Discovery Session

~

HL7 Basics

July 2015

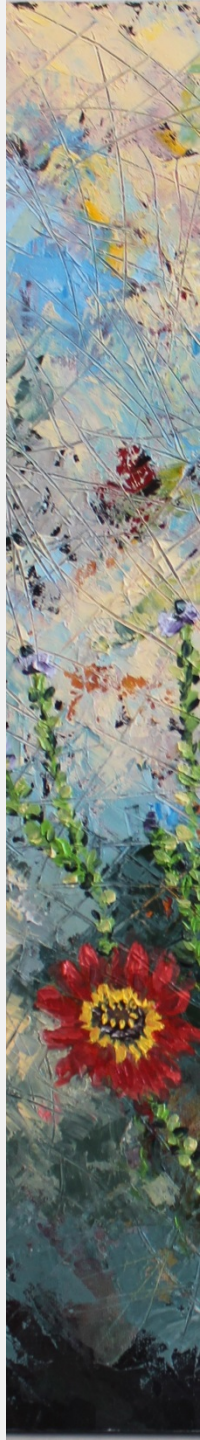American Immunization Registry Association

Nathan Bunker

Agenda

- Introduction

- HL7 Standards

- HL7 v2 Basics

- Key Principles of Interoperability

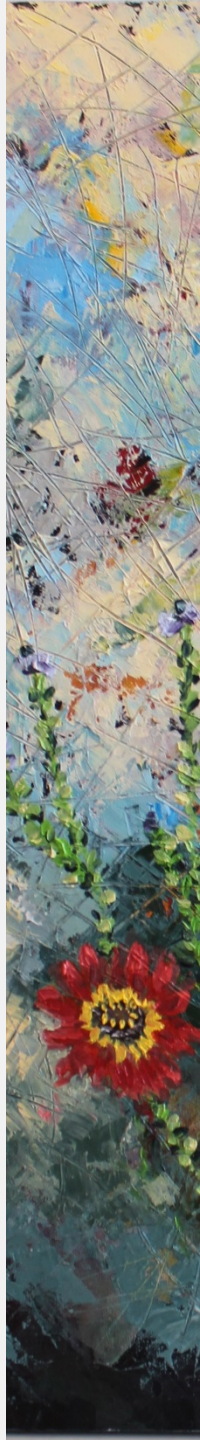- CDC, AIRA & NIST Resources

Introduction

Complexity of Health IT

- Why is interoperability for health systems so hard?

- Why are health technology standards so complex?

- Isn't there an easier way?

Complexity

- What is currently known is immense
- But health knowledge continues to increase exponentially
- It's not humanly possible to understand and manage all there is to know
- Information technology is a critical tool in managing this complexity
- The work you are doing is just one small piece of this critical effort

```xml
<medication xmlns="urn:hl7-org:greencda:c32">
  <id>1234</id>
  <code code="122" codeSystem="2.16.840.1.113883.6.88" name="Aspirin" />
  <status>completed</status>
  <effectiveTime>
    <start value="2012-01-30T09:00:00" />
    <end value="2012-02-30T09:00:00" />
  </effectiveTime>
  <administrationTiming institutionSpecified="true">
    <period amount="1" unit="2h" />
  </administrationTiming>
  <route code="C38288" codeSystem="2.16.840.1.113883.3.26.1.1" />
  <dose amount="2" unit="pills" />
  <site code="12354-2" codeSystem="2.16.840.1.113883.6.96" />
  <doseRestriction>
    <numerator amount="5" unit="pills" />
    <denominator amount="1" unit="day" />
  </doseRestriction>
  <fulfillmentHistory fillStatus="completed" fillNumber="1">
    <prescriptionNumber>12</prescriptionNumber>
    <dispenseDate>2012-01-31T09:00:00</dispenseDate>
    <quantityDispensed amount="100" unit="tablets" />
  </fulfillmentHistory>
  <orderInformation orderNumber="123" fills="3">
    <quantityOrdered amount="500" unit="tablets" />
    <orderDateTime>2012-01-29T09:00:00</orderDateTime>
      <expirationDateTime>2013-01-31T09:00:00</expirationDateTime>
  </orderInformation>
</medication>
```

Immunizations Leads the Way

- IIS Community is an example of success to other Public Health projects

- Standards were first set in the 1990's

- Domain is relatively quiet and well defined

- IIS pushed for adoption of national standards
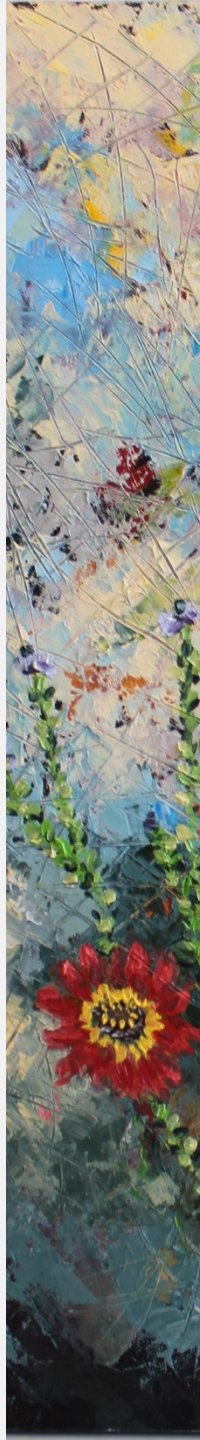
HL7 Standards

HL7 v2 Introduction

- HL7 v2
  - First developed in the late 1980's
  - A usable and likable standard but a bit "crusty"
  - Used in United States

- Limitations of HL7 v2
  - Structure and content are directly linked
  - Built before the use of other common messaging standards such as XML
  - Expressly defined to not include transport
  - Standard was not built with strong support for conformance testing
  - Local variation at many levels is supported
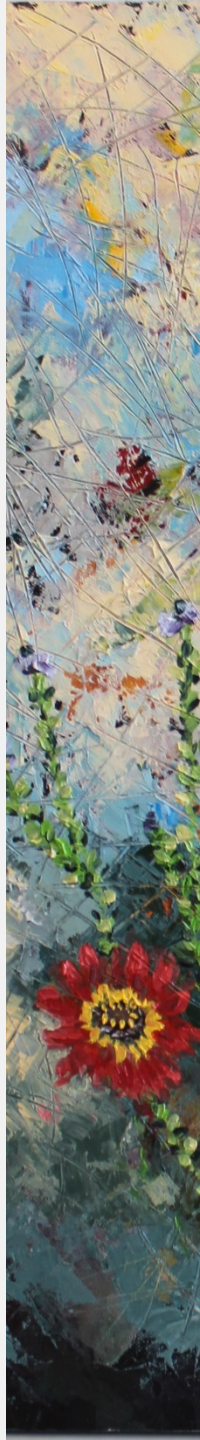
HL7 v3 Introduction

- ## HL7 v3
  - Developed in the 1990's to address shortcomings in V2
  - Uses other standards such as XML
  - Created Reference Information Model (RIM)
  - A "modeler's paradise"
  - In use in Canada, UK and other countries

v3 RIM

CDA Introduction

- Clinical Document Architecture - CDA
  - Most common use of HL7 v3
  - Defines structure of
    - Discharge Summaries
    - Progress Notes
    - Medical Records
  - Document that can be persisted rather than a message that can be sent
  - Human readable and computer coded sections
  - Great deal of variety in implementation
  - ONC has helped create the Consolidated CDA which EHRs support for Meaningful Use

CDA Example

```xml
<section>
  <code code="101155-0" codeSystem="2.16.840.1.113883.6.1"
   codeSystemName="LOINC"/>
  <title>Allergies and Adverse Reactions</title>
  <text>
    <list>
      <item><content ID="A1">Penicillin - Hives</content></item>
      <item>Aspirin – Wheezing</item>
      <item>Codeine - Itching and nausea</item>
    </list>
  </text>
  <entry>
    <observation classCode="OBS" moodCode="EVN">
      <code code="247472004" codeSystem="2.16.840.1.113883.6.96"
       codeSystemName="SNOMED CT" displayName="Hives">
        <originalText><reference value="#A1"/></originalText>
      </code>
      <entryRelationship typeCode="MFST">
        <observation classCode="OBS" moodCode="EVN">
          <code code="91936005" codeSystem="2.16.840.1.113883.6.96"
           codeSystemName="SNOMED CT" displayName="Allergy to penicillin"/>
        </observation>
      </entryRelationship>
    </observation>
  </entry>
</section>
```

Identifiers - OID

- Object Identifier – OID
  - System for creating globally unique id for *anything*
  - Standard set by International Organization for Standardization – ISO
  - Every OID represents a **node**
  - Every node can be extended by owner to create a new node

- HL7 OIDs
  - Node for HL7: 2.16.840.1.113883

Identifiers - OID

Object identifier - Wikipedia... ×   +

en.wikipedia.org/wiki/Object_identifier

Google

Work   Learning   Cool   News   Local   ImmTrac   Old   Dev   Family Documents   Most Visited

referencing of data attributes in a company or other entity.

Examples [edit]

The most common OIDs seen "in the wild" usually belong to the private enterprise numbers allocated by IANA under the 1.3.6.1.4.1 (iso.org.dod.internet.private.enterprise) arc.

Another increasingly used form[when?] of OID is in the area of health care and public health informatics in the United States. Health Level Seven (HL7), a standards-developing organization in the area of electronic health care data exchange, is an assigning authority at the 2.16.840.1.113883 (joint-iso-itu-t.country.us.organization.hl7) node. HL7 maintains its own OID registry, and as of January 1, 2008 it contained almost 3,000 nodes, most of them under the HL7 root. The Centers for Disease Control and Prevention has also adopted OIDs to manage the many complex values sets or "vocabularies" used in public health. The various OIDs are available in the Public Health Information Network (PHIN) Vocabulary Access and Distribution System (VADS).

See also [edit]

- Digital object identifier

Identifiers - OID

Identifiers - OID

Identifiers - OID

Identifiers - OID

Identifier - OID

- Benefits of using OIDs
  - Global id for anything
  - Ensure id is not used by any other system for any other purpose
  - Based on international standards beyond healthcare

- Drawbacks of using OIDs
  - Must have registry to provide meaning
  - No centralized management
  - Same concept can have more than one OID

Identifiers - LOINC

- Logical Observation Identifier Names and Codes
  - A universal code system for test, measurements, and observations
  - Created by Regenstrief Institute
  - http://loinc.org/
  - Free to use

- Used in
  - HL7 v2
  - HL7 v3

Identifiers - SNOMED

- Systemized Nomenclature of Medicine
  - Started by the College of American Pathologists in 1973
  - Released as SNOMED CT in 2002
  - From website:
    - Is the most comprehensive, multilingual clinical healthcare terminology in the world.
    - Is a resource with comprehensive, scientifically validated clinical content.
    - Enables consistent, processable representation of clinical content in electronic health records.
    - Is mapped to other international standards.
    - Is already used in more than fifty countries.

Identifiers – ICD & CPT

- International Classification of Disease - ICD
    - World Health Organization (WHO) system
    - Current version is ICD-10, replacing ICD-9
    - Focused on diagnosis

- Current Procedural Terminology - CPT
    - American Medical Association (AMA) system
    - Focused on procedures
    - Immunizations can be represented in CPT, but use is discouraged for IIS

More Information: http://www.healthfusion.com/blog/2014/health-topics/medical-coding/whats-difference-icd-cpt-loinc-snomed-ct/

Moving Past HL7 v3

- Limitations of HL7 v3
    - The complexity of the model is daunting
    - "Your team is not smart enough to implement"
- Some comments from John Halamka, MD at the 2013 HL7 meeting in Boston:
    - HL7 3.0 will not be widely used in the US
    - HL7v2 will continue to be used
    - Aspire to FHIR over REST

FHIR Introduction

- Fast Healthcare Interoperability Resources (FHIR)
  - Implementable after a weekend of training
  - Written by three software developers
  - Builds on lessons learned from V2 and V3
  - Combines HL7 knowledge with industry standards

- Impact for Immunization Community
  - Highly recommend for new types of interfaces
  - May eventually be a good replacement for V2

FHIR Introduction

- Draft Standard for Trial Use - DTSU
    - 1st DSTU version is currently available
    - 2nd DSTU version to be released this year (2015)

- FHIR information:
    - http://www.hl7.org/implement/standards/fhir/
    - Summary of FHIR:
        - http://www.hl7.org/implement/standards/fhir/summary.html
    - Example FHIR patient search:
        - http://fhir.healthintersections.com.au/open/Patient/_search

Other HL7 Activities

- HL7 User Group meetings are being held the second Thursday of every month

- New standards are coming out for writing implementation guides in HL7 version 2

- AIRA is taking lead within the HL7 community to help refine and improve HL7 v2 standards

HL7 v2 Basics

CDC Implementation Guide

- Download latest from here:
    - http://www.cdc.gov/vaccines/programs/iis/technical-guidance/hl7.html

- Be careful to note the difference:
    - HL7 *version* 2.5.1: The version released by HL7 for world-wide use
    - CDC Implementation Guide for Immunizations *release* 1.5: The latest version of the implementation guide for IIS in the United States based on HL7 *version* 2.5.1.

Message Format

- **Message**: a complete unit of data that can be transmitted from one system to another

- **Segment**: one line in a message

- **Field**: a data type valued in a segment

- **Component**: a data part of a field, defined by data type

Message Rules

- Message must begin with **MSH** Message Header segment

- Segments must be terminated by **carriage return** <CR> characters
  - See http://en.wikipedia.org/wiki/Newline

Systems based on ASCII or a compatible character set use either LF (Line feed, `'\n'`, 0x0A, 10 in decimal) or CR (Carriage return, `'\r'`, 0x0D, 13 in decimal) individually, or CR followed by LF (CR+LF, `'\r\n'`, 0x0D0A). These characters are based on printer commands: The **line feed** indicated that one line of paper should feed out of the printer thus instructed the printer to advance the paper one line, and a *carriage return* indicated that the printer carriage should return to the beginning of the current line. Some rare systems, such as QNX before version 4, used the ASCII RS (record separator, 0x1E, 30 in decimal) character as the newline character.

- LF: Multics, Unix and Unix-like systems (GNU/Linux, OS X, FreeBSD, AIX, Xenix, etc.), BeOS, Amiga, RISC OS and others.
- CR: Commodore 8-bit machines, Acorn BBC, ZX Spectrum, TRS-80, Apple II family, Mac OS up to version 9 and OS-9
- RS: QNX pre-POSIX implementation.
- 0x9B: Atari 8-bit machines using ATASCII variant of ASCII. (155 in decimal)
- LF+CR: Acorn BBC and RISC OS spooled text output.
- CR+LF: Microsoft Windows, DEC TOPS-10, RT-11 and most other early non-Unix and non-IBM OSes, CP/M, MP/M, DOS (MS-DOS, PC DOS, etc.), Atari TOS, OS/2, Symbian OS, Palm OS, Amstrad CPC

Message Rules

- Each segment must be started with its three character name
- The MSH Message Header segment must be sent first
- The MSH Message Header segment defines the separators to be used in the message

| Field Separator | Repetition Separator | Sub-Component Separator |

M S H | ^ ~ \ &

| Segment Name |

| Component Separator | Escape Character |
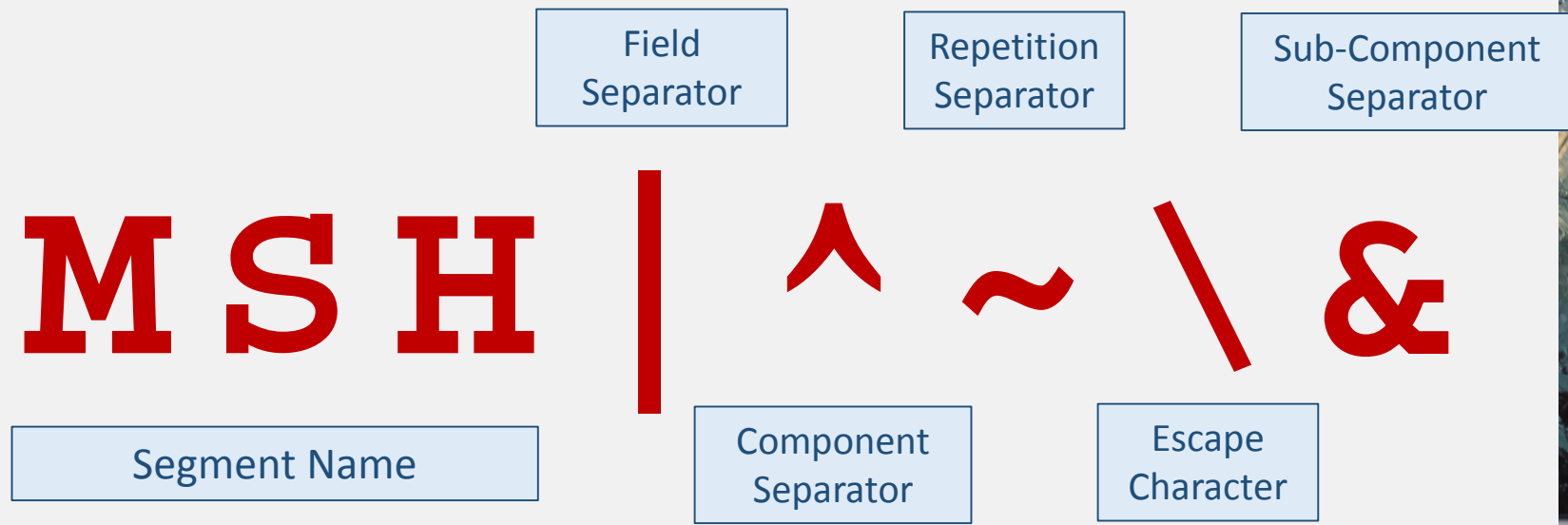
Message Rules

- Fields are numbered starting from 1
  - Normally field 1 is after the first bar |
  - For MSH, FHS, and BHS it is different
    - The first bar | is considered field 1
    - Field 2 is after the first bar

MSH-4

`MSH|^~\&||Apple Clinic|||`

PID-3

`PID|1||G14I1^^^OIS-TEST^MR||Johnsson^Sawyl^Arturo^^^^L|`

Message Rules

- Fields can be made of multiple components, as defined by data type
    - Components are separated by ^

- Components can also be made of multiple sub-components
    - Sub-components are separated by &
    - Not likely to be seen in immunization messages

- Fields can be repeated to send more than one value for a given field
    - Repeats are separated by ~

Message Rules

- Fields can have components

`PID|1||D2637^^^NIST MPI^MR||Snow^Madelynn^Ainsley^^^^L|`

- Components can have sub-components

`PID|1||D2656^^^NIST MPI^MR||Vargas&de^Henry^^^^^L|`

standard allows but is not used normally

- Fields can repeat

`PID|1|||||Snow^Madelynn^Ainsley^^^^L~Snow^Madi^^^^^A|`

Message Rules

- Escaping characters
  - Special characters, |^~\&, can not be sent as is
  - They must be replaced with something else
  - *WARNING: HL7 is not similar to how other languages escape characters*

- Example escaped character
  - Sending clinic name "Apple & Banana Clinic"

`MSH|^~\&||Apple \T\ Banana Clinic|||`

Message Rules

- The field delimiter | separates fields
  - Has no semantic meaning itself and is not otherwise significant
  - Segment definition does not specify how many delimiters are used
  - Only requires that fields that are valued are preceded by the right number of separators
  - Thus all of these examples are semantically equivalent in HL7:

```
PID|1||||Snow^Madelynn^Ainsley
PID|1||||Snow^Madelynn^Ainsley|
PID|1||||Snow^Madelynn^Ainsley||
PID|1||||Snow^Madelynn^Ainsley|||||||||||||||||||||||||||
```

Message Rules

- Component, sub-component and repetition characters
  - Separate but otherwise have not semantic meaning
  - Thus these fragments are equivalent in HL7:

```
PID|1||||Snow^Madelynn^Ainsley|

PID|1||||Snow^Madelynn^Ainsley^|

PID|1||||Snow^Madelynn^Ainsley^^^|

PID|1||||Snow^Madelynn^Ainsley~^|

PID|1||||Snow^Madelynn^Ainsley~~~~^^^~~~&|
```

Message Rules

- Repetitions are only allowed if specifically defined for the field
- Length of the field restrictions apply to each repetition individually

Usage

- R – Required
- RE – Required but may be empty
- C(a/b) – Conditional
- X – Not supported in this guide
- O - Optional

Sending And Receiving Application Conformance Requirements

TABLE 3-2 SENDING APPLICATION CONFORMANCE			
Symbol	Definition	Implementation Requirement	Operation Requirement
R	Required	The application SHALL implement "R" elements.	The application SHALL populate "R" elements with a non-empty value.

Usage

TABLE 3-2 SENDING APPLICATION CONFORMANCE			
Symbol	**Definition**	**Implementation Requirement**	**Operation Requirement**
RE	Required but may be empty	The application SHALL implement "RE" elements.	The application SHALL populate "RE" elements with a non-empty value if there is relevant data. The term "relevant" has a confounding interpretation in this definition[19]
C(a/b)	Conditional	An element with a conditional usage code has an associated condition predicate that determines the operational requirements (usage code) of the element. If the condition predicate associated with the element is true, follow the rules for *a* which shall be one of "R", "RE", "O" or X": If the condition predicate associated with the element is false, follow the rules for *b* which shall be one of "R", "RE", "O" or X". *a* and *b* can be valued the same. Note: when C(O/X) or similar is used a condition predicate will not be provided.	
X	Not supported in this guide	The application (or as configured) SHALL NOT implement "X" elements.	The application SHALL NOT populate "X" elements.
O	Optional	None. The usage indicator for this element has not yet been defined. For an implementation profile all optional elements must be profiled to R, RE, C(a/b), or X.	Not Applicable

Data Types

Origins of Data Types

- Standardization of commonly used concepts
- Re-use of concepts
- Example: AD Data Type for Address
  - Street Address
  - Other Designation
  - City
  - State or Province
  - Country
  - Address Type
  - Other Geographic Designation

Example Use of AD Data Type

|123 E Main Street^^Anytown^MI^20344|

Use of Data Types

Some used in multiple locations

Others only used in one location

Some are deprecated in favor of others

Data Types can be composed of other data types

- Components of a field use the & for a separator, if needed

Current Use in CDC Guide

CE - Coded Element (most uses)

CE_TX - Coded Element (text only in RXA-9)

CQ - Composite Quantity with Units

CWE - Coded With Exceptions

CX - Extended Composite ID With Check Digit

DT – Date

DTM - Date/Time

EI - Entity Identifier

ERL - Error Location

FN - Family Name

FT – Formatted Text

HD - Hierarchic Designator

ID - Coded Values for HL7 Tables

IS - Coded Values for User Defined Tables

LA2 - Location with Address Variation 2

MSG - Message Type

NM - Numeric

PT - Processing Type

SAD - Street Address

SI - Sequence Id

ST – String

TS - Time Stamp

VID - Version Id

XAD - Extended Address

XCN - Extended Composite ID Number and Name for Persons

XON - Extended Composite Name and ID Number and Name for Organizations

XPN - Extended Person Name

XTN - Extended Telecommunication Number
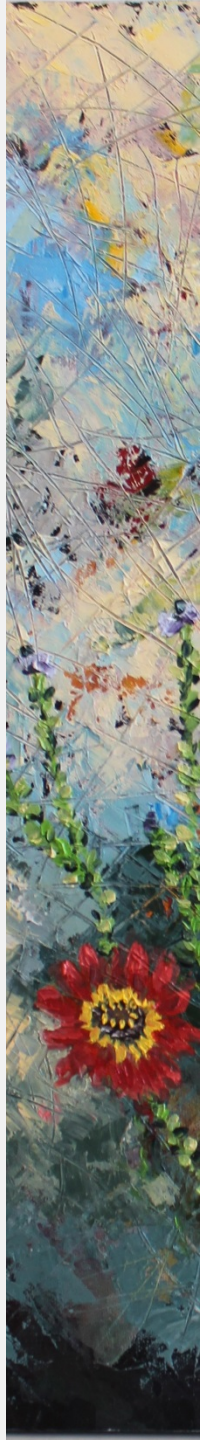
Messages and Segments

Messages

- VXU – Send Immunization History

- QBP – Request Immunization History

- RSP – Respond to Request for Immunization Record and Respond to Request for Person Id

- ACK – Send Message Acknowledgement

- ADT – Send Person Demographic Data

VXU Message

Table 6-2 VXU Segment Usage			
Segment	**Cardinality**	**Usage**	**Comment**
MSH	[1..1]	R	Every message begins with an MSH.
SFT	[0..*]	O	Not described in this Guide. May be locally specified.
PID	[1..1]	R	Every VXU has one PID segment.
PD1	[0..1]	RE	Every PID segment in VXU may have one or less PD1 segment
NK1	[0..*]	RE	The PID segment in a VXU may have zero or more NK1 segments.
PV1	[0..1]	O	Not described in this Guide. May be locally specified.
PV2	[0..1]	O	Not described in this Guide. May be locally specified.
GT1	[0..*]	O	Not described in this Guide. May be locally specified.
Begin Insurance group	[0..*]	O	The insurance group may repeat.
IN1	[1..1]	R	
IN2	[0..1]	O	
IN3	[0..1]	O	Not described in this Guide. May be locally specified.
End Insurance group			
Begin Order group	[0..*]	RE	Each VXU may have zero or more Order groups
ORC	[1..1]	R	The order group in a VXU must have one ORC segments.
TQ1	[0..1]	O	Not described in this Guide. May be locally specified.
TQ2	[0..1]	O	Not described in this Guide. May be locally specified.
RXA	[1..1]	R	Each ORC segment in a VXU must have one RXA segment. Every RXA requires an ORC segment.

VXU Message

RXR	[0..1]	RE	Every RXA segment in a VXU may have zero or one RXR segments.
Begin Observation Group	[0..*]	RE	Every RXA segment in a VXU may have zero or more observation groups.
OBX	[1..1]	R	
NTE	[0..1]	RE	Every OBX segment in a VXU may have zero or one NTE segment.
End Observation Group			
End Order Group			

PID - Patient Identifier Segment

						Table 5-18 Patient Identifier Segment (PID)		
SEQ	Element Name	Data Type	Usage	Cardinality	LEN	Conditional Predicate	Value Set	Constraint
1	Set ID - PID	SI	C(R/O)	[0..1]		If MSH-21 is valued 'Z31^cdcphinvs		
2	Patient ID	CX	X					
3	Patient Identifier List	CX	R	[1..*]				
4	Alternate Patient ID - 00106	CX	X					
5	Patient Name	XPN	R	[1..*]				The first repetition shall contain the legal name. Multiple given names or initials are separated by spaces.
6	Mother's Maiden Name	XPN	RE	[0..1]				Only last name and name type are required. Set Name Type code to "M" for maiden name usage.
7	Date/Time of Birth	TS	R	[1..1]				
8	Administrative Sex	IS	RE	[0..1]			HL70001	
9	Patient Alias	XPN	X					
10	Race	CE	RE	[0..*]			HL70005	
11	Patient Address	XAD	RE	[0..*]				The first repetition should be the primary address.
12	County Code	IS	X					County belongs in address field.

Key Principles of Interoperability
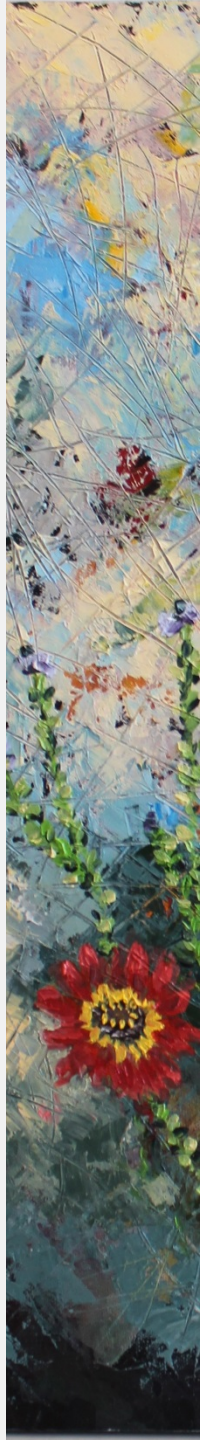
Key Principles

Conformance and interoperability should
be a science not an art

Key Principles

Standards should not be locally interpreted
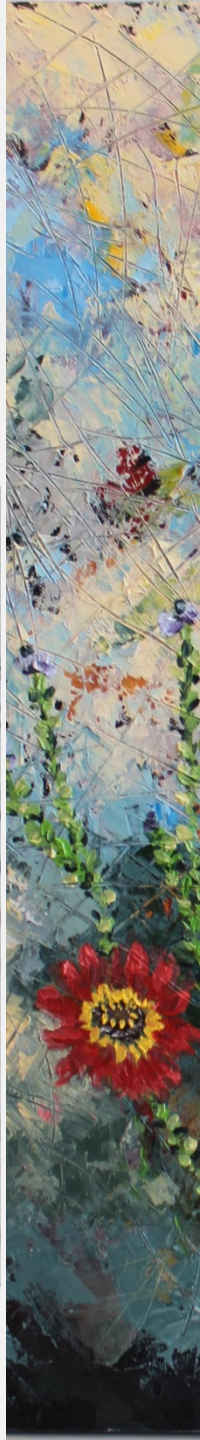
Key Principles

Written standards and conformance testing processes must be developed in tandem

- Ideally no normative standard should be approved without a corresponding process to determine whether an interface meets the standard
- Ideal is not yet realized, but must be in order to move conformance from an art to science

Key Principles In Action

AIRA is working to:

- Create testing resources
- Document local IIS requirements
- Propose changes to national standard to support local needs
- Provide training and assistance

Insuring Interoperability

- Different agendas:
  - HL7:   Create standards
  - CDC: Foster data exchange
  - NIST: Verify EHR software meets the standards
  - IIS: Collect and share quality data
- IIS work within constraints:
  - State law, agency policies and regulations
  - HL7 v2 message standard
  - CDC Implementation Guide and other standards
  - Software architecture and resources

Insuring Interoperability

- Goal of IIS is:
  - Collect complete immunization histories
  - Manage inventory and track VFC usage
  - Ensure that data quality problems are prevented or detected early and fixed

- IIS must focus on data quality
  - Validation and conformance testing is part of the toolkit
  - But data quality can not be assured simply by writing a good implementation guide or by validating the format of HL7 messages

Find Problems – Example A

```
MSH|^~\&|Test EHR Application|X68||NIST Test Iz Reg|20141201082201|
    |VXU^V04^VXU_V04|NIST-IZ-001.00|P|2.5.1
PID|||D26376273^^^NIST MPI^MR|D26376273|Snow^Madelynn^Ainsley|Lam^Morgan
    |20070706|F||2076-8^Native Hawaiian or Other Pacific Islander^CDCREC
    |32 Prescott Street Ave^^Warwick^MA^02452^USA^L|
    |^PRN^PH^^^657^4058563|||||||||2186-5^non Hispanic or Latino^CDCREC
PD1|||||||||||02^Reminder/Recall - any method^HL70215|||||A|20120701
    |20120701
NK1|1|Lam^Morgan^^^^^L|MTH^Mother^HL70063
    |32 Prescott Street Ave^^Warwick^MA^02452^USA^L|^PRN^PH^^^657^4058563
ORC|RE||IZ-783274^NDA|||||||I-23432^Burden^Donna^A^^^^^NIST-AA-1|
    |57422^RADON^NICHOLAS^^^^^^NIST-AA-1^L
RXA|1|0|20120814|
    |140^Influenza, seasonal, injectable, preservative free|0.5
    |ML^MilliLiter [SI Volume Units]^UCUM|
    |00^New immunization record^NIP001|7832-1^Lemon^Mike^A^^^^^NIST-AA-1
    |^^^X68|||||Z0860BB|20121104|CSL^CSL Behring^MVX|||CP|A
```

Find Problems – Example B

```
MSH|^~\&|Test EHR Application|X68||NIST Test Iz Reg|20141201082201|
    |VXU^V04^VXU_V04|NIST-IZ-001.00|P|2.5.1|||AL|ER
PID|1||D26376273^^^NIST MPI^MR||Snow^Horatio^Middle^^^^L|Snow^Horatio
    |20031107|M||2076-8^Native Hawaiian or Other Pacific Islander^CDCREC
    |193 Salem St^^Boston^MA^02113^USA^L|
    |^PRN^PH^^^657^5558563|||||||||2186-5^non Hispanic or Latino^CDCREC
PD1|||||||||||02^Reminder/Recall - any method^HL70215|||||A|20120701
    |20120701
NK1|1|Snow^Horatio^Middle^^^^L|MTH^Mother^HL70063
    |193 Salem St^^Boston^MA^02113^USA^L|^PRN^PH^^^657^5558563
ORC|RE||IZ-783274^NDA|||||||I-23432^Burden^Donna^A^^^^^NIST-AA-1|
    |57422^RADON^NICHOLAS^^^^^^NIST-AA-1^L
RXA|0|1|20120814|
    |01^DTP^CVX|5.0
    |mL^MilliLiter [SI Volume Units]^UCUM|
    |00^New immunization record^NIP001|7832-1^Lemon^Mike^A^^^^^NIST-AA-1
    |^^^X68||||LOTNUMUNKNOWN|20121104
    |BAY^Emergent BioDefense Operations Lansing^MVX|||CP|A
```

Good Manners

Generally accepted rules of conduct

Facilitate social interaction and help maintain good relationships

Rules for good manners are focused on your behavior not others

But a display of good manners is a positive indication that good behavior is more likely in the future

HL7 Standard

Generally accepted rules for encoding data

Facilitates exchange and helps maintain good data quality

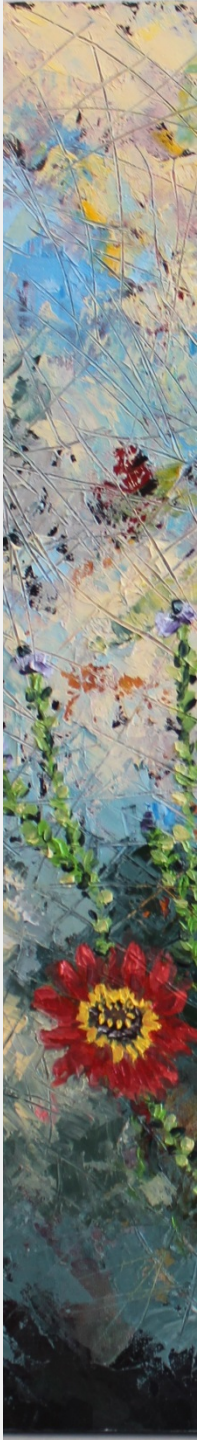Rules are focused on construction of a proper message

Good message construction is a positive indication that the data is likely to be of a good quality

Gaps in Manners

Reasons for not following the rules of manners or messaging?

- Not willing follow the rules
- Not able to follow the rules
- Different understanding of the rules
- Following a different set of rules

Rules for Broken Rules

1. Be careful when creating rules

2. Enforce only the rules that are important or critical

3. If a rule is broken
   - If important, discuss to see why it is happening and how it could be changed
   - If critical, clearly explain what needs to change

4. Be ready to accommodate differences

CDC Resources

CDC Resources

- CDC website for IIS resources
    - http://www.cdc.gov/vaccines/programs/iis/index.html

CDC Resources

- Resources you should be aware of:
  - Modeling of Immunization Registry Operations Workgroup – MIROW
  - HL7 Guides
  - Functional Standards
  - Code Sets
    - Be sure to sign up for updates!
  - Core Data Elements
  - SOAP Web Services
  - Deduplication
  - Clinical Decision Support for Immunization (CDSi)

AIRA Resources

- AIRA website is here:
  - http://www.immregistries.org/

- AIRA Tools
  - Interoperability Status Check
  - IIS Interface Tester

- Interoperability Testing Project
  - If your IIS has not yet joined, join today!
  - http://www.immregistries.org/resources/aira-initiatives/interoperability-testing-project

AIRA Resources

- ## HL7 User Group
  - Contact AIRA today to join
  - Meets every second Thursday at 2pm ET

- ## Standards & Interoperability Steering Committee
  - Meets monthly
  - Discusses changes to the CDC Implementation Guide

NIST Resources

- ## NIST Website
  - Meaningful Use 2014 Testing Tool for Immunization Messaging: http://hl7v2-iz-testing.nist.gov/mu-immunization/

- ## NIST Tools
  - EHR Testing and Certification Tool
  - Immunization Guide Authoring Management Tool (IGAMT)
  - CDC SOAP WSDL Testing
  - Future IIS Testing Tools

NIST Test Tools

Immunization Guide Authoring Management Tool (IGAMT)

- Will replace using MS Word as the software for writing implementation guides
- In development now, IIS community will be first to use it
- Requirements captured in IGAMT will be inputs for testing

CDC SOAP WSDL Testing

- NIST is working with AIRA to finalize development of tool for testing and verifying support for the CDC SOAP WSDL
- First step in a larger plan to create a system for connecting to and testing IIS

NIST Tools

NIST is working on tools to support EHR/IIS testing

- Transport testing (CDC SOAP WSDL)
- Message conformance (CDC Implementation Guide)
- Functional testing (Functional Guide)

NIST is looking to support testing of both IIS and EHR

Software will be available for IIS community use

AIRA is working with NIST to help coordinate, guide and inform their efforts

Going Forward

"Trajectory not Position" from John Halamka, MD:

John Kotter taught us that all change requires a sense of urgency. I agree that there is an urgency to improve healthcare IT usability, workflow, and functionality. However, there is no need to panic. We are in the biplane era of healthcare IT…There are logical steps from our current state to our future state. …

At age 53, my personal medical data is electronic. That was not true when I was 43.

At age 22, my daughter has never encountered a paper based record as an adult. She has always had access to 100 percent of her healthcare data on her iPhone. That was certainly not the case for me.

http://www.hiewatch.com/news/trajectory-not-position?mkt_tok=3RkMMJWWfF9wsRohuKnJZKXonjHpfsX56essWaSxlMI%2F0ER3fOvrPUfGjI4GRMZlI%2BSLDwEYGJlv6SgFQ7LHMbpszbgPUhM%3D