

HL7 Fundamentals

Presented by:
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Today's Presenters:

Dana McDonough

- **Associate Technical Consultant**
- **Allscripts and Epic data conversions**
- **EHR Reporting**

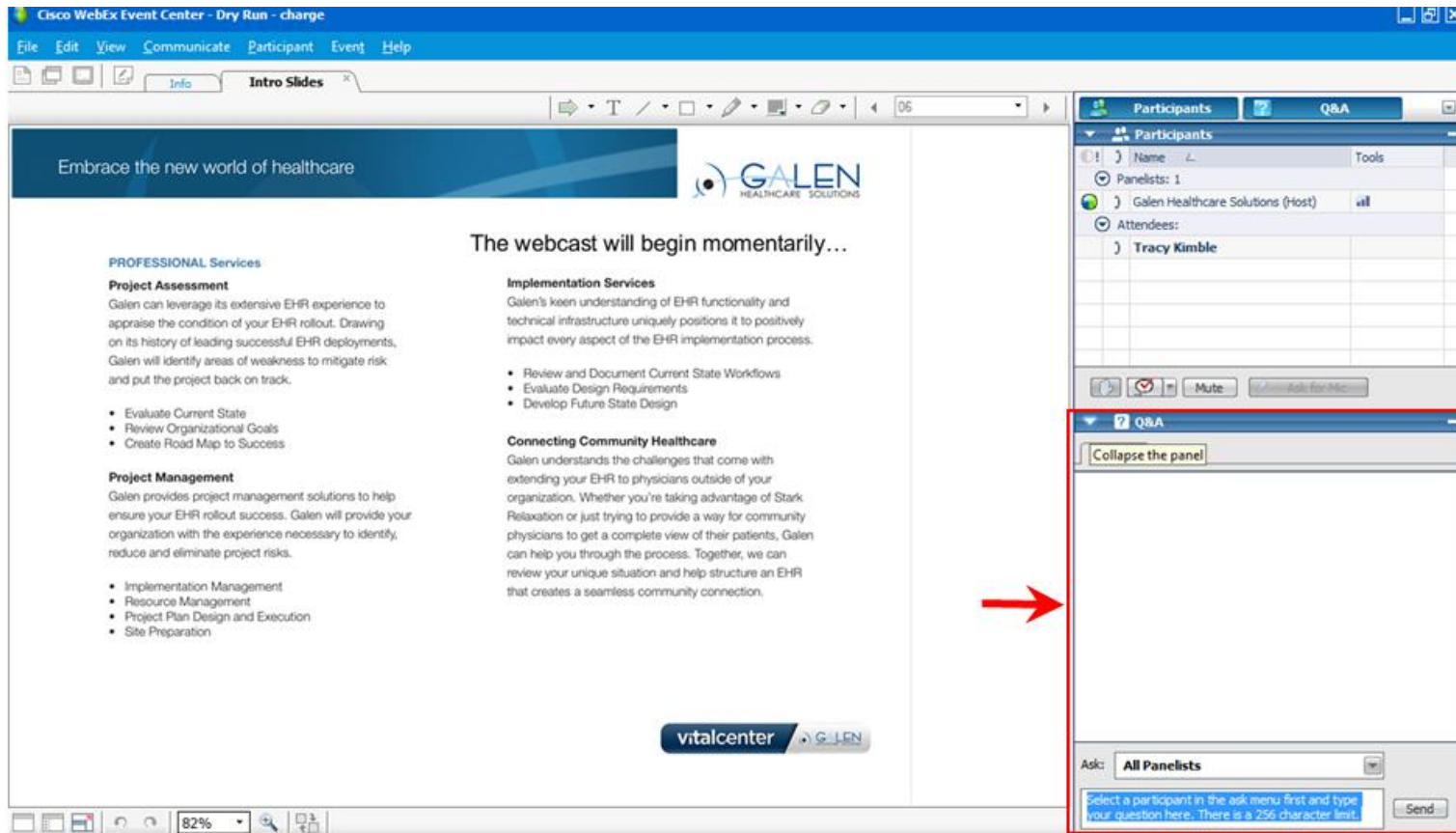
Carolina Velasquez

- **Technical Consultant**
- **Rhapsody HIE Development**
- **ConnectR Interface build**

Bing Chen

- **Technical Consultant**
- **Rhapsody HIE Development**
- **Cerner to dbMotion HIE**

Your phone has been automatically muted. Please use the Q&A panel to ask questions during the presentation!



The screenshot shows a Cisco WebEx Event Center window titled "Cisco WebEx Event Center - Dry Run - charge". The main presentation area displays a slide with the title "Embrace the new world of healthcare" and the Galen Healthcare Solutions logo. The slide content is divided into three sections: "PROFESSIONAL Services", "Implementation Services", and "Connecting Community Healthcare".

PROFESSIONAL Services

Project Assessment

Galen can leverage its extensive EHR experience to appraise the condition of your EHR rollout. Drawing on its history of leading successful EHR deployments, Galen will identify areas of weakness to mitigate risk and put the project back on track.

- Evaluate Current State
- Review Organizational Goals
- Create Road Map to Success

Project Management

Galen provides project management solutions to help ensure your EHR rollout success. Galen will provide your organization with the experience necessary to identify, reduce and eliminate project risks.

- Implementation Management
- Resource Management
- Project Plan Design and Execution
- Site Preparation

Implementation Services

Galen's keen understanding of EHR functionality and technical infrastructure uniquely positions it to positively impact every aspect of the EHR implementation process.

- Review and Document Current State Workflows
- Evaluate Design Requirements
- Develop Future State Design

Connecting Community Healthcare

Galen understands the challenges that come with extending your EHR to physicians outside of your organization. Whether you're taking advantage of Stark Relaxation or just trying to provide a way for community physicians to get a complete view of their patients, Galen can help you through the process. Together, we can review your unique situation and help structure an EHR that creates a seamless community connection.

The webcast will begin momentarily...

Participants

Name	Tools
Panelists: 1	
Galen Healthcare Solutions (host)	
Attendees:	
Tracy Kimble	

Q&A

Collapse the panel

Ask: All Panelists

Select a participant in the ask menu first and type your question here. There is a 256 character limit.

Send

Welcome

- Background of HL7
- How does it work?
- Messages & Formatting
 - Common message types
- Sample Message
- Segments
 - Common segments
 - Components
- Trigger Events
- Message breakdown
- Data Exchange Standards
- Future of HL7
- Current HL7 projects
- Q&A

HL7 STANDARD



What is HL7?

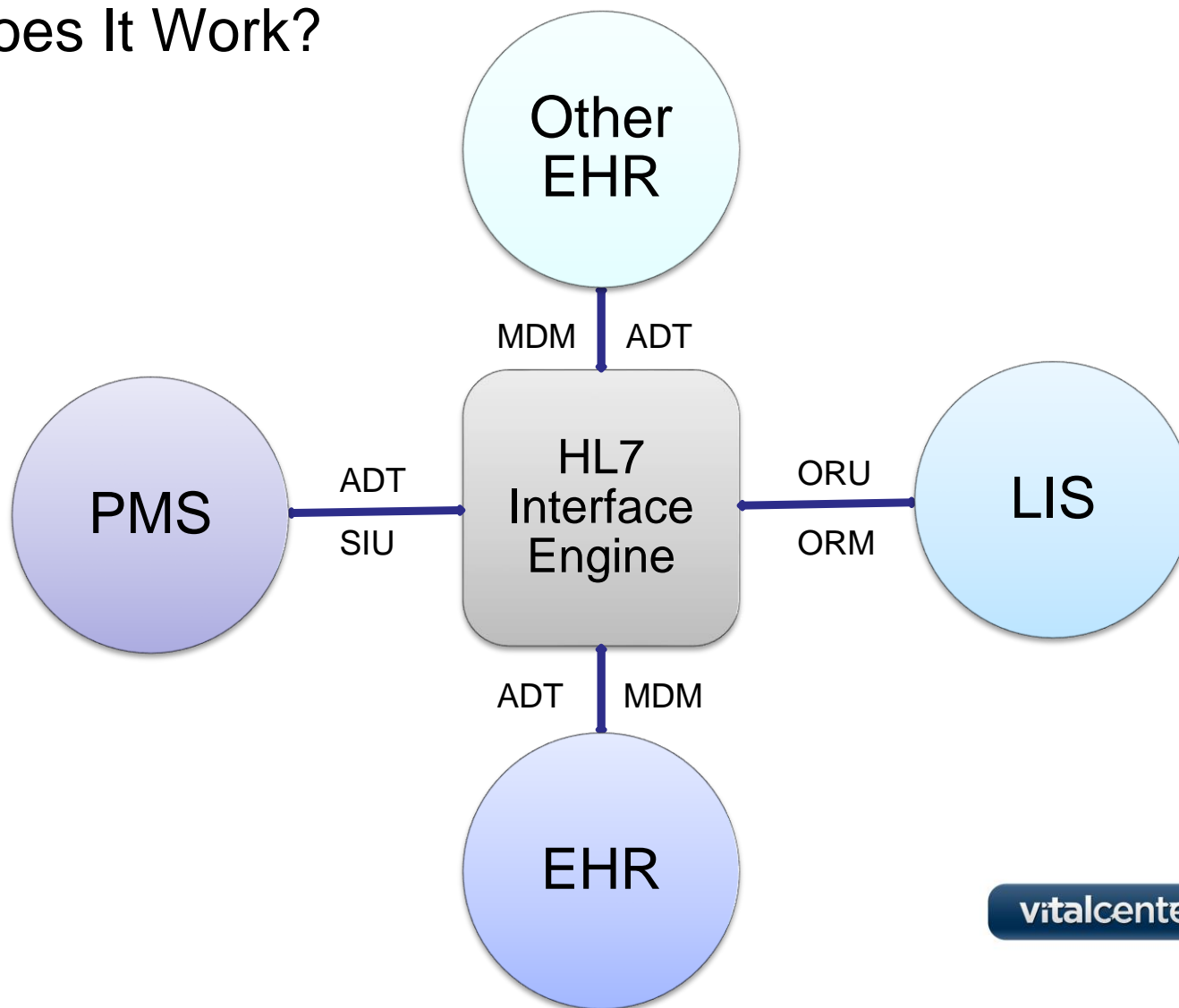
- **Founded in 1987**
- **Health Level Seven (HL7)**
- **International Standards Development Organization (SDO)** operating in the healthcare arena; non-profit
- **Framework for the “exchange, integration, sharing, and retrieval of electronic health information”**
- **"Level Seven" refers to the 7th level of ISO seven-layer communications model for Open Systems Interconnection**
- **Highly adaptable “standard”**



HL7 Example:

```
MSH|^~\&|ALLSCRIPTS|FTDLABH|EPIC||20140802173017||ORU^R01||P|2.3
PID|||144901997^^^^IHSMRN|TEST^PATIENT||19810101|M|||||||333333333
PV1||O|FTDFFMKR|||||||123456789|||||||20140317091700
ORC|RE||12046513282
OBR|1||12046513282|NA^SODIUM^FDTLAB||20120215|||||1215153077^PATEL^AIYUB^AIYU
B^^^^^^^^^PNPI||||20120215|||F
OBX|1|NM|NA^SODIUM^FDTCOMP||140|mmol/L|135-145|H
```

How Does It Work?



Messages

- Messages are the base format used for all HL7 communication
- Different message Types
 - ADT - Registering, admitting, updating demographics, or discharging a patient
 - SIU - Scheduling
 - ORM - Order
 - ORU - Observation Result
 - MDM - Documentation Message
 - ACK - Acknowledgement

Message Formatting

- Segments
 - Each segment is given a name and three-character code
 - Example: Message Header (MSH), Event Type (EVN), Patient ID (PID)
- Fields - |
- Components - ^
- Sub-components - &
- Separator for Repeating fields - ~
- Escape Character - \

HL7 Message Example

MSH|^~\&|EPIC|EPICADT|SMS|SMSADT|199912271408|CHARRIS|ADT
^A04|1817457|D|2.5|\r
PID||0493575^^^2^ID1|454721||DOE^JOHN^^^||19480203|M||B|254
MYSTREET AVE^^MYTOWN^OH^44123^USA||(216)123-
4567||M|NON|400003403~1129086|\r
NK1||ROE^MARIE^^^|SPO||(216)123-4567||EC||||||||||||||||||
PV1||O|168~219~C~PMA^^^^^^^|||277^ALLENMYLASTNAME^BONNI
E^^^|||||||||2688684|||||||||||||||||199912271408|||||002376853\r

Common Segments

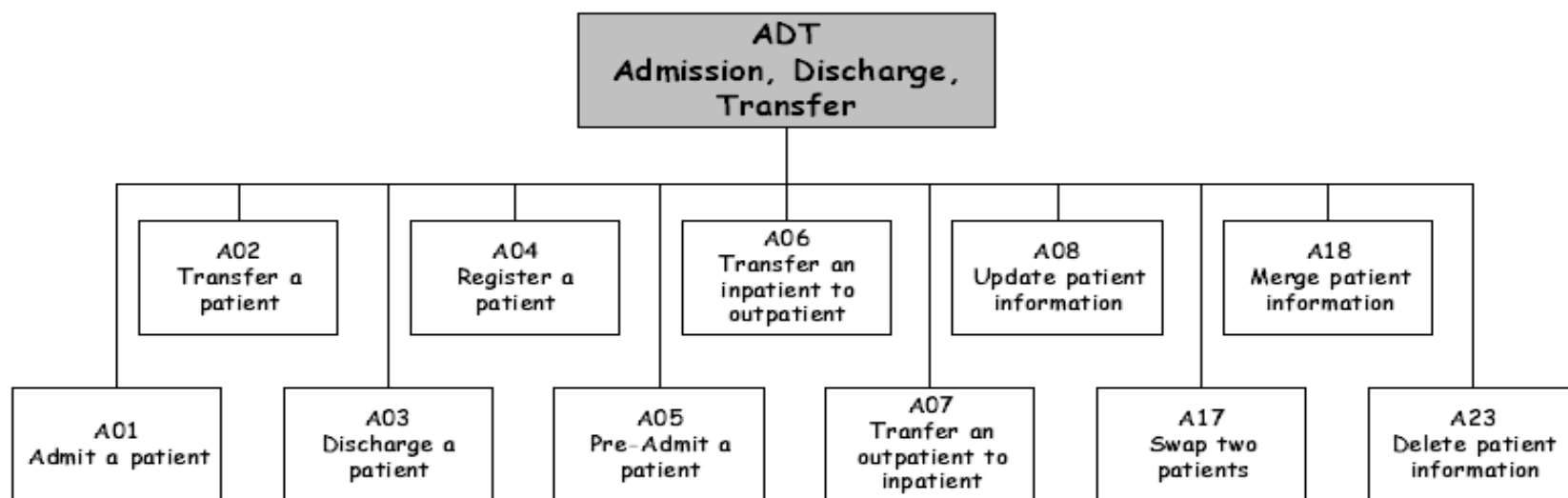
- MSH - Message Header
information about a message
- EVN - Event Type
event information
- PID - Patient Identification
information about a patient
- NK1 - Next of Kin
information about the patient's other related parties
- OBR - Observation Request
information about an order
- OBX - Observation Report
information about a result

Segments & Components

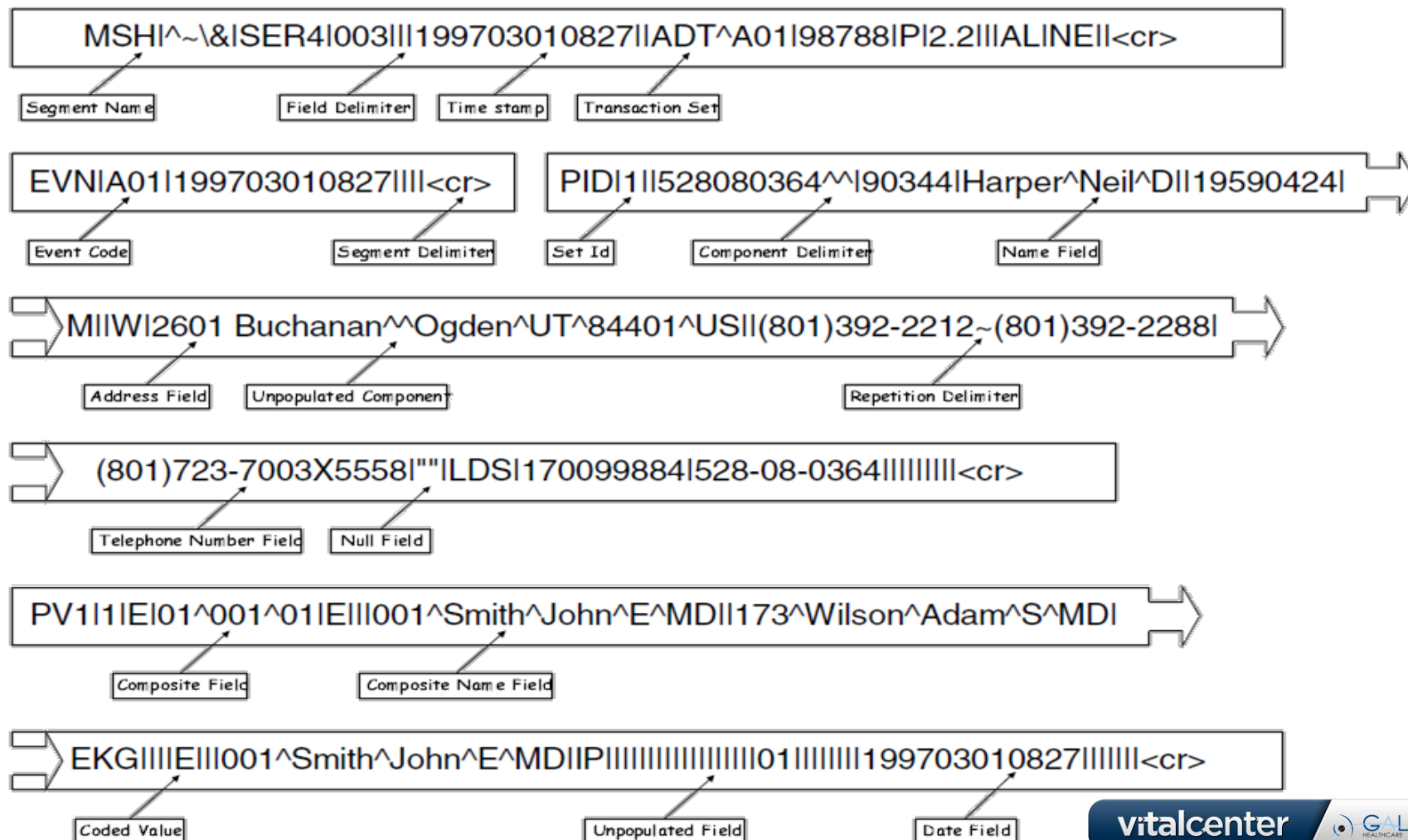
- May be required, optional, or conditional
- Some segments such as OBX, NTE, or NK1 can be repeating
- An example is the NK1 segment which shows the next of kin/associated parties

Trigger Events

- Trigger event initiates an exchange of messages
- Each HL7 transaction set supports many different types of activities.
- These activities are referred to as 'events'.
- An event is used to identify what triggered the creation of the HL7 message.
- Quite often, an application that receives HL7 messages will use the event to identify how the data should be used by the application.

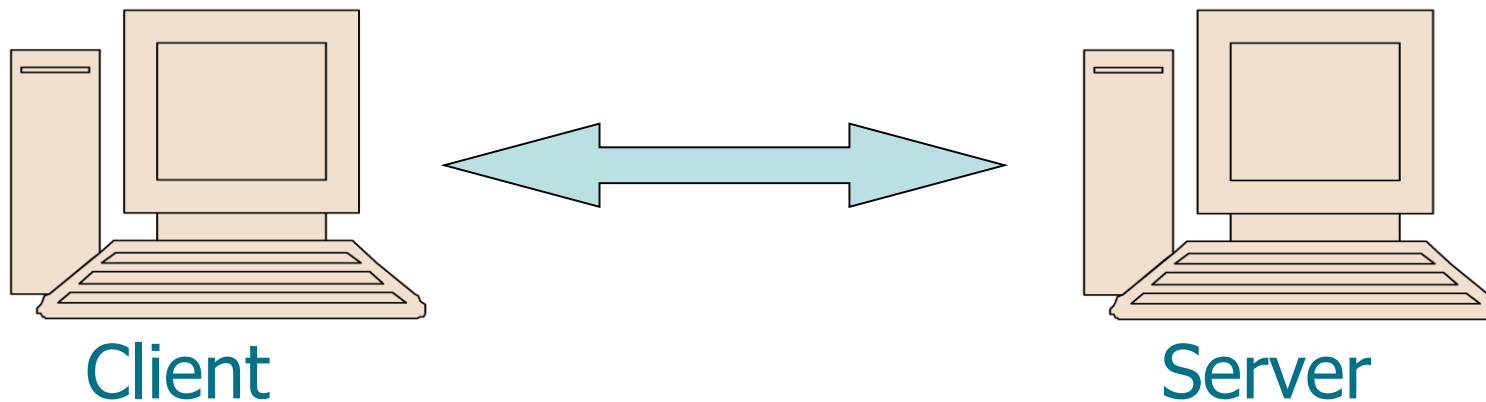


HL7 Message Breakdown



Data Exchange Standards

- Typically moved via a network connection via TCP/IP
- One acts as the Client and the other acts as the Server.
- The Client will open a TCP/IP Socket with the Server.
- This connection will be exclusively used for these two systems to communicate.



Data Exchange Standards

- Once the TCP/IP Connection is established the sending system can deliver an HL7 message

```
MSH|^~\&||SEM|||200605221309||ADT^A04|ADT1.1.9198|P|2.1  
EVN|A04|200605221309  
PID|1||M000001327||TEST^RECURRING^^^^||19680215|F|^^^^^|^^^^^|L0000295  
12|74  
DG1|1|TX||PROTIMES  
PV1|1|O|RCA^^|||TESTC^TEST^CAROL|TESTC^TEST^CAROL|RCR||U|||
```

- The receiving system will acknowledge the message using an ACK Message

```
MSH|^~\&|||SWA|200605221309||ACK|ADT1.1.9200|P|2.1|||  
MSA|AA|ADT1.1.9198
```


ACK and NACK

- Every time an application accepts a message and processes the data it sends an Acknowledgement (ACK) back to the sending application.

```
MSH|^~\&|||SWA|201305221309||ACK|ADT1.1.9200|P|2.1|||  
MSA|AA|ADT1.1.9198
```

- A NACK is an ACK that contains an error that is sent back to the sending application.

```
MSH|^~\&|||201305221309||ACK|ADT1.1.9200|P|2.1|||  
MSA|AE|000001  
ERR|DRG_DiagnosisRelatedGroupSegment^1^11^unexpected data found
```

Data Exchange Standards

- The acknowledgment of the delivery of a message is a significant feature
- In the MSH of the sending message is a field called the Message Control ID (MCI).

MSH|^~\&||SEM|||200605221309||ADT^A04|ADT1.1.9198|P|2.1
EVN|A04|200605221309
PID|1||M000001327||TEST^RECURRING^^^^||19680215|F|^^^^^||^|L0000295
12|74
DG1|1|TX||PROTIMES
PV1|1|O|RCA^^|||HARR^HARNER^ROBERT|HARR^HARNER^ROBERT|||RCR||U|||

MSH|^~\&|||SWA|200605221309||ACK|ADT1.1.9200|P|2.1|||
MSA|AA|ADT1.1.9198

Data Exchange Methods

- TCP/IP connection may require use of VPN
 - Can be circumvented through FTP
- Manually transfer HL7 messages by downloading and copying to shared folder

Batch messaging

- Allows one or more HL7 messages to be sent in a single file
- Contains specialized segments such as the batch header, batch trailer, file header, and file trailer segment
- Useful for systems that are not connected via real-time transmission protocols (such as those systems that do not transmit via TCP/IP connections)

Future

- Version 2.x has been approved by ANSI since the early 90's and is used throughout the Healthcare industry almost exclusively.
- Version 3.x is a departure from the 2.x version in how the messages are formatted.
- Version 3.x is based on XML, which is a Web based language.
- XML – CCD and Dictionary Updates

XML Message

```
<DictionaryEntry ID="93343:36">  
<Name>Other abdominal pain-R10.8</Name>  
<Code>R10.8</Code>  
<DxCode>R10.8</DxCode>  
<LastUpdate>ICD10 Upload</LastUpdate>  
<CreDt ID="63223">02/05/2014</CreDt>  
<CreTm>10:42AM</CreTm>  
<CreIni>KAT</CreIni>  
<UpdDt ID="63223">02/05/2014</UpdDt>  
<UpdTm>10:42AM</UpdTm>  
<UpdUsername>DGS</UpdUsername>  
<lcdCmDescription>Other abdominal pain</lcdCmDescription>  
<lcdCmCode>R10.8</lcdCmCode>  
<lcdCmVersion>10</lcdCmVersion>  
<VerNum>1</VerNum>  
<DeletedFlag></DeletedFlag>  
<IDXDictionaryInternalNumber>36</IDXDictionaryInternalNumber>  
<IDXDictEntryInternalNumber>93343</IDXDictEntryInternalNumber>  
</DictionaryEntry>
```

Current HL7 Uses

- **Epic Conversions**

- Convert discrete and non-discrete data elements into HL7 messages to pass through EPIC Bridges interface engine

- **HIE Onboarding**

- Creating interfaces to handle HL7 messages to pass into the HIE

- **Master Patient Index**

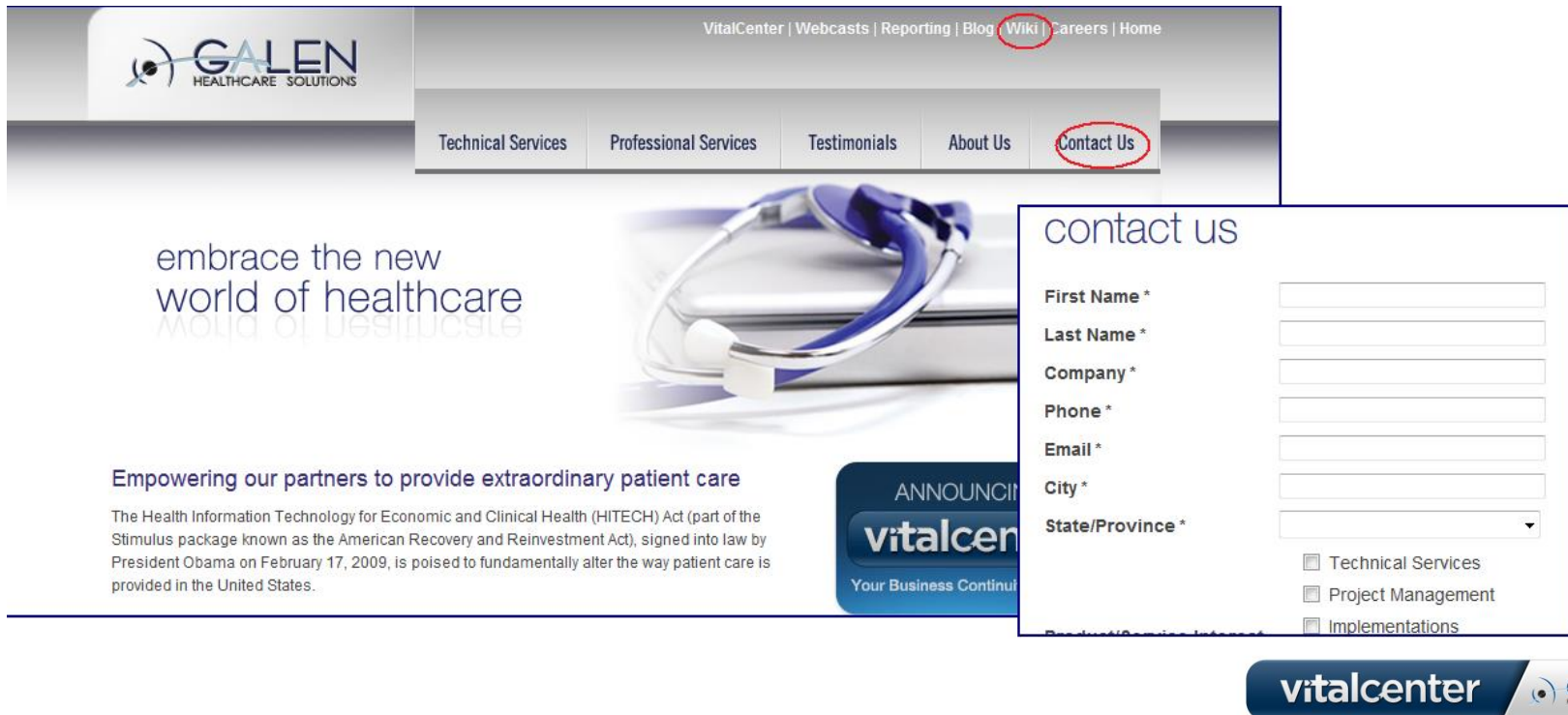
- Generating ADT messages from ORU result messages

Q&A



Thank you for joining us today, for additional assistance....

You can contact us through our website at
www.galenhealthcare.com



The screenshot displays the Galen Healthcare Solutions website. The header includes the company logo and navigation links: VitalCenter, Webcasts, Reporting, Blog, Wiki, Careers, and Home. A secondary navigation bar lists Technical Services, Professional Services, Testimonials, About Us, and Contact Us. The main content area features the tagline "embrace the new world of healthcare" with a stethoscope image. Below this is a section titled "Empowering our partners to provide extraordinary patient care" with text about the HITECH Act. A "vitalcenter" logo is also present. On the right, a "contact us" form is shown with fields for First Name, Last Name, Company, Phone, Email, City, and State/Province. It also includes checkboxes for Technical Services, Project Management, and Implementations, and a dropdown for Product/Service Interest.

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embrace the new
world of healthcare

Empowering our partners to provide extraordinary patient care

The Health Information Technology for Economic and Clinical Health (HITECH) Act (part of the Stimulus package known as the American Recovery and Reinvestment Act), signed into law by President Obama on February 17, 2009, is poised to fundamentally alter the way patient care is provided in the United States.

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