



# Tech Note HeartSuite™ Hemodynamics HL7 Interface

## 1. Purpose

To document the HeartSuite Hemodynamics HL7 Interface specification and to identify information needed to achieve integration with a hospital information system (HIS).

## 2. Scope

Applies to HeartSuite Hemodynamics 6.10.x and HeartSuite Hemodynamics HL7 Inbound Interface 5.0 and HeartSuite Hemodynamics HL7 Outbound Interface 4.2.

The VERICIS, HeartSuite Hemodynamics, and EchoIMS HL7 Interface Technical Note (P/N: 85000-0599) should be used for HeartSuite Hemodynamics systems installed with VERICIS.

## 3. General Information

The HeartSuite Hemodynamics HL7 Interface is bi-directional. As a server, it receives and processes a subset of incoming ADT, ORM, and ORU (laboratory results) messages from HIS. As a client, it sends an ORU or MDM (Case/Procedure and Physician reports) messages to HIS.

Some of the benefits realized by use of the HeartSuite Hemodynamics HL7 Interface include:

- Reduction or elimination of redundant physician/technician manual data entry of patient data in HeartSuite Hemodynamics
- Automatic scheduling of cath procedures in HeartSuite Hemodynamics
- Means for HIS to send laboratory results to HeartSuite Hemodynamics
- Means for HIS to receive clinical reports from HeartSuite Hemodynamics

The HeartSuite Hemodynamics HL7 Interface allows for moderate configuration changes to meet site-specific requirements. It can be adapted to an institution's existing HL7 communications protocol and messaging structure if changes are not feasible on the institution's interface engine and/or HIS components. That stated, some modifications may require engineering development, which in turn constitutes site-customization and is subject to a separate Statement of Work.

### 3.1. Applicable Standards

The Interface follows the requirements and guidelines of the following directives, specifications and standards:

ANSI/HL7 V2.3.1-1999	HL7 Standard Version 2.3.1
ANSI/HL7 V2.3-1997	HL7 Standard Version 2.3

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## 3.2. Definitions

Term/Abbreviation	Definition
HL7	Health Level 7
HIS	Hospital Information System (includes an interface engine where applicable)

## 4. Networking Requirements

### 4.1. MLLP Transport Protocol

All inbound and outbound HL7 messages transferred between HeartSuite Hemodynamics HL7 Interface and a HIS is done via TCP/IP socket based communications with the message in the following HL7 MLLP data protocol form:

<SB><HL7 Data><EB>

where:

<SB> is the start block. It is a single **ASCII 11** (x0B) character.

<HL7 Data> is the HL7 message flatwire consisting of HL7 segments. Each segment must be terminated by an **ASCII 13** (x0D) character.

<EB> is the end block. It is a two character sequence; **ASCII 28** (x1C) followed by **ASCII 13** (x0D).

### 4.2. Network Connection and Transport Protocols

The HeartSuite Hemodynamics HL7 Interface expects the following networking capabilities from a HIS:

- The physical network layer is Ethernet.
- The HL7 messages will be transmitted using MLLP over TCP/IP. **Batch HL7 is not supported.**
- The HIS will connect to configurable port at an IP Address that have been selected by the Hospital's Network and/or the IS department. Multiple inbound connections to this port are supported. **Multiple ports are not supported.**
- The HIS will accept an HL7 ACK acknowledgement message in response to the messages sent to HeartSuite Hemodynamics HL7 Interface.
- The HIS will buffer messages in the event that the connection to the HeartSuite Hemodynamics HL7 Interface goes down. The buffered messages will be sent once the connection has been re-established.
- The HIS will listen on a port at specific IP Address to receive unsolicited report messages from the HeartSuite Hemodynamics HL7 Interface.
- The HIS will send acknowledgement messages with the HL7 ACK message type in response to the unsolicited report messages sent from HeartSuite Hemodynamics HL7 Interface.

### 4.3. Messaging Data Flow

The HeartSuite Hemodynamics HL7 Interface is capable of handling data flow that is unsolicited. As a server, the HeartSuite Hemodynamics HL7 Interface accepts unsolicited messages sent by the HIS. The HeartSuite Hemodynamics HL7 Interface, in turn, replies with an HL7 acknowledgment message of type ACK. As a client, the HeartSuite Hemodynamics HL7 Interface sends unsolicited messages to the HIS. The HeartSuite Hemodynamics HL7 Interface, in turn, expects an HL7 acknowledgment message of type ACK.

The HeartSuite Hemodynamics HL7 Interface transfers and processes HL7 messages with the following conditions:

- Original Acknowledgement rules apply.
- Non-deferred reply is used.
- Segments are not continued across messages.
- Messages are not batched.

Messages transferred between HeartSuite Hemodynamics HL7 Interface and the HIS are sent individually (segments do not span more than one HL7 message), and are acknowledged individually.

As a server, on startup, the HeartSuite Hemodynamics HL7 Interface waits for a TCP/IP connection requests initiated by a HIS. When the HIS is required to send a message, and there is no existing connection, it must connect to the HeartSuite Hemodynamics HL7 Interface, and requests a connection. Upon acceptance of the requested connection, the HIS transfers the message data and keeps the connection open until an acknowledgement from the HeartSuite Hemodynamics HL7 Interface is received. After this message transfer and acknowledgement cycle, the HIS can keep the connection open for further message transfers, or disconnect from the HeartSuite Hemodynamics HL7 Interface until another message transfer is required. At that time, another request for connection by the HIS is required and the same sequence of events is executed.

As a client, the HeartSuite Hemodynamics HL7 Interface will attempt to connect to the HIS when data is available for transfer to the HIS. After the message is sent, the HeartSuite Hemodynamics HL7 Interface client will wait a configurable amount of time for an acknowledgement to be returned. If an acknowledgement is not returned, the HeartSuite Hemodynamics HL7 Interface will attempt to resend the message again at a configurable number of times. If a message has not been acknowledge after the configurable number of attempts, the HeartSuite Hemodynamics HL7 Interface will attempt to send the next message in the queue.

## 4.4. Message Acknowledgment

### 4.4.1. Acknowledgement from HeartSuite Hemodynamics HL7 Interface

The HeartSuite Hemodynamics HL7 Inbound Interface acknowledges a message after it has received the message. The acknowledgement is sent on the same TCP/IP connection that the inbound message was sent on.

The acknowledgment message returned from HeartSuite Hemodynamics conforms to the following message grammar:

#### MSH MSA [ERR]

The message type returned for all acknowledgements is **ACK**. **MSA-1** will be **'AA'**. The HeartSuite Hemodynamics HL7 Interface echoes the originating message's message control ID in **MSA-2**. If an unsupported message is received, an Acknowledgement message having type **'ACK'**, code **"AA"** is returned with **"Message type not supported."** in the Text Message field **MSA-3**. The ERR segment contains the "Error Code and Location" in **ERR-1**.

Enhanced acknowledgement is not supported.

MSH Segment	Description	Notes
MSH-1	Field Separator	' '
MSH-2	Encoding Characters	'^~\&'
MSH-3	Sending Application	'HS-HEMODYNAMICS'
MSH-7	Date/Time of Message	Date from MSH-7 of incoming message
MSH-9	Message type	'ACK'
MSH-10	Message control ID	Unique identifier to relate response to initial message.
MSH-11	Processing ID	'P'
MSH-12	Version ID	'2.3'

MSA Segment	Description	Notes
MSA-1	Acknowledgement Code	'AA'
MSA-2	Message Control ID	ID taken from Message Control ID field (MSH-10) of incoming message.
MSA-3	Text Message	'Message Received'
MSA-4	Expected Sequence Number	0

ERR Segment	Description	Notes
ERR-1	Error Code and Location	

#### 4.4.2. Acknowledgement from HIS

The acknowledgment message returned from the HIS consists of the **MSH** and **MSA** segments. The message type returned for all acknowledgements is **ACK**. The HIS echoes the originating message's message control ID in **MSA-2**. The ERR segment is not used.

MSH Segment	Description	Notes
MSH-1	Field Separator	' '
MSH-2	Encoding Characters	'^~\&'
MSH-7	Date/Time of Message	Date/time
MSH-9	Message type	'ACK'
MSH-10	Message control ID	Unique identifier.
MSH-11	Processing ID	'P'
MSH-12	Version ID	'2.3'

MSA Segment	Description	Notes
MSA-1	Acknowledgement Code	Status from HIS
MSA-2	Message Control ID	ID taken from Message Control ID field (MSH-10) of incoming message.
MSA-3	Text Message	

## 5. Inbound Supported Messages

### 5.1. Message Types Supported

Message Type	Description
ADT^A01	Patient Admit
ADT^A03	Patient Discharge
ADT^A04	Patient Registration
ADT^A08	Patient Update
ADT^A11	Cancel Admission
ORM^O01	New Order (NW) Cancel Order (CA) Order Cancel (OC)
ORU^R01	Results Message (Laboratory)

### 5.2. Message Processing Description

#### 5.2.1. ADT Messages

When the HeartSuite Hemodynamics HL7 Interface receives an **ADT^A01** (patient admission) or **ADT^A04** (patient registration) messages, it stores the applicable patient demographics in the HIS patient database table and makes these patients available to HeartSuite Hemodynamics to schedule cath procedures.

When the HeartSuite Hemodynamics HL7 Interface receives **ADT^A03** (patient discharge) or **ADT^A11** (cancel admission) messages, it deletes the scheduled cath procedure in HeartSuite Hemodynamics (if one was scheduled and if the cath procedure has not taken place).

When the HeartSuite Hemodynamics HL7 Interface receives **ADT^A08** (patient information update) message, it updates the patient demographic stored in HeartSuite Hemodynamics.

When the HeartSuite Hemodynamics HL7 Interface receives **ADT^A34** (merge patient identifier) or **ADT^A40** (merge patient identifier) messages, the patient identifier stored in HeartSuite Hemodynamics is updated with the new patient identifier.

#### 5.2.2. Order Messages

When the HeartSuite Hemodynamics HL7 Interface receives an **ORM^O01-NW** (new order) message, it will schedule the cath procedure if there is no other cath procedure scheduled for the patient in HeartSuite Hemodynamics.

When the HeartSuite Hemodynamics HL7 Interface receives an **ORM^O01-CA** (cancel order) or **ORM^O01-OC** (order canceled) messages, it will delete the previously scheduled cath procedure in HeartSuite Hemodynamics, if the cath procedure has not been performed.

#### 5.2.3. Laboratory Results Messages

When the HeartSuite Hemodynamics HL7 Interface receives an **ORU^R01** (laboratory results) message, it stores the relevant laboratory results in the database, and makes these laboratory results available to HeartSuite Hemodynamics to include in the cath study.

### 5.3. Message Grammar

This section describes the default structure of the HeartSuite Hemodynamics HL7 Interface supported messages. The following notation applies:

[ ] Can have '0' of these items

{ } Can have 'n' number of these items.

Optional and repeating fields are allowed provided that use of these structures does not conflict with other requirements stated in this specification.

#### 5.3.1. General Structure of the Message

Message Type	Event Type	Message
ADT	A01, A04, A08	MSH [EVN] PID [NK1] [PV1] [IN1] [IN2]
ADT	A03, A11	MSH [EVN] PID [PV1]
ADT	A34, A40	MSH [EVN] PID [PD1] MRG
ORM	O01	MSH PID [PV1] [PV2] ORC OBR
ORU	R01	MSH PID [PV1] OBR OBX

### 5.4. Message Segment Definition

The following section describes the segments and fields supported by the HeartSuite Hemodynamics HL7 Interface. Values shown in "**Bold**" are required. Optional fields are not bolded.

#### 5.4.1. ADT Message Segment Definition

MSH Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
<b>MSH-1</b>	<b>Field Separator</b>		N/A
<b>MSH-2</b>	<b>Encoding Characters</b>		N/A
MSH-3	Sending Application	This field is copied to the MSH-5- ReceivingApplication field in the reply message (ACK).	N/A
MSH-4	Sending Facility	This field is copied to the MSH-6- ReceivingFacility field in the reply message (ACK).	N/A
MSH-5	Receiving Application		N/A
MSH-7	Date/Time of Message		N/A
<b>MSH-9</b>	<b>Message Type</b>	'ADT^A01', etc.	N/A
<b>MSH-10</b>	<b>Message Control ID</b>		N/A
<b>MSH-11.1</b>	<b>Processing ID</b>		N/A
<b>MSH-12</b>	<b>Version ID</b>	2.3.1	N/A
MSH-15	Accept ACK Type		N/A

PID Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
PID-3.1	Patient Identifier List	Allowed to be repeating but only the first repeating item is used.	Patient:MRN
PID-5.1.1	Patient Name - Family Name		Patient:Patient_Name
PID-5.2	Patient Name - Given Name		Patient:Patient_Name
PID-7	Date Time Of Birth		Patient:Date_Of_Birth
PID-8	Patient Sex		Patient:Sex
PID-10	Race		Patient:Race_ID (FK SelectionItems:ID)
PID-11.1	Patient Address - Street Address		Patient:Address
PID-11.3	Patient Address - City		Patient:City
PID-11.4	Patient Address - State Or Province		Patient:State
PID-11.5	Patient Address - Zip Or Postal Code		Patient:Zip
PID-13.1	Phone Number - Home		Patient:Home_Phone
PID-14.1	Phone Number - Office		Patient:Work_Phone
PID-18	Patient Account Number		Study:FinancialNumber
PID-19	Social Security Number		Patient:SSN

PV1 Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
PV1-3.2	Assigned Patient Location - Room		Study:RoomNumber
PV1-7.1	Attending Doctor - ID Number		Personnel:Hospital_ID Study:Person_ID (FK Personnel:Person_ID)
PV1-7.2.1	Attending Doctor - Family Name		Personnel:Last_Name
PV1-7.3	Attending Doctor - Given Name		Personnel:First_Name
PV1-7.7	Attending Doctor - Degree		Personnel:Degree
PV1-8.1	Referring Doctor - ID Number		Personnel:Hospital_ID Study:ReferringMD_ID (FK Personnel:Person_ID)
PV1-8.2.1	Referring Doctor - Family Name		Personnel:Last_Name

<b>PV1 Segment</b>	<b>Description</b>	<b>Notes</b>	<b>HeartSuite Hemodynamics Database Table:Column</b>
PV1-8.3	Referring Doctor - Given Name		Personnel:First_Name
PV1-8.7	Referring Doctor - Degree		Personnel:Degree
PV1-19	Visit Number		Study:VisitNumber
PV1-44	Admit Date Time	If missing, the admit date and time will be set to the current date and time.	Study:AdmitDate

<b>NK1 Segment</b>	<b>Description</b>	<b>Notes</b>	<b>HeartSuite Hemodynamics Database Table:Column</b>
NK1-2.1.1	Name - Family Name		Patient:Next_Of_Kin
NK1-2.2	Name - Given Name		Patient:Next_Of_Kin
NK1-5.1	Phone Number		Patient:Kin_Phone
NK1-30.1.1	Contact Person's Name - Family Name		Patient:Local_Contact
NK1-30.2	Contact Person's Name - Given Name		Patient:Local_Contact
NK1-31.1	Contact Person's Telephone Number		Patient:Contact_Phone

<b>IN1 Segment</b>	<b>Description</b>	<b>Notes</b>	<b>HeartSuite Hemodynamics Database Table:Column</b>
IN1-2.2	Insurance Plan ID		Patient:Third_Party_Number
IN1-4.1	Insurance Company Name		Patient:Third_Party

<b>IN2 Segment</b>	<b>Description</b>	<b>Notes</b>	<b>HeartSuite Hemodynamics Database Table:Column</b>
IN2-6	Medicare Health Insurance Card Number		Patient:Medicare
IN2-8	Medicaid Case Number		Patient:Medicaid

<b>MRG Segment</b>	<b>Description</b>	<b>Notes</b>	<b>HeartSuite Hemodynamics Database Table:Column</b>
MRG-1.1	PriorPatientIdentifierList	Allowed to be repeating but only the first repeating item is used.	N/A

### 5.4.2. ORM Message Segment Definition

For **MSH**, **PID**, and **PV1** segments, refer to **ADT Message Segment Definition** section.

*NOTE: The HeartSuite Hemodynamics HL7 Interface supports single order only per order message.*

ORC Segment	Description	Comment	HeartSuite Hemodynamics Database Table:Column
ORC-1	Order Control	Supported Order Control values: New Order (NW) Order Cancel (CA) Order Cancelled (OC)	N/A
ORC-7.4	Quantity Timing - Start Date Time		Study:Scheduled_Start

OBR Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
OBR-2.1	Placer Order Number		Study:PlacerOrderNumber
OBR-4.1	Universal Service ID - Identifier		UniversalService:UniversalServiceID_ID Study:UniversalServiceTag (FK UniversalService:tag)
OBR-4.2	Universal Service ID - Text		UniversalService:UniversalServiceID_Text
OBR-16.1	Ordering Doctor - ID		Personnel:Hospital_ID Study:OrderingMD_ID (FK Personnel:Person_ID)
OBR-16.2	Ordering Doctor - Family Name		Personnel>Last_Name
OBR-16.3	Ordering Doctor - Given Name		Personnel:First_Name
OBR-16.7	Ordering Doctor - Degree		Personnel:Degree
OBR-24	Diagnostic Service Section ID	Used to filter order messages so that only those directed to the Cath Lab are processed by HeartSuite Hemodynamics HL7 Interface. Should be set to the value of 'CTH'.	N/A

### 5.4.3. ORU (Laboratory Results) Message Segment Support

For MSH segment, refer to ADT Message Segment Definition section.

PID Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
PID-3.1	Patient ID (Internal ID)		HI7_Observation_Value:Patient_MRN
PID-5.1	Patient Name - Family Name		N/A
PID-5.2	Patient Name - Given Name		N/A
PID-7	Date and Time of Birth	Date format: YYYYMMDDHHMMSS	N/A
PID-8	Sex		N/A
PID-19	Social Security Number		N/A

OBR Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
OBR-7	Observation Date and Time	Date format: YYYYMMDDHHMMSS. If this value is not present then each OBX-14 must have a value. This will be used if value in OBX-14 is empty.	HI7_Observation_Value:Observation_Date

OBX Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
OBX-1	Set ID		N/A
OBX-2	Value Type		N/A
OBX-3.1	Observation Identifier - Identifier	A list is of identifiers must be provided to configure the HeartSuite Hemodynamics HL7 Interface	HI7_Msg_Obs_Code:Msg_Obs_Code
OBX-3.2	Observation Identifier - Text		N/A
OBX-3.3	Observation Identifier - Name of Coding System		N/A
OBX-5	Observation Value		HI7_Observation_Value:Observation_Value  StudyLab table (each supported lab result value is stored in the appropriate field in this table when the lab results are incorporated in a study)

OBX Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
OBX-6.1	Units - Identifier	A list is of identifiers must be provided to configure the HeartSuite Hemodynamics HL7 Interface	HI7_Observation_Value:Unit
OBX-7	References Range		HI7_Observation_Value:Reference_Range
OBX-8	Abnormal Flag		HI7_Observation_Value:Abnormal_Flag
OBX-14	Date/Time of Observation	Date format: YYYYMMDDHHMMSS. If this value is not present then each OBR-7 must have a value.	HI7_Observation_Value:Observation_Date
OBX-15.1	Producer's ID - Identifier		HI7_Observation_Value:Producer_Id
OBX-15.2	Producer's ID - Text		HI7_Observation_Value:Producer_Id_Text
OBX-16.1	Responsible Observer - ID Number		HI7_Observation_Value:Responsible_Observer_Id
OBX-16.2	Responsible Observer - Family Name		HI7_Observation_Value:Responsible_Observer_Lastname
OBX-16.3	Responsible Observer - First Name		HI7_Observation_Value:Responsible_Observer_Firstname
OBX-17.1	Observation Method - Identifier		HI7_Observation_Value:Observation_Method_Id
OBX-17.2	Observation Method - Text		HI7_Observation_Value:Observation_Method_Text

### 5.5. Other Message Types and Segments

The HeartSuite Hemodynamics HL7 Interface will discard HL7 messages with message types other than those outlined above. Segments that do not contain any of the specified necessary or optional fields are also ignored. If possible, the HIS or interface engine should filter messages that are not supported by HeartSuite Hemodynamics HL7 Interface to minimize the number of messages it has to receive, process, and ultimately discard.

## 6. Outbound Supported Messages

### 6.1. Message Types Supported

Message Type	Description
ORU^R01	Report (Case/Procedure or Physician)
MDM^T02	Report (Case/Procedure or Physician)

### 6.2. Message Processing Description

When a Case/Procedure or Physician report is verified in HeartSuite Hemodynamics, the HeartSuite Hemodynamics HL7 Interface will send either an ORU^R01 or MDM^T02 to HIS as configured.

### 6.3. Message Grammar

This section describes the default structure of the HeartSuite Hemodynamics HL7 Interface supported messages. The following notation applies:

[ ] Can have '0' of these items

{ } Can have 'n' number of these items.

Optional and repeating fields are allowed provided that use of these structures does not conflict with other requirements stated in this specification.

#### 6.3.1. General Structure of the Message

Message Type	Event Type	Message
ORU	R01	MSH PID PV1 OBR {OBX} [DSC]
MDM	T02	MSH EVN PID PV1 TXA {OBX}

### 6.4. Message Segment Definition

The following section describes the segments and fields supported by the HeartSuite Hemodynamics HL7 Interface. Values shown in "**Bold**" are required. Optional fields are not bolded.

#### 6.4.1. MDM (Case / Physician Report) Message Segment Definition

*NOTE: The HeartSuite Hemodynamics HL7 Interface supports either ORU^R01 or MDM^T02, but not both for a given implementation.*

MSH Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
MSH-1	Field Separator	" "	N/A
MSH-2	Encoding Characters	"^~\&"	N/A
MSH-3	Sending Application	HeartSuite Hemodynamics	N/A
MSH-4	Sending Facility	HeartSuite Hemodynamics	N/A
MSH-5.1	Receiving Application		N/A

MSH Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
MSH-7	Date/Time of Message	Current date/time. Date format: YYYYMMDDHHMMSS.	N/A
MSH-9	Message Type	"ORU^R01"	N/A
MSH-10	Message Control ID	System generated. Unique identifier.	N/A
MSH-11	Processing ID	"P"	N/A
MSH-12	Version ID	"2.3"	N/A
MSH-15	Accept ACK Type	AL	N/A

PID Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
PID-3.1	Patient ID		Patient:MRN
PID-5.1	Patient Name - Family Name		Patient:Patient_Name
PID-5.2	Patient Name - Given Name		Patient:Patient_Name
PID-7	Date/Time of Birth	Date format: YYYYMMDDHHMMSS.	Patient:Date_Of_Birth
PID-8	Sex		Patient:Sex
PID-11.1	Patient Address - Street Address		Patient:Address
PID-11.3	Patient Address - City		Patient:City
PID-11.4	Patient Address - State or Province		Patient:State
PID-11.5	Patient Address - Zip or Postal code		Patient:Zip
PID-13.1	Phone Number - Home		Patient:Home_Phone
PID-14.1	Phone Number - Business		Patient:Work_Phone
PID-18.1	Patient Account Number		Study:FinancialNumber
PID-19	Social Security Number		Patient:SSN

PV1 Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
PV1-3.2	Assigned Patient Location - Room		Study:RoomNumber
PV1-7.1	Attending doctor - ID Number		Personnel:Hospital_ID Study:Person_ID (FK Personnel:Person_ID)

<b>PV1 Segment</b>	<b>Description</b>	<b>Notes</b>	<b>HeartSuite Hemodynamics Database Table:Column</b>
PV1-7.2	Attending doctor - Family Name		Personnel:Last_Name
PV1-7.3	Attending doctor - Given Name		Personnel:First_Name
PV1-8.1	Referring doctor - ID number		Personnel:Hospital_ID Study:ReferringMD_ID (FK Personnel:Person_ID)
PV1-8.2	Referring doctor - family name	The name is stored in LN, FN format in the database.	Personnel:Last_Name
PV1-8.3	Referring doctor - given name	The name is stored in LN, FN format in the database.	Personnel:First_Name
PV1-19.1	Visit Number		Study:VisitNumber
PV1-44	Admit Date/Time	Date format: YYYYMMDDHHMMSS.	Study:AdmitDate

<b>TXA Segment</b>	<b>Description</b>	<b>Notes</b>	<b>HeartSuite Hemodynamics Database Table:Column</b>
TXA-1	Set ID-TXA	1	N/A
TXA-2	Document Type	CR = Case Report PR = Physician Report	N/A
TXA-3	Document Content Presentation	FT = Formatted text	N/A
TXA-4	Activity Date/Time		Study:Cath_Date
TXA-5	Primary Activity Provider Code/ Name		Study:Person_ID
TXA-12	Unique Document Number		For Case Report: Study:Case_ID + CR  For Physician Report: Study:Case_ID + PR
TXA-14	Placer Order Number		Study:PlacerOrderNumber
TXA-17	Document Completion Status	AU = Authenticated	
TXA-22-1	Authentication Person, Time Stamp - ID number		Personnel:Hospital_ID  For Physician Report: Inscript_CaseVerification:Person_ID (FK Personnel:Person_ID)  For Case Report: Study:Person_ID (FK Personnel:Person_ID)
TXA-22.2	Authentication Person, Time Stamp - Family Name		Personnel:Last_Name

TXA Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
TXA-22.3	Authentication Person, Time Stamp - Given Name		Personnel:First_Name
TXA-22.15	Authentication Person, Time Stamp - Date/Time Action Performed		For Physician Report: Inscript_CaseVerification:VerifyDate  For Case Report: His_Text_Reports:Create_Date

The OBX segment encapsulates the entire text of the verified report. HeartSuite Hemodynamics HL7 Interface supports three options: (1) one OBX segment containing the whole report; (2) one OBX segment per line; (3) configurable number of bytes per OBX segment.

OBX Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
OBX-1	Set ID		N/A
OBX-2	Value Type	Value is set to "TX	"N/A
OBX-5	Observation Data		HIS_TextReports:Text
OBX-11	Observation Status	Value is set to "F	"N/A

#### 6.4.2. ORU (Case / Physician Report) Message Segment Definition

For MSH, PID, PV1, and OBX segments definition, refer to MDM (Case / Physician Report Message Segment Definition section).

*NOTE: The HeartSuite Hemodynamics HL7 Interface supports either ORU^R01 or MDM^T02, but not both for a given implementation.*

OBR Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
OBR-2.1	Placer Order Number		Study:PlacerOrderNumber
OBR-4.1	Universal Service ID - Identifier		UniversalService:UniversalServiceID_ID Study:UniversalServiceTag (FK UniversalService:tag)
OBR-4.2	Universal Service ID - Text		UniversalService:UniversalServiceID_Text
OBR-6	Requested Date & Time	Scheduled date for cath Date format: YYYYMMDDHHMMSS.	Study:Scheduled_Start
OBR-7	Observation Date & Time	Date cath was performed Date format: YYYYMMDDHHMMSS	Study:CathDate

OBR Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
OBR-16.1	Ordering Doctor - ID		Personnel:Hospital_ID Study:OrderingMD_ID (FK Personnel:Person_ID)
OBR-16.2	Ordering Doctor - Family Name		Personnel:Last_Name
OBR-16.3	Ordering Doctor - Given Name		Personnel:First_Name
OBR-22	Report Results/Status Change Date	Date format: YYYYMMDDHHMMSS  This is the date the report is verified/ confirmed	For Physician Report: Inscript_CaseVerification:VerifyDate  For Case Report: His_Text_Reports:Create_Date
OBR-25	Status/Correction Flag	Used to determine whether or not it is the first time the result has been uploaded.  If the result message is a subsequent result, then this field will have value of 'C', otherwise it is empty signaling the first time the result has been uploaded.	For Physician Report: Inscript_CaseVerification:Revision_ID  For Case Report: HIS_Text_Report:Version_Num
OBR-27.4	Quantity Timing - Start Date/ Time	Scheduled date for cath  Date format: YYYYMMDDHHMMSS.	Study:Scheduled_Start
OBR-32.1.1	Principal Results Interpreter - ID	Practitioner who confirmed the report. For Case report this is the Attending Doctor.	Personnel:Hospital_ID  For Physician Report: Inscript_CaseVerification:Person_ID (FK Personnel:Person_ID)  For Case Report: Study:Person_ID (FK Personnel:Person_ID)
OBR-32.1.2	Principal Results Interpreter - Family Name		Personnel:Last_Name
OBR-32.1.3	Principal Results Interpreter - Given Name		Personnel:First_Name

The DSC segment is used when a report message is broken into multiple ORU^R01 messages in support of a HIS that may restrict the number of OBX per ORU^R01 message.

DSC Segment	Description	Notes	HeartSuite Hemodynamics Database Table:Column
DSC-1	Continuation Pointer		N/A

## 6.5. Other Message Types and Segments

The HeartSuite Hemodynamics HL7 Interface will discard HL7 messages with message types other than those outlined above. Segments that do not contain any of the specified necessary or optional fields are also ignored.

## 7. Message Filtering

If possible, the HIS or interface engine should filter messages that are not supported by HeartSuite Hemodynamics HL7 Interface to minimize the number of messages it has to receive, process, and ultimately discard.

## 8. Laboratory Results ID And Unit ID

In order to correctly process laboratory results, the identifiers used by HIS to identify the laboratory result (OBX-3.1) as well as the units (OBX-6.1) must be provided. The following table shows the defaults used by HeartSuite Hemodynamics HL7 Interface.

Laboratory Result Name	Default Identifiers Recognized By HeartSuite Hemodynamics HL7 Interface (OBX-3.1)	Default Units Recognized By HeartSuite Hemodynamics HL7 Interface (OBX-6.1)
Activated clotting time - Pre	ActPre	sec
Activated clotting time - Post	ActPost	sec
Alanine aminotransferase	Alt	U/L
Aspartate aniotransferase	Ast	U/L
Blood Urea Nitrogen	BUN	mg/dL
BUN-to-Creatine Ratio	BunToCreatinine	ratio
c Reactive Protein	cRP	mg/dL
Calcium	Ca	mg/dL
Carbon dioxide	CO2	meq/L
Chlorine	Cl	meq/L
Cholesterol	Cholesterol	mg/dL
Creatine	Creat	mg/dL
Creatine phosphokinase	CPK	iu/L
Creatine phosphokinase-MB	CPKMB	iu/L
Glucose	GLU	mg/dL
Glycated Hemoglobin	A1c	%
HDL-to-LDL Ratio	HDLtoLDL	ratio
Hematocrit	HCT	%
Hemoglobin	Hgb	g/dL
High Density Lipoprotein	HDL	mg/dL
International Normalized Ratio	INR	ratio of PT

Laboratory Result Name	Default Identifiers Recognized By HeartSuite Hemodynamics HL7 Interface (OBX-3.1)	Default Units Recognized By HeartSuite Hemodynamics HL7 Interface (OBX-6.1)
Lactate dehydrogenase	LDH	U/L
Low Density Lipoprotein	LDL	mg/dL
Partial Thromboplastin Time	PTT	Sec
Platelet count	Plat	th/mm3
Potassium	K	meq/L
Prothrombin time	PT	Sec
Red Blood Cell count	RBC	mil/mm3
Sodium	Na	meq/L
Triglycerides	Triglycerides	mg/dL
Troponin I	Triponin	ng/ml
White Blood Cell count	WBC	th/mm3



## 9.2. Sample HeartSuite Hemodynamics Outbound ORU^R01 (Result) Message (Multiple OBX Segments)

```

MSH|^~\&|HS-HEMODYNAMICS^""^""|HeartSuite Hemodynamics^""^""|HIS||20060118113431||ORU^R01|06011811343132980244|P|2.3||AL|
PID||111111||Lastname^Firstname||1968070800000|M||12345 Somewhere Ave^^Ottawa^ON^90504||(111)111-1111|(222)222-
2222||ACT111|111111111|
PV1|^""^RM1||111111^Attending^Firstname|22222^Referring^Firstname|||||VID111|||||20031101140400|
OBR||PON111222||12345^Cath||20060111143000|^""^""||55555^Ordering^Firstname|||||20060111143910|^""^""||11111&Attending&Firstname|
OBX|1|TX||Cardiac Catheterization Report|||||F|
OBX|2|TX|||||F|
OBX|8|TX||Emageon|||||F|
OBX|9|TX||at|||||F|
OBX|10|TX|||||F|
OBX|11|TX||809C South Orlando Ave.|||||F|
OBX|12|TX||Winter Park, FL 32789|||||F|
OBX|13|TX|||||F|
OBX|17|TX||General|||||F|
OBX|18|TX|| Patient Information:|||||F|
OBX|19|TX||Patient:|||||F|
OBX|20|TX||PROCEDURE PTCA|||||F|
OBX|21|TX||DOB:|||||F|
OBX|22|TX||02/02/1950|||||F|
OBX|23|TX||Sex:|||||F|
OBX|24|TX||M|||||F|
OBX|25|TX||SSN:|||||F|
OBX|26|TX||345-34-5345|||||F|
OBX|27|TX|||||F|
OBX|28|TX||Age:|||||F|
OBX|29|TX||52 Years|||||F|
OBX|30|TX||Room No:|||||F|
OBX|31|TX|| |||||F|
OBX|37|TX|| Case Information:|||||F|
OBX|38|TX|||||F|
OBX|42|TX||Mrn:|||||F|
OBX|43|TX||04040433|||||F|
OBX|44|TX||Admit Date:|||||F|
OBX|45|TX||11/12/2002|||||F|
OBX|46|TX||Hospital No.:|||||F|
OBX|47|TX||1|||||F|
OBX|48|TX||Date of Procedure:|||||F|
OBX|49|TX||11/12/2002|||||F|
OBX|50|TX||Time:|||||F|
OBX|51|TX||15:55|||||F|
OBX|52|TX||Disc No:|||||F|
OBX|53|TX||0|||||F|
OBX|54|TX||Case No:|||||F|
OBX|55|TX||56423|||||F|
OBX|56|TX||Scheduled Time:|||||F|
OBX|57|TX||00:04|||||F|
OBX|58|TX||Frame/Side No:|||||F|
OBX|59|TX|| |||||F|
OBX|60|TX||Protocol No:|||||F|
OBX|61|TX|| |||||F|
OBX|62|TX||Financial No.:|||||F|

```

OBX|63|TX||567457|||||F|  
 OBX|64|TX||Lab No:|||||F|  
 OBX|65|TX||1|||||F|  
 OBX|67|TX|||||||F|  
 OBX|68|TX||Patient Status:|||||F|  
 OBX|69|TX||urgent|||||F|  
 OBX|70|TX||Physician:|||||F|  
 OBX|71|TX||test Zdoctor|||||F|  
 OBX|73|TX|||||||F|  
 OBX|74|TX|| Procedures:|||||F|  
 OBX|75|TX||IV site check Forearm (left)\X09\Sheath Insertion Fem Art (right)|||||F|  
 OBX|76|TX||Guide Cath Insert Fem Art (right)\X09\Coronary Angiogram LCA|||||F|  
 OBX|77|TX||PTCA wire insertion Fem Art (right)\X09\Balloon Insertion Fem Art (right)|||||F|  
 OBX|78|TX||PTCA LAD Mid\X09\Sheath sutured Fem Art (right)|||||F| OBX|79|TX|||||||F|  
 OBX|80|TX||\*\*\*\*\*|||||F|  
 OBX|81|TX||\*\*\*\*\*|||||F|  
 OBX|84|TX|||||||F|  
 OBX|85|TX||Patient Information|||||F|  
 OBX|86|TX||Capitated Pricing:|||||F|  
 OBX|87|TX|| No|||||F|  
 OBX|88|TX|| |||||F|  
 OBX|90|TX||Street Address|||||F|  
 OBX|91|TX||City|||||F|  
 OBX|92|TX||St.|||||F|  
 OBX|93|TX||Zip|||||F|  
 OBX|94|TX|| Street Address|||||F|  
 OBX|95|TX|| City|||||F|  
 OBX|96|TX|| |||||F|  
 OBX|97|TX|| Zip|||||F|  
 OBX|98|TX|||||||F|  
 OBX|99|TX||Home Phone #|||||F|  
 OBX|100|TX||Work Phone #|||||F|  
 OBX|101|TX|| |||||F|  
 OBX|104|TX||Next of Kin|||||F|  
 OBX|105|TX||Kin Phone #|||||F|  
 OBX|106|TX|| |||||F|  
 OBX|109|TX||Local Contact|||||F|  
 OBX|110|TX||Contact Phone #|||||F|  
 OBX|111|TX|| |||||F|  
 OBX|114|TX||Insurance|||||F|  
 OBX|115|TX|||||||F|  
 OBX|116|TX||Medicare #|||||F|  
 OBX|117|TX||Medicaid #|||||F|  
 OBX|118|TX|| |||||F|  
 OBX|121|TX||Third Party|||||F|  
 OBX|122|TX||Party #|||||F|  
 OBX|123|TX|| |||||F|  
 OBX|126|TX||Staff|||||F|  
 OBX|127|TX|||||||F|  
 OBX|128|TX||Referring Physician:|||||F|  
 OBX|129|TX|| |||||F|  
 OBX|131|TX||Assisting Physician(s):|||||F|  
 OBX|140|TX|||||||F|  
 OBX|141|TX||Fellow(s):|||||F|

OBX|142|TX||| |||||F|  
 OBX|149|TX||| \X09\6x|||||F|  
 OBX|150|TX|||||||F|  
 OBX|151|TX|||Scrub:|||||F|  
 OBX|152|TX||| |||||F|  
 OBX|153|TX|||X-ray:|||||F|  
 OBX|154|TX||| |||||F|  
 OBX|155|TX|||Record:|||||F|  
 OBX|156|TX||| Staff, One|||||F|  
 OBX|157|TX|||Other:|||||F|  
 OBX|158|TX||| |||||F|  
 OBX|159|TX|||Circulating:|||||F|  
 OBX|160|TX||| |||||F|  
 OBX|164|TX||| \_\_\_\_\_ |||||F|  
 OBX|165|TX|||Chronological Log (Military Time)|||||F|  
 OBX|166|TX|||||||F|  
 OBX|168|TX|||15:55 Patient Arrival Time (Pt. in proc room)|||||F|  
 OBX|169|TX|||15:55 Initial Case assessment performed.|||||F|  
 OBX|170|TX|||15:55 Consent signed and verified.|||||F|  
 OBX|171|TX|||15:56 A 22g IV was noted in the Forearm (left).|||||F|  
 OBX|172|TX|||15:56 MD notified|||||F|  
 OBX|173|TX|||15:56 MD arrived|||||F|  
 OBX|174|TX|||15:56 2.000 mg VERSED via Peripheral IV by Staff, One.|||||F|  
 OBX|175|TX|||15:56 Patient complaining of chest pain.|||||F|  
 OBX|176|TX|||15:56 50.000 mg NITROGLYCERINE S/L via Sublingual by Staff, One.|||||F|  
 OBX|177|TX|||15:56 30.000 cc XYLOCAINE via Subcutaneous by Zdoctor, test.|||||F|  
 OBX|178|TX|||15:56 Avanti Sheath 11cm, 7F, Cordis J\T\J|||||F|  
 OBX|179|TX|||15:57 JL4 Guide, 7F, Cordis J\T\J|||||F|  
 OBX|180|TX|||15:57 Choice XS, 014X300, Scimed|||||F|  
 OBX|181|TX|||15:57 Gemini, 2.5X30, ACS|||||F|  
 OBX|182|TX|||15:58 BP 122/88 HR 80 SaO2 98.0|||||F|  
 OBX|183|TX|||15:58 A Avanti Sheath 11cm, 7F, Cordis J\T\J was advanced into the Fem Art |||||F|  
 OBX|184|TX|||(right) using the Modified Seldinger technique.|||||F|  
 OBX|185|TX|||15:58 A JL4 Guide, 7F, Cordis J\T\J was advanced over a wire.|||||F|  
 OBX|186|TX|||16:13 BP 125/80 HR 88 SaO2 96.0|||||F|  
 OBX|187|TX|||16:14 Recorded in condition 1: AO.|||||F|  
 OBX|188|TX|||16:19 The LCA was injected and visualized.|||||F|  
 OBX|189|TX|||16:19 A Choice XS, 014X300, Scimed was introduced through the JL4 Guide, 7F, |||||F|  
 OBX|190|TX|||Cordis J\T\J.|||||F|  
 OBX|191|TX|||16:20 A Gemini, 2.5X30, ACS was inserted over a Choice XS, 014X300, Scimed. |||||F|  
 OBX|192|TX|||16:20 The LAD Mid had a Gemini, 2.5X30, ACS positioned which was deployed to |||||F|  
 OBX|193|TX|||14ATM for 60seconds.|||||F|  
 OBX|194|TX|||16:20 Balloon removed.|||||F|  
 OBX|195|TX|||16:21 Wire removed.|||||F|  
 OBX|196|TX|||16:21 The LCA was injected and visualized.|||||F|  
 OBX|197|TX|||16:21 Static Image 1 saved|||||F|  
 OBX|198|TX|||16:21 Static Image 2 saved|||||F|  
 OBX|199|TX|||16:21 Static Image 3 saved|||||F|  
 OBX|200|TX|||16:21 Static Image 4 saved|||||F|  
 OBX|201|TX|||16:21 Catheter was removed.|||||F|  
 OBX|202|TX|||16:23 The Avanti Sheath 11cm, 7F, Cordis J\T\J was sutured in place in the Fem |||||F|  
 OBX|203|TX|||Art (right).|||||F|  
 OBX|204|TX|||16:23 Sterile dressing applied to site.|||||F|  
 OBX|205|TX|||16:23 End Case record created.|||||F|

OBX|206|TX|||16:24 Recorded in condition 1: AOp.|||||F|  
 OBX|207|TX|||10:03 Case recovered|||||F|  
 OBX|208|TX|||14:17 Case Report Printed|||||F|  
 OBX|209|TX|||14:18 Case Report Printed|||||F|  
 OBX|210|TX|||14:20 Case Report Printed|||||F|  
 OBX|211|TX|||ENDCASE|||||F|  
 OBX|212|TX|||A total of 250 mL's of Isovue-370 was used. 225 mL's of contrast was |||||F|  
 OBX|213|TX|||administered to the patient leaving 25 mL's wasted. |||||F|  
 OBX|214|TX|||11.5 minutes total fluoro time. |||||F|  
 OBX|215|TX|||Patient transferred to Floor.|||||F|  
 OBX|216|TX|||Interventional outcome was successful|||||F|  
 OBX|217|TX|||||||F|  
 OBX|219|TX|||Equipment|||||F|  
 OBX|220|TX|||||||F|  
 OBX|221|TX|||Mfg.\X09\Description\X09\Size\X09\Barcode|||||F|  
 OBX|222|TX|||||||F|  
 OBX|223|TX|||Cordis J\TJ\X09\Avanti Sheath 11cm\X09\7F\X09\504607X|||||F|  
 OBX|224|TX|||Cordis J\TJ\X09\JL4 Guide\X09\7F\X09\778-081-00|||||F|  
 OBX|225|TX|||Scimed\X09\Choice XS\X09\014X300\X09\12119-01J|||||F|  
 OBX|226|TX|||ACS\X09\Gemini\X09\2.5X30\X09\+H512100291530XX|||||F|  
 OBX|227|TX|||||||F|  
 OBX|229|TX|||Medications|||||F|  
 OBX|230|TX|||||||F|  
 OBX|232|TX|||In Lab\X09\11/12/2002 15:56\X09\VERSED\X09\2.00 mg\X09|||||F|  
 OBX|233|TX|||In Lab\X09\11/12/2002 15:56\X09\NITROGLYCERINE S/L\X09\50.00 mg\X09|||||F|  
 OBX|234|TX|||In Lab\X09\11/12/2002 15:56\X09\XYLOCAINE\X09\30.00 mL\X09|||||F|  
 OBX|235|TX|||Patient History |||||F|  
 OBX|236|TX|||||||F|  
 OBX|237|TX|||Patient is a male weighing 220.0 pounds and is 5 feet, 10 inches tall.|||||F|  
 OBX|238|TX|||||||F|  
 OBX|240|TX|||On Going Assessments|||||F|  
 OBX|241|TX|||||||F|  
 OBX|242|TX||| Date\X09\Time\X09\BP\X09\HR\X09\SpO2\X09\Resp.\X09\Temp.\X09\ACT\X09\Comments |||||F|  
 OBX|243|TX|||11/12/2002\X09\15:58\X09\122/88 \X09\80\X09\98\X09\--\X09\--\X09\--\X09|||||F|  
 OBX|244|TX|||11/12/2002\X09\16:13\X09\125/80 \X09\88\X09\96\X09\--\X09\--\X09\--\X09|||||F|  
 OBX|245|TX|||||||F|  
 OBX|247|TX|||Initial Assessments|||||F|  
 OBX|248|TX|||||||F|  
 OBX|249|TX|||Respiratory comment:|||||F|  
 OBX|250|TX||| |||||F|  
 OBX|252|TX|||Rate|||||F|  
 OBX|253|TX|||14|||||F|  
 OBX|254|TX|||BPM|||||F|  
 OBX|255|TX|||TV:|||||F|  
 OBX|256|TX||| |||||F|  
 OBX|257|TX|||IMV:|||||F|  
 OBX|258|TX||| |||||F|  
 OBX|259|TX|||FIO2:|||||F|  
 OBX|260|TX||| |||||F|  
 OBX|261|TX|||SpO2|||||F|  
 OBX|262|TX|||98|||||F|  
 OBX|263|TX|||percent|||||F|  
 OBX|264|TX|||PEEP:|||||F|  
 OBX|265|TX||| |||||F|



\.br\11\12\2002\X09\15:58\X09\122\88 \X09\80\X09\98\X09\--\X09\--\X09\--\X09\br\11\12\2002\X09\16:13\X09\125\80 \X09\88\X09\96\X09\--\X09\--\X09\--\X09\br\br\Initial Assessments\br\br\Respiratory comment:\br\ \br\Rate\br\14\br\BPM\br\TV:\br\ \br\IMV:\br\ \br\FIO2:\br\ \br\SpO2\br\98\br\percent\br\PEEP:\br\ \br\PS:\br\ \br\ \br\O2\br\4\br\LPM\br\ \br\ \_\_\_\_\_ \br\ \_\_\_\_\_ \br\PTCA PROCEDURE Cath Date: 11/12/2002\X09\MRN: 04040433\X09\9\br\|F|

#### 9.4. Sample HeartSuite Hemodynamics Outbound MDM^T02 (Result) Message (Multiple OBX Segments)

MSH^~&\|HS-HEMODYNAMICS^""^""|HeartSuite Hemodynamics^""^""|HIS|20060118122820||MDM^T02|06011812282049854460|P|2.3||AL|  
EVN|T02|20060118122820|  
PID||111111||Lastname^Firstname||1968070800000|M||12345 Somewhere Ave^^Ottawa^ON^90504|(111)111-1111|(222)222-2222||ACT111|111111111|  
PV1|^RM1||11111^Attending^Firstname|22222^Referring^Firstname|VID111|20031101140400|  
TXA|1|CR|FT|151|12000001CR|AU|11124^Attending24^20060118112939|  
OBX|1|TX||Cardiac Catheterization Report|F|  
OBX|2|TX||F|  
OBX|8|TX||Emageon|F|  
OBX|9|TX||at|F|  
OBX|10|TX||F|  
OBX|11|TX||809C South Orlando Ave.|F|  
OBX|12|TX||Winter Park, FL 32789|F|  
OBX|13|TX||F|  
OBX|17|TX||General|F|  
OBX|18|TX|| Patient Information:|F|  
OBX|19|TX||Patient:|F|  
OBX|20|TX||PROCEDURE PTCA|F|  
OBX|21|TX||DOB:|F|  
OBX|22|TX||02/02/1950|F|  
OBX|23|TX||Sex:|F|  
OBX|24|TX||M|F|  
OBX|25|TX||SSN:|F|  
OBX|26|TX||345-34-5345|F|  
OBX|27|TX||F|  
OBX|28|TX||Age:|F|  
OBX|29|TX||52 Years|F|  
OBX|30|TX||Room No:|F|  
OBX|31|TX||F|  
OBX|37|TX|| Case Information:|F|  
OBX|38|TX||F|  
OBX|42|TX||Mrn:|F|  
OBX|43|TX||04040433|F|  
OBX|44|TX||Admit Date:|F|  
OBX|45|TX||11/12/2002|F|  
OBX|46|TX||Hospital No.:|F|  
OBX|47|TX||1|F|  
OBX|48|TX||Date of Procedure:|F|  
OBX|49|TX||11/12/2002|F|  
OBX|50|TX||Time:|F|  
OBX|51|TX||15:55|F|  
OBX|52|TX||Disc No:|F|  
OBX|53|TX||0|F|  
OBX|54|TX||Case No:|F|  
OBX|55|TX||56423|F|

OBX|56|TX||Scheduled Time:|||||F|  
 OBX|57|TX||00:04|||||F|  
 OBX|58|TX||Frame/Side No:|||||F|  
 OBX|59|TX|| |||||F|  
 OBX|60|TX||Protocol No:|||||F|  
 OBX|61|TX|| |||||F|  
 OBX|62|TX||Financial No.:|||||F|  
 OBX|63|TX||567457|||||F|  
 OBX|64|TX||Lab No:|||||F|  
 OBX|65|TX||1|||||F|  
 OBX|67|TX|||||||F|  
 OBX|68|TX||Patient Status:|||||F|  
 OBX|69|TX||urgent|||||F|  
 OBX|70|TX||Physician:|||||F|  
 OBX|71|TX||test Zdoctor|||||F|  
 OBX|73|TX|||||||F|  
 OBX|74|TX|| Procedures:|||||F|  
 OBX|75|TX||IV site check Forearm (left)\X09Sheath Insertion Fem Art (right)|||||F|  
 OBX|76|TX||Guide Cath Insert Fem Art (right)\X09Coronary Angiogram LCA|||||F|  
 OBX|77|TX||PTCA wire insertion Fem Art (right)\X09Balloon Insertion Fem Art (right)|||||F|  
 OBX|78|TX||PTCA LAD Mid\X09Sheath sutured Fem Art (right)|||||F|  
 OBX|79|TX|||||||F|  
 OBX|80|TX||\*\*\*\*\*|||||F|  
 OBX|81|TX||\*\*\*\*\*|||||F|  
 OBX|82|TX|||||||F|  
 OBX|85|TX||Patient Information|||||F|  
 OBX|86|TX||Capitated Pricing:|||||F|  
 OBX|87|TX|| No|||||F|  
 OBX|88|TX|| |||||F|  
 OBX|90|TX||Street Address|||||F|  
 OBX|91|TX||City|||||F|  
 OBX|92|TX||St.|||||F|  
 OBX|93|TX||Zip|||||F|  
 OBX|94|TX|| Street Address|||||F|  
 OBX|95|TX|| City|||||F|  
 OBX|96|TX|| |||||F|  
 OBX|97|TX|| Zip|||||F|  
 OBX|98|TX|||||||F|  
 OBX|99|TX||Home Phone #|||||F|  
 OBX|100|TX||Work Phone #|||||F|  
 OBX|101|TX|| |||||F|  
 OBX|104|TX||Next of Kin|||||F|  
 OBX|105|TX||Kin Phone #|||||F|  
 OBX|106|TX|| |||||F|  
 OBX|109|TX||Local Contact|||||F|  
 OBX|110|TX||Contact Phone #|||||F|  
 OBX|111|TX|| |||||F|  
 OBX|114|TX||Insurance|||||F|  
 OBX|115|TX|||||||F|  
 OBX|116|TX||Medicare #|||||F|  
 OBX|117|TX||Medicaid #|||||F|  
 OBX|118|TX|| |||||F|  
 OBX|121|TX||Third Party|||||F|  
 OBX|122|TX||Party #|||||F|

OBX|123|TX||| |||||F|  
 OBX|126|TX|||Staff|||F|  
 OBX|127|TX|||F|  
 OBX|128|TX|||Referring Physician:|F|  
 OBX|129|TX||| |||||F|  
 OBX|130|TX|||F|  
 OBX|131|TX|||Assisting Physician(s):|F|  
 OBX|132|TX||| |||||F|  
 OBX|141|TX|||Fellow(s):|F|  
 OBX|142|TX||| |||||F|  
 OBX|149|TX||| \X09\6x|||F|  
 OBX|150|TX|||F|  
 OBX|151|TX|||Scrub:|F|  
 OBX|152|TX||| |||||F|  
 OBX|153|TX|||X-ray:|F|  
 OBX|154|TX||| |||||F|  
 OBX|155|TX|||Record:|F|  
 OBX|156|TX||| Staff, One|||F|  
 OBX|157|TX|||Other:|F|  
 OBX|158|TX||| |||||F|  
 OBX|159|TX|||Circulating:|F|  
 OBX|160|TX||| |||||F|  
 OBX|164|TX||| \_\_\_\_\_|F|  
 OBX|165|TX|||Chronological Log (Military Time)|||F|  
 OBX|166|TX|||F|  
 OBX|168|TX|||15:55 Patient Arrival Time (Pt. in proc room)|||F|  
 OBX|169|TX|||15:55 Initial Case assessment performed.|||F|  
 OBX|170|TX|||15:55 Consent signed and verified.|||F|  
 OBX|171|TX|||15:56 A 22g IV was noted in the Forearm (left).|||F|  
 OBX|172|TX|||15:56 MD notified|||F|  
 OBX|173|TX|||15:56 MD arrived|||F|  
 OBX|174|TX|||15:56 2.000 mg VERSED via Peripheral IV by Staff, One.|||F|  
 OBX|175|TX|||15:56 Patient complaining of chest pain.|||F|  
 OBX|176|TX|||15:56 50.000 mg NITROGLYCERINE S/L via Sublingual by Staff, One.|||F|  
 OBX|177|TX|||15:56 30.000 cc XYLOCAINE via Subcutaneous by Zdoctor, test.|||F|  
 OBX|178|TX|||15:56 Avanti Sheath 11cm, 7F, Cordis J\T\J|||F|  
 OBX|179|TX|||15:57 JL4 Guide, 7F, Cordis J\T\J|||F|  
 OBX|180|TX|||15:57 Choice XS, 014X300, Scimed|||F|  
 OBX|181|TX|||15:57 Gemini, 2.5X30, ACS|||F|  
 OBX|182|TX|||15:58 BP 122/88 HR 80 SaO2 98.0|||F|  
 OBX|183|TX|||15:58 A Avanti Sheath 11cm, 7F, Cordis J\T\J was advanced into the Fem Art |||F|  
 OBX|184|TX|||(right) using the Modified Seldinger technique.|||F|  
 OBX|185|TX|||15:58 A JL4 Guide, 7F, Cordis J\T\J was advanced over a wire.|||F|  
 OBX|186|TX|||16:13 BP 125/80 HR 88 SaO2 96.0|||F|  
 OBX|187|TX|||16:14 Recorded in condition 1: AO.|||F|  
 OBX|188|TX|||16:19 The LCA was injected and visualized.|||F|  
 OBX|189|TX|||16:19 A Choice XS, 014X300, Scimed was introduced through the JL4 Guide, 7F, |||F|  
 OBX|190|TX|||Cordis J\T\J.|||F|  
 OBX|191|TX|||16:20 A Gemini, 2.5X30, ACS was inserted over a Choice XS, 014X300, Scimed .|||F|  
 OBX|192|TX|||16:20 The LAD Mid had a Gemini, 2.5X30, ACS positioned which was deployed to |||F|  
 OBX|193|TX|||14ATM for 60seconds.|||F|  
 OBX|194|TX|||16:20 Balloon removed.|||F|  
 OBX|195|TX|||16:21 Wire removed.|||F|  
 OBX|196|TX|||16:21 The LCA was injected and visualized.|||F|

OBX|197|TX|||16:21 Static Image 1 saved|||||F|  
 OBX|198|TX|||16:21 Static Image 2 saved|||||F|  
 OBX|199|TX|||16:21 Static Image 3 saved|||||F|  
 OBX|200|TX|||16:21 Static Image 4 saved|||||F|  
 OBX|201|TX|||16:21 Catheter was removed.|||||F|  
 OBX|202|TX|||16:23 The Avanti Sheath 11cm, 7F, Cordis J\TJ was sutured in place in the Fem |||||F|  
 OBX|203|TX|||Art (right).|||||F|  
 OBX|204|TX|||16:23 Sterile dressing applied to site.|||||F|  
 OBX|205|TX|||16:23 End Case record created.|||||F|  
 OBX|206|TX|||16:24 Recorded in condition 1: AOp.|||||F|  
 OBX|207|TX|||10:03 Case recovered|||||F|  
 OBX|208|TX|||14:17 Case Report Printed|||||F|  
 OBX|209|TX|||14:18 Case Report Printed|||||F|  
 OBX|210|TX|||14:20 Case Report Printed|||||F|  
 OBX|211|TX|||ENDCASE|||||F|  
 OBX|212|TX|||A total of 250 mL's of Isovue-370 was used. 225 mL's of contrast was |||||F|  
 OBX|213|TX|||administered to the patient leaving 25 mL's wasted. |||||F|  
 OBX|214|TX|||11.5 minutes total fluoro time. |||||F|  
 OBX|215|TX|||Patient transferred to Floor.|||||F|  
 OBX|216|TX|||Interventional outcome was successful|||||F|  
 OBX|217|TX|||||||F|  
 OBX|219|TX|||Equipment|||||F|  
 OBX|220|TX|||||||F|  
 OBX|221|TX|||Mfg.\X09\Description\X09\Size\X09\Barcode|||||F|  
 OBX|222|TX|||||||F|  
 OBX|223|TX|||Cordis J\TJ\X09\Avanti Sheath 11cm\X09\7F\X09\504607X|||||F|  
 OBX|224|TX|||Cordis J\TJ\X09\JL4 Guide\X09\7F\X09\778-081-00|||||F|  
 OBX|225|TX|||Scimed\X09\Choice XS\X09\014X300\X09\12119-01J|||||F|  
 OBX|226|TX|||ACS\X09\Gemini\X09\2.5X30\X09\+H512100291530XX|||||F|  
 OBX|227|TX|||||||F|  
 OBX|229|TX|||Medications|||||F|  
 OBX|230|TX|||||||F|  
 OBX|232|TX|||In Lab\X09\11/12/2002 15:56\X09\VERSED\X09\2.00 mg\X09|||||F|  
 OBX|233|TX|||In Lab\X09\11/12/2002 15:56\X09\NITROGLYCERINE S/L\X09\50.00 mg\X09|||||F|  
 OBX|234|TX|||In Lab\X09\11/12/2002 15:56\X09\XYLOCAINE\X09\30.00 mL\X09|||||F|  
 OBX|235|TX|||Patient History |||||F|  
 OBX|236|TX|||||||F|  
 OBX|237|TX|||Patient is a male weighing 220.0 pounds and is 5 feet, 10 inches tall.|||||F|  
 OBX|238|TX|||||||F|  
 OBX|240|TX|||On Going Assessments|||||F|  
 OBX|241|TX|||||||F|  
 OBX|242|TX||| Date\X09\Time\X09\BP\X09\HR\X09\SpO2\X09\Resp.\X09\Temp.\X09\ACT\X09\Comments |||||F|  
 OBX|243|TX|||11/12/2002\X09\15:58\X09\122/88 \X09\80\X09\98\X09--\X09--\X09--\X09|||||F|  
 OBX|244|TX|||11/12/2002\X09\16:13\X09\125/80 \X09\88\X09\96\X09--\X09--\X09--\X09|||||F|  
 OBX|245|TX|||||||F|  
 OBX|247|TX|||Initial Assessments|||||F|  
 OBX|248|TX|||||||F|  
 OBX|249|TX|||Respiratory comment:|||||F|  
 OBX|250|TX||| |||||F|  
 OBX|252|TX|||Rate|||||F|  
 OBX|253|TX|||14|||||F|  
 OBX|254|TX|||BPM|||||F|  
 OBX|255|TX|||TV:|||||F|  
 OBX|256|TX||| |||||F|

OBX|257|TX|||MV:|||||F|  
 OBX|258|TX||| |||||F|  
 OBX|259|TX|||FIO2:|||||F|  
 OBX|260|TX||| |||||F|  
 OBX|261|TX|||SpO2|||||F|  
 OBX|262|TX|||98|||||F|  
 OBX|263|TX|||percent|||||F|  
 OBX|264|TX|||PEEP:|||||F|  
 OBX|265|TX||| |||||F|  
 OBX|266|TX|||PS:|||||F|  
 OBX|267|TX||| |||||F|  
 OBX|270|TX|||O2|||||F|  
 OBX|271|TX|||4|||||F|  
 OBX|272|TX|||LPM|||||F|  
 OBX|273|TX|||||||F|  
 OBX|275|TX|||\_\_\_\_\_|||||F|  
 OBX|276|TX|||\_\_\_\_\_|||||F|  
 OBX|277|TX|||PTCA PROCEDURE Cath Date: 11/12/2002\X09\MRN: 04040433\X09\9|||||F|