Connecting to the Care Continuum
Mark Welch
Product Manager
Agenda

• Introductions
• Review of Exchanges
• Technical Deep-dive
• Standards and Implementation
• Lessons Learned
• Takeaways
Strategy

Automate  Connect  Coordinate Care

Physician Involvement

Connectivity & Data Exchange

Hospital

Physician Office

Pharmacy

Lab

Payor

IL

AL

SNF

Hospice

Memory Care

Adult Day Care

Home Care

Rehab

Collaborative Care Plan

Evidence Based Content

Analytic Tools
Exchange – a brief review

- Admission, Discharge, & Transfer – or ADT
- Enterprise Master Person Index – or eMPI
- Document Exchange
- Pharmacy Exchange
ADT Exchange

Messages

• A01 Admit/Visit Notification
• A02 Transfer a Patient
• A03 Discharge/End Visit
• A05 Pre-Admit a Patient
• A08 Update Patient Information
• A11 Cancel Admit/Visit Notification
ADT Exchange

Messages

• A13 Cancel Discharge/End Visit
• A17 Swap Patients
• A21 Patient goes on a Leave of Absence
• A22 Patient Returns from a Leave of Absence
• A52 Cancel Leave of Absence for a Patient
• A53 Cancel Patient Returns from a Leave of Absence
ADT Exchange

• Used with:
  • Document Exchange – person identification
  • Pharmacy Exchange
  • Ancillary EMR or specialty system where Vision ID is “master”
    • Therapy
    • Dietary
    • Supply
EMPI Exchange

Messages

• IHE PDQ v2 Profile
  • Q22 Find Candidates
  • K22 Response
• HL7 ADT
  • A19 Patient Query – Outbound
  • A19 ADT Response – Inbound
  • A28 Add Person – Outbound
  • A31 Update Person – Inbound/Outbound
  • A40 Merge Person - Inbound
EMPI Exchange

• When do you need an EMPI Exchange?
  • Do you have a Master Person Repository or MPI system?
  • Do you have central registration system using a 3\textsuperscript{rd} party product?
  • Does it allow participating EMR systems to query for person?
EMPI Exchange

• When do you need an EMPI Exchange?
  • Does your MPI support PDQ profile – only?
  • Does your MPI also support HL7 query/response?
Active or Solicited EMPI

• Advanced search from Vision
• Seeks matching person in MPI or central repository
• If:
  • Found, an MRN is retrieved
  • Not found, an MRN is requested
• Pre-admission record created
• Qualification or further assessment performed
EMPI Exchange

Passive or unsolicited EMPI

- Person is created and master person identifier (MRN) is created external to Vision
- Person demographic and MRN sent to Vision
- Pre-admission record created
- Qualification or further assessment performed
Document Exchange

Messages

• T02 Clinical note – Inbound
• T02 Assessment – Inbound
• T02 Attachment – Inbound
• T02 Attachment - Outbound
Document Exchange

- Inbound to Vision
  - Clinical Note
  - Assessments
  - Attachments

- Outbound from Vision
  - Attachments – Continuity of Care Document
## Attachment Category Codes

**Categories Affected:** Census, Clinical

### List of Reference Codes

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
<th>Reserved Description</th>
<th>Edit</th>
</tr>
</thead>
<tbody>
<tr>
<td>A1</td>
<td>Admission Forms</td>
<td>Admission Forms</td>
<td>Edit</td>
</tr>
<tr>
<td>A2</td>
<td>Advanced Directives</td>
<td>Advanced Directives</td>
<td>Edit</td>
</tr>
<tr>
<td>C1</td>
<td>Consents</td>
<td>Consents</td>
<td>Edit</td>
</tr>
<tr>
<td>C9</td>
<td>Continuity of Care Document</td>
<td>Continuity of Care Document</td>
<td>Edit</td>
</tr>
<tr>
<td>D1</td>
<td>Discharge Forms</td>
<td>Discharge Forms</td>
<td>Edit</td>
</tr>
<tr>
<td>I1</td>
<td>Payer/Insurance Documents</td>
<td>Payer/Insurance Documents</td>
<td>Edit</td>
</tr>
<tr>
<td>I2</td>
<td>Incidents</td>
<td>Incidents</td>
<td>Edit</td>
</tr>
<tr>
<td>L1</td>
<td>Labs</td>
<td>Labs</td>
<td>Edit</td>
</tr>
<tr>
<td>P1</td>
<td>Profile Picture</td>
<td>Resident Picture</td>
<td>Edit</td>
</tr>
<tr>
<td>P9</td>
<td>Physician</td>
<td>History and Physical</td>
<td>Edit</td>
</tr>
<tr>
<td>W1</td>
<td>Wounds</td>
<td>Wounds</td>
<td>Edit</td>
</tr>
<tr>
<td>X1</td>
<td>X-Rays</td>
<td>X-Rays</td>
<td>Edit</td>
</tr>
</tbody>
</table>

### Editor Window

- **Reserved Code**
  - **Code:** A2
  - **Description:** Advanced Directives
  - **Reserved Description:** Advanced Directives
  - **Is Admission Specific?**
    - Yes
  - **Is Exchange Enabled?**
    - No

### Sub Category Codes

- Authorizations
- Bone
- Card
- CAT Scan
- Consults
- Continuity of Care Document

### Location

- Census / Resident Info
- Census / Resident Trust Accounts
- Census / Admission Activity
- Census / Clinical Info
- Census / Payer/Bill Info
- Census / Referral Info
- Clinical / Care Plans
- Clinical / Resident Info
- Clinical / Resident/Admission
- Clinical / Alerts
### Exchange Partner Messaging

**Message Category:** Clinical Documents

**Enabled:** Yes

#### Event Subscription

<table>
<thead>
<tr>
<th>Event Description</th>
<th>Subscribe</th>
</tr>
</thead>
<tbody>
<tr>
<td>Admission Forms - Contracts</td>
<td></td>
</tr>
<tr>
<td>Admission Forms - Inventory</td>
<td></td>
</tr>
<tr>
<td>Admission Forms - Other</td>
<td></td>
</tr>
<tr>
<td>Admission Forms - Transfer/Discharge Summary</td>
<td></td>
</tr>
<tr>
<td>Advanced Directives - Durable Power of Attorney</td>
<td></td>
</tr>
<tr>
<td>Advanced Directives - Guardianship</td>
<td></td>
</tr>
<tr>
<td>Advanced Directives - Living Will</td>
<td></td>
</tr>
<tr>
<td>Advanced Directives - Other</td>
<td></td>
</tr>
<tr>
<td>Advanced Directives - State Forms</td>
<td></td>
</tr>
<tr>
<td>Labs - Other</td>
<td></td>
</tr>
</tbody>
</table>

**Default Destination:**

**Communication Method:** Web Service

**Communication URI:**

**Exchange Partner Application:**

**Exchange Partner ID:**

**Exchange Username:**

**Exchange Password:**
Document Exchange

- CCD vs. C-CDA
  - CCD - Continuity of Care Document
  - Standard = HITSP C32

- C-CDA - Consolidated Clinical Document Architecture
  - Standard = HL7 CDA R2
Pharmacy Exchange

• HL7 ADT w/NCPDP 10.6 Script Orders, Fills, Refills, Cancellations

• NCPDP 10.6 Script Census, Orders, Fills, Refills, Cancellations
Pharmacy Exchange

Messages

• HL7 ADT

• NCPDP 10.6 Script
  • CENSUS – Outbound
  • NEWRX – Outbound
  • RXFILL – Inbound
  • RESUPP – Outbound
  • CANRX - Outbound
Technical Deep-Dive

This session will cover the following topics:

• Exchange Partners
• Messages outbound from Vision
• Messages inbound to Vision
Outbound Exchange Engine

Outbound Interop Engine

Interop Exe Tester

Either

Outbound Windows Service

Parse Application Config

When Changed

Continually Monitor Config (Raise Event on change)

Enterprise List Changed?

Yes

Wait Delay

Start Async Processing

Cancel Processing Each Removed Enterprise

Cancel Token Observed

Start Processing Each Added Enterprise (Async)

Outbound Processor

Process Change Tracking

Yes

Is Exchange Active?

No

Stop Processing Enterprise

Process Queue

Insert Blank Bodies

Process each Message

Detailed on next page
Inbound Exchange Engine

- Validation
- Translation between formats
  - (ex. CIM to HL7/NCPDP/etc.)
- Acknowledgement
- Routing
- And more
Exchange Partners

• Identifies an entity with whom you exchange messages

• Each Exchange partner can have multiple types of messages

• You subscribe them to events in Vision for each message they want to receive

• Contains information for message header and routing rules

• Specific connections in the HealthShare
Exchange Partners and Patient IDs

Domain A

Geriatrician’s EMR

IDs in Message
Vision
Geriatrician
1234
5665

HL7 messages

Post acute care’s Vision

Patient’s IDs
Vision
1234
Geriatrician
5665
Podiatrist
9876

Domain B

Podiatrist’s EMR

IDs in Message
Vision
Podiatrist
1234
9876

HL7 messages
Pharmacy Exchange Messages

Enter order

New order

Status/Error

Fill Prescription

Status/Error

Resupply

Status/Error

Cancel Prescription

Cancel Response

Processes order and sends med to facility
Exchange Windows Service

- Check for Events
  - Native SQL change tracking for selected tables
  - Create List of events from SQL’s audit tables
  - Analyze changes to determine if message should be generated

- Process Message Queue
  - Create list of messages that are ready to be sent
  - Create header and re-use or create message body
  - Validate message against schema write to ATNA log
  - Call HealthShare Web Service

- Sleep for remaining time in cycle interval
Intersystem HealthShare Foundation

• Services
  • Waiting for a specific Exchange partner
  • Reading, parsing, and validating the data
  • Returning, if required, an acknowledgment

• Processes
  • Routes messages
  • Run Business Process languages
  • Data transformations

• Operations
  • Communicate with Vision and outside world
  • Return a response to caller
Production

To view the Production Settings, click on the Production Settings link in the title area of the configuration diagram.
Routing messages

1. **New Prescription**
   - **Condition**: Document [header messagetype] = "NewPrescription"
   - **Actions**:
     - send
     - transform: HMXBASECODE Transform NCPDP.CMTToNewRx
     - target: OutboundACKsbl
   - return

2. **Cancel Prescription**
   - **Condition**: Document [header messagetype] = "CancelPrescription"
   - **Actions**:
     - send
     - transform: HMXBASECODE Transform NCPDP.CMTCanRX
     - target: OutboundACKsbl
     - send
     - transform: HMXBASECODE Transform NCPDP.CMTToCanRX
     - target: FileNCPDPOut
   - return

3. **Fill Prescription**
   - **Condition**: Document [header messagetype] = "RefillPrescription"
   - **Actions**:
     - send
     - transform: HMXBASECODE Transform NCPDP.CMTToReSupp
     - target: OutboundACKsbl
     - send
     - transform: HMXBASECODE Transform NCPDP.CMTToReSupp
     - target: FileNCPDPOut
   - return
Validating Messages

```xml
<?xml version="1.0" ?>
<!DOCTYPE doc [>
<!-- type: EnaLib.EI.XML.Document id: 48250 -->
<arrayofxmlvalidationexception
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xmlns:xsd="http://www.w3.org/2001/XMLSchema">
+xmlvalidationexception>
<sequence/>
<sequence/>
<error>
<errorcode>the 'individualpolicynumber' element is invalid - the value ' ' is invalid according to its datatype 'an..35m' - the pattern constraint failed. message path /message/body/census/benefitscoordin contains value of ""</errorcode>
</error>
</xmlvalidationexception>
</arrayofxmlvalidationexception>
```
Inbound Messages to Vision

HealthMEDX Pharmacy Exchange

VPN with SSL

HealthMEDX Exchange

SOAP Message with NCPDP message in the SOAP body

Client A SOAP Listener

Client A Message transformation history

http://192.168.1.3:57772/csp/healthshare/ClientA/...

Client B SOAP Listener

Client B Message transformation history

http://192.168.1.3:57772/csp/healthshare/ClientB/...

Client C SOAP Listener

Client C Message transformation history

http://192.168.1.3:57772/csp/healthshare/ClientC/...

Vision 8.1

Client A

Vision 8.2

Client B

Client C

Automate Connect ENGAGE UG 2014
Inbound Messages to Vision

HMX Vision Exchange

Destinations

- Stored Procedure
- Inbound Web Service

Namespaces

- Services
- Process
- Operations

Exchange Partner

Automate Connect
HealthMEDX UG 2014
Inbound Web Service

• Receives XML message
• Run the appropriate controller stored procedure for the message
• Log success/failure results in audit log
• Run any Vision post processing (e.g. sign and lock a clinical note)
• Return success/failure results to IES
Inbound Messages and Acknowledging Errors

• Validated against the NCPDP standard

• Stored procedure validates key identifiers and will reject if unknown

• Inbasket for end user involvement when a user needs to determine how to resolve an issue
Validation against the standard

```xml
<xml version="1.0"?>
<!-- type: NDRBASECODE.BusProc.BPL.XMLValid
:XMLValidationResponse
:xmlns:xi="http://www.w3.org/2001/XMLSchema-instance"
:xmlns="http://www.w3.org/2001/XMLSchema"
:...; xmlns="http://www.w3.org/2001/XMLSchema"
:><XMLValidationResponse>true</XMLValidationResponse>
</XMLValidationResponse>
```
Standards and Implementation

- HL7 v2.6
- IHE PDQ v2.5
- NCPDP 10.6 Script, Dec 2012 schema
- Miscellaneous codes cross references
Lessons Learned

• Resources – the right ones, technical, clinical, interdepartmental

• Connectivity – follow the rules

• Technology – capabilities and methods

• Architecture – structural representation of the organization and the data

• Workflow – understand the process

• Test plans – that represent the major and the minor

• Patience – and some more patience
Action Items

• Budget for your team’s time, not just the software

• Trading partners – this is a three-way relationship
  • Managing business relationships
  • Aligning (or at least working with) disparate priorities and schedules
  • Test and training environments

• Understand workflow
  • Minimum data set
  • Process in the “real world”
  • Both sides of the exchange

• What causes problems inside your process today?
Session Summary

The key insights you should take away from this session include:

• Understand the impact the implementation of the technology and business logic has on your ability to connect to trading partners, health systems, and health information exchanges

• Evaluate how Exchange can impact internal operations through access to information produced by ancillary information systems and trading partners

• Understand the key steps you can take immediately to pave the way to connect to the continuum with Exchange
Exchange Special Interest Group

Meeting on Friday morning at User Group

Quarterly calls – May 5th will be the next

Seeking input and perspectives
Contact your CSC or PM for more details!

Thank you!