Connex CS HL7 Interface Guide and Conformance Statement

Contents

1   Purpose

This document contains specifications intended as a guide for software and HL7 Interface developers who understand HL7 Interface requirements. It explains the Welch Allyn Connex CS Interface requirements. This document shall be used to assist software and HL7 Interface developers and allow these technical personnel to develop the HL7 interface between a facility-controlled Hospital Information System (HIS) and the WA Connex CS System including the Admit, Discharge, Transfer (ADT) Interface and the Observations/Results (ORU) Interface.

For information about configuring the HL7 Interfaces and other configuration settings for your facility, please work with the WA Project delivery team and HIS provider to address issues not covered in this guide.

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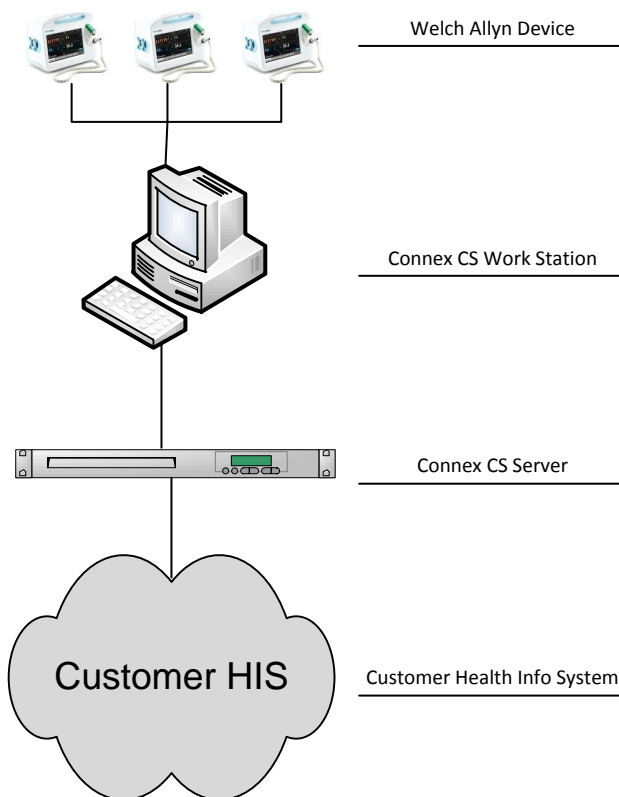
2 Connex CS

2.1 *Definitions*

Terms	Acronyms and Definitions
ACK	Acknowledgement, a network packet sent from a device which confirms receipt of data sent by another device.
ADT	Admit Discharge, and Transfer, an HL7 group used to describe the state of patients in the facility.
CCSS	Connex Clinical Surveillance System
Continuous Profile	A CVSM 2.x device configured to a Continuous profile. Measurements taken in this profile could be a continuous (e.g. CO2 measurement) or Spot measurement (e.g. Temperature measurement).
Compatible Welch Allyn devices	The following Welch Allyn devices are compatible with Connex CS Spot LXi, CIWS, CSM, CVSM 1.7 or greater
EMR	Electronic Medical Record, the umbrella term used to describe all patient records and the systems that manage them.
HIS	Hospital Information System, the umbrella term used to describe the facilities network. The EMR is part of the facility's HIS.
HL7	Health Level 7
Installation	The on-site processes for the installation of hardware, infrastructure, connectivity and system configuration at your location of business.
I.T.	Information Technology
ORU	Observation Result Unsolicited, an HL7 message type used to send patient vitals data to the facility EMR or HIS application.
Spot Profile	A CVSM 2.x device configured to Spot, Interval or Office profile. Measurements taken in this profile are Spot measurements (e.g. Temperature measurement).
SW	Software
WA	Welch Allyn
WA Authorized Representative	A third party representative, service or other, who has completed training requirements to the satisfaction of WA.
WHI	WA HL7 Interface
WLAN	Wireless Local Area Network

2.2 *Connex CS Overview*

2.2.1 Connex CS Client/Server Overview

Connex CS is a monitoring system that collects, displays, and can forward Spot and continuous information from multiple devices to your HIS. Data can be reviewed at the Connex CS Workstation.

Figure 1: Connex CS Client/Server

Data captured by devices can be viewed at the Connex CS workstation and sent to your facility's HIS through the Connex CS server.

Components of the Connex CS system include:

- Patient monitors: Spot LXi, CIWS, CSM, CVSM 1.7 or greater

- Connex CS workstation

- A computer network

  o Wireless network capable of supporting WA patient monitors

  o Wired network capable of supporting WA patient monitors and systems

- A Connex CS server setup to support HL7 messaging (Connex CS Server is setup with 2 Ethernet ports)

o   One Ethernet port is dedicated to support the Connex CS network systems and devices (required)

o   One Ethernet port is dedicated to support HL7 messaging with your facility's HIS system (optional)

o   ADT interface

o   ORU interface (optional)

With the proper equipment in place, patient data can be sent from the vital signs devices to the CS server where the data is transformed into an HL7 standard message and sent to the HIS.

You are responsible for purchasing the Connex CS server, any ADT or ORU interfaces, and associated services to enable connectivity to the HIS.

2.2.2 Connex Only Server Overview

Connex CS Server Only is a monitoring system that collects and forwards Spot measurements from multiple devices to your HIS. In a Server Only configuration, there is no Connex CS Workstation.

Figure 2: Connex CS Server Only

Welch Allyn Device

Connex CS Server

Customer HIS

Customer Health Info System
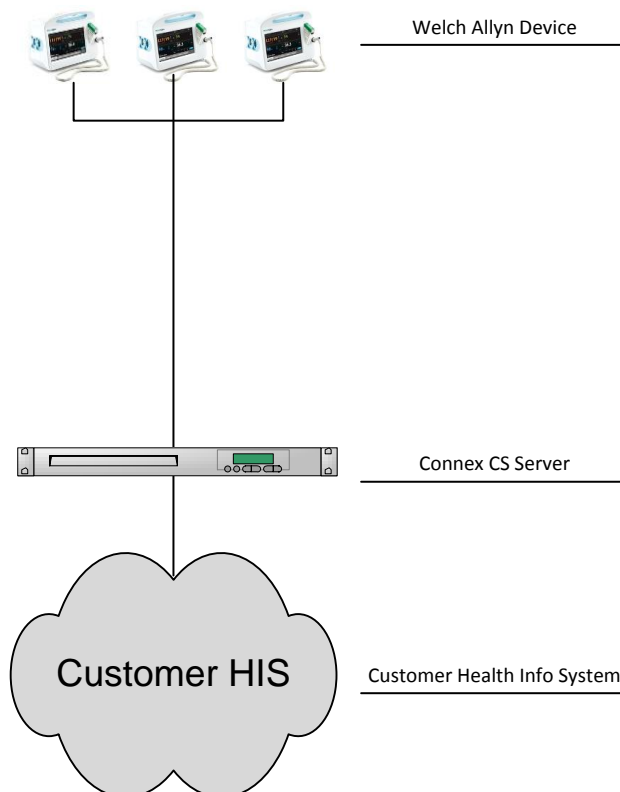
Data captured by devices can be viewed is sent to your facility's HIS through the Connex CS server.

Components of the Connex CS system include:

- Compatible Welch Allyn devices such as : Spot LXi, CVSM 1.7 or greater, CSM

- A computer network

    o Wireless network capable of supporting WA patient monitors

    o Wired network capable of supporting WA patient monitors and systems

- A Connex CS server setup to support HL7 messaging (Connex CS Server is setup with 2 Ethernet ports)

    o One Ethernet port is dedicated to support the Connex CS network systems and devices (required)

    o One Ethernet port is dedicated to support HL7 messaging with your facility's HIS system (optional)

    o ADT interface

    o ORU interface (optional)

With the proper equipment in place, patient data can be sent from the vital signs devices to the CS server where the data is transformed into an HL7 standard message and sent to the HIS.

You are responsible for purchasing the Connex CS server, any ADT or ORU interfaces, and associated services to enable connectivity to the HIS.

2.3 Interface Connections

2.3.1 ADT Interface is required for all HL7 deployments

When WA's Connex CS Server is purchased with an ADT interface, by default, it will support ADT messaging. The CS Server shall be configured with a single ADT Connection.

Figure 3: ADT Interface
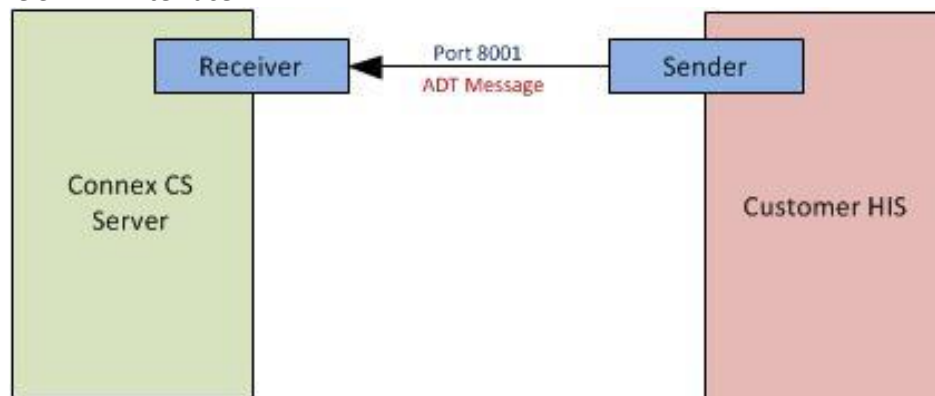
2.3.2 ORU Interface – Single and Dual ORU

WA supports two interface configurations for ORU messaging: Single or Dual ORU Interface support. In each configuration, WA will create a Client connection to the customer-supplied IP Address and Port number for the HIS Server to establish the connection.

2.3.2.1   Single ORU Interface Support

For Single ORU Interface support, all data collected will be sent through a single Interface connection to the HIS.

Figure 4: Single ORU Interface
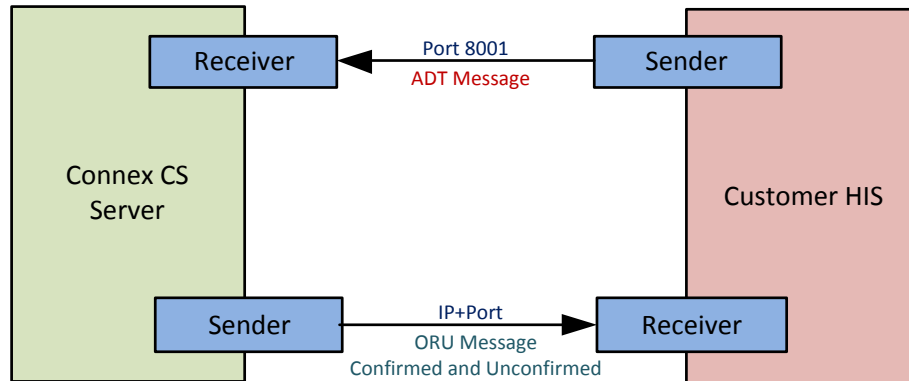
2.3.2.2   Dual ORU Interface Support

For Dual ORU Interface support, Spot observations sent from a compatible Welch Allyn device using a non-continuous profile, are filtered and sent to a specific connection based on the type of data. Spot data sent from a device, not in continuous profile, is considered "confirmed" data. Confirmed data has been reviewed and approved before sending. Confirmed data is tagged and sent to a specific connection called: "WA_ORU_OB_CONFIRMED".

All data from the continuous profile (both Spot and continuous) is considered "unconfirmed" data. A clinician cannot review the data before sending from the device. This unconfirmed data is tagged and sent to a specific connection called: "WA_ORU_OB_UNCONFIRMED".

Figure 5: Dual ORU Interfaces (Confirmed and Unconfirmed)
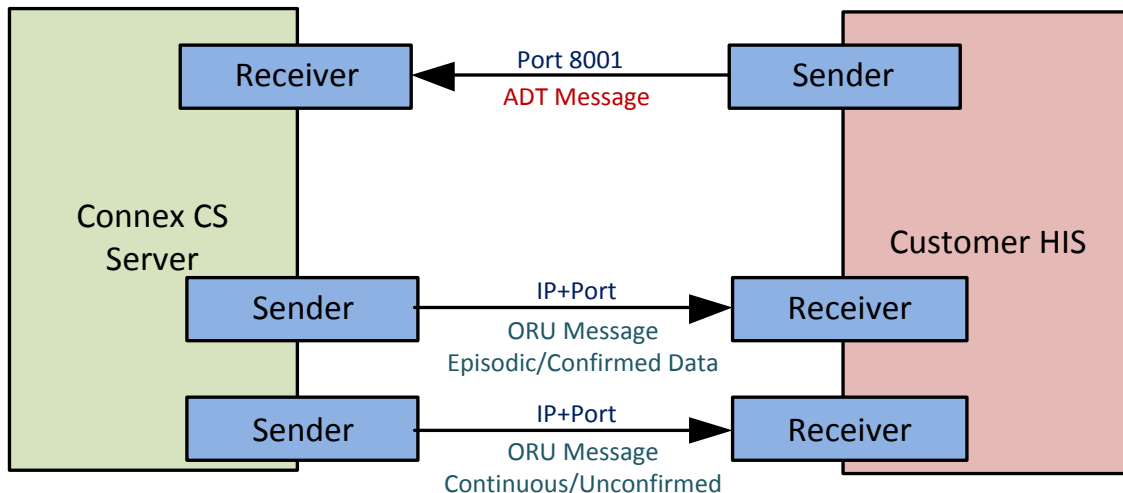
2.4 Interface Details (ADT and ORU)

2.4.1 Supported HL7 Versions (MSH-12-1)

- 2.3
- 2.3.1
- 2.4
- 2.5

2.4.2 Supported Message Types (MSH-9-1)

- ADT Admit, Discharge, Transfer message
- ACK Message acknowledgment
- ORU Unsolicited transmission of an observation message

2.4.3 ADT Interface Details

2.4.3.1 Overview

Your HIS is expected to initiate a client connection to the IP address of the WA Connex CS Server on a predetermined port (WA default is 8001, and configurable). Once a connection is established between the two systems, ADT messages can be sent from the ADT Source application, over the TCP/IP connection to the WA receiving connection. If a properly formatted ADT message is sent, the CS Connex Server will respond with an HL7 acknowledgement message to the HIS system.

For more details on this exchange, refer to Appendix A.

2.4.3.2 Supported ADT Trigger Events (MSH-9-2)

Standard messages are messages that perform standard functions based on the HL7 specification and apply a single update to a patient record. A list of messages is included below.

a. A01   Admit/visit notification
b. A02   Transfer a patient
c. A03   Discharge/end visit
d. A04   Register a patient
e. A05   Pre-admit a patient
f. A06   Change an outpatient to an inpatient
g. A07   Change an inpatient to an outpatient
h. A08   Update patient information
i. A11   Cancel admit/visit notification
j. A12   Cancel transfer
k. A13   Cancel discharge/end visit
l. A23   Delete a patient record
m. A29   Delete person information
n. A38   Cancel pre-admit

Note: Messages not specified in this list of supported messages will not be processed.

2.4.3.3 ADT Patient Identifiers, Patient Locations and Barcode ID

ADT messages will work as per HL7 specifications only when standard HL7 Level 1, 2 and 3 identifiers are set. Depending on the data provided and data used within the Connex CS application, certain merge messages may not process properly and should be disabled.

Standard HL7 identifiers are:
- **Level 3** – PID - 3 (Patient Identifier)
- **Level 2** – PID-18 (Patient Account Number)
- **Level 1** – PV1-19 (Visit Number)

Standard HL7 source and target identifiers used for merge and change messages:

Target Identifier	Source Identifier
PID-3 (Patient Identifier)	MRG-1 (Prior Patient Identifier)
PID-18 (Patient Account Number)	MRG-3 (Prior Account Number)
PV1-19 (Visit Number)	MRG-5 (Prior Visit Number)

2.4.3.4   Patient Identifiers

Connex CS requires two unique identifiers to identify a patient and track a patient in the Connex CS. Connex CS requires a Patient/Person identifier (typically PID-3) and a Visit/Account identifier (typically PV1-19). A combination of these two identifying numbers will allow Connex CS to properly store patient information.

Here is an example of an ADT message that meets the **minimum** HL7 specifications. This is an HL7 version 2.5, ADT A01 Message.

EXAMPLE 1
MSH|^~\&||||||20120629092011||ADT^A01|MESSAGEIDA01-1|P|2.5||||||
EVN||20120521|||||
PID|||1888881||Male^One||||||||||||||||||||||||||||||||||||
PV1||I|||||||||||||||||||||||||||||||||||||||||||||||||

In Example 1, the HL7 message is missing two additional fields required by Connex CS. Connex CS additionally requires PV1-3-1 and PV1-19 to be populated. Example 2 includes a visit identifier (PV1-19) and location information (PV1-3-1).

EXAMPLE 2
MSH|^~\&||||||20120629092011||ADT^A01|MESSAGEIDA01-1|P|2.5||||||
EVN||20120521|||||
PID|||1888881||Male^One||||||||||||||||||||||||||||||||||||
PV1||I|WA|||||||||||||||44444||||||||||||||||||||||||||||||||||||

Example 2 contains the minimum amount of data required to process an ADT message into the WA Connex CS system.

Key Identifiers for Connex CS

1. **Identifier #1 –Patient Identifier / HL7 Level 3 Identifier**

It is recommended to use the value in PID-3 as the Patient/Person, or Level 3 Identifier.

Another Identifier could be used if the facility is using another field in the HL7 message as the primary identifier.

Note: If PID-3 is not used then A34, A40 and A47 Merge messages cannot be supported.

2. **Identifier #2 –Visit Number / Level 1 Identifier**
   Connex CS requires a unique visit identifier, preferably PV1-19. Connex CS uses PV1-19 by default.

   Another Identifier could be used if the facility is using another field in the HL7 message as the Visit/Account identifier, for example PID-18.

3. **Barcode Identifiers**
   A barcode identifier can be configured in the Connex CS application so that when a clinician scans a patient barcode, Connex CS will associate the barcode number to the patient record. Typically, this Barcode Identifier is PID-3, PV1-19, or PID-18, or another field within the ADT message.

Note: Please work with the WA Project team and HIS to determine which Identifiers are to be used as the person identifier (Level 3 identifier), the visit number identifier (Level 1 identifier) and the Barcode identifier.

2.4.3.5   ADT Merge Messages

Merge messages are messages that perform a merge function based on the HL7 2.5 specification using Level 3, Level 2 and Level 1 Patient Identifiers. A list of messages is included below.

   a. A34   Merge patient information - patient ID only (for backward compatibility)
   b. A40   Merge patient - patient identifier
   c. A41   Merge account - patient account number
   d. A42   Merge visit - visit number
   e. A47   Change patient identifier list
   f. A49   Change patient account number
   g. A50   Change visit number

WA adheres to the HL7 specifications when supporting Merge messages. If you are using non-standard identifiers then support for some Merge messages may not be available.
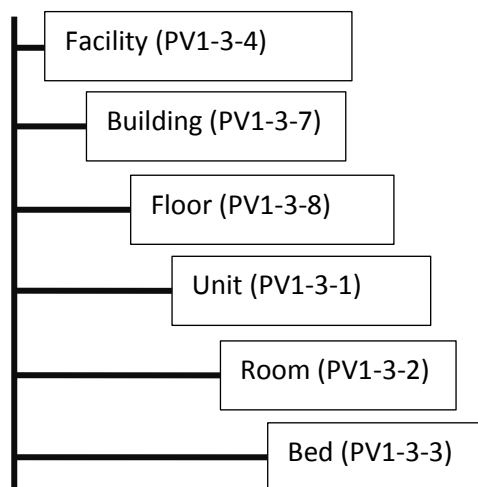
2.4.3.6   ADT Swap Messages

Swap messages are messages that perform a swap of locations. A17 is the only swap message supported.

   a. A17   Swap Patients

WA adheres to the HL7 2.5 spec when supporting a Swap message. If you are using non-standard identifiers, support for Swap may not be available.

2.4.3.7   Patient Locations

Connex CS is engineered so that the each CS Workstation filters on the patient location data. The Connex CS Workstation and the Connex CS Server systems must be configured to populate and filter on the PV1-3 field of the HL7 message.

```
├── Facility (PV1-3-4)
    ├── Building (PV1-3-7)
        ├── Floor (PV1-3-8)
            ├── Unit (PV1-3-1)
                ├── Room (PV1-3-2)
                    └── Bed (PV1-3-3)
```

1. **Patient Location – PV1-3**
    The key field for identifying patient locations is the PV1-3 field. The elements critical for establishing location include:

    a. **PV1-3-1 Point of Care**. This is a REQUIRED Field. This is required to determine which Connex CS Workstation/Unit will be monitoring each patient.

    b. **PV1-3-2 Room**. This is an OPTIONAL field. It is not required to be populated for the message to be processed. However, if the Room is present, this data will be populated in the Connex Server and available on the Workstation.

    c. **PV1-3-3 Bed**. This is an OPTIONAL field. It is not required to be populated for the message to be processed. However, if the Bed is present, this data will be populated in the Connex Server and available on the Workstation.

    d. **PV1-3-4 Facility**. This is a CONDITIONAL field. It is not required to be populated for the message to be processed through to the central station but this data must match the configuration on the Master Bed List. Thus, if the PV1-3-4 (Facility) is populated in the ADT message with data, this data will be populated in the Connex Server.

        If you are using a multi-facility deployment of Connex CS then you will have to populate this field, and have it configured to match the Master Bed List.

    e. **PV1-3-7 Building**. This is a CONDITIONAL Field. It is not required to be populated for the message to be processed through to the central station but this data must match the configuration on the Master Bed List. Thus if the PV1-3-7 (Building) is populated in the

ADT message with data, this data will be populated in the Connex Server.

If you are using a multi-building deployment of Connex CS you will have to populate this field, and have it configured to match the Master Bed List.

f. **PV1-3-8 Floor**. This is a CONDITIONAL Field. It is not required to be populated for the message to be processed through to the central station but this data must match the configuration on the Master Bed List. Thus if the PV1-3-8 (Floor) is populated in the ADT message with data, this data will be populated in the Connex Server.

If you are using a multi-floor deployment of Connex CS where there could be a conflict in locations based on the floor name you will have to populate this field, and have it configured to match the Master Bed List.

Note: All sub-fields sent in the ADT message PV1-3 field must match <u>EXACTLY</u> to the Covered Area Configuration on Connex CS otherwise those patients will be viewable on the system.

2.4.4 ORU Interface Details

2.4.4.1 Overview

If there is a requirement to have the WA system provide observation data from the patient monitors to the HIS, then you can purchase an ORU Interface for the Connex CS Server. Connex CS supports "Care Unit" licensing. Using this license model, specific "Units" can be filtered to send ORU data to the EMR. For example, "ER" and "MEDSURG" are 2 units within the facility. The ED could be licensed at Connex to send ORU messages while MEDSURG is not.

WA's ORU Interface also distinguishes between two basic observation types, Confirmed and Unconfirmed measurements.

- Confirmed measurements – This is data collected at a patient monitor that has been confirmed on the device by a clinician at the bedside. Spot data (a compatible Welch Allyn device in a non-continuous profile) typically is "Confirmed" measurements
- Unconfirmed measurements - This is data collected at a patient monitor that has not been confirmed on the device by a clinician at the bedside. Continuous data (a compatible Welch Allyn device in a continuous profile) typically is "Unconfirmed" measurements

Confirmed/Spot data sent from the device and is received into Connex CS database. The Connex CS server pulls the data from the database for licensed care units, creates an HL7 message, populates the HL7 message with the desired patient information and clinical observations collected and then sends the ORU message to the HIS.

Unconfirmed/Continuous data sent from the device is received by the Connex CS workstation. The continuous measurements are stored on the Connex CS workstation in a proprietary file. Any Spot parameters are stored in the workstations. Connex CS handles these two measurement types differently.

Figure 6: Device to HIS Workflow, Profile Type/Measurement Type based
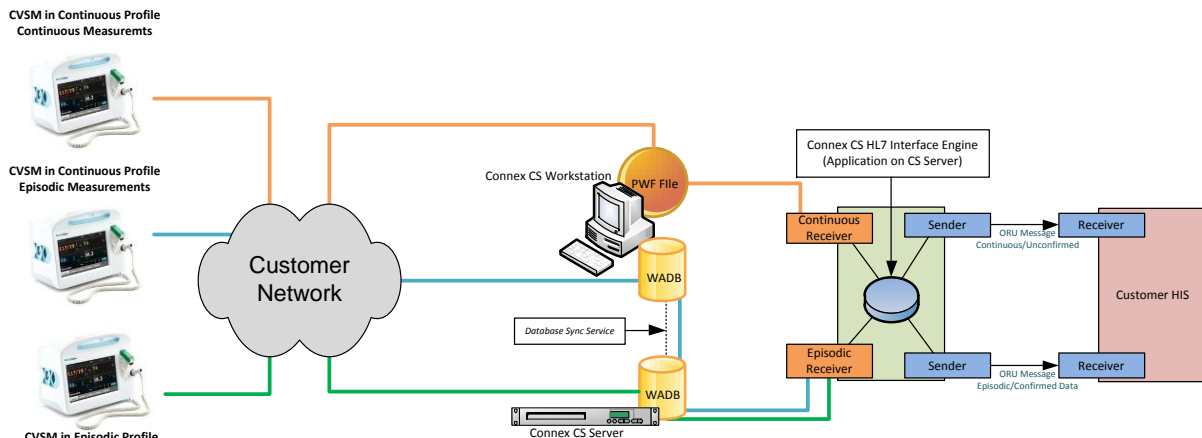
Supported Trigger Events:

- R01 ORU/ACK - Unsolicited transmission of an observation message

2.4.4.2 Supported CVSM Profiles

1. **Continuous Profile**
   a. **Continuous Measurements (Unconfirmed Data)**
   Continuous measurements are captured by a compatible Welch Allyn device in continuous profile, received by a Connex CS Workstation, stored in a proprietary file and stored on the Connex CS Workstation. At a predetermined, configurable interval all the continuous measurements captured by the compatible Welch Allyn device are aggregated to a single set of values for all parameters. This data is collected by the Connex CS Server. An ORU message is created by the Connex CS Server populated with data available in the parameter set and then sent to the HIS.

   b. **Continuous Profile – Spot Measurements (Unconfirmed Data)**
   Spot Data collected is stored in the Connex CS workstation database. The Workstation shares this data with the Connex CS Server database. Once a Spot measurement is available in the Connex CS server, an ORU message is created and populated with data and appropriate patient data is then sent to the HIS.

   Spot and Continuous measurements collected from a device will be sent to the HIS in two different HL7 messages even if both measurements are taken in a Continuous Profile.

2. **Spot or Interval Profile**
   Spot Measurements (Confirmed Data)
   Spot Data collected is stored in the Connex CS server database. Once a Spot measurement is available in the Connex CS server, an ORU message is created and populated with data and appropriate patient data is then sent to the HIS. This server shares this data with the Connex CS Workstation.

3. **Office Profile**
   Spot Measurements (Unconfirmed Data)
   The Office profile is designed for outpatient clinical settings, such as a physician's office and is stored in the Connex CS server database. The profile supports two features that are not available in other profiles, Non-invasive blood pressure (NIBP) averaging programs and

Calculation of body mass index (BMI). After all readings are taken, Connex CS will send all measurements including NIBP values plus an averaged NIBP value to the HIS.

For more details refer to Appendix A.

2.4.4.3 EarlySense Parameters

Early Sense is an addition to the CVSM device using 2.x software (or greater) that can be purchased to monitor heart rate, respiration rate and contact-free motion. Additionally, it can be used to generate bed exit alarms and reminders to turn patients.

EarlySense adds the following new parameters in Continuous Vitals Outbound:

- Motion
- Turn
- Bed Exit Alarm

2.4.4.4 ORU Workflow

2.4.4.4.1 Single ORU Workflow

In this workflow, two connections are in use, an ADT connection for the ADT Interface and an ORU connection for the ORU Interface. All observations regardless of profile in this workflow will be sent through the single ORU connection.

Data collected from a compatible Welch Allyn device may include Spot measurements and continuous measurements depending on the device configuration or profile. Each measurement type will be sent out in a unique ORU message. See examples below.

For example, we can have a single device, configured for a continuous profile, sending Spot and continuous observations. Connex ORU Interface creates and sends 2 different messages for this patient/device.

Both HL7 messages are for the same patient, using the same device and device profile and are sent within the same time period, but are sent as individual readings based on the observations type. Both messages are sent through the same ORU Connection called "WA_ORU_OB_UNCONFIRMED". The HIS must have a corresponding Interface setup and configured to receive this "unconfirmed" data. This data typically requires a confirmation in the HIS.

Refer to Appendix B for sample messages

2.4.4.4.2 Dual ORU Workflow

In this workflow, three connections are in use, one ADT connection for the ADT Interface and two ORU connections for the ORU Interface. Spot observations will be sent through the "confirmed" ORU connection. Continuous observations will be sent through the "unconfirmed" ORU connection.

In this example, we have a compatible Welch Allyn device in a Continuous profile and sending continuous observation and an Spot observation. Connex creates and sends 2 different messages for this patient/device.

Refer to Appendix B for sample messages

Both HL7 messages are for the same patient/device. Both are sent within the same time period. Each message contains individual readings based on the observations type (continuous or Spot). Both messages are sent through the Unconfirmed ORU connection because they originated from a Continuous profile.

In this example, a device is configured in a Spot profile (non-continuous). Data collected is tagged and sent out the Confirmed ORU connection.

Refer to Appendix B for sample messages

Note: OBR-4 denotes if the data in the ORU message is Spot (S) or continuous (C) data while OBR-25 denotes if the data in the ORU message is to be sent the Confirmed (F) or Unconfirmed (R) connection to the HIS in a Dual ORU configuration.

For more details on this exchange, refer to Appendix A.

2.5 Customer-side Interface changes

All messages received by the Connex CS system HL7 ADT Interface will be logged by the receiving interface on the CS Server. Supported ADT messages will be processed and stored. Unsupported ADT messages will be logged and discarded.

2.5.1 Filtering messages based on Unit or Location

You can filter the HIS Interface so that the Connex CS System only receives ADT messages destined for the WA system. Your HIS can setup filters on the sending application.

Connex CS can only process received ADT messages. If this filtering is enabled, it is your responsibility to setup and test outbound ADT messages to ensure the proper messages are passed to the Connex CS Server ADT Interface.

> **Example filter: Unit and Previous Unit**
> 1) Pass ADT messages with PV1-3-1 matching UNITNAME
> 2) Pass ADT messages with PV1-6-1 matching UNITNAME

"UNITNAME" is equal to the data configured in PV1-3-1 for Connex CS supported Workstations.

Test all supported ADT Message types and Connex CS Workstation locations when using filters prior to validating the Connex CS system.

Contact the WA Project Team with questions.

WA has also added the capability to filter on interesting locations. This filtering also based on PV1-3-1 and PV1-6-1.

> **Example filter: Unit and Previous Unit**
> 1) Pass ADT messages with PV1-3-1 matching UNITNAME
> 2) Pass ADT messages with PV1-6-1 matching UNITNAME

The Connex system will only process ADT messages based on these fields.
Contact your Project Manager to configure WA location filters.

2.6 Email Alerts- Notifications of an Interface

Engine alerts can be configured to monitor for specific events and the severity and escalation of those events, according to day and time. Additional configuration includes the ability to specify who receives the alert e-mails.

Alerts include the type of alert being monitored and the thresholds that determine if the event is severe enough to be alerted upon. These alert types include the following:
- Stopped – WA, interface connection to customer has stopped
- Not connected – WA, interface connection to customer is no longer connected
- Idle – WA, interface connection has been idle for a period of time
- Send fail - failed to send an OB ORU message

When an Alert trigger has been met, WA can send an Email to a group of users including the following:
- An email to an Operator group after 10 minutes
- An email to a Supervisor group after 30 minutes
- An email to an Administrator group after 60 minutes

WA can add or delete alerts based on your requirements.
Contact your project manager to configure WA email alerts.

2.7 Testing the WA HL7 Interface

The Connex CS is configured by WA and shipped to the Customer. The configuration applied to the Connex CS hardware is based on the information collected in the Connex CS Customer Project Requirements Form, DIR 80017306.

Steps in the delivery process from manufacturing to your acceptance of Connex CS:
1. The system ships from WA to your site
2. The hardware is installed by WA
    a. TEST Environment (if applicable)
        i. CS TEST Server (if purchased)
        ii. CS TEST Workstation (if purchased)
    b. PROD Environment
        i. The CS Server is:
            1. Installed in TEST environment to develop your ORU interface
            2. Moved from TEST to PROD once the customer-side ORU programming is complete
        ii. The CS Workstation is used to generate test data along with devices as necessary
3. Testing phase
    a. You test the ADT interface.
    b. You test and confirm the ORU Interface is configured correctly

      i.   You and WA agree to a "Go-Live" date.
4.   Your acceptance / go-live
    a.   WA assists in moving from TEST to PROD
    b.   WA performs a final check on the Connex CS system
    c.   You review the configuration and confirm the system is working correctly with the HIS
    d.   Before patients are connected in a clinical environment, WA requires the entire Connex CS system to be validated.
    e.   You and WA sign the Customer Acceptance form.
    f.   The site is ready for go-live

2.7.1 Connex CS Server "TEST" environment

When Connex CS Server interfaces are setup to a TEST environment, Connex CS devices, Connex CS Workstations and a Connex CS Server are setup and tested to ensure that data transfers through the system. Before moving to the go-live phase, you must execute some form of "Test Plan" to confirm the interfaces between Connex CS and the HIS are working properly.

HL7 Interface issues discovered during the test phase will be resolved in a coordinated effort between you and the WA Project Team, and the HIS vendor if necessary.

Tests include:
1.   Validate the HIS Patient Census and Connex CS Workstation Patient Lists match.
2.   Check Units of Measure, Unit Labels and confirm ORU results (including all modifier options) are being received by the HIS in an expected manner. This is only required if an ORU interface is used. Disregard if using ADT only. Refer to the Appendix B for possible modifiers and defaults.
3.   A sample test plan and suggestions are available in Appendix C.

2.7.2 Connex CS Server "Production" or "Live" environment

The Connex CS System must be validated prior to being released for Clinical Use. Clinical use is defined as connecting patients to the system and sending real patient data to the HIS in a production or "live" environment. Connex CS devices, workstation and server will need to be setup and tested to ensure data is sent and received to the correct systems.

It is required the same test plan is executed on the PROD environment. The purpose of the second test is to confirm the interfaces between Connex CS and the HIS are working properly in the live environment. HL7 Issues discovered during the 2nd test phase will be resolved in a coordinated effort between the WA and you.

Additional configuration steps are required on the Connex Workstations and Server to convert from TEST to PROD environments, including cleaning up the Patient Census created in TEST environment and redirecting the Connex CS Server to point to the PROD Environment. Data must be purged when moving from TEST to PROD.
Here are the steps required to move from a TEST environment to a PROD environment

Moving from TEST to PROD
1.   This conversion consists of:

a. The TEST data is purged
b. Connections are migrated from TEST to PROD
c. All patients in the current census have their ADT messages resent by the HIS
d. Test the PROD system

3 Associated Documents

Table 3: Reference Documentation		
Part Number	**Title**	**Referred to as:**
80017306	CONNEX CS CUSTOMER PROJECT REQ FORM	*Customer Requirement Doc.*
80018048	CONNEX CS STATEMENT OF WORK (WDS)	*Work Definition Statement*

Appendix A: Connex CS HL7 Specifications

1   Connex CS HL7 Requirements and Details

This section describes the Welch Allyn, Connex CS HL7 message requirements and details.

1.1 Supported HL7 Versions

Connex CS conforms to the Health Level 7 (HL7) standard for electronic data exchange and supports the following HL7 versions
- 2.3
- 2.3.1
- 2.4
- 2.5

1.2 Connex CS Customer facing Connections

Type	Connection Name	Default Port	Description
ADT	WA_ADT_IB	8001 (Configurable)	This connection is used to receive ADT HL7 messages from HIS over a socket.
ORU Confirmed	WA_ORU_OB_CONFIRMED	8004 (Configurable)	This is available only in a Dual Outbound or confirmed only ORU environment and sends only "Confirmed Data" to the customer system.
ORU Unconfirmed	WA_ORU_OB_UNCONFIRMED	8005 (configurable)	This is available for all ORU environments. This connection will send "Unconfirmed Data" to the customer system in a Dual ORU environment. -OR- This connection will send ALL ORU messages in a Single ORU environment.

1.3 HL7 Message hierarchy and message delimiters

HL7 messages are composed of groups and segments with the following hierarchy:
- Messages contain groups and segments.
- Segments contain fields.
- Fields contain components.
- Components contain subcomponents.

1.4 HL7 Segment notation

Notation example	Definition
PID	This segment is mandatory.
[PV2]	This segment is optional.
{IN1}	This segment is mandatory, and it can

	repeat.
[{NK1}]	This segment is both optional and repeating

HL7 segment notation: mandatory, optional and repeating

- No brackets and no braces surrounding a segment indicate that the message must contain exactly one value for the segment. For example, PID requires exactly one patient ID value.

- Brackets [...] around a segment identifier indicate that the message can contain one or no value for the indicated segment. For example, [PID] permits either a single demographic value or no demographic value.

- Braces {...} around a segment identifier indicate that the message requires one or more values for the indicated segment. For example, {IN1} requires one or more values of IN1.

- Braces within brackets [{...}] around a segment identifier indicate that the message can contain any number of values or no value for the indicated segment. For example, [{NK1}] permits zero to n next-of-kin segments.

1.5 *Message Requirements*

Required HL7 message segments and fields are described below. This section describes the terminology and structure to be used.

1.5.1 Message and Segment Tables

The supported messages are described using a Message Tables and Segment Tables having columns that provides specific information. The possible columns values which need to be known to interpret the information provided by the Message Tables and Segment Tables are described below.

Column Value	Option
R	Required
O	Optional
C	Conditionally Populated/ Required

1.5.2 Supported HL7 Message Types

Type	Description
ADT	ADT message
ORU	Unsolicited transmission of an observation message
ACK	General acknowledgment

1.5.3 Supported HL7 Event Definitions

Event	Description
R01	ORU/ACK - Unsolicited transmission of an observation message
A01	ADT/ACK - Admit/visit notification
A02	ADT/ACK - Transfer a patient
A03	ADT/ACK - Discharge/end visit
A04	ADT/ACK - Register a patient

Event	Description
A05	ADT/ACK - Pre-admit a patient
A06	ADT/ACK - Change an outpatient to an inpatient
A07	ADT/ACK - Change an inpatient to an outpatient
A08	ADT/ACK - Update patient information
A11	ADT/ACK - Cancel admit/visit notification
A12	ADT/ACK - Cancel transfer
A13	ADT/ACK - Cancel discharge/end visit
A17	ADT/ACK – Swap Patients
A23	ADT/ACK - Delete a patient record
A29	ADT/ACK - Delete person information
A34	ADT/ACK - Merge patient information - patient ID only (for backward compatibility)
A38	ADT/ACK - Cancel pre-admit
A40	ADT/ACK - Merge patient - patient identifier list
A41	ADT/ACK - Merge account - patient account number
A42	ADT/ACK - Merge visit - visit number
A47	ADT/ACK - Change patient identifier list
A49	ADT/ACK - Change patient account number
A50	ADT/ACK - Change visit number

General Notes

Every supported inbound ADT message is used to Add/Update/Delete/Merge/Swap patient and visit information. Patient and Visit information will be updated, overwritten or kept as-is, based on the message type and data content sent from the HIS as defined in the filtering conditions

The Connex CS Server ADT inbound receiver connection is configured to send an HL7 ACK message to HIS to acknowledge the successful delivery of the ADT message. This acknowledgement message only confirms successfully delivery of the ADT message and not the contents of the message or whether Connex supports this message received.

Additionally, merge and change ADT messages will work as per HL7 specifications only when standard HL7 Level-1, 2 and 3 identifiers are set. Depending on the data provided and data used within the Connex CS application, certain merge messages may not process properly and should be disabled. For example, if facility is using PID-18 as the Connex CS visit number which is normally PV1-19 and PV1-19 is left empty then messages requiring MRG-5 should be excluded.

> **Standard HL7 identifiers are:**
>
> - **Level 3** – PID - 3 (Patient Identifier)
> - **Level 2** – PID-18 (Patient Account Number)
> - **Level 1** – PV1-19 (Visit Number)

Standard HL7 source and target identifiers used for merge and change messages:

Target Identifier	Source Identifier
PID-3 (Patient Identifier)	MRG-1 (Prior Patient Identifier)

| PID-18 (Patient Account Number) | MRG-3 (Prior Account Number) |
| PV1-19 (Visit Number) | MRG-5 (Prior Visit Number) |

1. **ADT^A01 – Admit/visit notification**

   An ADT-A01 event is used for admitting the patient in the Connex CS Sever.

   Message Format: refer *Error! Reference source not found.*

2. **ADT^A02 – Transfer a patient**

   An ADT-A02 event is used for the changing patient's assigned physical location in the Connex CS Sever.

   Message Format: refer *Error! Reference source not found.*

3. **ADT^A03 – Discharge/end visit**

   An ADT-A03 event is used for discharging the patient from the Connex CS Sever.

   Message Format: refer *Error! Reference source not found.*

4. **ADT^A04 – Register a patient**

   An ADT-A04 event is used for registering the patient with a pre-admitted status in the Connex CS Sever.

   Message Format: refer *Error! Reference source not found.*

5. **ADT^A05 – Pre-admit a patient**

   An ADT-A05 event is used for pre-admitting the patient in the Connex CS Sever.

   Message Format: refer *Error! Reference source not found.*

6. **ADT^A06 – Change an outpatient to an inpatient**

   An ADT-A06 event is used for changing the patient's pre-admitted visit to admitted visit in the Connex CS Sever.

   Message Format: refer *Error! Reference source not found.*

7. **ADT^A07 – Change an inpatient to an outpatient**

   An ADT-A07 event is used for changing the patient's admitted visit to pre-admitted visit in the Connex CS Sever.

   Message Format: refer *Error! Reference source not found.*

8. **ADT^A08 – Update patient information**

   An ADT-A08 event is used for updating the patient and visit information in the Connex CS Sever.

   Message Format: refer *Error! Reference source not found.*

9. **ADT^A11 – Cancel admit/visit notification**

   An ADT-A11 event is used for removing an erroneously admitted visit entry from the Connex CS Sever.

   Message Format: refer *Error! Reference source not found.*

10. **ADT^A12 – Cancel transfer**

An ADT-A12 event is used to cancel an erroneously transferred patient and update the patient's assigned physical locations in the Connex CS Sever.

Message Format: refer ***Error! Reference source not found.***

11. **ADT^A13 – Cancel discharge/end visit**

An ADT-A13 event is used to cancel an erroneously discharged patient and admit the patient in their assigned physical locations in the Connex CS Sever.

Message Format: refer ***Error! Reference source not found.***

12. **ADT^A17 – Swap patient**

An A17 event is used for swapping the patient locations in Connex CS.

When two patients patient A & B exchanges room/bed (Assigned Locations), HIS sends ADT^A17 message to reflect the updated location in Connex CS.

Here is the sample location data of both Patient A & B in Connex database before receiving A17 message:

		Assigned Location		
Patient	Patient Class	Point of Care	Room	Bed
A	I	PTC	353	1
B	I	PTC	354	2

HIS/EMR sends following message to swap location for patient A and patient B,

```
MSH|^~\&|ADT|MCM|LABADT|MCM|20121007000259||ADT^A17|MSG00001|P|2.5|
EVN|A17|20121007000259||
PID|||A||Smith^Alex^J||19610525|M|||||||||ACCT01
PV1|1|I|PTC^354^2|||PTC^353^1|||||||||||||V01||||||||||||||||||||||||||||20121004235959|
PID|||B||Taylor^Brian^M||19610527|M|||||||||ACCT02
PV1|1|I|PTC^353^1|||PTC^354^2|||||||||||||V02||||||||||||||||||||||||||||20121005235959|
```

Connex database values after processing A17

		Assigned Location		
Patient	Patient Class	Point of Care	Room	Bed
A	I	PTC	354	2
B	I	PTC	353	1

Note: Fields other than location do not update with processing of A17 message. An A08 message should be sent by HIS/EMR to update other fields of patient and visit.

Message Format: refer **Error! Reference source not found.**

13. **ADT^A23 – Delete a patient record**

An ADT-A23 event is used for removing the patient from the Connex CS Sever.

Message Format: refer ***Error! Reference source not found.***

14. **ADT^A29 – Delete person information**

An ADT-A29 event is used for removing the patient information from the Connex CS Sever.

Message Format: refer ***Error! Reference source not found.***

15. **ADT^A34 – Merge patient information – Patient ID only**

Connex CS Sever uses this message to signal a merge of patient records that were incorrectly filed under two different Level 3 identifiers. An ADT-A34 event is used for merging the incorrect patient identifier (MRG-1 - prior patient identifier list) with correct patient identifier (PID-3 - patient identifier list).

The identifiers involved in identifying the patients may or may not have accounts, which may or may not have visits. Connex CS Sever transfers all visits and tests of "incorrect patient identifier" to "correct patient identifier".

Example transaction of ADT-A34 message process

Before Merge		After Merge
MRN1 (correct target identifier)	MRN2 (incorrect source identifier)	MRN1
VISIT1	VISIT3	VISIT1
VISIT2	VISIT4	VISIT2
		VISIT3
		VISIT4

Message Format: refer *Error! Reference source not found.*

16. **ADT^A38 – Cancel pre-admit**

An ADT-A38 event is used for removing an erroneous pre-admitted visit entry from the Connex System.

Message Format: refer *Error! Reference source not found.*

17. **ADT^A40 – Merge patient – patient identifier list**

Connex CS Sever uses this message to signal a merge of records for a patient that was incorrectly filed under two different Level 3 identifiers. An ADT-A40 event is used for merging the incorrect patient identifier (MRG-1 – prior patient identifier list) with correct patient identifier (PID-3 - patient identifier list). The incorrect patient identifier would never be used in future transactions.

The identifiers involved in identifying the patients may or may not have accounts, which may or may not have visits. Connex CS Sever transfers all visits and tests of "incorrect patient identifier" to "correct patient identifier".

Example transaction of ADT-A40 message process

Before Merge		After Merge
MRN1 (correct target identifier)	MRN2 (incorrect source identifier)	MRN1
VISIT1	VISIT3	VISIT1
VISIT2	VISIT4	VISIT2
		VISIT3
		VISIT4

Message Format: refer *Error! Reference source not found.*

18. **ADT^A41 – Merge account – patient account number**

Connex CS Sever uses this message to signal a merge of records for an account that was incorrectly filed under two different account numbers. The "incorrect source patient account number" identified in the MRG segment (MRG-3 - prior patient account number) is to be merged with the "correct target patient account number" identified in the PID segment (PID-18 - patient account number).

The "incorrect source patient account number" would then logically never be referenced in future transactions. An ADT-A41 event is used for merging the incorrect patient account number (MRG-3 – prior patient account number) with correct patient account number (PID-18 - patient account number). The incorrect patient account number would never be used in future transactions.

The patient account numbers involved may or may not have visit. CCSS Sever updates existing visits "incorrect patient account number" with "correct patient account number".

Example transaction of ADT-A41 Message Process

Before Merge		After Merge
MRN1	MRN1	MRN1
ACCT1 (correct target identifier)	ACCT2 (incorrect source identifier)	ACCT1
VISIT1	VISIT2	VISIT1
		VISIT2

Message Format: refer *Error! Reference source not found.*

19. **ADT^A42 – Merge visit – visit Number**

An ADT-A42 event is used for merging the incorrect visit number (MRG-5 – prior visit number) with correct visit number (PV1-19 – visit number). The incorrect visit number would never be used in future transactions.

Connex CS Sever merges visit records without merging other identifiers and transfers all tests of "incorrect visit number" to "correct visit number".

Example transaction of ADT-A42 message process

Before Merge	After Merge
MRN1	MRN1
VISIT1 (correct target visit number)	VISIT1
VISIT2 (incorrect source visit number)	

Message Format: refer *Error! Reference source not found.*

20. **ADT^A47 – Change patient identifier list**

An ADT-A47 event is used for changing the incorrectly assigned patient ID (MRG-1 – prior patient identifier) with correct patient ID (PID-3 - patient identifier).

If patient with "correct patient ID" value does not exist, Connex CS Sever replaces patient "incorrect patient ID" value with "correct patient ID" value.

If patient with "correct patient ID" value exists, then Connex CS Sever will merge both patients.

Example transaction 1: "correct target patient ID" does not exist

Before Change	After Change
MRN2 (incorrect source identifier)	MRN1 (correct target patient identifier)
VISIT1	VISIT1

Example transaction 2: "correct target patient ID" exists

Before Change		After Change
MRN1 (correct patient identifier)	MRN2 (incorrect source identifier)	MRN1
VISIT1	VISIT2	VISIT1
		VISIT2

Message Format: refer ***Error! Reference source not found.***

21. **ADT^A49 – Change patient account number**

Connex CS Sever uses this message to signal a change of an incorrectly assigned account number value. The "incorrect source account number" value is stored in the MRG segment (MRG-3 - prior patient account number) and is to be changed to the "correct target account number" value stored in the PID segment (PID-18 – patient account number).

The patient account numbers involved may or may not have visits. Connex CS Sever updates all the visits' "incorrect patient account number" with "correct patient account number".

Example transaction of ADT-A49 message process

Before Change	After Change
MRN1	MRN1
ACCT2 (incorrect source account number)	ACCT1 (correct target account number)
VISIT1	VISIT1

Message Format: refer ***Error! Reference source not found.***

22. **ADT^A50 – Change visit number**

Connex CS Sever uses this message to signal a change of an incorrectly assigned visit number value. The "incorrect source visit number" value is stored in the MRG segment (MRG-5 - prior visit number) and is to be changed to the "correct target visit number" value stored in the PV1 segment (PV1-19 - visit number).

Each superior identifier associated with this account identifier level should have the same value in both the PID and MRG segments.

Example transaction of ADT-A50 message process

Before Change	After Change
MRN1	MRN1
VISIT2 (incorrect source visit number)	VISIT1 (correct target visit number)

Message Format: refer ***Error! Reference source not found.***

1.6 *HL7 Message handling*

When WA processes an HL7 message, the HL7 message is processed by an Interface Engine. All connections and configurations required to support a customer or installation will be configured in conjunction with the WA Project team.

1.6.1 ADT Messaging

When WA receives an ADT message, the ADT message is processed by the Interface Engine and stored in the Connex CS database.

1.6.2 ORU Messaging

When Connex CS receives a set of vitals from a patient monitor, the data processed by the Interface Engine and is sent to the HIS.

1.7 *ADT Messages - Inbound*

Following section describes each category of supported inbound messages.
Below are various message formats used by the supported ADT messages.

1.7.1 ADT Message Segment Format

1.7.1.1 ADT/Generic Message Format

Segment	Segment Description	CS	Notes
MSH	Message Header	R	
EVN	Event Type	R	
PID	Patient Identification	R	
PV1	Patient Visit	R	
[PV2]	Patient Visit – Additional Information	O	Cannot be present for A23, A29.
[{ NK1 }]	Next of Kin/Associated Parties	O	Cannot be present for A23, A29.
[{AL1}]	Patient Allergy Information	O	Cannot be present for A23, A29.

List of events using this message format: A01, A02, A03, A04, A05, A06, A07, A08, A11, A12, A13, A23, A29, A38

1.7.1.2 ADT/Merge1 Message Format

Message	Segment Description	CS	Notes
MSH	Message Header	R	
EVN	Event Type	R	
PID	Patient Identification	R	
MRG	Merge Information	R	

List of events using this message format: A34, A47, A49

1.7.1.3 ADT/Merge2 Message Format

Message	Segment Description	CS	Notes
MSH	Message Header	R	
EVN	Event Type	R	
PID	Patient Identification	R	

Message	Segment Description	CS	Notes
MRG	Merge Information	R	
[PV1]	Patient Visit	O	Required for A42, A50.

List of events using this message format: A40, A41, A42, A50

1.7.1.4   ADT/A17 Message Format

Message	Segment Description	WAHL7	Notes
MSH	Message Header	R	
EVN	Event Type	R	
PID	Patient Identification	R	Patient 1 information
PV1	Patient Visit	R	Visit of Patient 1
[PV2]	Patient Visit - Additional Information	O	
PID	Patient Identification	R	Patient 2 information
PV1	Patient Visit	R	Visit of Patient 2
[PV2]	Patient Visit - Additional Information	O	

1.7.2 ADT Inbound Supported Segment Details

This section defines the supported HL7 segment field data for ADT Inbound in Connex CS Sever.

Field ID	Description	Required/Optional		Repetitive		Comments
MSH	**Message Header**					
MSH-1	Field Separator	R	NA	N	NA	
MSH-2	Encoding Characters	R	NA	N	NA	
MSH-7	Date/Time Of Message	R	NA	N	NA	
MSH-9	Message Type	R	NA	N	NA	Unsupported type / trigger combination will error and log into message history.
MSH-10	Message Control ID	R	NA	N	NA	
MSH-11	Processing ID	R	NA	N	NA	
MSH-12	Version ID	R	NA	N	NA	
PID	**Patient Identification**					
PID-3	Patient Identifier List	R	R	Y	Y	
PID-5	Patient Name	R	R	Y	Y	
PID-18	Patient Account Number	O	O	N	N	Required if Patient Account number is the Barcode ID.
PID-19	SSN Number - Patient	O	O	N	N	Required if SSN number is the Barcode ID.
PV1	**Patient Visit**					
PV1-2	Patient Class	R	R	N	N	

Field ID	Description	Required/Optional		Repetitive		Comments
PV1-3	Patient Location	O	R	N	N	PV1-3-1 is Required
	PV1-3-1 (Unit)	O	R			
	PV1-3-2 (Room)	O	C			
	PV1-3-3 (Bed)	O	C			
	PV1-3-4 (Facility)	O	O			
	PV1-3-7 (Building)	O	O			
	PV1-3- 8 (Floor)	O	O			
PV1-6	Prior Patient Location	O	O	N	N	Required for A02 messages
PV1-19	Visit Number	O	R	N	N	Connex CS requires a Visit number. Other fields can be used instead of PV1-19.
PV1-44	Admit Date/Time	O	O	N	N	
PV1-45	Discharge Date/Time	O	C	Y	N	Required for ADT-A03 (Discharge Patient) message.
MRG	**Merge Patient Info**					
MRG-1	Prior Patient Identifier List	R	R	Y	N	This field is used in ADT-A34, A40 & A47 HL7 messages. If PID-3 is not the primary patient identifier (Level 3 ID) then Connex CS cannot support ADT-A34, A40 & A47 HL7 messages.
MRG-3	Prior Patient Account Number	R	R	N	N	This field is used in ADT-A41 & A49 HL7 messages. If PID-18 is not a key patient identifier (Level 2 ID) then Connex CS cannot support ADT-A41 & A49 HL7 messages.
MRG-5	Prior Visit Number	R	R	N	N	This field is used in ADT-A42 & A50 HL7 messages. If PV1-19 is not a key patient identifier (Level 1 ID) then Connex CS cannot support ADT ADT-A42 & A50 HL7 messages.

1.7.3 Key Identifiers in ADT Messages

Merge and change ADT messages will work as per HL7 specifications only when standard HL7 Level-1, 2 and 3 identifiers are set. Depending on the data provided and data used within the Connex CS application, certain merge messages may not process properly and should be disabled.

For example, if facility is using PID-18 as the Connex CS visit number which is normally PV1-19 and PV1-19 is left empty then messages requiring MRG-5 should be excluded.

Standard HL7 identifiers are:

- **Level 3** – PID - 3 (Patient Identifier)
- **Level 2** – PID-18 (Patient Account Number)
- **Level 1** – PV1-19 (Visit Number)

Standard HL7 source and target identifiers used for merge and change messages:

Target Identifier	Source Identifier
PID-3 (Patient Identifier)	MRG-1 (Prior Patient Identifier)
PID-18 (Patient Account Number)	MRG-3 (Prior Account Number)
PV1-19 (Visit Number)	MRG-5 (Prior Visit Number)

1.8 ORU Messages – Outbound

1.8.1 ORU Message Segment Format

This message is used to send observations (Captured Vitals) to HIS with Patient and visit information.

Message	Segment Description	Populated	Notes
MSH	Message Header	Y	
[	--- PATIENT Begin		
PID	Patient Identification	Y	
[	--- VISIT Begin		
PV1	Patient Visit	Y	
]	--- VISIT End		
]	--- PATIENT End		
OBR	Observations Request	Y	
[{	--- OBSERVATION Begin		
OBX	Observation	Y	
}]	--- OBSERVATION End		

1.8.2 ORU Outbound Supported Segment Details

Field ID	Description	Required/Optional	Repetitive	Comments

		HL7	Connex CS Sever	HL7	Connex CS Sever	
MSH	**Message Header**					
MSH-1	Field Separator	R	R	N	N	"|"
MSH-2	Encoding Characters	R	R	N	N	"^~\&"
MSH-3	Sending Application	O	O	N	N	
MSH-4	Sending Facility	O	O	N	N	
MSH-5	Receiving Application	O	O	N	N	
MSH-6	Receiving Facility	O	O	N	N	
MSH-7	Date / Time Of Message	R	R	N	N	Current system date time in "YYYYMMDDHHMMSS" date format
MSH-9	Message Type	R	R	N	N	ORU^R01
MSH-10	Message Control ID	R	R	N	N	Last modified date time of Vital test
MSH-11	Processing ID	R	R	N	N	Default value "P" and is configurable.
MSH-12	Version ID	R	R	N	N	Default value "2.5" and is configurable.
PID	**Patient Identification**					
PID-3-1	Patient Identifier List	R	R	Y	Y	
PID-5-1	Patient Name	R	R	Y	Y	
PID-7	Date/Time Of Birth	O	O	N	N	
PID-8	Administrative Sex	O	O	N	N	
PID-18	Patient Account Number	O	O	N	N	
PID-19	SSN Number – Patient	O	O	N	N	
PID-20	Driver's License Number - Patient	O	O	N	N	
PV1	**Patient Visit**					
PV1-2	Patient Class	R	R	N	N	
PV1-3	Patient Location	O	R	N	N	PV1-3-1 is Required. PV1-3-2 is Conditional PV1-3-3 is Conditional PV1-3-4 is Optional PV1-3-7 is Optional PV1-3-8 is Optional
PV1-19-1	Visit Number	O	R	N	N	
PV1-44	Admit Date/Time	O	O	N	N	
OBR	**Observation Request**					
OBR-4	Universal Service Identifier	R	R	N	NA	"S" for Spot and "C" for continuous data
OBR-7	Observation Date/Time	C	R	N	N	
OBR-10	Collector Identifier	O	O	Y	N	Vitals taken by information

OBR-25	Result Status	C	R	N	N	Data sent from a bedside device confirmed by a clinician at the bedside device is tagged as "confirmed" data
						
						Data sent from a bedside device without a clinician confirming the data at the bedside is tagged as "unconfirmed data".
						
						When creating an outbound ORU message, the tagged data is converted to the following values.
						    "F" - Final Results (confirmed)
						    "R" - Results stored; not yet verified (unconfirmed)

OBX	**Observation / Result**					
OBX-1	Set ID – OBX	O	NA	N	NA	
OBX-2	Value Type	C	NA	N	N	"NM" or "ST"
OBX-3	Observation Identifier	R	R	N	N	Vitals measurement Code name. This is configurable through Admin Tools; refer to User Guide of Admin Tool for the steps.
OBX-5	Observation Value	C	R	Y	N	Measurement value
OBX-6	Units	O	O	N	N	Measurement unit
OBX-8	Abnormal Flags	O	O	Y	N	Measurement alarm value

OBX-11	Observation Result Status	R	R	N	N	Data confirmed by a clinician at the bedside device is tagged as "confirmed" data.
						Data sent from a bedside device without a clinician confirming the data at the bedside is tagged as "unconfirmed data"
						This tag defines the data as "confirmed" or "unconfirmed data".
						When creating an outbound ORU message, the tagged data is converted to the following values.
						    "F" - Final Results (confirmed)
						    "R" - Results stored; not yet verified (unconfirmed)
						
						Note: These values are applied to each individual measurement captured at the source medical device.

OBX-14	Date/Time of the Observation	O	R	N	N	Default format is "YYYYMMDDHHMMSS"
OBX-15	Producer's ID	O	O	N	N	Device serial number
OBX-16	Responsible Observer	O	O	Y	N	Vitals taken by information
OBX-18	Equipment Instance Identifier	O	O	Y	N	Source Value of Vital parameters. Value is the same as value coming from the CVSM. There is no manipulation from EGS and Corepoint.

1.8.3 OBX-3-1 Observation Identifiers (WA Defined)

Following observation identifiers are in Continuous Vitals Outbound:

Code	Description
BED EXIT	BED EXIT ALARM
MOTION	PATIENT MOTION
TURN	PATIENT TURN (TIMESTAMP OF CONFIRM TURN IS OCCURED)

Note: Value of OBX-3 (Observation Identifier) for Bed Exit Alarms and PATIENT MOTION is same because both alarms are related to Patient Motion parameter.

1.8.4   Source Values of Vital Parameters

This section defines different source values of vital signs data which is exported into OBX-18 (Equipment instance identifier) in ORU message. This value is exported same as that is coming from a Welch Allyn device and there is no manipulation from Connex CS Server and Corepoint.

1.8.4.1   Sources of Parameters (OBX-18-1)

1.8.4.1.1 *Sources of Spot Parameters*

Parameter	Sources
BLOOD PRESSURE	None
	Unknown
	Manual
	NIBP
HEART RATE	None
	Unknown
	Manual
	NIBP
	SPO2
	ECG
HEMOGLOBIN	None
	Unknown
	Manual

	SpHB
TEMPERATURE	None
	Unknown
	Manual
	Temperature
PULSE OXIMETRY	None
	Unknown
	Manual
	SPO2
PAIN	None
	Unknown
	Manual
RESPIRATION	None
	Unknown
	Manual
	Respiration
	CO2
	BedSensor
	ChairSensor
HEIGHT	None
	Unknown
	Manual
WEIGHT	None
	Unknown
	Manual
	Weight
GLUCOSE	None
	Unknown
	Manual
EtCO2, FiCO2	None
	Unknown
	BreathDetected
	Interval
	Manual
Motion	None
	Unknown
	Manual
	Bed
	Chair
Turn	None
	Unknown

Manual	
Bed	

1.8.4.1.2 *Sources of Continuous Parameters*

Parameter	Sources
EtCO2 FiCO2 PR RR SpHB IPI Motion Turn Bed_Exit	None
	Unknown
	Manual
	NIBP
	SPO2
	CO2
	SpHB
	Respiration
	ECG

1.8.5 EarlySense Parameters Details

Parameter	Default Code (OBX-3-1)	Description	Value (OBX-5)	Units (OBX-6)
Motion	MOTION	Patient Motion level	1 - 6	-
Turn	TURN	Patient's confirmed turn's timestamp	Timestamp (yyyymmddhhmmss) of confirmed turn	-
Bed Exit Alarm	MOTION	Patient's Bed Exit Alarm	EXITING_BED	-
Heart/Pulse Rate	HR	Heart rate reading	Actual reading	Beats Per Minute
Respiration Rate	RESP	Respiration rate reading	Actual reading	-

1.8.6 Device Profile mapping to ORU Interface

Following table specifies the Observation Result status values in ORU message based on different profile (mode) of CVSM device.

CVSM Profile	Measurement Type	Outbound Interface	OBR-4	OBR-25	OBX-11
Continuous	Continuous	Unconfirmed	C	R	R
Continuous	Spot	Unconfirmed	S	R	R
Intervals	Spot	Confirmed	S	F	F
Intervals	Without Alarm threshold exceeded	Confirmed	S	F	F
Intervals	With Alarm threshold exceeded	Unconfirmed	S	F	F
Spot check	Spot	Confirmed	S	F	F

Where "S" means "Spot" and "C" means "Continuous" for OBR-4 value.
Where "R" means "Unconfirmed" and "F" means "Confirmed" for OBR-25 value.

Where "R" means "Unconfirmed" and "F" means "Confirmed" for OBX-11 value.

1.9 *Connex CS Customer facing Connections*

Type	Connection Name	Default Port	Description
ADT	WA_ADT_IB	8001 (Configurable)	This connection is used to receive ADT HL7 messages from HIS over a socket.
ORU Confirmed	WA_ORU_OB_CONFIRMED	8004 (Configurable)	This is available only in a Dual Outbound or confirmed only ORU environment and sends only "Confirmed Data" to the customer system.
ORU Unconfirmed	WA_ORU_OB_UNCONFIRMED	8005 (configurable)	This is available for all ORU environments. This connection will send "Unconfirmed Data" to the customer system in a Dual ORU environment. -OR- This connection will send ALL ORU messages in a Single ORU environment.

Appendix B: Sample Messages

1   Overview

This section includes a set of sample ADT and ORU messages.

If using standard modifiers and parameters, these data points can be collected during the project.

If using Custom Data (i.e. Custom Parameters, Custom Modifiers or Custom Scores), refer to **20013600C Deploying Custom Data - W/I**.

1.1 *Sample ADT Messages*

1.1.1 Sample Inbound ADT with HL7 required fields populated

MSH|^~\&|||||20120629092011||ADT^A01|MESSAGEIDA01-1|P|2.5||||||
EVN||20120521|||||
PID|||1888881||Male^One|||||||||||||||||||||||||||||||||
PV1||I|||||||||||||||||||||||||||||||||||||||||||

1.1.2 Sample Inbound ADT with HL7 and Connex CS required fields populated

MSH|^~\&|||||20120629092011||ADT^A01|MESSAGEIDA01-1|P|2.5||||||
EVN||20120521|||||
PID|||1888881||Male^One|||||||||||||||||||||||||||||||||
PV1||I|WA|||||||||||||||44444|||||||||||||||||||||||||||||||

1.2 *Sample ORU Messages*

1.2.1 Sample Outbound Message CVSM - Continuous Profile

MSH|^~\&|Connex|WA|HIS|WA|20130830031600||ORU^R01|19996A27-8A5E-4166-9F03-F129768DF041|P|2.5
PID|||MRN1||Hudson^Michel
PV1||I|||||||||||||||||||VISIT01
OBR||||C|||20130830031500|||||||||||||||||||R
OBX|1|NM|SPO2||98|%||N|||R|||20130830031500|120503002|||SPO2
OBX|2|NM|HR||75|BeatsPerMinute||N|||R|||20130830031500|120503002|||SPO2
OBX|3|NM|ETCO2||4|Kilopascal||N|||R|||20130830031500|120503002|||Unknown
OBX|4|NM|FICO2||1|Kilopascal||N|||R|||20130830031500|120503002|||Unknown
OBX|5|NM|IPI||6|||N|||R|||20130830031500|120503002|||Unknown
OBX|6|NM|RESP||19|BPM||N|||R|||20130830031500|120503002|||CO2
OBX|7|NM|HL||10|gdL||N|||R|||20130830031500|120503002|||Unknown
OBX|8|NM|MOTION||1|||N|||R|||20130830031500|120503002|||PatientMotion_Bed
OBX|9|ST|TURN||20130830031502|||N|||R|||20130830031500|120503002|||PatientMotion_Bed

If Bed Exit Alarm is occurred then OBX in ORU message looks like:

OBX|10|ST|MOTION||EXITING_BED|||N|||R|||20130830031500|120503002|||None

1.2.2 Sample Outbound Message CVSM - Spot Profile

MSH|^~\&|Connex|WA|HIS|WA|20131015151607||ORU^R01|19996A27-8A5E-4166-9F03-F129768DF041|P|2.5
PID|||MRN1||Hudson^Michel
PV1||I||||||||||||||||||VISIT01
OBR||||S|||20131015151606|||CL1234^Taylor^Robin||||||||||||||F
OBX|1|ST|MODE||Venous||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SpHB
OBX|2|NM|HL||12|gdL||N|||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SpHB
OBX|3|NM|StringModifier||3||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||Manual
OBX|4|NM|GLUC||100|MassConcentration||N|||F|||20131015151606|103000210611|CL1234^Taylor^Robin|| Manual
OBX|5|NM|SYS||14665|Pascal||N|||F|||20131015151606|103000210611|CL1234^Taylor^Robin||NIBP
OBX|6|NM|DIA||9602|Pascal||N|||F|||20131015151606|103000210611|CL1234^Taylor^Robin||NIBP
OBX|7|NM|MAP||11065.7|Pascal||N|||F|||20131015151606|103000210611|CL1234^Taylor^Robin||NIBP
OBX|8|ST|BPSITE||LArm||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||NIBP
OBX|9|ST|BPPP||Lying||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||NIBP
OBX|10|ST|BPCUFF||Adult||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||NIBP
OBX|11|ST|HRSITE||Right||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SPO2
OBX|12|ST|HRMETH||Doppler||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SPO2
OBX|13|ST|HRPP||Lying||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SPO2
OBX|14|NM|HR||72|BeatsPerMinute||T|||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SPO2
OBX|18|ST|WTQUAL||Dry||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||Weight
OBX|19|ST|WTMETH||Chair||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||Weight
OBX|20|NM|WT||55000|Gram||N|||F|||20131015151606|103000210611|CL1234^Taylor^Robin||Weight
OBX|21|NM|BMI||24.4|||N|||F|||20131015151606|103000210611|CL1234^Tailor^John||Weight
OBX|22|ST|PAINMATH||Verbal||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||Manual
OBX|23|NM|PAIN||5|||N|||F|||20131015151606|103000210611|CL1234^Taylor^Robin||Manual
OBX|24|ST|TEMPSITE||Oral||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||Temperature
OBX|25|NM|TEMP||98|Kelvin||N|||F|||20131015151606|103000210611|CL1234^Taylor^Robin||Temperature
OBX|26|ST|SPO2METH||RoomAir||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SPO2
OBX|27|ST|SPO2SITE||Forehead||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SPO2
OBX|28|NM|SPO2FLOW||1||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SPO2
OBX|29|NM|SPO2CONC||21||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SPO2
OBX|30|NM|SPO2||99|%||N|||F|||20131015151606|103000210611|CL1234^Taylor^Robin||SPO2
OBX|31|ST|HTQUAL||Actual||||||F|||20131015151606|103000210611|CL1234^Taylor^Robin||Manual
OBX|32|NM|HT||1500.0|Millimeter||N|||F|||20131015151606|103000210611|CL1234^Taylor^Robin||Manual

1.2.3 Sample Outbound Message CVSM - Continuous Profile with Intervals (Spot measurements)

MSH|^~\&|Connex|WA|HIS|WA|20130830031657||ORU^R01|19996A27-8A5E-4166-9F03-F129768DF041|P|2.5
PID|||MRN1||Hudson^Michel
PV1||I||||||||||||||||||VISIT01
OBR||||S|||20130830031519|||CL1234^Taylor^Robin||||||||||||||R
OBX|1|NM|SYS||14665|Pascal||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|2|NM|DIA||9602|Pascal||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|3|NM|MAP||11065.7|Pascal||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|4|ST|BPSITE||LArm|||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|5|ST|BPPP||Lying|||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|6|ST|BPCUFF||Adult|||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP

Sample Outbound Message CVSM - Continuous Profile sending Spot Measurements

MSH|^~\&|Connex|WA|HIS|WA|20130830031657||ORU^R01|19996A27-8A5E-4166-9F03-F129768DF041|P|2.5
PID|||MRN1||Hudson^Michel
PV1||I||||||||||||||||||VISIT01
OBR||||S|||20130830031519|||CL1234^Taylor^Robin||||||||||||||||R
OBX|1|NM|SYS||14665|Pascal||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|2|NM|DIA||9602|Pascal||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|3|NM|MAP||11065.7|Pascal||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|4|ST|BPSITE||LArm|||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|5|ST|BPPP||Lying|||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|6|ST|BPCUFF||Adult|||N|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP

1.2.4 Sample Outbound Message CVSM - Intervals Profile without Alarms

MSH|^~\&|Connex|WA|HIS|WA|20130830031657||ORU^R01|19996A27-8A5E-4166-9F03-F129768DF041|P|2.5
PID|||MRN1||Hudson^Michel
PV1||I||||||||||||||||||VISIT01
OBR||||S|||20130830031519|||CL1234^Taylor^Robin||||||||||||||||F
OBX|1|NM|SYS||14665|Pascal||N|||F|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|2|NM|DIA||9602|Pascal||N|||F|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|3|NM|MAP||11065.7|Pascal||N|||F|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|4|ST|BPSITE||LArm|||N|||F|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|5|ST|BPPP||Lying|||N|||F|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|6|ST|BPCUFF||Adult|||N|||F|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP

1.2.5 Sample Outbound Message CVSM - Intervals Profile with Alarms

MSH|^~\&|Connex|WA|HIS|WA|20130830031657||ORU^R01|19996A27-8A5E-4166-9F03-F129768DF041|P|2.5
PID|||MRN1||Hudson^Michel
PV1||I||||||||||||||||||VISIT01
OBR||||S|||20130830031519|||CL1234^Taylor^Robin||||||||||||||||R
OBX|1|NM|SYS||26665|Pascal||HH|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|2|NM|DIA||12666|Pascal||HH|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|3|NM|MAP||22065.7|Pascal||HH|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|4|ST|BPSITE||LArm|||HH|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|5|ST|BPPP||Lying|||HH|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP
OBX|6|ST|BPCUFF||Adult|||HH|||R|||20130830031519|103000210611|CL1234^Taylor^Robin||NIBP

1.2.6 Sample Outbound Message CVSM - Spot Profile with Customer Measurements and Modifiers

MSH|^~\&|||||20131112125830||ORU^R01|0C9A7937-E034-40C6-AF1E-53568981F488|P|2.5
PID|||MRN1||Hudson^Michel
PV1||I||||||||||||||||||VISIT01
OBR||||S|||20131112125828|||CL1234^Taylor^Robin||||||||||||||||F
NTE|1||This is Sample Note
OBX|1|NM|SYS||14665|Pascal||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||NIBP
OBX|2|NM|DIA||9602|Pascal||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||NIBP
OBX|3|NM|MAP||11065.7|Pascal||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||NIBP
OBX|4|ST|BPSITE||LArm||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||NIBP
OBX|5|ST|BPPP||Lying||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||NIBP

OBX|6|ST|BPCUFF||Adult||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||NIBP
OBX|7|ST|NIBPCust||NIBPCustValue|NIBPCustHL7Unit||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|8|ST|HRSITE||Right||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||ECG
OBX|9|ST|HRMETH||Doppler||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||ECG
OBX|10|ST|HRPP||Lying|||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||ECG
OBX|11|NM|HR||75|BeatsPerMinute||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||ECG
OBX|12|ST|HRCust||HRCustValue|HRCustHL7Unit||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|13|ST|SPO2METH||RoomAir||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||SPO2
OBX|14|ST|SPO2SITE||Forehead||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||SPO2
OBX|15|NM|SPO2FLOW||1|||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||SPO2
OBX|16|NM|SPO2CONC||21||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||SPO2
OBX|17|NM|SPO2||99|%||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||SPO2
OBX|18|ST|SPO2Cust||SPO2CustValue||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|19|ST|TEMPSITE||Oral||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Temperature
OBX|20|NM|TEMP||98.0|Kelvin||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Temperature
OBX|21|ST|TEMPCust||TEMPCustValue||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|22|ST|RESPMETH||Spontaneous||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||CO2
OBX|23|ST|RESPPP||Standing|||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||CO2
OBX|24|NM|RESP||19|BPM||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||CO2
OBX|25|NM|RESPCust||345|RESPCustHL7Unit|||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|26|ST|PAINMATH||Verbal||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|27|NM|PAIN||5|||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|28|NM|PAINCust||2|PAINCustHL7Unit|||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|29|ST|HTQUAL||Actual||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|30|NM|HT||15000.0|Millimeter||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|31|ST|HTCust||HTCustValue||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|32|NM|StringModifier||3||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|33|NM|GLUC||100.0|MassConcentration||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|34|ST|GLUCCust||GLUCCustValue||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|35|NM|BMI||24.4|||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Weight
OBX|36|ST|WTQUAL||Dry||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Weight
OBX|37|ST|WTMETH||Chair||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Weight
OBX|38|NM|WT||55000.0|Gram||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Weight
OBX|39|ST|WTCust||WTCustValue||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|40|ST|MODE||Venous||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||SpHB
OBX|41|NM|HL||12|gdL||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||SpHB
OBX|42|ST|HBCust||HBCustValue||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|43|NM|MOTION||2|||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Bed
OBX|44|NM|MOTIONCUST||11|MOTIONCustHL7Unit|||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual
OBX|45|NM|ETCO2||1|Mmhg||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||BreathDetected
OBX|46|NM|FICO2||1|Mmhg||N|||F|||20131112125828|103000210611|CL1234^Taylor^Robin||BreathDetected
OBX|47|ST|CO2Cust||CO2CustValue||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin||Manual

OBX|48|NM|WL||80|Mmhg||HH|||F|||20131112125828|103000210611|CL1234^Taylor^Robin
OBX|49|ST|WLP||Lying||||||F|||20131112125828|103000210611|CL1234^Taylor^Robin
OBX|50|ST|WLSIZE||Rarm|WLCustHL7Unit|||||F|||20131112125828|103000210611|CL1234^Taylor^Robin

MSH|^~\&|||||20120629092011||ADT^A01|MESSAGEIDA01-1|P|2.5||||||
EVN||20120521|||||
PID|||1888881||Male^One|||||||||||||||||||||||||||||||||||||
PV1||I|||||||||||||||||||||||||||||||||||||||||||||||||

1.2.7 Sample Outbound Message CVSM – Office Profile with Average NIBP

Example: Two Contributing NIBP measurements are taken for Averaged NIBP

MSH|^~\&|||||20140903144833||ORU^R01|A1A5011B-D13D-4FD9-91CE-299C59D24F9C|P|2.5
PID|||20140903091830262||Kepler^John
PV1||I||||||||||||||||||20140903091830614
OBR||||S|||20140903144831|||20140903091831725^Tailor^John|||||||||||||||F
OBX|1|NM|AveragedSYS||125|Mmhg||N|||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|2|NM|AveragedDIA||81|Mmhg||N|||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|3|ST|AveragedMAP||95.7|Mmhg||N|||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|4|NM|SYS_1||124|Mmhg||N|||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|5|NM|DIA_1||80|Mmhg||N|||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|6|ST|MAP_1||94.7|Mmhg||N|||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|7|ST|BPSITE_1||LArm||||||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|8|ST|BPPP_1||Sitting||||||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|9|ST|BPCUFF_1||Adult||||||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|10|NM|SYS_2||126|Mmhg||N|||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|11|NM|DIA_2||82|Mmhg||N|||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|12|ST|MAP_2||96.7|Mmhg||N|||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|13|ST|BPSITE_2||RArm||||||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|14|ST|BPPP_2||Lying||||||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP
OBX|15|ST|BPCUFF_2||Child||||||F|||20140903144831|20140903091831727|20140903091831725^Tailor^John||NIBP