.6.1 Cardiology Use Case

Cardiology patients are typically seen and treated in a variety of institutional contexts, whose information systems are often in different security domains connected by public data communications networks (the Internet). For effective patient care, data must be transported across those networks, and it is required that network transmissions of protected health information across un-trusted networks be appropriately secured. Certain actors of the XDS profile are required to participate in the ATNA profile, and actors of the IDCO profile may also use ATNA when such transport across public networks is required.

Add New Appendix

Appendix I: Observation Processors and Repositories - Extended Workflow Actor Groupings

The IDCO profile specifies two actors, the Observation Repository and the Observation Processor, that are endpoints for observation messages within the defined workflow, but which are actually transition points to other use of the observation data in other workflows. This section describes some of the use cases for these actors.

I.1 Basic IDCO Report Display using Retrieve Information for Display Profile (RID)

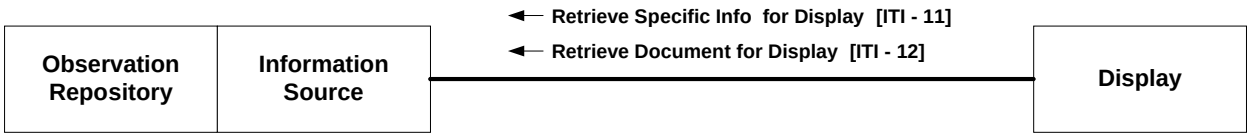


Figure I.1-1 Extended Actor Groupings - RID

The Observation Repository actor may be grouped with the Information Source actor of the Retrieve Information for Display (RID) Profile. The full specification of the Retrieve Information for Display Profile is found in **ITI-TF 1:3**; a summary is included in Appendix H.3 of this document (CARD-TF 1:H.3).

With this grouping, the system would store received observations, perhaps providing some aggregating function (e.g., managing replacement of individual observations with later results), and serving the data in a ready-for-display format in response to a RID query transaction.

As an Observation Repository, the system is also required to be grouped with the Patient Demographics Consumer actor, and thus to support update of patient demographic data in the stored observations.

I.2 IDCO Data Incorporation into a Report using Displayable Reports Profile (DRPT)

Figure I.2-1 Extended Actor Groupings - DRPT

The Observation Processor actor may be grouped with the Report Creator actor of the Displayable Reports (DRPT) Profile.

With this grouping, the system would receive observations and provide a mechanism to create a report, perhaps combining the observations from several devices (e.g., implanted device observations with electrophysiology lab evidence).

As a Report Creator, the created report would be forwarded to a Report Manager for signature and distribution.

I.3 IDCO Discrete Data Storage using Evidence Documents Profile (ED)

Figure I.3-1 Extended Actor Groupings - ED

The Observation Processor actor may be grouped with the Evidence Creator actor of the Evidence Documents (ED) Profile.

Such a system would be able to generate Evidence Documents (DICOM Structured Reports) based on content in the Observation message. If the Observation comes from within the context of an implant procedure, e.g., the record of the initial device settings, the derived evidence document would be linked to the other images and evidence of the implant procedure via the Study Instance UID.

I.4 IDCO Submission to an EHR using Cross Domain Document Sharing Profile (XDS)

Figure I.4-1 Extended Actor Groupings - XDS

The Observation Processor actor may be grouped with the Document Source actor of the Cross-Enterprise Document Sharing (XDS) Profile.

With this grouping, the system would create a medical summary report, perhaps combining the observations from several devices (e.g., implanted device observations with electrophysiology lab evidence), to be shared cross encounters, with referral doctors, etc. As a Document Source, the created report would be forwarded to a Document Repository and, in turn, would be registered at Document Registry and made available in community of care. Another possibility is to share and publish the attached PDF report as is, if it was provided by Observation Creator.

I.5 Observation Repository with a Database

The Observation Repository actor may store received observations in a database suitable for longitudinal patient studies, outcomes research, clinical trials, or data mining. While IHE does not currently define any Profiles or Transactions for such a database actor, there are several such types of systems which could participate in the IDCO Profile as an Observation Repository.

Such a system would be required to be grouped with the Patient Demographics Consumer actor, and thus to support update of patient demographic data in the stored observations.

Changes to Volume II – Transactions

Add New Transaction

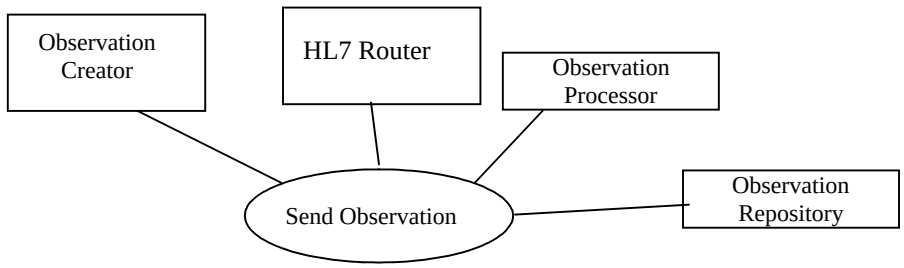
4.12 Send Observation (CARD-12)

This section corresponds to transaction CARD-12 of the IHE Technical Framework. Transaction CARD-12 is used by the Observation Creator, HL7 Message Router, Observation Repository and Observation Processor actors.

4.12.1 Scope

In the Send Observation transaction, the Observation Creator sends the observation as an unsolicited HL7 ORU message to the HL7 Message Router, and the HL7 Message Router sends the observation as an unsolicited HL7 ORU message to the Observation Repository and Observation Processor actors. Optionally, the Observation Creator can send an unsolicited HL7 ORU message directly to the Observation Processor and Observation Repository.

4.12.2 Use Case Roles



Actor: Observation Creator

Role: Outputs the Observation as an HL7 ORU message upon completion of the observation. This message contains the the discrete data for the observation and/or a PDF document containing displayable data relating to the observation.

Actor: HL7 Message Router

Role: Receives the HL7 ORU message from the Observation Creator, reconciles patient identification using transactions from the PIX profile, and outputs the message to each configured destination actor.

Actor: Observation Processor

Role: Receives the HL7 ORU message and provides some implementation-specific processing. This may include creation of reports, integration of information into electronic health records, or creation of derived data (trends, analyses, reformatted data, population statistics, etc.). If needed,

it will reconcile patient identification using an implementation-specific mapping function or using transactions from the PIX profile.

Actor: Observation Repository

Role: Receives the HL7 ORU message and provides long-tem storage of information contained within the message. It makes this data available in some implementation-specific manner. If needed, it will reconcile patient identification using transactions from the PIX profile. It maintains demographic information consistency with the enterprise based on patient update transactions of the PAM profile.

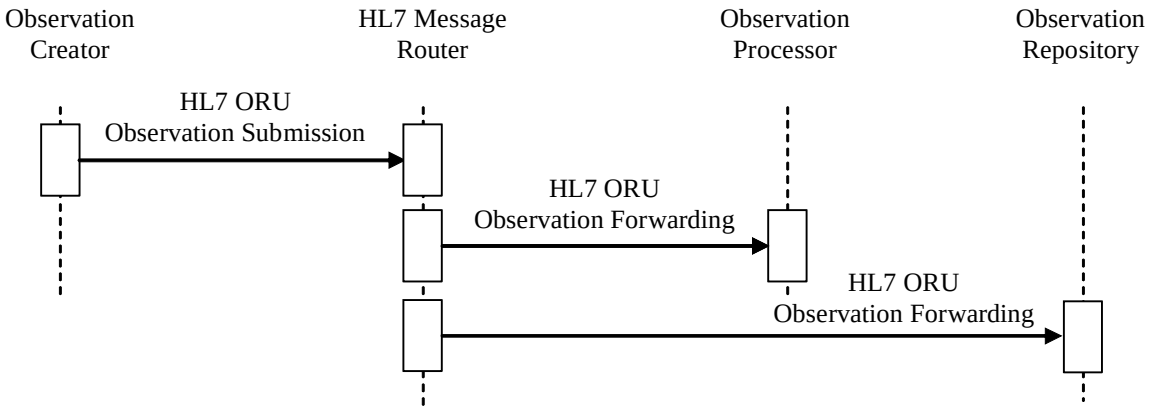
4.12.3 Referenced Standards

HL7 Messaging Standard v2.5

HL7 Messaging Standard v3

IEEE 11073.1.1.3 MDC_IDC Nomenclature

4.12.4 Interaction Diagram



4.12.5 Observation Submission

4.12.5.1 Trigger Events

The Observation Creator initiates the HL7 ORU message to the HL7 Message Router following an implanted cardiac device interrogation, when it has assembled all the data desired to be reported.

4.12.5.2 Message Semantics

The message is an unsolicited v2.5 ORU message from the Observation Creator to the HL7 Message Router with a corresponding ACK message back to the Observation Creator. The

contents of the message (in OBX segments) are a required set of individual observations or measurements trans-coded into separate HL7 v2.5 OBX segments and an optional encapsulated PDF document.

Refer to the HL7 2.5 Standard, Chapter 7 ORU Message for general message semantics.

Refer to the HL7 v3 Standard, Therapeutic Device Domain – Implantable Cardiac Device Topic, and the subsections below for the content of the required OBX.

The constrained message structure is given in Table 4.12-1, with additional details provided in sections below.

Table 4.12-1 ORU Message Structure

ORU	Observation Results Message	Usage	HL7 Spec Chapter
MSH	Message Header		2
[{ SFT }]	Software Segment		2
PID	Patient Identification	Demographics for id matching	3
[PV1]	Patient Visit		3
{	Order Observation Repeat Grouping BEGIN		
OBR	Observations Request	Clinical context	7
{[NTE]}	Notes Section	Notes related to OBR	
{OBX}	Observation results	Observations related to the pulse generator	7
{[NTE]}	Notes Section	Notes Related to OBX	
[{OBX}]	Observation result	Optional PDF document payload	7
}	Order Observation Repeat Grouping END		
[DSC]	Continuation Pointer		2

4.12.5.2.1 MSH Segment – Message Header

Table 4.12-2 – MSH Segment

Name	Seq	DT	Len	Opt	Rep	Min	Max	Tbl	Fixed	Ex Val
Field Separator	1	ST	1	R	False	1	1		Y	|
Encoding Characters	2	ST	4	R	False	1	1		Y	^~\&
Sending Application	3	HD	227	RE	False	0	1	0361		
namespace ID	*1*	IS	20	O		0	1	0300		APP NAME
universal ID	*2*	ST	199	C		0	1			
universal ID type	*3*	ID	6	C		0	1	0301		
Sending Facility	4	HD	227	RE	False	0	1	0362		
namespace ID	*1*	IS	20	O		0	1	0300		VENDOR NAME
universal ID	*2*	ST	199	C		0	1			
universal ID type	*3*	ID	6	C		0	1	0301		
Receiving Application	5	HD	227	RE	False	0	1	0361		
namespace ID	*1*	IS	20	O		0	1	0300		CLINIC APPLICATION
universal ID	*2*	ST	199	C		0	1			
universal ID type	*3*	ID	6	C		0	1	0301		
Receiving Facility	6	HD	227	RE	False	0	1	0362		
namespace ID	*1*	IS	20	O		0	1	0300		CLINIC ID

Name	Seq	DT	Len	Opt	Rep	Min	Max	Tbl	Fixed	Ex Val
universal ID	*2*	ST	199	C		0	1			
universal ID type	*3*	ID	6	C		0	1	0301		
Date/Time Of Message	7	TS	26	R	False	1	1			
time	*1*	DTM	24	R		1	1			20040328134623.1234+0300
degree of precision	*2*	ST	1	NS		0	0	0529		
Message Type	9	MSG	15	R	False	1	1			
message code	*1*	ID	3	R		1	1	0076	Y	ORU
trigger event	*2*	ID	3	R		1	1	0003	Y	RO1
message structure	*3*	ID	7	R		1	1	0354		
Message Control ID	10	ST	20	R	False	1	1			
Processing ID	11	PT	3	R	False	1	1			
processing ID	*1*	ID	1	R		1	1	0103	Y	P
processing mode	*2*	ID	1	O		0	1	0207		
Version ID	12	VID	971	R	False	1	1			
version ID	*1*	ID	5	R		1	1	0104	Y	2.5

4.12.5.2.2 PID Segment – Patient Identification

Table 4.12-3 – PID Segment

Name	Seq	DT	Len	Opt	Rep	Min	Max	Tbl	Fixed Val	Ex Val
Patient Identifier List	3	CX	250	R	True	1	*			
ID number	*1*	ST	15	R		1	1			MODEL:XXX/SERIAL:XXX
assigning authority	*4*	HD	227	NS		0	0	0363		BSC
identifier type code	*5*	ID	5	O		0	1	0203		U
Patient Name	5	XPN	294	R	True	1	*			
family name	*1*	FN	194	O		0	1			DOE
given name	*2*	ST	30	O		0	1			JOHN
second and further given names or initials thereof	*3*	ST	30	O		0	1			
suffix (e.g., JR or III)	*4*	ST	20	O		0	1			
Date/Time of Birth	7	TS	26	RE	False	0	1			
time	*1*	DTM	24	R		1	1			20040328134623.1234+0300
Administrative Sex	8	IS	1	RE	False	0	1	0001		M
Patient Address	11	XAD	513	RE	True	0	*			
street address	*1*	SAD	184	O		0	1			
other designation	*2*	ST	120	O		0	1			
city	*3*	ST	50	O		0	1			
state or province	*4*	ST	50	O		0	1			
zip or postal code	*5*	ST	12	O		0	1			12345
country	*6*	ID	3	O		0	1	0399		

PID-3.1 Patient Identifier List - ID Number contain a unique identifier for the patient assigned by the Observation Creator. Identifier Type Code is constrained by Table 0203 listed below (others can be included as defined in the 2.5 standard). The first identifier will always be the unique model/serial number of the implanted device with an identifier of type U (see table following). This will be used by the Observation Processor / Repository actor to match the device interrogations with the patient accounts. Assigning Authority is a unique name of the Observation Creator system or owning organization that creates the observation and will be coded using the MDC_IDC Nomenclature, MDC_IDC_SYS_DEV_INFO_MANUFACTURER term.

Table 4.12-4 Table 0203

Code	Description	Notes	Usage
U	Model and Serial Number of Device IEEE 11073.1.1.3 MDC_IDC_SYS_DEV_INFO_MODEL and MDC_IDC_SYS_DEV_INFO_SERIAL_NUMBER	Model and Serial number shall be concatenated together and must be unique within an Assigning Authority. The format of the ID shall be following: "model:xxx/serial:yyy" Example: model:XZY987/serial:abc123	R
SS	Patient Social Security Number	Social Security number shall be included if known.	RE

4.12.5.2.3 PV1 Segment – Patient Visit (Optional)

Table 4.12-5 – PV1 Segment

Name	Seq	DT	Len	Opt	Rep	Min	Max	Tbl	Fixed Value	Ex Val
Set ID - PV1	1	SI	4	O	False	0	1			1
Patient Class	2	IS	1	R	False	1	1	0004		R
Assigned Patient Location	3	PL	1220	O	False	0	1			
point of care	*1*	IS	20	O		0	1	0302		
room	*2*	IS	20	O		0	1	0303		
bed	*3*	IS	20	O		0	1	0304		
facility (HD)	*4*	HD	227	O		0	1			
location status	*5*	IS	20	O		0	1	0306		
person location type	*6*	IS	20	C		0	1	0305		
building	*7*	IS	20	O		0	1	0307		
floor	*8*	IS	20	O		0	1	0308		
location description	*9*	ST	199	O		0	1			
comprehensive location identiifier	*10*	EI	427	O		0	1			
assigning authority for location	*11*	HD	227	O		0	1			
Attending Doctor	7	XCN	309	O	True	0	*	0010		
ID number	*1*	ST	15	O		0	1			MWELBY
family name	*2*	FN	194	O		0	1			
given name	*3*	ST	30	O		0	1			
second and further given names or initials thereof	*4*	ST	30	O		0	1			
suffix (e.g., JR or III)	*5*	ST	20	O		0	1			
prefix (e.g., DR)	*6*	ST	20	O		0	1			
Visit Number	19	CX	250	RE	False	0	1			
ID number	*1*	ST	15	R		1	1			123456

Because this is an unsolicited observation and the Observation Creator will not be aware of an associated order, this segment is optional. The Observation Creator may want to track the

interrogation as a visit using this segment. If information is provided here it must match corresponding information provided in the OBX segments.

PV1-7 Attending Doctor will be captured by the Interrogator / Observation Creator actor. If present, PV1-7.1 Attending Doctor ID Number will be a unique identifier for each doctor in the context of the Interrogator / Observation Creator actor, not the Observation Processor / Repository actor.

PV1-19 Visit Number, ID Number will be a unique identifier generated by the Observation Creator for each visit.

4.12.5.2.4 OBR Segment – Observation Request

The ORU message may include discrete OBX segments for individual observations reported. An OBR Segment shall be used for each set of such OBX segments to establish the equipment context for the observations (i.e., whether they apply to the pulse generator, or to a specific lead).

Table 4.12-6 – OBR Segment

Name	Seq	DT	Len	Opt	Rep	Min	Max	Tbl	Fixed Val	Ex Val
Set ID - OBR	1	SI	4	O	False	0	1			1
Placer Order Number	2	EI	424	O	False	0	1			
entity identifier	*1*	ST	199	O		0	1			
Filler Order Number	3	EI	424	R	False	0	1			
entity identifier	*1*	ST	199	O		0	1			123456
Universal Service Identifier	4	CE	478	R	False	1	1			
identifier	*1*	ST	20	R		1	1			Remote Follow-up
text	*2*	ST	199	O		0	1			
Observation Date/Time	7	TS	26	C	False	0	1			
time	*1*	DTM	24	R		1	1			20040328134623.1234+0300
Observation End Date/Time	8	TS	26	O	False	0	1			
time	*1*	DTM	24	R		1	1			20040328134623.1234+0300
Results Rpt/Status Chng - Date/Time	22	TS	26	C	False	0	1			
time	*1*	DTM	24	R		1	1			20040328134623.1234+0300
Result Status	25	ID	1	C	False	0	1	0123		F
Principal Result Interpreter	32	NDL	825	O	False	0	1			
name	*1*	CNS	406	O		0	1			
facility	*7*	HD	227	O		0	1			
Assistant Result Interpreter	33	NDL	825	O	True	0	*			
name	*1*	CNS	406	O		0	1			
facility	*7*	HD	227	O		0	1			
Technician	34	NDL	825	O	True	0	*			
name	*1*	CNS	406	O		0	1			
facility	*7*	HD	227	O		0	1			

OBR-2 Placer Order Number will usually be empty given that this is an unsolicited order.

OBR-3 Filler Order Number will contain a unique identifier for the observation / interrogation session generated by the Observation Creator actor.

OBR-4.1-2 Universal Service ID, Identifier and Text can identify unique OBR segments that partition observations. The following table lists of values for these fields.

Table 4.12-7 OBR-4 Table

ID	Text
Implant	HL7 v2.5 device observations at Implant
In Clinic Follow-up	HL7 v2.5 device observations for an in clinic Follow-up
Remote Follow-up	HL7 v2.5 device observations for a remote Follow-up

OBR-25 Result Status values shall be one of the values in Table 4.12-8.

Table 4.12-8 Result Status

Value	Description
R	Results stored; not yet verified
P	Preliminary: A verified early result is available, final results not yet obtained
F	Final results; results stored and verified. Can only be changed with a corrected result.
C	Correction to results

OBR-32 Principal Result Interpreter, OBR-33 Assistant Result Interpreter, and OBR-34 Technician if present shall at a minimum define components Name and Facility.

4.12.5.2.5 OBX Segments – Pulse Generator and Lead Observation Results

Discrete OBX segments for individual observations must be encoded into separate OBX segments as individual observations or measurements. These OBX segments shall be preceded

by an appropriate OBR segment (see 4.12.5.2.4) to set the context for observations dealing with the implantable devices or leads.

Table 4.12-8 – OBX Segment

Name	Seq	DT	Len	Opt	Rep	Min	Max	Tbl	Fixed Value	Ex Val
Set ID - OBX	1	SI	4	R	False	0	1			1
Value Type	2	ID	2	R	False	0	1	0125		TX
Observation Identifier	3	CE	478	R	False	1	1			
identifier	*1*	ST	20	R		1	1			257
text	*2*	ST	199	O		0	1			MDC-IDC_SYSTEM_STATUS
name of coding system	*3*	ID	20	R		0	1	0396		MDC_IDC
Observation Value	5	varies	99999	R	True	0	*			Normal
Units	6	CE	478	RE	False	0	1			
identifier	*1*	ST	20	RE		0	1			
text	*2*	ST	199	O		0	1			
Abnormal Flags	8	IS	5	O	True	0	*	0078		
Observation Result Status	11	ID	1	R	False	1	1	0085		
Date/Time of the Observation	14	TS	26	RE	False	0	1			
time	*1*	DTM	24	R		1	1			20070422170125
Observation Method	17	CE	478	O	True	0	*			
identifier	*1*	ST	20	R		0	1			
text	*2*	ST	199	R		0	1			
name of coding system	*3*	ID	20	R		0	1	0396		
Equipment Instance Identifier	18	EI	424	O	True	0	*			
entity identifier	*1*	ST	199	O		0	1			

OBX-1 Set ID – This field contains the sequence number.

OBX-2 Value Type – The HL7 data type of the Observation Value will depend on the P110731.1.3 term data type, as shown in Table 4.12-9.

Table 4.12-9 – HL7 to IEEE Data Type Matching

HL7 v2 data type	Applicable IEEE 11073 MDC_IDC types
ST	String, not enumerated
CWE	String, coded entry with exceptions allowed
DTM	Date / Time
NM	Number(x,y), Number(x,0), Number(x)

OBX-3.1 Observation Identifier, Identifier – Must be coded with the MDC_IDC Nomenclature code value.

OBX-3.2 Observation Identifier, Text – Must be coded with the MDC_IDC Nomenclature Reference ID for associated observation.

OBX-3.3 Observation Identifier, Name of Coding System – Must be coded with the IEEE 11073.1.1.3 coding system identifier: “MDC_IDC”

OBX-4 Observation Sub-ID – Used to uniquely identify repeating terms within an OBR segment and to organize relationships within sets of observations or composite (complex data type) observations. Use a dot notation to represent nesting relationships.

OBX-5 Observation Value – This is the actual value of the observation.

OBX-6 Unit – Must be coded with the MDC_IDC Nomenclature (based on UCUM) Unit for associated observation.

OBX-8 Abnormal Flags – optional field.

OBX-11 Observation Result Status – In normal case this field holds the value from the table *HL7 Table 0085 - Observation result status codes interpretation.* Valid values are following: F, P, R, S, & X. The value X denotes missing value, and in this case the OBX-5 should be empty.

OBX-14 Date/Time of Observation – This field is required when the observation reported is different from the OBR report header. If an observation method defines a range of time (in the case of aggregate functions like average or mean) the date represents end date/time of the reported interval.

OBX-17.1-3 Observation Method, Identifier, Text & Name of Coding system – These optional fields can be used to transmit the method or procedure by which an observation was obtained when the sending system wishes to distinguish among one measurement obtained by different methods and the distinction is not implicit in term. A user defined table can be used to define the observation methods.

OBX-18 Equipment Instance Identifier – A unique identifier for the equipment or software that was responsible for the production of the observation

4.12.5.2.5.1 IEEE 1073.1.1.3 IDC term mapping to OBX segment

In the IEEE 11073.1.1.3 MDC_IDC nomenclature each term is discrete, self descriptive and maps to one OBX segment.

A list of the terms is in Appendix A of this document.

4.12.5.2.6 OBX Segment with Encapsulated PDF [Optional]

Optionally, observations or additional analyses can be provided in an encapsulated PDF containing displayable information.

Table 4.12-10 – OBX Segment

Name	Seq	DT	Len	Opt	Rep	Min	Max	Tbl	Fixed Value	Ex Val
Set ID - OBX	1	SI	4	R	False	0	1			
Value Type	2	ID	2	R	False	0	1	0125	Y	ED
Observation Identifier	3	CE	478	R	False	1	1			
identifier	1	ST	20	R		1	1		Y	*18750-0*
text	2	ST	199	R		0	1		Y	Cardiac Electrophysiology Report
name of coding system	3	ID	20	R		0	1	0396	Y	LN
Observation Value	5	ED	99999	R	True	0	*			Encapsulated PDF
type of data	2	ST	10	R		1	1		Y	Application

Name	Seq	DT	Len	Opt	Rep	Min	Max	Tbl	Fixed Value	Ex Val
data subtype	3	ST	10	R		1	1		Y	PDF
encoding	4	ST	10	R		1	1		Y	Base64
data	5	TX	*	RE		1	1		Y	*Encapsulated and Base64 binary encoded PDF File*
Observation Result Status	11	ID	1	R	False	1	1	0085		
Date/Time of the Observation	14	TS	26	RE	False	0	1			
time	1	DTM	24	R		1	1			20040328134623.1234+0300
Equipment Instance Identifier	18	EI	424	O	True	0	*			
entity identifier	1	ST	199	O		0	1			

OBX-3 is report ID from LOINC coding system, and shall be set to `18750-0^Cardiac Electrophysiology Report^LN.`

OBX-5.2 Type of Data component shall have the value “Application”

OBX-5.3 Data Subtype component shall have the value “PDF”.

OBX-5.4 Encoding component shall have the value “Base64”.

OBX-5.5 Data component contains the encapsulated Base64-encoded PDF document.

*Note! The base64 encoded PDF stream **must not include** CR/LF characters, which are forbidden within HL7 field text streams. Breaking a base64 encoded stream into lines of 76 characters or less is used for email in accordance with RFC 822, but is not applicable to encapsulated data in HL7.*

OBX-18 Equipment Instance Identifier – A unique identifier for the equipment or software that was responsible for the production of the observation.

The attached PDF shall contain in its content the device ID, patient ID and name if known, and the dates of the procedure and document.

Note: If the PDF content is electrocardiogram see the CARD-6 Retrieve ECG Document for Display for recommendations on the message semantics of an ECG document. The limitations of an ECG collected by an implantable cardiac device may make some of those recommendations inappropriate.

4.12.5.2.7 NTE Segment – Notes and Comments [Optional]

Table 4.12-11 – NTE Segment – Notes and Comments

ELEMENT NAME	SEQ	COMP	DT	LEN	USAGE	CARD	TBL#	ITEM #	Fixed	Ex. Values
Set ID - NTE	1		SI	4	O	[1..1]		00096		1
Source of comment	2		CX	20	O	[1..1]		00097	Y	L
Comment	3		FT	65536	O	[1..*]		01318		

NTE-3 Comments – Contains any notes, comments needed that are not included as part of an observation.

4.12.5.3 Expected Actions

4.12.5.3.1 HL7 Message Router

The HL7 Message Router shall return the standard HL7 acknowledgement message to the Observation Creator actor.

Upon receipt of this message, the HL7 Message Router shall reconcile the Patient ID in the message with the Patient ID of the assigning authority domain of the local institution, using the PIX Profile transactions. It shall update the PID-3 and PID-5 fields to reflect the local institution Patient ID and name. The HL7 Message Router shall not otherwise modify the content of the observation report it receives. After performing this update the HL7 Message Router shall route the message to all configured recipients. Recipients include Observation Processor and/or Observation Repository actors.

4.12.6 Observation Forwarding

4.12.6.1 Trigger Events

The HL7 Message Router initiates the HL7 ORU message to the configured Observation Processor and Observation Repository recipients when it has received the message from the Observation Creator.

4.12.6.2 Message Semantics

The message semantics are identical to the HL7 ORU message used in Observation Submission (see 4.12.5.2).

4.12.6.3 Expected Actions

4.12.6.3.1 Observation Processor

The Observation Processor actor shall return the standard HL7 acknowledgement message to the Observation Creator or the HL7 Message Router actor.

Upon receipt of this message, if the Patient ID has not been reconciled with the local assigning authority, the Observation Processor shall reconcile the Patient ID in the message with the Patient ID of the assigning authority domain of the local institution. If the Observation Processor supports the PIX-based Reconciliation Option, it shall use the PIX Profile transactions (PIX ITI-9) to perform the reconciliation.

The Observation Processor will perform additional actions that are specific to that application. Reference section 4.12.2 for a description of the types of actions this actor may support.

4.12.6.3.2 Observation Repository

The Observation Repository actor shall return the standard HL7 acknowledgement message to the Observation Creator or HL7 Message Router actors.

Upon receipt of this message, if the Patient ID has not been reconciled with the local assigning authority, the Observation Repository shall reconcile the Patient ID in the message with the Patient ID of the assigning authority domain of the Observation Repository using the PIX Profile transactions (PIX ITI-9).

The Observation Repository shall store the received data and make it available through means that are specific to that application. Reference section 4.12.2 for a description of the types of actions this actor may support.

The demographic data in the stored data is updated by means of the Patient Demographics Consumer actor grouped with the Observation Repository actor (PAM Profile transaction ITI-30). Any such updates shall be applied to data made available by this application.

Appendix A – MDC_IDC Nomenclature

The IEEE 11073.1.1.3 MDC_IDC Nomenclature is used to code observations within the IDCO profile. This appendix contains tables that define the terms and associated value constraints.

A.1 MDC_IDC Term Definitions

Table A.1 which defines the MDC_IDC terms. The following columns are defined in the table.

- Display Name – The common name of the term that would be displayed on a report or screen.
- Reference ID – A structured name for the term. This will be reported in OBX 3.2.
- MDC_IDC Code – The code value of the term. This will be reported in OBX 3.1.
- Description – A brief description or definition of the term
- Data Type ID – The data type for the term. Terms can be typed as String, Number or Timestamp (Date/Time). Terms can also be typed as Enumerate. Term that are Enumerated are Strings with a constrained set of values. Terms that are of the type Enumerated will always have an Enumeration table associated.
- Unit Code – The unit of measure for a term if appropriate. Based on the Unified Code for Units of Measure (UCUM) version 1.6.
- Enumeration Table – The unique identifier for the table of enumerations associated with a term of the type enumerated.

Table A.1.1 – MDC_IDC Nomenclature Term Definitions

Display Name	Reference ID	MDC_IDC Code	Description	Data Type ID	Unit Code	Enumeration Table
Implantable Device Cardiac System	MDC_IDC_SYS	256	The system that consists of implanted cardiac rhythm management device and set of leads	Complex		
System Status	MDC_IDC_SYS_STATUS	257	Overall status of the system.	String		
Session	MDC_IDC_SYS_SESSION	512	IDC system interrogation session - follow-up or implantation	Complex		
Date/Time of Communication Session	MDC_IDC_SYS_SESSION_DATE_TIME	513	Date of the current in-clinic or remote	Timestamp		

Display Name	Reference ID	MDC_IDC Code	Description	Data Type ID	Unit Code	Enumeration Table
			interrogation.			
Session Observation Producer	MDC_IDC_SYS_SESSION_OBSERVATION_PRODUCER	514	An identifier of the device or entity responsible for the production of the observation	String		
Previous Session Date	MDC_IDC_SYS_SESSION_PREVIOUS_DATE_TIME	515	Date of most recent in-clinic or remote interrogation.	Timestamp		
Session Type	MDC_IDC_SYS_SESSION_TYPE	516	The type of device interaction that generated the current data set.	Enumerated		Table6
CRM Device	MDC_IDC_SYS_DEV	768	Cardiac rhythm management device	Complex		
Device Information	MDC_IDC_SYS_DEV_INFO	1024	Group of items describing the device	Complex		
Device Implant Date	MDC_IDC_SYS_DEV_INFO_IMPLANT_DATE	1025	The implant date of the device.	Timestamp		
Device Manufacturer	MDC_IDC_SYS_DEV_INFO_MANUFACTURER	1026	The manufacturer of the device.	Enumerated		Table1
Device Model	MDC_IDC_SYS_DEV_INFO_MODEL	1027	The model of a device.	String		
Device Name	MDC_IDC_SYS_DEV_INFO_NAME	1028	The marketing name given to a device by the manufacturer.	String		
Device Serial Number	MDC_IDC_SYS_DEV_INFO_SERIAL_NUMBER	1029	The serial number for a device.	String		
Device Type	MDC_IDC_SYS_DEV_INFO_TYPE	1030	The type of device.	Enumerated		Table2
Device Settings	MDC_IDC_SYS_DEV_SET	1280	Group of items describing the device settings	Complex		
AT Mode Switch	MDC_IDC_SYS_DEV_SET_AT_MODE_SWITCH	1281	Pacing mode switch for atrial tachycardia .	Enumerated		Table14
AT Mode Switch Rate	MDC_IDC_SYS_DEV_SET_AT_MODE_SWITCH_RATE	1282	Intrinsic atrial rate at which the mode switches.	Number(3,0)U	1/min	
ATachy Mode	MDC_IDC_SYS_DEV_SET_ATACHY_MODE	1283	Atrial Tachy therapy mode.	Enumerated		Table10
Paced AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE	1284	The programmed delay between a paced atrial event and ventricular event (fixed discriminator single value, dynamic discriminator min and max values). If the AV delay times out before an intrinsic ventricular event is sensed, ventricular pacing will be delivered.	Number(3,0)U	ms	
Minimum Paced AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE_MIN	1285	The programmed delay between a paced atrial event and ventricular event (fixed discriminator single value, dynamic discriminator min and max values). If the AV delay times out before an intrinsic ventricular event is sensed, ventricular pacing will be delivered. Minimum	Number(3,0)U	ms	
Maximum Paced AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE_MAX	1286	The programmed delay between a paced atrial event and ventricular event (fixed discriminator single value, dynamic discriminator min and max values). If the AV delay times out before an intrinsic ventricular event is sensed, ventricular pacing will be delivered. Maximum	Number(3,0)U	ms	

Display Name	Reference ID	MDC_IDC Code	Description	Data Type ID	Unit Code	Enumeration Table
Mean Paced AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE_MEAN	1287	The programmed delay between a paced atrial event and ventricular event (fixed discriminator single value, dynamic discriminator min and max values). If the AV delay times out before an intrinsic ventricular event is sensed, ventricular pacing will be delivered. Mean	Number(3,0)U	ms	
Average Paced AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE_AVG	1288	The programmed delay between a paced atrial event and ventricular event (fixed discriminator single value, dynamic discriminator min and max values). If the AV delay times out before an intrinsic ventricular event is sensed, ventricular pacing will be delivered. Average	Number(3,0)U	ms	
Sensed AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE	1293	The programmed delay between a sensed atrial event and ventricular event (fixed discriminator single value, dynamic discriminator min and max values). If the AV delay times out before an intrinsic ventricular event is sensed, ventricular pacing will be delivered.	Number(3,0)U	ms	
Minimum Sensed AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE_MIN	1294	The programmed delay between a sensed atrial event and ventricular event (fixed discriminator single value, dynamic discriminator min and max values). If the AV delay times out before an intrinsic ventricular event is sensed, ventricular pacing will be delivered. Minimum	Number(3,0)U	ms	
Maximum Sensed AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE_MAX	1295	The programmed delay between a sensed atrial event and ventricular event (fixed discriminator single value, dynamic discriminator min and max values). If the AV delay times out before an intrinsic ventricular event is sensed, ventricular pacing will be delivered. Maximum	Number(3,0)U	ms	
Mean Sensed AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE_MEAN	1296	The programmed delay between a sensed atrial event and ventricular event (fixed discriminator single value, dynamic discriminator min and max values). If the AV delay times out before an intrinsic ventricular event is sensed, ventricular pacing will be delivered. Mean	Number(3,0)U	ms	
Average Sensed AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE_AVG	1297	The programmed delay between a sensed atrial event and ventricular event (fixed discriminator single value, dynamic discriminator min and max values). If the AV delay times out before an intrinsic ventricular event is sensed, ventricular pacing will be delivered. Average	Number(3,0)U	ms	

Display Name	Reference ID	MDC_IDC Code	Description	Data Type ID	Unit Code	Enumeration Table
Brady Mode	MDC_IDC_SYS_DEV_SET_BRADY_MODE	1301	The manner in which a device provides rate and rhythm support.	Enumerated		Table11
Initial Paced Ventricular Chamber	MDC_IDC_SYS_DEV_SET_INITIAL_PACED_VENT_CHMBR	1302	Initial ventricular chamber paced.	Enumerated		Table12
Lower Rate Limit	MDC_IDC_SYS_DEV_SET_LOWER_RATE_LIMIT	1303	The rate at which the implanted device paces the atrium and/or ventricle in the absence of sensed intrinsic activity and the absence of sensor-controlled pacing at a higher rate.	Number(3,0)U	1/min	
Left Ventricular Blanking Period	MDC_IDC_SYS_DEV_SET_LV_BLANKING_PERIOD	1304	The time period after a left ventricular event, either paced or sensed, when the device will not pace the left ventricle.	Number(3,0)U	ms	
Left Ventricular Refractory (LVRP)	MDC_IDC_SYS_DEV_SET_LVRP	1305	The time period after a ventricular sensed or paced event during which the left ventricular channel does not respond to input signals.	Number(3,0)U	ms	
Magnet Rate	MDC_IDC_SYS_DEV_SET_MAGNET_RATE	1306	A rate at which an implanted device paces when the magnate switch is activated.	Number(3,0)U	1/min	
Max Sensor Rate	MDC_IDC_SYS_DEV_SET_MAX_SENSOR_RATE	1307	The fastest sensor-driven pacing rate that can be achieved in a rate-adaptive pacing system.	Number(3,0)U	1/min	
Max Tracking Rate	MDC_IDC_SYS_DEV_SET_MAX_TRACKING_RATE	1308	The rate over which the pacemaker will not allow the ventricles to be paced in response to sensed atrial activity.	Number(3,0)U	1/min	
Sensed AV Offset	MDC_IDC_SYS_DEV_SET_PACING_SENSED_AV_OFFSET	1309	The amount of time the AV Delay is shortened after a sensed atrial event.	Number(3,0)U	ms	
Post Ventricular Atrial Refractory Period (PVARP)	MDC_IDC_SYS_DEV_SET_PVARP	1310	The time period after a ventricular sensed or paced event during which the atrial channel does not respond to input signals.	Number(3,0)U	ms	
Minimum Post Ventricular Atrial Refractory Period (PVARP)	MDC_IDC_SYS_DEV_SET_PVARP_MIN	1311	The time period after a ventricular sensed or paced event during which the atrial channel does not respond to input signals. Minimum	Number(3,0)U	ms	
Maximum Post Ventricular Atrial Refractory Period (PVARP)	MDC_IDC_SYS_DEV_SET_PVARP_MAX	1312	The time period after a ventricular sensed or paced event during which the atrial channel does not respond to input signals. Maximum	Number(3,0)U	ms	
Mean Post Ventricular Atrial Refractory Period (PVARP)	MDC_IDC_SYS_DEV_SET_PVARP_MEAN	1313	The time period after a ventricular sensed or paced event during which the atrial channel does not respond to input signals. Mean	Number(3,0)U	ms	
Average Post Ventricular Atrial Refractory Period (PVARP)	MDC_IDC_SYS_DEV_SET_PVARP_AVG	1314	The time period after a ventricular sensed or paced event during which the atrial channel does not respond to input signals. Average	Number(3,0)U	ms	
Rate Hysteresis	MDC_IDC_SYS_DEV_SET_RATE_HYSTERESIS	1318	The rate above which pacing is inhibited.	Number(3,0)U	1/min	
Right Ventricular Refractory Period (RVRP)	MDC_IDC_SYS_DEV_SET_RVRP	1319	The time period after a ventricular sensed or paced event during which the right ventricular channel does not respond to input signals.	Number(3,0)U	ms	

Display Name	Reference ID	MDC_IDC Code	Description	Data Type ID	Unit Code	Enumeration Table
Minimum Right Ventricular Refractory Period (RVRP)	MDC_IDC_SYS_DEV_SET_RVRP_MIN	1320	The time period after a ventricular sensed or paced event during which the right ventricular channel does not respond to input signals. Minimum	Number(3,0)U	ms	
Maximum Right Ventricular Refractory Period (RVRP)	MDC_IDC_SYS_DEV_SET_RVRP_MAX	1321	The time period after a ventricular sensed or paced event during which the right ventricular channel does not respond to input signals. Maximum	Number(3,0)U	ms	
Mean Right Ventricular Refractory Period (RVRP)	MDC_IDC_SYS_DEV_SET_RVRP_MEAN	1322	The time period after a ventricular sensed or paced event during which the right ventricular channel does not respond to input signals. Mean	Number(3,0)U	ms	
Average Right Ventricular Refractory Period (RVRP)	MDC_IDC_SYS_DEV_SET_RVRP_AVG	1323	The time period after a ventricular sensed or paced event during which the right ventricular channel does not respond to input signals. Average	Number(3,0)U	ms	
Search Hysteresis	MDC_IDC_SYS_DEV_SET_SEARCH_HYSTERESIS	1327	The number of pacing cycles at which a search for intrisic activity will occur.	Number(3,0)		
V to V Offset	MDC_IDC_SYS_DEV_SET_V_TO_V_OFFSET	1328	The offset between delivery of Right Ventricular and Left Ventricular pacing pulses. The offset is applied to the Left Ventricular pacing pulse, based on the timing of the Right Ventricular pacing pulse.	Number(3,0)U	ms	
Ventricular Pacing Config	MDC_IDC_SYS_DEV_SET_VENT_PACING_CONFIG	1329	The ventricular pacing configuration, either right or left ventricular or bi-ventricular pacing.	Enumerated		Table22
VTachy Mode	MDC_IDC_SYS_DEV_SET_VTACHY_MODE	1330	Ventricular Tachy therapy mode.	Enumerated		Table10
Battery	MDC_IDC_SYS_DEV_BATTERY	1536	Battery of the cardiac rhythm management device	Complex		
Battery Impedance	MDC_IDC_SYS_DEV_BATTERY_IMPEDANCE	1537	The impedance of the battery.	Number(2,0)U	kOhm	
Battery Last Measured Date	MDC_IDC_SYS_DEV_BATTERY_LAST_MEASURED_DATE	1538	Date of the last battery status measurement.	Timestamp		
Battery Life	MDC_IDC_SYS_DEV_BATTERY_LIFE	1539	A relative status of battery life.	Enumerated		Table7
Longevity Remaining	MDC_IDC_SYS_DEV_BATTERY_LONGEVITY_REMAINING	1540	Estimate of how long the battery is expected to last with its full capabilities based on current configuration.	Number(2,0)U	mo	
Battery Voltage	MDC_IDC_SYS_DEV_BATTERY_VOLTAGE	1541	The battery voltage measurement.	Number(1,2)U	V	
Capacitor	MDC_IDC_SYS_DEV_CAP	1792	Capacitor of the defibrillator	Complex		
Charge Date	MDC_IDC_SYS_DEV_CAP_CHARGE_DATE	1793	The date of the last capacitor charge.	Timestamp		
Delivered Charge Energy	MDC_IDC_SYS_DEV_CAP_CHARGE_ENERGY	1794	The energy of the last delivered shock.	Number(2,0)U	J	
Delivered Charge Time	MDC_IDC_SYS_DEV_CAP_CHARGE_TIME	1795	The length of time required for the delivered high voltage capacitor charge.	Number(2,1)U	s	
Reform Charge Date	MDC_IDC_SYS_DEV_CAP_REFORM_CHARGE_DATE	1796	The date of the last capacitor reform.	Timestamp		
Reform Charge Energy	MDC_IDC_SYS_DEV_CAP_REFORM_CHARGE_ENERGY	1797	The energy of the capacitor reform charge.	Number(2,0)U	J	
Reform Charge Time	MDC_IDC_SYS_DEV_CAP_REFORM_CHARGE_TIME	1798	The length of time required for the reform high voltage capacitor charge.	Number(2,1)U	s	
Device Counters	MDC_IDC_SYS_DEV_COUNT	2048	Group of counters related to the device	Complex		

Display Name	Reference ID	MDC_IDC Code	Description	Data Type ID	Unit Code	Enumeration Table
Device Counters Cleared Date	MDC_IDC_SYS_DEV_COUNT_CLEARED_DATE	2049	The date when recent device diagnostic counters were lasted cleared.	Timestamp		
Mode Switch Duration	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION	2050	The duration of mode switching.	Number(2,0)U	s	
Minimum Mode Switch Duration	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION_MIN	2051	The duration of mode switching. Minimum	Number(2,0)U	s	
Maximum Mode Switch Duration	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION_MAX	2052	The duration of mode switching. Maximum	Number(2,0)U	s	
Mean Mode Switch Duration	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION_MEAN	2053	The duration of mode switching. Mean	Number(2,0)U	s	
Average Mode Switch Duration	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION_AVG	2054	The duration of mode switching. Average	Number(2,0)U	s	
Mode Switch Percent	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_PERCENT	2058	The percent of time mode switching.	Number(3,0)U	%	
Recent Percent Paced	MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT	2059	The percent of time pacing.	Number(3,0)U	%	
Right Atrium Recent Percent Paced	MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT_RA	2060	The percent of time pacing. Right Atrium	Number(3,0)U	%	
Left Atrium Recent Percent Paced	MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT_LA	2061	The percent of time pacing. Left Atrium	Number(3,0)U	%	
Right Ventricle Recent Percent Paced	MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT_RV	2062	The percent of time pacing. Right Ventricle	Number(3,0)U	%	
Left Ventricle Recent Percent Paced	MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT_LV	2063	The percent of time pacing. Left Ventricle	Number(3,0)U	%	
Tachy Therapy	MDC_IDC_SYS_DEV_TAC_THRPY	2304	Group of terms describing tachy therpay settings	Complex		
Tachy Therapy Counter Recent	MDC_IDC_SYS_DEV_TAC_THRPY_COUNT_RECENT	2305	The tachy therapy counter value of designated type for recent events.	Number(10,0)		
Tachy Therapy Counter Total	MDC_IDC_SYS_DEV_TAC_THRPY_COUNT_TOTAL	2306	The tachy therapy counter total of designated type for all events.	Number(10,0)		
Tachy Therapy Counter Type	MDC_IDC_SYS_DEV_TAC_THRPY_COUNT_TYPE	2307	The tachy therapy counter type.	Enumerated		Table23
Tachy Therapy ATP Number of Pulses	MDC_IDC_SYS_DEV_TAC_THRPY_PULSES_ATP	2308	The programmed number of atrial antitachy pacing pulses delivered in the zone for the atrial therapy set.	Number(2,0)		
Tachy Therapy Shock Energy	MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY	2309	The shock energy delivered at a particular sequence of a zone therapy.	Number(2,0)U	J	
Tachy Therapy Number of Max Shocks	MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_MAX_ADDITIONAL	2310	The number of additional max energy shocks in the zone programmed for delivery.	Number(2,0)		
Tachy Therapy Maximum Shock Energy	MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_MAX_ENERGY	2311	The amount of maximum energy delivered in each remaining shock after the initial sequence of shocks.	Number(2,0)U	J	
Tachy Therapy ATP Type	MDC_IDC_SYS_DEV_TAC_THRPY_TYPE_ATP	2312	The ATP therapy type	Enumerated		Table21
Tachy Therapy Zone Detection Rate	MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_DETECT_RATE	2313	The rate at which a therapy zone is detected.	Number(3,0)U	1/min	
Tachy Therapy Zone	MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_NAME	2314	The zone name for the tachy therapy parameters.	Enumerated		Table23
Tachy Therapy Zone Status	MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_STATUS	2315	The status of the device therapy functions.	Enumerated		Table13
Tachy Therapy SVT Discrimination Status	MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_SVT_DISCR_STATUS	2316	The status of SVT discrimination therapy.	Enumerated		Table13
Tachy Therapy Counters	MDC_IDC_SYS_DEV_TAC_THRPY_COUNT	2560	Group of terms describing tachy therpay counters	Complex		
Episode	MDC_IDC_SYS_DEV_EPISODE	2816	Group of terms describing an Episode	Complex		
Episode Date Time	MDC_IDC_SYS_DEV_EPISODE_DATE_TIME	2817	The date / time of the episode.	Timestamp		

Display Name	Reference ID	MDC_IDC Code	Description	Data Type ID	Unit Code	Enumeration Table
Episode Description	MDC_IDC_SYS_DEV_EPISODE_DESCRIPTION	2818	A description of the episode.	String		
Episode Duration	MDC_IDC_SYS_DEV_EPISODE_DURATION	2819	The duration of the episode.	Number(2,0)U	s	
Episode Identifier	MDC_IDC_SYS_DEV_EPISODE_IDENTIFIER	2820	An identifier for the episode.	String		
Episode Type	MDC_IDC_SYS_DEV_EPISODE_TYPE	2821	The episode type.	Enumerated		Table23
Episode Counter	MDC_IDC_SYS_DEV_EPISODE_COUNT	3072	Group of counters per therapy zone	Complex		
Recent Episodes	MDC_IDC_SYS_DEV_EPISODE_COUNT_RECENT	3073	Recent episodes of designated type since last clear.	Number(10,0)		
Total Episodes	MDC_IDC_SYS_DEV_EPISODE_COUNT_TOTAL	3074	Total episodes of designated type for life of device.	Number(10,0)		
Episode Counter Type	MDC_IDC_SYS_DEV_EPISODE_COUNT_TYPE	3075	The episode counter type.	Enumerated		Table23
Lead	MDC_IDC_SYS_LEAD	3328	The implanted wire which contains electrodes	Complex		
Lead Information	MDC_IDC_SYS_LEAD_INFO	3584	Group of items describing the lead	Complex		
Lead Abandon Date	MDC_IDC_SYS_LEAD_INFO_ABANDON_DATE	3585	The abandon date of the lead.	Timestamp		
Lead Explant Date	MDC_IDC_SYS_LEAD_INFO_EXPLANT_DATE	3586	The explant date of the lead.	Timestamp		
Lead Fixation Location	MDC_IDC_SYS_LEAD_INFO_FIXATION_SITE	3587	The heart anatomy location where the lead is fixated.	Enumerated		Table5
Lead Fixation Location Modifier	MDC_IDC_SYS_LEAD_INFO_FIXATION_SITE_MODIFIER	3588	The site within the heart anatomy where the lead is fixated.	Enumerated		Table15
Lead Implant Date	MDC_IDC_SYS_LEAD_INFO_IMPLANT_DATE	3589	The implant date of the lead.	Timestamp		
Lead Manufacturer	MDC_IDC_SYS_LEAD_INFO_MANUFACTURER	3590	The manufacturer of the lead	Enumerated		Table1
Lead Model	MDC_IDC_SYS_LEAD_INFO_MODEL	3591	The model of the lead.	String		
Lead Name	MDC_IDC_SYS_LEAD_INFO_NAME	3592	The marketing name given to the lead by the manufacturer.	String		
Lead Serial Number	MDC_IDC_SYS_LEAD_INFO_SERIAL_NUMBER	3593	The serial number of the lead.	String		
Lead State	MDC_IDC_SYS_LEAD_INFO_STATE	3594	The state of the lead.	Enumerated		Table9
Lead Status	MDC_IDC_SYS_LEAD_INFO_STATUS	3595	The status of the lead.	Enumerated		Table18
Brady Channel	MDC_IDC_SYS_CHNL	3840	Group of metrics related to Brady Channel	Complex		
Channel Status	MDC_IDC_SYS_CHNL_STATUS	3841	The status of the lead channel.	Enumerated		Table9
Heart Chamber	MDC_IDC_SYS_CHNL_CHMBR	3842	The chamber of the heart.	Enumerated		Table12
Pacing Impedance	MDC_IDC_SYS_CHNL_IMPEDANCE	3843	Lead pacing impedance measured during a lead test.	Number(3,0)U	Ohm	
Intrinsic Amplitude	MDC_IDC_SYS_CHNL_INTRINSIC_AMPLITUDE	3844	The amplitude measured during an intrisic amplitude test.	Number(1,1)U	mV	
Lead Serial Number Reference	MDC_IDC_SYS_CHNL_LEAD_SERIAL_NUMBER	3845	The serial number of the lead.	String		
Pacing Threshold	MDC_IDC_SYS_CHNL_PACE_THRESHOLD	3846	The minimum electrical stimulation (pacingr output) required to consistently initiate chamber depolarization and cardiac contraction.	String		
Pacing Amplitude	MDC_IDC_SYS_CHNL_PACE_THRESHOLD_AMPLITUDE	3847	The minimum pulse amplitude needed for pacing capture.	Number(1,1)U	V	
Pacing Pulsewidth	MDC_IDC_SYS_CHNL_PACE_THRESHOLD_PULSE_WIDTH	3848	The minimum pulse width needed for pacing capture.	Number(1,1)U	ms	
Pacing Anode	MDC_IDC_SYS_CHNL_PACING_CONFIG_ANODE	3849	The channel anode.	Enumerated		Table16
Pacing Anode Location	MDC_IDC_SYS_CHNL_PACING_CONFIG_ANODE_LOC	3850	The channel anode location.	Enumerated		Table5
Pacing Cathode	MDC_IDC_SYS_CHNL_PACING_CONFIG_CATHODE	3851	The channel cathode.	Enumerated		Table16
Pacing Cathode Location	MDC_IDC_SYS_CHNL_PACING_CONFIG_CATHODE_LOC	3852	The channel cathode location.	Enumerated		Table5
Polarity Type	MDC_IDC_SYS_CHNL_POLARITY_TYPE	3853	The type of polarity for the lead channel.	Enumerated		Table3

Display Name	Reference ID	MDC_IDC Code	Description	Data Type ID	Unit Code	Enumeration Table
Sensing Anode	MDC_IDC_SYS_CHNL_SENSING_CONFIG_ANODE	3854	The channel anode.	Enumerated		Table16
Sensing Anode Location	MDC_IDC_SYS_CHNL_SENSING_CONFIG_ANODE_LOC	3855	The channel anode location.	Enumerated		Table5
Sensing Cathode	MDC_IDC_SYS_CHNL_SENSING_CONFIG_CATHODE	3856	The channel cathode.	Enumerated		Table16
Sensing Cathode Location	MDC_IDC_SYS_CHNL_SENSING_CONFIG_CATHODE_LOC	3857	The channel cathode location.	Enumerated		Table5
Setting Pacing Amplitude	MDC_IDC_SYS_CHNL_SET_PACING_AMPLITUDE	3858	The current setting for pacing output amplitude.	Number(1,1)U	V	
Setting Pacing Automatic Capture	MDC_IDC_SYS_CHNL_SET_PACING_AUTO_CAPTURE	3859	Determines whether pacing device automatically adjusts pacing output to maintain capture.	Enumerated		Table13
Setting Pacing Output	MDC_IDC_SYS_CHNL_SET_PACING_OUTPUT	3860	The current setting for pacing output measured as amplitude at pulsewidth.	String		
Setting Pacing Pulse Width	MDC_IDC_SYS_CHNL_SET_PACING_PULSE_WIDTH	3861	The current setting for pacing output pulsewidth.	Number(1,1)U	ms	
Setting Pacing Sensitivity	MDC_IDC_SYS_CHNL_SET_SENSING_SENSITIVITY	3862	Defines the smallest signal that will be sensed in paced chamber using relative terms.	Enumerated		Table4
Tachy Channel	MDC_IDC_SYS_HV_CHNL	4096	Group of metrics related to Tachy Channel	Complex		
Lead Tachy Channel Threshold	MDC_IDC_SYS_HV_CHNL_DEFIB_THRESHOLD	4097	Lead tachy channel defibrillation threshold measured at implant.	Number(2,0)U	J	
Lead Tachy Channel Impedance	MDC_IDC_SYS_HV_CHNL_IMPEDANCE	4098	Lead tachy channel impedance measured during a lead impedance test.	Number(3,0)U	Ohm	
Shock Lead Tachy Channel Impedance	MDC_IDC_SYS_HV_CHNL_IMPEDANCE_SHOCK	4099	Lead tachy channel impedance measured during a lead impedance test. Shock	Number(3,0)U	Ohm	
Low Voltage Lead Tachy Channel Impedance	MDC_IDC_SYS_HV_CHNL_IMPEDANCE_LOWVOLT	4100	Lead tachy channel impedance measured during a lead impedance test. Low Voltage	Number(3,0)U	Ohm	
Lead Serial Number Reference	MDC_IDC_SYS_HV_CHNL_LEAD_SERIAL_NUMBER	4106	The serial number of the lead.	String		
Lead Tachy Channel Polarity	MDC_IDC_SYS_HV_CHNL_POLARITY_TYPE	4107	The lead tachy channel polarity type.	Enumerated		Table3
Shock Anode	MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_ANODE	4108	The channel anode.	Enumerated		Table16
Shock Anode Location	MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_ANODE_LOC	4109	The channel anode location.	Enumerated		Table5
Shock Cathode	MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_CATHODE	4110	The channel cathode.	Enumerated		Table16
Shock Cathode Location	MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_CATHODE_LOC	4111	The channel cathode location.	Enumerated		Table5
Lead Tachy Channel Status	MDC_IDC_SYS_HV_CHNL_STATUS	4112	The current status of the lead tachy channel determined by the device based off of analysis of the impedance. If a value encountered is outside of the expected range its status is presented.	Enumerated		Table19

A.2 MDC_IDC Term Enumeration Tables

The following tables are Enumeration Tables that define a restricted set of values for terms of the type enumerated. See Table A.1 for which enumerated terms are associated with a given Enumeration Table. The following columns are defined within an Enumeration Table.

- Code Value – This is the value that will be used for the term. This value will be reported in OBX-5.1.
- Display Text – This is the text that should be displayed on a report or screen.

Table1 : Manufacturers

Code Value	Display Text
STJ	St.Jude Medical
GDT	Guidant
MDT	Medtronic
BIO	Biotronik
TEL	Teletronics
COR	Cordis
ELA	ELA
VIT	Vitatron
CK	Cook
MCO	Medico
SOR	Sorin
PCS	Pacesetter
SIE	Siemens
CCS	CCS
INT	Intermedics
OSC	Oscor
OTH	Other
BSC	Boston Scientific

Table2 : Implanted Cardiac Device Types

Code Value	Display Text
IPG	Pacemaker
ICD	Defibrillator
CRT_D	Cardiac Resynchronization Therapy - Defibrillator
CRT_P	Cardiac Resynchronization Therapy - Pacemaker
LEAD	Implantable Transveneous Lead
ILR	Implantable Loop Recorder
IDM	Implantable Diagnostic Monitor
ADP	Lead Adapter
Other	Other

Table3 : Lead Polarity Types

Code Value	Display Text
Unipolar	Unipolar
Bipolar	Bipolar
Tripolar	Tripolar
Quadripolar	Quadripolar

Table4 : Pacing Sensitivity

Code Value	Display Text
Nominal	Nominal
Min	Minimum
Max	Maximum
Lead	Lead

Table5 : Anatomy Location for Leads

Code Value	Display Text
Right_Atrium	Right Atrium
Left_Atrium	Left Atrium
Right_Ventricle	Right Ventricle
Left_Ventricle	Left Ventricle
Superior_Vena_Cava	Superior Vena Cava
Not_Reported	Not Reported
Other	Other

Table6 : Session Type

Code Value	Display Text
Implant	Implant
In_clinic	In Clinic
Remote	Remote
Remote_Scheduled	Remote-Scheduled
Remote_Patient_Initiated	Remote-Patient Initiated
Remote_Device_Initiated	Remote-Device Initiated
Device_Initiated	Device Initiated
TTM	TTM
Transtelephonic	Transtelephonic
Device_Scheduled	Device Scheduled

Table7 : Battery Life

Code Value	Display Text
EOL	End of Life
ERI	Elective Replacement Indicator
MOL	Middle of Life
BOL	Beginning of Life
OTHER	Other

Table8 : Battery Status

Code Value	Display Text
Normal	Normal
Abnormal	Abnormal

Table9 : Lead State

Code Value	Display Text
Active	Lead Active
InActive	Lead In-Active
Damaged	Lead Damaged

Table10 : Tachy Therapy Mode

Code Value	Display Text
Monitor	Monitor
Therapy	Therapy
Off	Off

Table11 : Brady Mode

Code Value	Display Text
AAI	AAI
AAIR	AAIR
AAT	AAT
AATR	AATR
AOO	AOO
AOOR	AOOR
DAD	DAD
DDD	DDD
DDDR	DDDR
DDI	DDI
DDIR	DDIR
DOO	DOO
DOOR	DOOR
DVI	DVI
DVIR	DVIR
VAT	VAT
VDD	VDD
VDDR	VDDR
VOO	VOO
VOOR	VOOR
VVI	VVI
VVIR	VVIR
VVT	VVT
OOO	OOO
OOR	OOR
DDD_CLS	DDD_CLS
DDI_CLS	DDI_CLS
VVI_CLS	VVI_CLS
VDD_CLS	VDD_CLS
AAI_CLS	AAI_CLS

Table12 : Chamber

Code Value	Display Text
LV	Left Ventricle
RV	Right Ventricle
LA	Left Atrium
RA	Right Atrium
BOTH_V	Both Ventricles
BOTH_A	Both Atriums
BOTH_L	Both Left Chambers
BOTH_R	Both Right Chambers
ALL	All Chambers

Table13 : OnOff

Code Value	Display Text
On	On
Off	Off

Table14 : Mode Switch

Code Value	Display Text
VDI	VDI
VDIR	VDIR
VVI	VVI
VVIR	VVIR
DDI	DDI
DDIR	DDIR
VDI_CLS	VDI_CLS

Table15 : Implanted Lead Sites

Code Value	Display Text
Anterior	Anterior
Posterior	Posterior
Lateral	Lateral
Apex	Apex
Septum	Septum
Low	Low
Mid	High
High	High
Base	Base
Middle	Middle
Apex	Apex
Great	Great
Appendage	Appendage
HIS_Bundle	HIS Bundle
Bachman_Bundle	Bachman Bundle
Coronary_Sinus	Coronary Sinus
Cardiac_Vein	Cardiac Vein
Wall	Wall
Epicardial	Epicardial

Table16 : Lead Configurations

Code Value	Display Text
Tip	Tip
Ring	Ring
Can	Can
Coil	Coil

Table18 : Lead Status

Code Value	Display Text
OK	OK
Check_Intrinsic_Amplitude	Check Intrinsic Amplitude
Check_Impedance	Check Impedance

Table19 : Shock Lead Status

Code Value	Display Text
OK	OK
Check_Impedance	Check Impedance

Table21 : ATP Types

Code Value	Display Text
Burst	Burst
Scan	Scan
Ramp	Ramp
Ramp_Scan	Ramp/Scan

Table22 : Pacing Chamber

Code Value	Display Text
BiV	Bi-Ventricular
RV	Right Ventricular
LV	Left Ventricular

Table23 : Therapy Zone Names

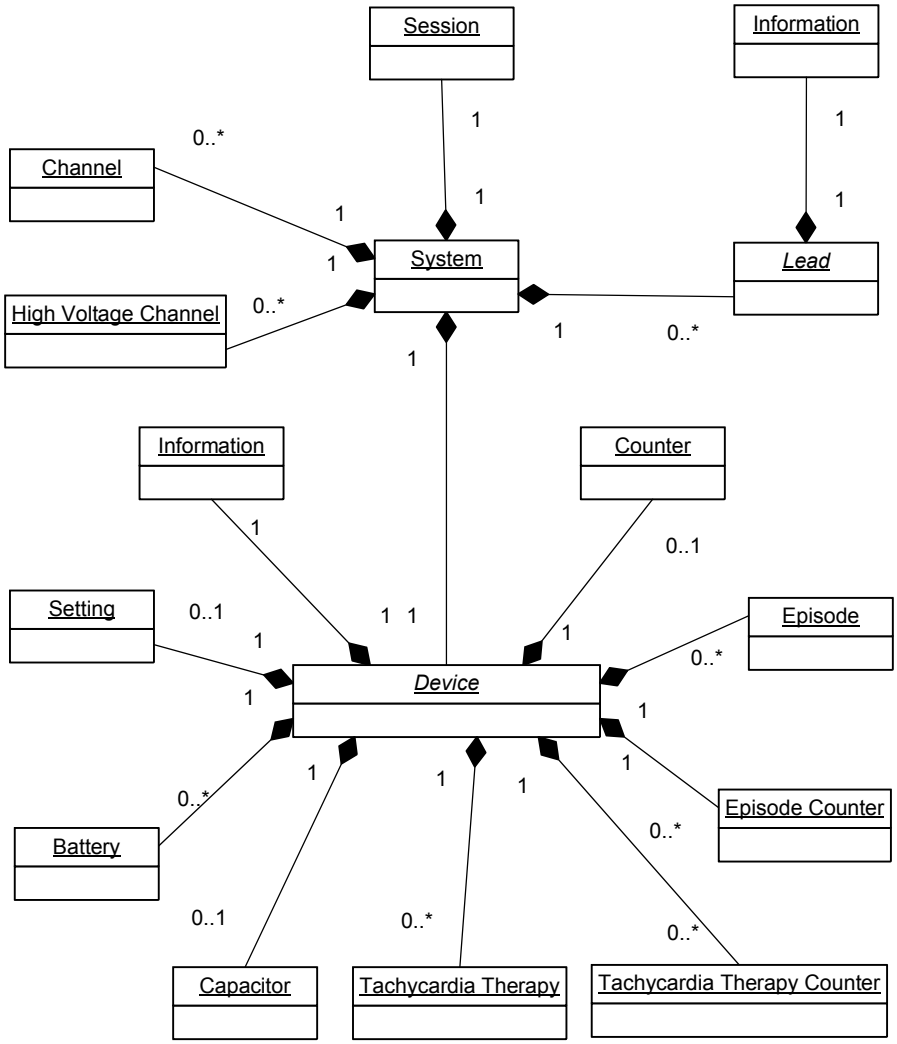
Code Value	Display Text
Afib	Afib
SVT	SVT
VF	VF
FastVT	FastVT
SlowVT	SlowVT
VT1	VT1
VT2	VT2
AT1	AT1
AT2	AT2
AT3	AT3
NST	NST

Table24 : Tachy Therapy Counters

Code Value	Display Text
Shocks_Attempted	Shocks Attempted
Shocks_Delivered	Shocks Delivered
Shocks_Aborted	Shocks Aborted
Shocks_Ineffective	Shocks Ineffective
Shocks_Successful	Shocks Successful
ATP_VT_Delivered	ATP in VT Delivered
ATP_VF_Delivered	ATP in VF Delivered

A.3 MDC_IDC Containment Tree

The MDC_IDC nomenclature terms are grouped into classifications and are structured in a hierarchical containment tree. Terms within the same containment tree classification are associated to provide a common context for post coordination. Terms within the same term classification must be reported sequentially within the IDCO HL7 message. The following UML diagram represents the containment tree.



The term classifications for the containment tree are defined as follows.

- System (Sys) – A term classification that contains attributes related to the overall implantable cardiac system. This is the parent classification for all device related terms.
- Session – A term classification that contains attributes related to the device follow-up session.
- Lead – A term class identifier that contains all child class attributes related to a implantable cardiac device lead. This is a structural component of the nomenclature and doesn't currently have any terms associated at this level.
- Lead > Information (Lead_Info) – A term classification that contains attributes related to implantable cardiac device lead information.
- Channel (Chnl) – A term classification that contains attributes related to the virtual device bradycardia electrical channels.
- High Voltage Channel (HV_Chnl) – A term classification that contains attributes related to the virtual device tachycardia electrical channels.
- Device (Dev) – A term class identifier that contains attributes related to the implantable cardiac device. This is a structural component of the nomenclature and doesn't currently have any terms associated at this level.
- Device > Information (Dev_Info) – A term classification that contains attributes related to the implantable cardiac device information.
- Setting (Set) – A term classification that contains attributes related to the implantable cardiac device settings.
- Battery – A term classification that contains attributes related to the implantable cardiac device battery.
- Capacitor (Cap) – A term classification that contains attributes related to the implantable cardiac device capacitor.
- Tachycardia Therapy (Tac_Thrpy) – A term classification that contains attributes related to tachycardia therapy configurations.
- Tachycardia Therapy Counter (Tac_Thrpy_Count) – A term classification that contains attributes related to tachycardia therapy statistical counters.
- Episode – A term classification that contains attributes related to device detected cardiac episodes.
- Episode Counter (Episode_Count) – A term classification that contains attributes related to device detected cardiac episode statistical counters.

- Device Counters (Dev_Count) – A term classification that contains attributes related to general device statistical counters.

The following table shows the term classifications and their hierarchical relationships within the containment tree and whether these groups are required and will repeat. The following columns are defined in the table.

- Containment Tree – A column of term classifications (groupings) with hierarchy represented by indentation. A classification for a term can be determined from the Reference ID. All term Reference IDs are prefixed with the term classification.
- Cardinality – The cardinality of the classified term group. The left side of the cardinality defines whether the term group is required in the HL7 message (0=not required, 1=required). The right side of the cardinality defines whether the term group can repeat within the HL7 message (1=not repeating, *=repeating).

Table A.3.1 – MDC_IDC Containment Tree

Containment Tree	Cardinality
MDC_IDC	-
MDC_IDC_SYS	1:1
MDC_IDC_SYS_SESSION	
MDC_IDC_SYS_DEV	-
MDC_IDC_SYS_DEV_INFO	1:1
MDC_IDC_SYS_DEV_SETTING	0:1
MDC_IDC_SYS_DEV_BATTERY	0:*
MDC_IDC_SYS_DEV_CAPACITOR	0:1
MDC_IDC_SYS_DEV_COUNTER	0:1
MDC_IDC_SYS_DEV_TACHY_THERAPY	0:*
MDC_IDC_SYS_DEV_TACHY_THERAPY_COUNTER	0:*
MDC_IDC_SYS_DEV_EPISODE	0:*
MDC_IDC_SYS_DEV_EPISODE_COUNTER	0:*
MDC_IDC_SYS_LEAD	-
MDC_IDC_SYS_LEAD_INFO	0:*
MDC_IDC_SYS_CHNL	0:*
MDC_IDC_SYS_HV_CHNL	0:*

A.4 MDC_IDC Use of OBX-4 for Containment

Containment or relationships between terms are implemented in the IDCO profile using OBX-4 Observation Sub ID. The OBX-4 field is used to distinguish between multiple OBX segments with the same OBX-3 Observation Identifier (repeating terms) and to group terms that have a common context. Terms within a classification that don't repeat do not require the use of OBX-4. The following tables describe each term classification, whether these terms are required and will repeat within a segment, how terms should be grouped, and the use of OBX-4. The following columns are defined in the tables.

- Display Name – The common name of the term that would be displayed on a report or screen.
- Reference ID – A structured name for the term. This will be reported in OBX 3.2.
- MDC_IDC Code – The code value of the term. This will be reported in OBX 3.1.
- Cardinality – The cardinality of the term within the term classification. The left side of the cardinality defines whether the term is required for a given term classification group (0=not required, 1=required). The right side of the cardinality defines whether the term can repeat within the given term classification group (1=not repeating, *=repeating).
- OBX-4 Levels – The number of levels needed within OBX 4 to represent the containment tree for the term.
- OBX Grouping –Used to define how terms should be grouped. Terms with the same OBX grouping must be reported sequentially in a message and if repeating must be identified in a message using the same OBX-4 value.
- OBX Example – An example of an OBX-4 value for the given term.

Table A.4.1 – MDC_IDC_SYS_SESSION

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Date/Time of Communication Session	MDC_IDC_SYS_SESSION_DATE_TIME	513	1:1	NA		
Session Observation Producer	MDC_IDC_SYS_SESSION_OBSERVATION_PRODUCER	514	0:1	NA		
Previous Session Date	MDC_IDC_SYS_SESSION_PREVIOUS_DATE_TIME	515	0:1	NA		
Session Type	MDC_IDC_SYS_SESSION_TYPE	516	1:1	NA		

Table A.4.2 – MDC_IDC_SYS_DEV_INFO

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Device Information	MDC_IDC_SYS_DEV_INFO	1024	1:1	NA		
Device Implant Date	MDC_IDC_SYS_DEV_INFO_IMPLANT_DATE	1025	1:1	NA		
Device Manufacturer	MDC_IDC_SYS_DEV_INFO_MANUFACTURER	1026	1:1	NA		
Device Model	MDC_IDC_SYS_DEV_INFO_MODEL	1027	1:1	NA		
Device Name	MDC_IDC_SYS_DEV_INFO_NAME	1028	1:1	NA		
Device Serial Number	MDC_IDC_SYS_DEV_INFO_SERIAL_NUMBER	1029	1:1	NA		

Table A.4.3 – MDC_IDC_SYS_DEV_BATTERY

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Battery Impedance	MDC_IDC_SYS_DEV_BATTERY_IMPEDANCE	1537	0:1	1	MDC_IDC_SYS_DEV_BATTERY	1
Battery Last Measured Date	MDC_IDC_SYS_DEV_BATTERY_LAST_MEASURED_DATE	1538	0:1	1	MDC_IDC_SYS_DEV_BATTERY	1
Battery Life	MDC_IDC_SYS_DEV_BATTERY_LIFE	1539	0:1	1	MDC_IDC_SYS_DEV_BATTERY	1
Longevity Remaining	MDC_IDC_SYS_DEV_BATTERY_LONGEVITY_REMAINING	1540	0:1	1	MDC_IDC_SYS_DEV_BATTERY	1
Battery Voltage	MDC_IDC_SYS_DEV_BATTERY_VOLTAGE	1541	0:1	1	MDC_IDC_SYS_DEV_BATTERY	1

Table A.4.4 – MDC_IDC_SYS_DEV_COUNT

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Device Counters Cleared Date	MDC_IDC_SYS_DEV_COUNT_CLEARED_DATE	2049	0:1	NA		
Mode Switch Duration	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION	2050	0:1	NA		
Minimum Mode Switch Duration	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION_MIN	2051	0:1	NA		
Maximum Mode Switch Duration	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION_MAX	2052	0:1	NA		
Mean Mode Switch Duration	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION_MEAN	2053	0:1	NA		
Average Mode Switch Duration	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION_AVG	2054	0:1	NA		
Mode Switch Percent	MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_PERCENT	2058	0:1	NA		
Recent Percent Paced	MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT	2059	0:1	NA		
Right Atrium Recent Percent Paced	MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT_RA	2060	0:1	NA		
Left Atrium Recent Percent Paced	MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT_LA	2061	0:1	NA		
Right Ventricle Recent Percent Paced	MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT_RV	2062	0:1	NA		
Left Ventricle Recent Percent Paced	MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT_LV	2063	0:1	NA		

Table A.4.5 – MDC_IDC_SYS_DEV_CAP

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Charge Date	MDC_IDC_SYS_DEV_CAP_CHARGE_DATE	1793	0:1	NA		
Delivered Charge Energy	MDC_IDC_SYS_DEV_CAP_CHARGE_ENERGY	1794	0:1	NA		
Delivered Charge Time	MDC_IDC_SYS_DEV_CAP_CHARGE_TIME	1795	0:1	NA		
Reform Charge Date	MDC_IDC_SYS_DEV_CAP_REFORM_CHARGE_DATE	1796	0:1	NA		
Reform Charge Energy	MDC_IDC_SYS_DEV_CAP_REFORM_CHARGE_ENERGY	1797	0:1	NA		
Reform Charge Time	MDC_IDC_SYS_DEV_CAP_REFORM_CHARGE_TIME	1798	0:1	NA		

Table A.4.6 – MDC_IDC_SYS_DEV_SET

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
AT Mode Switch	MDC_IDC_SYS_DEV_SET_AT_MODE_SWITCH	1281	0:1	NA		
AT Mode Switch Rate	MDC_IDC_SYS_DEV_SET_AT_MODE_SWITCH_RATE	1282	0:1	NA		
ATachy Mode	MDC_IDC_SYS_DEV_SET_ATACHY_MODE	1283	0:1	NA		
Paced AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE	1284	0:1	NA		
Minimum Paced AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE_MIN	1285	0:1	NA		
Maximum Paced AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE_MAX	1286	0:1	NA		
Mean Paced AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE_MEAN	1287	0:1	NA		
Average Paced AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE_AVG	1288	0:1	NA		
Sensed AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE	1293	0:1	NA		
Minimum Sensed AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE_MIN	1294	0:1	NA		
Maximum Sensed AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE_MAX	1295	0:1	NA		
Mean Sensed AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE_MEAN	1296	0:1	NA		
Average Sensed AV Delay	MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE_AVG	1297	0:1	NA		
Brady Mode	MDC_IDC_SYS_DEV_SET_BRADY_MODE	1301	0:1	NA		
Initial Paced Ventricular Chamber	MDC_IDC_SYS_DEV_SET_INITIAL_PACED_VENT_CHMBR	1302	0:1	NA		
Lower Rate Limit	MDC_IDC_SYS_DEV_SET_LOWER_RATE_LIMIT	1303	0:1	NA		
Left Ventricular Blanking Period	MDC_IDC_SYS_DEV_SET_LV_BLANKING_PERIOD	1304	0:1	NA		
Left Ventricular Refractory (LVRP)	MDC_IDC_SYS_DEV_SET_LVRP	1305	0:1	NA		
Magnet Rate	MDC_IDC_SYS_DEV_SET_MAGNET_RATE	1306	0:1	NA		
Max Sensor Rate	MDC_IDC_SYS_DEV_SET_MAX_SENSOR_RATE	1307	0:1	NA		
Max Tracking Rate	MDC_IDC_SYS_DEV_SET_MAX_TRACKING_RATE	1308	0:1	NA		
Sensed AV Offset	MDC_IDC_SYS_DEV_SET_PACING_SENSED_AV_OFFSET	1309	0:1	NA		
Post Ventricular Atrial Refractory Period (PVARP)	MDC_IDC_SYS_DEV_SET_PVARP	1310	0:1	NA		
Minimum Post Ventricular Atrial Refractory Period (PVARP)	MDC_IDC_SYS_DEV_SET_PVARP_MIN	1311	0:1	NA		
Maximum Post Ventricular Atrial Refractory Period (PVARP)	MDC_IDC_SYS_DEV_SET_PVARP_MAX	1312	0:1	NA		
Mean Post Ventricular Atrial Refractory Period (PVARP)	MDC_IDC_SYS_DEV_SET_PVARP_MEAN	1313	0:1	NA		
Average Post Ventricular Atrial Refractory Period (PVARP)	MDC_IDC_SYS_DEV_SET_PVARP_AVG	1314	0:1	NA		
Rate Hysteresis	MDC_IDC_SYS_DEV_SET_RATE_HYSTERESIS	1318	0:1	NA		
Right Ventricular Refractory Period (RVRP)	MDC_IDC_SYS_DEV_SET_RVRP	1319	0:1	NA		
Minimum Right Ventricular Refractory Period (RVRP)	MDC_IDC_SYS_DEV_SET_RVRP_MIN	1320	0:1	NA		
Maximum Right Ventricular Refractory Period (RVRP)	MDC_IDC_SYS_DEV_SET_RVRP_MAX	1321	0:1	NA		
Mean Right Ventricular Refractory Period (RVRP)	MDC_IDC_SYS_DEV_SET_RVRP_MEAN	1322	0:1	NA		
Average Right Ventricular Refractory Period (RVRP)	MDC_IDC_SYS_DEV_SET_RVRP_AVG	1323	0:1	NA		
Search Hysteresis	MDC_IDC_SYS_DEV_SET_SEARCH_HYSTERESIS	1327	0:1	NA		
V to V Offset	MDC_IDC_SYS_DEV_SET_V_TO_V_OFFSET	1328	0:1	NA		
Ventricular Pacing Config	MDC_IDC_SYS_DEV_SET_VENT_PACING_CONFIG	1329	0:1	NA		
VTachy Mode	MDC_IDC_SYS_DEV_SET_VTACHY_MODE	1330	0:1	NA		

Table A.4.7 – MDC_IDC_SYS_DEV_TAC_THRPY

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Tachy Therapy ATP Number of Pulses	MDC_IDC_SYS_DEV_TAC_THRPY_PULSES_ATP	2305	0:1	1	MDC_IDC_SYS_DEV_TAC_THRPY	1
Tachy Therapy Shock Energy	MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY	2306	0:*	2	MDC_IDC_SYS_DEV_TAC_THRPY	1.1, 1.2, …
Tachy Therapy Number of Max Shocks	MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_MAX_ADDITIONAL	2307	0:1	1	MDC_IDC_SYS_DEV_TAC_THRPY	1
Tachy Therapy Maximum Shock Energy	MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_MAX_ENERGY	2308	0:1	1	MDC_IDC_SYS_DEV_TAC_THRPY	1
Tachy Therapy ATP Type	MDC_IDC_SYS_DEV_TAC_THRPY_TYPE_ATP	2309	0:1	1	MDC_IDC_SYS_DEV_TAC_THRPY	1
Tachy Therapy Zone Detection Rate	MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_DETECT_RATE	2310	0:1	1	MDC_IDC_SYS_DEV_TAC_THRPY	1
Tachy Therapy Zone	MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_NAME	2311	1:1	1	MDC_IDC_SYS_DEV_TAC_THRPY	1
Tachy Therapy Zone Status	MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_STATUS	2312	0:1	1	MDC_IDC_SYS_DEV_TAC_THRPY	1
Tachy Therapy SVT Discrimination Status	MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_SVT_DISCR_STATUS	2313	0:1	1	MDC_IDC_SYS_DEV_TAC_THRPY	1

Table A.4.8 – MDC_IDC_SYS_DEV_TAC_THRPY_COUNT

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Tachy Therapy Counter Recent	MDC_IDC_SYS_DEV_TAC_THRPY_COUNT_RECENT	2561	0:1	1	MDC_IDC_SYS_DEV_TAC_THRPY_COUNTER	1
Tachy Therapy Counter Total	MDC_IDC_SYS_DEV_TAC_THRPY_COUNT_TOTAL	2562	0:1	1	MDC_IDC_SYS_DEV_TAC_THRPY_COUNTER	1
Tachy Therapy Counter Type	MDC_IDC_SYS_DEV_TAC_THRPY_COUNT_TYPE	2563	1:1	1	MDC_IDC_SYS_DEV_TAC_THRPY_COUNTER	1

Table A.4.9 – MDC_IDC_SYS_DEV_EPISODE

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Episode Date Time	MDC_IDC_SYS_DEV_EPISODE_DATE_TIME	2817	0:1	1	MDC_IDC_SYS_DEV_EPISODE	1
Episode Description	MDC_IDC_SYS_DEV_EPISODE_DESCRIPTION	2818	0:1	1	MDC_IDC_SYS_DEV_EPISODE	1
Episode Duration	MDC_IDC_SYS_DEV_EPISODE_DURATION	2819	0:1	1	MDC_IDC_SYS_DEV_EPISODE	1
Episode Identifier	MDC_IDC_SYS_DEV_EPISODE_IDENTIFIER	2820	0:1	1	MDC_IDC_SYS_DEV_EPISODE	1
Episode Type	MDC_IDC_SYS_DEV_EPISODE_TYPE	2821	1:1	1	MDC_IDC_SYS_DEV_EPISODE	1

Table A.4.10 – MDC_IDC_SYS_DEV_EPISODE_COUNT

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Recent Episodes	MDC_IDC_SYS_DEV_EPISODE_COUNT_RECENT	3073	0:1	1	MDC_IDC_SYS_DEV_EPISODE_COUNT	1
Total Episodes	MDC_IDC_SYS_DEV_EPISODE_COUNT_TOTAL	3074	0:1	1	MDC_IDC_SYS_DEV_EPISODE_COUNT	1
Episode Counter Type	MDC_IDC_SYS_DEV_EPISODE_COUNT_TYPE	3075	1:1	1	MDC_IDC_SYS_DEV_EPISODE_COUNT	1

Table A.4.11 – MDC_IDC_SYS_LEAD_INFO

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Lead Information	MDC_IDC_SYS_LEAD_INFO	3584	0:1	1	MDC_IDC_SYS_LEAD_INFO	1
Lead Abandon Date	MDC_IDC_SYS_LEAD_INFO_ABANDON_DATE	3585	0:1	1	MDC_IDC_SYS_LEAD_INFO	1
Lead Explant Date	MDC_IDC_SYS_LEAD_INFO_EXPLANT_DATE	3586	0:1	1	MDC_IDC_SYS_LEAD_INFO	1
Lead Fixation Location	MDC_IDC_SYS_LEAD_INFO_FIXATION_SITE	3587	0:1	1	MDC_IDC_SYS_LEAD_INFO	1
Lead Fixation Location Modifier	MDC_IDC_SYS_LEAD_INFO_FIXATION_SITE_MODIFIER	3588	0:1	1	MDC_IDC_SYS_LEAD_INFO	1
Lead Implant Date	MDC_IDC_SYS_LEAD_INFO_IMPLANT_DATE	3589	1:1	1	MDC_IDC_SYS_LEAD_INFO	1
Lead Manufacturer	MDC_IDC_SYS_LEAD_INFO_MANUFACTURER	3590	1:1	1	MDC_IDC_SYS_LEAD_INFO	1
Lead Model	MDC_IDC_SYS_LEAD_INFO_MODEL	3591	1:1	1	MDC_IDC_SYS_LEAD_INFO	1
Lead Name	MDC_IDC_SYS_LEAD_INFO_NAME	3592	1:1	1	MDC_IDC_SYS_LEAD_INFO	1
Lead Serial Number	MDC_IDC_SYS_LEAD_INFO_SERIAL_NUMBER	3593	0:1	1	MDC_IDC_SYS_LEAD_INFO	1
Lead State	MDC_IDC_SYS_LEAD_INFO_STATE	3594	0:1	1	MDC_IDC_SYS_LEAD_INFO	1

Table A.4.12 – MDC_IDC_SYS_CHNL

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Channel Status	MDC_IDC_SYS_CHNL_STATUS	3841	0:1	1	MDC_IDC_SYS_CHNL	1
Heart Chamber	MDC_IDC_SYS_CHNL_CHMBR	3842	1:1	1	MDC_IDC_SYS_CHNL	1
Pacing Impedance	MDC_IDC_SYS_CHNL_IMPEDANCE	3843	0:1	1	MDC_IDC_SYS_CHNL	1
Intrinsic Amplitude	MDC_IDC_SYS_CHNL_INTRINSIC_AMPLITUDE	3844	0:1	1	MDC_IDC_SYS_CHNL	1
Lead Serial Number Reference	MDC_IDC_SYS_CHNL_LEAD_SERIAL_NUMBER	3845	1:*	2	MDC_IDC_SYS_CHNL	1.1, 1.2, …
Pacing Threshold	MDC_IDC_SYS_CHNL_PACE_THRESHOLD	3846	0:1	1	MDC_IDC_SYS_CHNL	1
Pacing Amplitude	MDC_IDC_SYS_CHNL_PACE_THRESHOLD_AMPLITUDE	3847	0:1	1	MDC_IDC_SYS_CHNL	1
Pacing Pulsewidth	MDC_IDC_SYS_CHNL_PACE_THRESHOLD_PULSE_WIDTH	3848	0:*	2	MDC_IDC_SYS_CHNL_PACING_CONFIG	1.1, 1.2, …
Pacing Anode	MDC_IDC_SYS_CHNL_PACING_CONFIG_ANODE	3849	0:*	2	MDC_IDC_SYS_CHNL_PACING_CONFIG	1.1, 1.2, …
Pacing Anode Location	MDC_IDC_SYS_CHNL_PACING_CONFIG_ANODE_LOC	3850	0:*	2	MDC_IDC_SYS_CHNL_PACING_CONFIG	1.1, 1.2, …
Pacing Cathode	MDC_IDC_SYS_CHNL_PACING_CONFIG_CATHODE	3851	0:*	2	MDC_IDC_SYS_CHNL_PACING_CONFIG	1.1, 1.2, …
Pacing Cathode Location	MDC_IDC_SYS_CHNL_PACING_CONFIG_CATHODE_LOC	3852	0:*	2	MDC_IDC_SYS_CHNL_PACING_CONFIG	1.1, 1.2, …
Polarity Type	MDC_IDC_SYS_CHNL_POLARITY_TYPE	3853	0:1	1	MDC_IDC_SYS_CHNL	1
Sensing Anode	MDC_IDC_SYS_CHNL_SENSING_CONFIG_ANODE	3854	0:*	2	MDC_IDC_SYS_CHNL_SENSING_CONFIG	1.1, 1.2, …
Sensing Anode Location	MDC_IDC_SYS_CHNL_SENSING_CONFIG_ANODE_LOC	3855	0:*	2	MDC_IDC_SYS_CHNL_SENSING_CONFIG	1.1, 1.2, …
Sensing Cathode	MDC_IDC_SYS_CHNL_SENSING_CONFIG_CATHODE	3856	0:*	2	MDC_IDC_SYS_CHNL_SENSING_CONFIG	1.1, 1.2, …
Sensing Cathode Location	MDC_IDC_SYS_CHNL_SENSING_CONFIG_CATHODE_LOC	3857	0:*	2	MDC_IDC_SYS_CHNL_SENSING_CONFIG	1.1, 1.2, …
Setting Pacing Amplitude	MDC_IDC_SYS_CHNL_SET_PACING_AMPLITUDE	3858	0:1	1	MDC_IDC_SYS_CHNL	1
Setting Pacing Automatic Capture	MDC_IDC_SYS_CHNL_SET_PACING_AUTO_CAPTURE	3859	0:1	1	MDC_IDC_SYS_CHNL	1
Setting Pacing Output	MDC_IDC_SYS_CHNL_SET_PACING_OUTPUT	3860	0:1	1	MDC_IDC_SYS_CHNL	1
Setting Pacing Pulse Width	MDC_IDC_SYS_CHNL_SET_PACING_PULSE_WIDTH	3861	0:1	1	MDC_IDC_SYS_CHNL	1
Setting Pacing Sensitivity	MDC_IDC_SYS_CHNL_SET_SENSING_SENSITIVITY	3862	0:1	1	MDC_IDC_SYS_CHNL	1

Table A.4.13 – MDC_IDC_SYS_HV_CHANNEL

Display Name	Reference ID	Code	Card	OBX-4 Levels	OBX Grouping	OBX-4 Example
Lead Tachy Channel Threshold	MDC_IDC_SYS_HV_CHNL_DEFIB_THRESHOLD	4097	0:1	1	MDC_IDC_SYS_HV_CHANNEL	1
Lead Tachy Channel Impedance	MDC_IDC_SYS_HV_CHNL_IMPEDANCE	4098	0:1	1	MDC_IDC_SYS_HV_CHANNEL	1
Shock Lead Tachy Channel Impedance	MDC_IDC_SYS_HV_CHNL_IMPEDANCE_SHOCK	4099	0:1	1	MDC_IDC_SYS_HV_CHANNEL	1
Low Voltage Lead Tachy Channel Impedance	MDC_IDC_SYS_HV_CHNL_IMPEDANCE_LOWVOLT	4100	0:1	1	MDC_IDC_SYS_HV_CHANNEL	1
Lead Serial Number Reference	MDC_IDC_SYS_HV_CHNL_LEAD_SERIAL_NUMBER	4106	0:*	2	MDC_IDC_SYS_HV_CHANNEL	1.1, 1.2, …
Lead Tachy Channel Polarity	MDC_IDC_SYS_HV_CHNL_POLARITY_TYPE	4107	0:1	1	MDC_IDC_SYS_HV_CHANNEL	1
Shock Anode	MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_ANODE	4108	0:*	2	MDC_IDC_SYS_HV_CHANNEL_SHOCK_CONFIG	1.1, 1.2, …
Shock Anode Location	MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_ANODE_LOC	4109	0:*	2	MDC_IDC_SYS_HV_CHANNEL_SHOCK_CONFIG	1.1, 1.2, …
Shock Cathode	MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_CATHODE	4110	0:*	2	MDC_IDC_SYS_HV_CHANNEL_SHOCK_CONFIG	1.1, 1.2, …
Shock Cathode Location	MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_CATHODE_LOC	4111	0:*	2	MDC_IDC_SYS_HV_CHANNEL_SHOCK_CONFIG	1.1, 1.2, …
Lead Tachy Channel Status	MDC_IDC_SYS_HV_CHNL_STATUS	4112	0:1	1	MDC_IDC_SYS_HV_CHANNEL	1

Appendix Z – IDCO Observation Message Example

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MSH|^~\&|LATITUDE|BOSTON SCIENTIFIC|DEVICE CLINIC|LOCATION|20070422152341||ORU^R01|12345||2.5
PID|||MODEL:XXX/SERIAL:YYY^^^BSC^U~123-12-1234^^^BSC^SS||DOE^JOHN||20070422153118|M|||^^^^12345-1234
PV1|1|R|||||MWELBY|||||||||||12345
OBR|1||123456|REMOTE FOLLOW-UP|||20070422162958|20070422163006|||||||||||||||||F|||||||&OLSON&JANE||&ANDERSON&BOB
OBX|1|TX|514^MDC_IDC_SYS_SESSION_OBSERVATION_PRODUCER^MDC_IDC||Data Collector 123456||||||F|||20070422170125||||DEV12345
OBX|2|DTM|513^MDC_IDC_SYS_SESSION_DATE_TIME^MDC_IDC||20070422170125||||||F|||20070422170125||||DEV12345
OBX|3|DTM|515^MDC_IDC_SYS_SESSION_PREVIOUS_DATE_TIME^MDC_IDC||20070323170125||||||F|||20070422170125||||DEV12345
OBX|4|TX|516^MDC_IDC_SYS_SESSION_TYPE^MDC_IDC||Remote||||||F|||20070422170125||||DEV12345
OBX|5|TX|257^MDC_IDC_SYS_STATUS^MDC_IDC||Normal||||||F|||20070422170125||||DEV12345
OBX|6|TX|1026^MDC_IDC_SYS_DEV_INFO_MANUFACTURER^MDC_IDC||GDT||||||F|||20070422170125||||DEV12345
OBX|7|TX|1027^MDC_IDC_SYS_DEV_INFO_MODEL^MDC_IDC||H135||||||F|||20070422170125||||DEV12345
OBX|8|TX|1028^MDC_IDC_SYS_DEV_INFO_NAME^MDC_IDC||Contak Renewal||||||F|||20070422170125||||DEV12345
OBX|9|TX|1029^MDC_IDC_SYS_DEV_INFO_SERIAL_NUMBER^MDC_IDC||12345678||||||F|||20070422170125||||DEV12345
OBX|10|TX|1030^MDC_IDC_SYS_DEV_INFO_TYPE^MDC_IDC||CRT_D||||||F|||20070422170125||||DEV12345
OBX|11|DTM|1025^MDC_IDC_SYS_DEV_INFO_IMPLANT_DATE^MDC_IDC||20060422170125||||||F|||20070422170125||||DEV12345
OBX|12|NM|1537^MDC_IDC_SYS_DEV_BATTERY_IMPEDANCE^MDC_IDC||3|kOhm|||||F|||20070422170125||||DEV12345
OBX|13|DTM|1538^MDC_IDC_SYS_DEV_BATTERY_LAST_MEASURED_DATE^MDC_IDC||20070422170125||||||F|||20070422170125||||DEV12345
OBX|14|TX|1539^MDC_IDC_SYS_DEV_BATTERY_LIFE^MDC_IDC||BOL||||||F|||20070422170125||||DEV12345
OBX|15|NM|1540^MDC_IDC_SYS_DEV_BATTERY_LONGEVITY_REMAINING^MDC_IDC||40|mo|||||F|||20070422170125||||DEV12345
OBX|16|NM|1541^MDC_IDC_SYS_DEV_BATTERY_VOLTAGE^MDC_IDC||6.02|V|||||F|||20070422170125||||DEV12345
OBX|17|DTM|1793^MDC_IDC_SYS_DEV_CAP_CHARGE_DATE^MDC_IDC||20070222170125||||||F|||20070422170125||||DEV12345
OBX|18|NM|1794^MDC_IDC_SYS_DEV_CAP_CHARGE_ENERGY^MDC_IDC||20 J|J|||||F|||20070422170125||||DEV12345
OBX|19|NM|1795^MDC_IDC_SYS_DEV_CAP_CHARGE_TIME^MDC_IDC||6.2 s|s|||||F|||20070422170125||||DEV12345
OBX|20|DTM|1796^MDC_IDC_SYS_DEV_CAP_REFORM_CHARGE_DATE^MDC_IDC||20070222170125||||||F|||20070422170125||||DEV12345
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OBX|21|NM|1797^MDC_IDC_SYS_DEV_CAP_REFORM_CHARGE_ENERGY^MDC_IDC||30 J|J|||||F|||20070422170125||||DEV12345
OBX|22|NM|1798^MDC_IDC_SYS_DEV_CAP_REFORM_CHARGE_TIME^MDC_IDC||9.4 s|s|||||F|||20070422170125||||DEV12345
OBX|23|DTM|2049^MDC_IDC_SYS_DEV_COUNT_CLEARED_DATE^MDC_IDC||20070323170125||||||F|||20070422170125||||DEV12345
OBX|24|NM|2050^MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_DURATION^MDC_IDC||0.0625|min:sec|||||F|||20070422170125||||DEV12345
OBX|25|NM|2058^MDC_IDC_SYS_DEV_COUNT_MODE_SWITCH_PERCENT^MDC_IDC||2|%|||||F|||20070422170125||||DEV12345
OBX|26|NM|2059^MDC_IDC_SYS_DEV_COUNT_PACED_PERCENT^MDC_IDC||90|%|||||F|||20070422170125||||DEV12345
OBX|27|TX|1281^MDC_IDC_SYS_DEV_SET_AT_MODE_SWITCH^MDC_IDC||DDI||||||F|||20070422170125||||DEV12345
OBX|28|NM|1282^MDC_IDC_SYS_DEV_SET_AT_MODE_SWITCH_RATE^MDC_IDC||200|1/min|||||F|||20070422170125||||DEV12345
OBX|29|TX|1283^MDC_IDC_SYS_DEV_SET_ATACHY_MODE^MDC_IDC||Monitor||||||F|||20070422170125||||DEV12345
OBX|30|NM|1284^MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_PACE^MDC_IDC||100|ms|||||F|||20070422170125||||DEV12345
OBX|31|NM|1293^MDC_IDC_SYS_DEV_SET_AV_DELAY_AFTER_SENSE^MDC_IDC||100|ms|||||F|||20070422170125||||DEV12345
OBX|32|TX|1301^MDC_IDC_SYS_DEV_SET_BRADY_MODE^MDC_IDC||DDDR||||||F|||20070422170125||||DEV12345
OBX|33|TX|1302^MDC_IDC_SYS_DEV_SET_INITIAL_PACED_VENT_CHMBR^MDC_IDC||RV||||||F|||20070422170125||||DEV12345
OBX|34|NM|1303^MDC_IDC_SYS_DEV_SET_LOWER_RATE_LIMIT^MDC_IDC||70|1/min|||||F|||20070422170125||||DEV12346
OBX|35|NM|1304^MDC_IDC_SYS_DEV_SET_LV_BLANKING_PERIOD^MDC_IDC||400|ms|||||F|||20070422170125||||DEV12347
OBX|36|NM|1305^MDC_IDC_SYS_DEV_SET_LVRP^MDC_IDC||250|ms|||||F|||20070422170125||||DEV12348
OBX|37|NM|1306^MDC_IDC_SYS_DEV_SET_MAGNET_RATE^MDC_IDC||55|1/min|||||F|||20070422170125||||DEV12349
OBX|38|NM|1307^MDC_IDC_SYS_DEV_SET_MAX_SENSOR_RATE^MDC_IDC||130|1/min|||||F|||20070422170125||||DEV12350
OBX|39|NM|1308^MDC_IDC_SYS_DEV_SET_MAX_TRACKING_RATE^MDC_IDC||100 /min|1/min|||||F|||20070422170125||||DEV12351
OBX|40|NM|1309^MDC_IDC_SYS_DEV_SET_PACING_SENSED_AV_OFFSET^MDC_IDC||-50|ms|||||F|||20070422170125||||DEV12352
OBX|41|NM|1310^MDC_IDC_SYS_DEV_SET_PVARP^MDC_IDC||250|ms|||||F|||20070422170125||||DEV12353
OBX|42|NM|1318^MDC_IDC_SYS_DEV_SET_RATE_HYSTERESIS^MDC_IDC||60|1/min|||||F|||20070422170125||||DEV12354
OBX|43|NM|1319^MDC_IDC_SYS_DEV_SET_RVRP^MDC_IDC||250|ms|||||F|||20070422170125||||DEV12355
OBX|44|NM|1327^MDC_IDC_SYS_DEV_SET_SEARCH_HYSTERESIS^MDC_IDC||256||||||F|||20070422170125||||DEV12356
OBX|45|NM|1328^MDC_IDC_SYS_DEV_SET_V_TO_V_OFFSET^MDC_IDC||15|ms|||||F|||20070422170125||||DEV12357
OBX|46|TX|1329^MDC_IDC_SYS_DEV_SET_VENT_PACING_CONFIG^MDC_IDC||BiV||||||F|||20070422170125||||DEV12358
OBX|47|TX|1330^MDC_IDC_SYS_DEV_SET_VTACHY_MODE^MDC_IDC||Therapy||||||F|||20070422170125||||DEV12359
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OBX|48|TX|2314^MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_NAME^MDC_IDC|1|Slow VT||||||F|||20070422170125||||DEV12359
OBX|49|TX|2315^MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_STATUS^MDC_IDC|1|Active||||||F|||20070422170125||||DEV12359
OBX|50|TX|2312^MDC_IDC_SYS_DEV_TAC_THRPY_TYPE_ATP^MDC_IDC|1|Ramp||||||F|||20070422170125||||DEV12359
OBX|51|NM|2308^MDC_IDC_SYS_DEV_TAC_THRPY_PULSES_ATP^MDC_IDC|1|3||||||F|||20070422170125||||DEV12359
OBX|52|NM|2309^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY^MDC_IDC|1.1|25|J|||||F|||20070422170125||||DEV12359
OBX|53|NM|2309^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY^MDC_IDC|1.2|27|J|||||F|||20070422170125||||DEV12359
OBX|54|NM|2309^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY^MDC_IDC|1.3|29|J|||||F|||20070422170125||||DEV12359
OBX|55|NM|2309^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY^MDC_IDC|1.4|32|J|||||F|||20070422170125||||DEV12359
OBX|56|NM|2309^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY^MDC_IDC|1.5|35|J|||||F|||20070422170125||||DEV12359
OBX|57|NM|2310^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_MAX_ADDITIONAL^MDC_IDC|1|4||||||F|||20070422170125||||DEV12359
OBX|58|NM|2311^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_MAX_ENERGY^MDC_IDC|1|35|J|||||F|||20070422170125||||DEV12359
OBX|59|NM|2313^MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_DETECT_RATE^MDC_IDC|1|120|1/min|||||F|||20070422170125||||DEV12359
OBX|60|TX|2316^MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_SVT_DISCR_STATUS^MDC_IDC|1|ON||||||F|||20070422170125||||DEV12359
OBX|61|TX|2314^MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_NAME^MDC_IDC|2|Fast VT||||||F|||20070422170125||||DEV12359
OBX|62|TX|2315^MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_STATUS^MDC_IDC|2|Active||||||F|||20070422170125||||DEV12359
OBX|63|TX|2312^MDC_IDC_SYS_DEV_TAC_THRPY_TYPE_ATP^MDC_IDC|2|Ramp Scan||||||F|||20070422170125||||DEV12359
OBX|64|NM|2308^MDC_IDC_SYS_DEV_TAC_THRPY_PULSES_ATP^MDC_IDC|2|3||||||F|||20070422170125||||DEV12359
OBX|65|NM|2309^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY^MDC_IDC|2.1|25|J|||||F|||20070422170125||||DEV12359
OBX|66|NM|2309^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY^MDC_IDC|2.2|27|J|||||F|||20070422170125||||DEV12359
OBX|67|NM|2309^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY^MDC_IDC|2.3|29|J|||||F|||20070422170125||||DEV12359
OBX|68|NM|2309^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY^MDC_IDC|2.4|32|J|||||F|||20070422170125||||DEV12359
OBX|69|NM|2309^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_ENERGY^MDC_IDC|2.5|35|J|||||F|||20070422170125||||DEV12359
OBX|70|NM|2310^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_MAX_ADDITIONAL^MDC_IDC|2|4||||||F|||20070422170125||||DEV12359
OBX|71|NM|2311^MDC_IDC_SYS_DEV_TAC_THRPY_SHOCK_MAX_ENERGY^MDC_IDC|2|35|J|||||F|||20070422170125||||DEV12359
OBX|72|NM|2313^MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_DETECT_RATE^MDC_IDC|2|150|1/min|||||F|||20070422170125||||DEV12359
OBX|73|TX|2316^MDC_IDC_SYS_DEV_TAC_THRPY_ZONE_SVT_DISCR_STATUS^MDC_IDC|2|ON||||||F|||20070422170125||||DEV12359
OBX|74|TX|2307^MDC_IDC_SYS_DEV_TAC_THRPY_COUNTER_TYPE^MDC_IDC|1|Shocks_Delivered||||||F|||20070422170125||||DEV12360
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OBX|75|NM|2305^MDC_IDC_SYS_DEV_TAC_THRPY_COUNTER_RECENT^MDC_IDC|1|1||||||F|||20070422170125||||DEV12361
OBX|76|NM|2306^MDC_IDC_SYS_DEV_TAC_THRPY_COUNTER_TOTAL^MDC_IDC|1|3||||||F|||20070422170125||||DEV12362
OBX|77|TX|2307^MDC_IDC_SYS_DEV_TAC_THRPY_COUNTER_TYPE^MDC_IDC|2|Shocks_Aborted||||||F|||20070422170125||||DEV12363
OBX|78|NM|2305^MDC_IDC_SYS_DEV_TAC_THRPY_COUNTER_RECENT^MDC_IDC|2|0||||||F|||20070422170125||||DEV12364
OBX|79|NM|2306^MDC_IDC_SYS_DEV_TAC_THRPY_COUNTER_TOTAL^MDC_IDC|2|1||||||F|||20070422170125||||DEV12365
OBX|80|NM|2821^MDC_IDC_SYS_DEV_EPISODE_TYPE^MDC_IDC|1|VF||||||F|||20070422170125||||DEV12370
OBX|81|TX|2820^MDC_IDC_SYS_DEV_EPISODE_IDENTIFIER^MDC_IDC|1|VF-12345||||||F|||20070422170125||||DEV12369
OBX|82|DTM|2817^MDC_IDC_SYS_DEV_EPISODE_DATE_TIME^MDC_IDC|1|20070222170125||||||F|||20070422170125||||DEV12366
OBX|83|TX|2818^MDC_IDC_SYS_DEV_EPISODE_DESCRIPTION^MDC_IDC|1|Ventricular asdfxj djodwa …||||||F|||20070422170125||||DEV12367
OBX|84|NM|2819^MDC_IDC_SYS_DEV_EPISODE_DURATION^MDC_IDC|1|00:01:30|hr:min:sec|||||F|||20070422170125||||DEV12368
OBX|85|NM|2821^MDC_IDC_SYS_DEV_EPISODE_TYPE^MDC_IDC|2|NST||||||F|||20070422170125||||DEV12370
OBX|86|TX|2820^MDC_IDC_SYS_DEV_EPISODE_IDENTIFIER^MDC_IDC|2|NST-12345||||||F|||20070422170125||||DEV12369
OBX|87|DTM|2817^MDC_IDC_SYS_DEV_EPISODE_DATE_TIME^MDC_IDC|2|20070215170125||||||F|||20070422170125||||DEV12366
OBX|88|TX|2818^MDC_IDC_SYS_DEV_EPISODE_DESCRIPTION^MDC_IDC|2|Non-sustained asdfxj djodwa …||||||F|||20070422170125||||DEV12367
OBX|89|NM|2819^MDC_IDC_SYS_DEV_EPISODE_DURATION^MDC_IDC|2|00:00:45|hr:min:sec|||||F|||20070422170125||||DEV12368
OBX|90|TX|3075^MDC_IDC_SYS_DEV_EPISODE_COUNTER_TYPE^MDC_IDC|1|SVT||||||F|||20070422170125||||DEV12371
OBX|91|NM|3073^MDC_IDC_SYS_DEV_EPISODE_COUNTER_RECENT^MDC_IDC|1|10||||||F|||20070422170125||||DEV12369
OBX|92|NM|3074^MDC_IDC_SYS_DEV_EPISODE_COUNTER_TOTAL^MDC_IDC|1|10||||||F|||20070422170125||||DEV12370
OBX|93|TX|3075^MDC_IDC_SYS_DEV_EPISODE_COUNTER_TYPE^MDC_IDC|2|Afib||||||F|||20070422170125||||DEV12371
OBX|94|NM|3073^MDC_IDC_SYS_DEV_EPISODE_COUNTER_RECENT^MDC_IDC|2|5||||||F|||20070422170125||||DEV12369
OBX|95|NM|3074^MDC_IDC_SYS_DEV_EPISODE_COUNTER_TOTAL^MDC_IDC|2|5||||||F|||20070422170125||||DEV12370
OBX|96|TX|3592^MDC_IDC_SYS_LEAD_INFO_NAME^MDC_IDC|1|Kentrox Steroid||||||F|||20070422170125||||DEV12371
OBX|97|TX|3590^MDC_IDC_SYS_LEAD_INFO_MANUFACTURER^MDC_IDC|1|BIO||||||F|||20070422170125||||DEV12372
OBX|98|TX|3591^MDC_IDC_SYS_LEAD_INFO_MODEL^MDC_IDC|1|SL_S||||||F|||20070422170125||||DEV12373
OBX|99|TX|3593^MDC_IDC_SYS_LEAD_INFO_SERIAL_NUMBER^MDC_IDC|1|54324321||||||F|||20070422170125||||DEV12374
OBX|100|TX|3594^MDC_IDC_SYS_LEAD_INFO_STATE^MDC_IDC|1|Active||||||F|||20070422170125||||DEV12375
OBX|101|TX|3595^MDC_IDC_SYS_LEAD_INFO_STATUS^MDC_IDC|1|OK||||||F|||20070422170125||||DEV12376
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OBX|102|DTM|3589^MDC_IDC_SYS_LEAD_INFO_IMPLANT_DATE^MDC_IDC|1|20060422170125||||||F|||20070422170125||||DEV12377
OBX|103|TX|3587^MDC_IDC_SYS_LEAD_INFO_FIXATION_SITE^MDC_IDC|1|RV||||||F|||20070422170125||||DEV12378
OBX|104|TX|3588^MDC_IDC_SYS_LEAD_INFO_FIXATION_SITE_MODIFIER^MDC_IDC|1|Apex||||||F|||20070422170125||||DEV12379
OBX|105|TX|3592^MDC_IDC_SYS_LEAD_INFO_NAME^MDC_IDC|2|MDT Lead Name||||||F|||20070422170125||||DEV12371
OBX|106|TX|3590^MDC_IDC_SYS_LEAD_INFO_MANUFACTURER^MDC_IDC|2|MDT||||||F|||20070422170125||||DEV12372
OBX|107|TX|3591^MDC_IDC_SYS_LEAD_INFO_MODEL^MDC_IDC|2|MDT Lead||||||F|||20070422170125||||DEV12373
OBX|108|TX|3593^MDC_IDC_SYS_LEAD_INFO_SERIAL_NUMBER^MDC_IDC|2|12345678||||||F|||20070422170125||||DEV12374
OBX|109|TX|3594^MDC_IDC_SYS_LEAD_INFO_STATE^MDC_IDC|2|Active||||||F|||20070422170125||||DEV12375
OBX|110|TX|3595^MDC_IDC_SYS_LEAD_INFO_STATUS^MDC_IDC|2|OK||||||F|||20070422170125||||DEV12376
OBX|111|DTM|3589^MDC_IDC_SYS_LEAD_INFO_IMPLANT_DATE^MDC_IDC|2|20060422170125||||||F|||20070422170125||||DEV12377
OBX|112|TX|3587^MDC_IDC_SYS_LEAD_INFO_FIXATION_SITE^MDC_IDC|2|RA||||||F|||20070422170125||||DEV12378
OBX|113|TX|3588^MDC_IDC_SYS_LEAD_INFO_FIXATION_SITE_MODIFIER^MDC_IDC|2|Mid||||||F|||20070422170125||||DEV12379
OBX|114|TX|3842^MDC_IDC_SYS_CHNL_CHMBR^MDC_IDC|1|RV||||||F|||20070422170125||||DEV12380
OBX|115|TX|3845^MDC_IDC_SYS_CHNL_LEAD_SERIAL_NUMBER^MDC_IDC|1|12345678||||||F|||20070422170125||||DEV12381
OBX|116|NM|3841^MDC_IDC_SYS_CHNL_STATUS^MDC_IDC|1|Active||||||F|||20070422170125||||DEV12382
OBX|117|TX|3853^MDC_IDC_SYS_CHNL_POLARITY_TYPE^MDC_IDC|1|Bipolar||||||F|||20070422170125||||DEV12383
OBX|118|NM|3843^MDC_IDC_SYS_CHNL_IMPEDANCE^MDC_IDC|1|510|Ohms|||||F|||20070422170125||||DEV12384
OBX|119|NM|3844^MDC_IDC_SYS_CHNL_INTRINSIC_AMPLITUDE^MDC_IDC|1|2.2|mV|||||F|||20070422170125||||DEV12385
OBX|120|TX|3846^MDC_IDC_SYS_CHNL_PACE_THRESHOLD^MDC_IDC|1|1.0V @ 0.5 ms||||||F|||20070422170125||||DEV12386
OBX|121|NM|3847^MDC_IDC_SYS_CHNL_PACE_THRESHOLD_AMPLITUDE^MDC_IDC|1|1.0|V|||||F|||20070422170125||||DEV12387
OBX|122|NM|3848^MDC_IDC_SYS_CHNL_PACE_THRESHOLD_PULSE_WIDTH^MDC_IDC|1|0.5|ms|||||F|||20070422170125||||DEV12388
OBX|123|NM|3858^MDC_IDC_SYS_CHNL_SETTING_PACING_AMPLITUDE^MDC_IDC|1|2.5|V|||||F|||20070422170125||||DEV12389
OBX|124|TX|3859^MDC_IDC_SYS_CHNL_SETTING_PACING_AUTOMATIC_CAPTURE^MDC_IDC|1|OFF||||||F|||20070422170125||||DEV12390
OBX|125|TX|3860^MDC_IDC_SYS_CHNL_SETTING_PACING_OUTPUT^MDC_IDC|1|2.5V @ 0.5 ms||||||F|||20070422170125||||DEV12391
OBX|126|NM|3861^MDC_IDC_SYS_CHNL_SETTING_PACING_PULSE_WIDTH^MDC_IDC|1|0.5|ms|||||F|||20070422170125||||DEV12392
OBX|127|NM|3862^MDC_IDC_SYS_CHNL_SETTING_SENSING_SENSITIVITY^MDC_IDC|1|Nominal||||||F|||20070422170125||||DEV12393
OBX|128|TX|3849^MDC_IDC_SYS_CHNL_PACING_CONFIG_ANODE^MDC_IDC|1|Tip||||||F|||20070422170125||||DEV12394
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OBX|129|TX|3850^MDC_IDC_SYS_CHNL_PACING_CONFIG_ANODE_LOC^MDC_IDC|1|Right_Ventricle||||||F|||20070422170125||||DEV12395
OBX|130|TX|3851^MDC_IDC_SYS_CHNL_PACING_CONFIG_CATHODE^MDC_IDC|1.1|Ring||||||F|||20070422170125||||DEV12396
OBX|131|TX|3852^MDC_IDC_SYS_CHNL_PACING_CONFIG_CATHODE_LOC^MDC_IDC|1.1|Right_Ventricle||||||F|||20070422170125||||DEV12397
OBX|132|TX|3851^MDC_IDC_SYS_CHNL_PACING_CONFIG_CATHODE^MDC_IDC|1.2|Ring||||||F|||20070422170125||||DEV12398
OBX|133|TX|3852^MDC_IDC_SYS_CHNL_PACING_CONFIG_CATHODE_LOC^MDC_IDC|1.2|Right_Ventricle||||||F|||20070422170125||||DEV12399
OBX|134|TX|3854^MDC_IDC_SYS_CHNL_SENSING_CONFIG_ANODE^MDC_IDC|1|Tip||||||F|||20070422170125||||DEV12400
OBX|135|TX|3855^MDC_IDC_SYS_CHNL_SENSING_CONFIG_ANODE_LOC^MDC_IDC|1|Right_Ventricle||||||F|||20070422170125||||DEV12401
OBX|136|TX|3856^MDC_IDC_SYS_CHNL_SENSING_CONFIG_CATHODE^MDC_IDC|1|Ring||||||F|||20070422170125||||DEV12402
OBX|137|TX|3857^MDC_IDC_SYS_CHNL_SENSING_CONFIG_CATHODE_LOC^MDC_IDC|1|Right_Ventricle||||||F|||20070422170125||||DEV12403
OBX|138|TX|3842^MDC_IDC_SYS_CHNL_CHMBR^MDC_IDC|2|RA||||||F|||20070422170125||||DEV12404
OBX|139|TX|3845^MDC_IDC_SYS_CHNL_LEAD_SERIAL_NUMBER^MDC_IDC|2|54324321||||||F|||20070422170125||||DEV12405
OBX|140|NM|3841^MDC_IDC_SYS_CHNL_STATUS^MDC_IDC|2|Active||||||F|||20070422170125||||DEV12406
OBX|141|TX|3853^MDC_IDC_SYS_CHNL_POLARITY_TYPE^MDC_IDC|2|Bipolar||||||F|||20070422170125||||DEV12407
OBX|142|NM|3843^MDC_IDC_SYS_CHNL_IMPEDANCE^MDC_IDC|2|510|Ohms|||||F|||20070422170125||||DEV12408
OBX|143|NM|3844^MDC_IDC_SYS_CHNL_INTRINSIC_AMPLITUDE^MDC_IDC|2|2.2|mV|||||F|||20070422170125||||DEV12409
OBX|144|TX|3846^MDC_IDC_SYS_CHNL_PACE_THRESHOLD^MDC_IDC|2|1.0V @ 0.5 ms||||||F|||20070422170125||||DEV12410
OBX|145|NM|3847^MDC_IDC_SYS_CHNL_PACE_THRESHOLD_AMPLITUDE^MDC_IDC|2|1.0|V|||||F|||20070422170125||||DEV12411
OBX|146|NM|3848^MDC_IDC_SYS_CHNL_PACE_THRESHOLD_PULSE_WIDTH^MDC_IDC|2|0.5|ms|||||F|||20070422170125||||DEV12412
OBX|147|NM|3858^MDC_IDC_SYS_CHNL_SETTING_PACING_AMPLITUDE^MDC_IDC|2|2.5|V|||||F|||20070422170125||||DEV12413
OBX|148|TX|3859^MDC_IDC_SYS_CHNL_SETTING_PACING_AUTOMATIC_CAPTURE^MDC_IDC|2|OFF||||||F|||20070422170125||||DEV12414
OBX|149|TX|3860^MDC_IDC_SYS_CHNL_SETTING_PACING_OUTPUT^MDC_IDC|2|2.5V @ 0.5 ms||||||F|||20070422170125||||DEV12415
OBX|150|NM|3861^MDC_IDC_SYS_CHNL_SETTING_PACING_PULSE_WIDTH^MDC_IDC|2|0.5 ms|ms|||||F|||20070422170125||||DEV12416
OBX|151|NM|3862^MDC_IDC_SYS_CHNL_SETTING_SENSING_SENSITIVITY^MDC_IDC|2|Nominal||||||F|||20070422170125||||DEV12417
OBX|152|TX|3849^MDC_IDC_SYS_CHNL_PACING_CONFIG_ANODE^MDC_IDC|2|Tip||||||F|||20070422170125||||DEV12418
OBX|153|TX|3850^MDC_IDC_SYS_CHNL_PACING_CONFIG_ANODE_LOC^MDC_IDC|2|Right_Atrial||||||F|||20070422170125||||DEV12419
OBX|154|TX|3851^MDC_IDC_SYS_CHNL_PACING_CONFIG_CATHODE^MDC_IDC|2|Ring||||||F|||20070422170125||||DEV12420
OBX|155|TX|3852^MDC_IDC_SYS_CHNL_PACING_CONFIG_CATHODE_LOC^MDC_IDC|2|Right_Atrial||||||F|||20070422170125||||DEV12421
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OBX|156|TX|3854^MDC_IDC_SYS_CHNL_SENSING_CONFIG_ANODE^MDC_IDC|2|Tip||||||F|||20070422170125||||DEV12424
OBX|157|TX|3855^MDC_IDC_SYS_CHNL_SENSING_CONFIG_ANODE_LOC^MDC_IDC|2|Right_Atrial||||||F|||20070422170125||||DEV12425
OBX|158|TX|3856^MDC_IDC_SYS_CHNL_SENSING_CONFIG_CATHODE^MDC_IDC|2|Ring||||||F|||20070422170125||||DEV12426
OBX|159|TX|3857^MDC_IDC_SYS_CHNL_SENSING_CONFIG_CATHODE_LOC^MDC_IDC|2|Right_Atrial||||||F|||20070422170125||||DEV12427
OBX|160|NM|4097^MDC_IDC_SYS_HV_CHNL_DEFIB_THRESHOLD^MDC_IDC|1|12|J|||||F|||20070422170125||||DEV12428
OBX|161|NM|4098^MDC_IDC_SYS_HV_CHNL_IMPEDANCE^MDC_IDC|1|52 Ohms|Ohms|||||F|||20070422170125||||DEV12429
OBX|162|TX|4106^MDC_IDC_SYS_HV_CHNL_LEAD_SERIAL_NUMBER^MDC_IDC|1|12345||||||F|||20070422170125||||DEV12430
OBX|163|TX|4107^MDC_IDC_SYS_HV_CHNL_POLARITY_TYPE^MDC_IDC|1|Unipolar||||||F|||20070422170125||||DEV12431
OBX|164|TX|4108^MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_ANODE^MDC_IDC|1.1|Ring||||||F|||20070422170125||||DEV12432
OBX|165|TX|4109^MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_ANODE_LOC^MDC_IDC|1.1|RV||||||F|||20070422170125||||DEV12433
OBX|166|TX|4108^MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_ANODE^MDC_IDC|1.2|Can||||||F|||20070422170125||||DEV12434
OBX|167|TX|4109^MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_ANODE_LOC^MDC_IDC|1.2|Unknown||||||F|||20070422170125||||DEV12435
OBX|168|TX|4110^MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_CATHODE^MDC_IDC|1|Tip||||||F|||20070422170125||||DEV12436
OBX|169|TX|4111^MDC_IDC_SYS_HV_CHNL_SHOCK_CONFIG_CATHODE_LOC^MDC_IDC|1|RV||||||F|||20070422170125||||DEV12437
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