Welcome to the
Healthcare Integration 101

The presentation will begin shortly.
Please note that all attendees are in listen only mode.
Inquiries may be submitted using the **Questions** window.
A recording of this webinar will be sent out to all attendees.

Healthcare Integration 101

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eMedApps - About Us

eMedApps is a Healthcare Information Technology Services company providing practices, clinics and hospitals with a full range of services, as well as a suite of products designed to increase efficiency and facilitate communication.

- Founded in 1999
- Serving healthcare clients across USA
- Services and Products for Various EHR clients

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About Our Presenter

About Our Presenter

- Vik is our VP of Product Development

- He has been with the company since it's founding, and he brings his experience and deep knowledge of the healthcare community's toughest challenges to consistently deliver excellence, innovation, and success to clients.

FUN FACT

It has been said that Vik knows all the best quotes from the best movies and tv shows!

Outline Of Todays Presentation

Integration 101 - Intro to the concepts and terminology you will see when discussing Healthcare Integration

- Technology Used in Integration - How systems connect to each other?
- Languages used in integration – How systems talk to each other?
- Healthcare integration in practice – Beyond the standard

Technology Used in Integration

- Methods of Communicating
  - TCP/IP
  - File Transfer
  - Direct
  - Web Services / APIs

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Method of Communicating - TCP/IP

- Point to point - Messages sent to a single receiver
- Messages sent in sequence
  - Receiver must acknowledge message before next one is sent
- Very good for sending and receiving within an organization
  - Security becomes an issue when going outside the organization
    - Not all systems will support secure TCP/IP socket connections
    - Will have to utilize a VPN to provide the secure connection
- Most common integration in healthcare
  - Although this is changing

Method of Communicating - File Transfer

- Message files are picked up from a source location
- Better suited to interfaces that are not real time
  - Can achieve near real time with a high enough polling frequency
- Protocols are available to extend beyond your organization
  - SFTP and FTPS
- Protocols have built in capacity to ensure delivery of messages
- Files can contain multiple messages but usually they are processed in sequence

Method of Communicating - Direct

- Built on the SMTP (email) protocol
  - Direct defines security process to ensure that messages are secure
- Generally requires a third-party service provider
  - HISP (Health Information Service Provider)
  - Manage the direct addresses and the security
- Leverages the Direct Trust Network to link HISPs together
  - Ability to deliver messages across HISPs
- Connecting to a HISP gives you the ability to send to multiple different recipients

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Method of Communicating – Web Services/APIs

- Connection over the internet
- Designed to be distributed
  - Multiple sites can connect to push/pull information
  - As a result, highly scalable
- Security is built into the connection protocol
- Starting to gain popularity in health care
  - Has been around in other industries for a long time
- Can support CRUD operations depending on the implementation
  - Create, Read, Update and Delete

Languages Used in Integration

Languages Used in Integration

- HL7 2.x
- HL7 3.0
  - CCD
- NCPDP
  - NCPDP SCRIPT
- USCDI/FHIR
- IHE

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HL7 2.x

- Most commonly used language in healthcare
  - Many versions 2.1 – 2.9
- Comprises of segments with fields using predefined separators
- Message type determines the segments that should be present
  - ADT – Demographic messages
  - SIU – Scheduling messages
  - DFT – Financial messages
  - ORM/ORU – Orders/Results
  - RDE – Medication orders
  - VXU – Immunization messages
  - MDM – Transcription and Notes

HL 2.x

- 100s of different segments defined
  - Based on the data that is being sent in the segment
    - PID – Patient demographic information
    - PV1 – Patient Visit
    - RXA – Pharmacy Administration
  - Z segments are use for custom data
    - Trading partners exchange meaning for segment
    - Allows for data that does not fall into segments from the specifications to be sent in a message
    - All begin with a Z

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HL7 2.x

Sample Message

MSH|^~\&|CareBridge|Facility||Rec Facility|20220223000530||ADT^A03|12345|P|2.3

EVN|A03| 20220223000530|||891701| 20220223000530

PID|||874324^^^^MRN||TEST^PATIENT^^^||19700101|F|||1305 REMINGTON ROAD^SUITE P^SCHAUMBURG^IL^60173^||8474906869|||||874324|

PV1||E|ER^123^B||||123456^PROVIDER^TEST^^^^^^^^^NPI|||INC||||||| 123456^PROVIDER^TEST^^^^^^^^^NPI|||||||||||||||||||||01||||||||| 20220223000130 |

PV2|||||||||||

DG1|||^Hx Palpitations|||

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HL7 3.0

- XML based standard from HL7
- XML uses elements and attributes in a hierarchical structure to represent data

        `<phone type="home">`

           `<areacode>847</areacode>`

           `<number>4906869</number>`

        `</phone>`

- CCD is the most commonly used HL7 3.0 message
  - Continuity of Care Document
  - Required in transition of care

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CCD

```
</> ClinicalDocument
  </> realmCode
  </> typeId
  </> templateId
  </> templateId
  </> id
  </> code
  </> title
  </> effectiveTime
  </> confidentialityCode
  </> languageCode
  </> recordTarget
    </> patientRole
      </> id
      </> addr
      </> telecom
      </> patient
        </> name
        </> administrativeGenderCode
        </> birthTime
        </> raceCode
        </> ethnicGroupCode
        </> languageCommunication
      </> providerOrganization
  </> author
  </> informant
  </> custodian
  </> legalAuthenticator
  </> authenticator
  </> documentationOf
  </> component
    </> structuredBody
      </> component
        </> section
          </> templateId
          </> id
          </> code
          </> title
          </> text
          </> entry
```

Look for these tags to determine the patient the CCD is for

These tags repeat for each of the clinical Data elements that are in the CCD: Results, Medications, Allergies, etc.
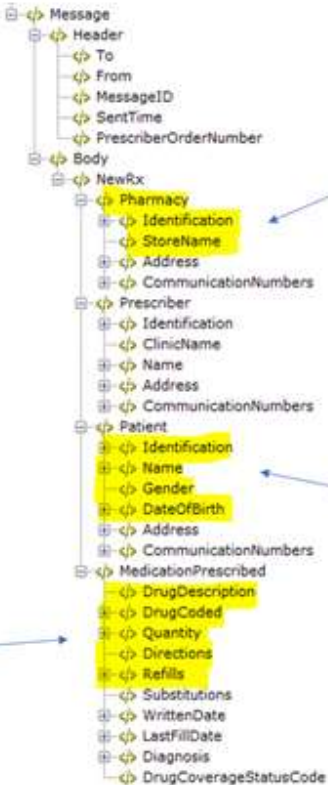
This tag will contain the information in human readable format

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NCPDP

- National Council for Prescription Drug Programs
  - Sets standards around prescription drugs
- Most common standard is the NCPDP SCRIPT
  - EHR vendors use this standard to send ePrescriptions via SureScripts
  - Message is sent from EHR to SureScripts and then to the Pharmacy
- XML base standard

NCPDP SCRIPT

```
Message
  Header
    To
    From
    MessageID
    SentTime
    PrescriberOrderNumber
  Body
    NewRx
      Pharmacy
        Identification
        StoreName
        Address
        CommunicationNumbers
      Prescriber
        Identification
        ClinicName
        Name
        Address
        CommunicationNumbers
      Patient
        Identification
        Name
        Gender
        DateOfBirth
        Address
        CommunicationNumbers
      MedicationPrescribed
        DrugDescription
        DrugCoded
        Quantity
        Directions
        Refills
        Substitutions
        WrittenDate
        LastFillDate
        Diagnosis
        DrugCoverageStatusCode
```

Identification is the SureScripts ID Number

Patient Info from the EHR

Details of the drug prescribed

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USCDI/FHIR

USCDI

- United States Core Data for Interoperability
- Defines a core set of data and data elements that systems need to exchange for interoperability
- Required for implementation by 21st Century Cures Act

Assessment and plan of treatment	Care Team members	Clinical Notes	Goals	Health concerns
Immunizations	Laboratory	Medications	Patient Demographics	Problems
Procedures	Provenance	Smoking Status	Unique device identifier	Vital signs

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USCDI/FHIR

FHIR

- Fast Healthcare Interoperability Resources
- The language for exchanging information between systems
- Based on different resources that can be pushed or pulled to systems
- Based on the use of web services
- Used to implement the USCDI required data elements
- Supports both XML and JSON (JavaScript Object Notation)
  - JSON is made up of key value pairs

```
{ "coding":
        [{
                "system" : "http://snomed.info/sct",
                "code" : "104934005"
        },
        {
                "system" : "http://loinc.org",
                "code" : "2947-0"
        }]
}
```

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USCDI/FHIR

- Most EHRs are using FHIR as part of their API offering
  - Patient facing APIs is based on FHIR
  - Enterprise APIs may include FHIR as well as proprietary calls
- Includes a number of different resources in the standard
- https://hl7.org/fhir/ lists the resources based on the different versions that are available

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IHE

IHE Domains

- Integrating the Healthcare Enterprise
- Defines a series of profiles across clinical domains so both sides are using the same communication methods and languages
- Used commonly for clinical document exchange
  - HIE
  - Peer to Peer

- Cardiology
- Dental
- Devices
- Endoscopy
- Eye Care
- IT Infrastructure
- Pathology and Laboratory Medicine
- Patient Care Coordination
- Pharmacy
- Quality, Research and Public Health
- Radiation Oncology
- Radiology

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Vocabulary Used in Integration

- SNOMED CT – Systematized Nomenclature of Medicine – Clinical Terms
- CPT – Current Procedural Terminology
- ICD10 – International Classification of Diseases
- LOINC – Logical Observation Identifiers Names and Codes
- NDC – National Drug Code
- MediSpan

Healthcare Integration in Practice – Beyond the Standard

Healthcare Integration in Practice – Beyond the Standard

- Integration with non-clinical systems
- FHIR APIs
  - Patient facing applications
  - SMART on FHIR
- Enterprise APIs
  - Provider facing applications
- CareQuality/CommonWell
  - Your EHR is probably taking part in one or both of these
  - By participating you can share and consume information
- HIEs
  - Aggregating data and providing on demand
    - ➢ Aggregating on demand
  - Pushing data as it becomes available

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Questions?