Objectives

Understand the basic components of FHIR

Understand potential of FHIR in clinical environment

Recognize a new maturity model for FHIR

How FHIR enables living in the hybrid standards environment
The Healthcare Continuum

One Patient Record

- Home Care & Hospice
- Skilled Nursing Subacute Facilities
- Assisted Living & Long-Term Care
- Inpatient Rehabs
- Hospitals
- Emergency Departments
- Urgent Care
- Outpatient Rehabs
- Outpatient Diag/Services
- Ambulance/Helicopter Services
- Occupational Health
- Diagnostic Imaging Centers
- After Hours Care
- Physician Practice Management
- Medical Group Offices
- CLINIC
- IMPak Health
- Retail Clinics
- Community Health Initiatives
- Integrative Medicine
- Fitness & Wellness
- Mobile Apps e-Health
- Health Navigation
- Telemedicine Virtual Visits
- Retail Pharmacy

[Circle diagram showing various healthcare services and platforms connected to One Patient Record]
Who invented FHIR?

And why?
HL7 version 2 (2.x) is 30 years old.

HL7 CDA® is over 10 years old.
What if HL7 created a new interoperability standard starting from scratch?
Contextual drivers for FHIR

**Shift from off-line to on-line**
- BYOD (clinician / nursing / patient apps)
- FHIR is optimized for apps

**Shift towards data transparency**
- Examples: MU, NHS GPSoC, VNA, ECM
- FHIR acts as an ‘RESTful API’

**Hybrid mixture of narrative vs. codes**
- FHIR supports such hybrid documents
FHIR Supports 4 Interoperability Paradigms

- RESTful
- Documents
- Messages
- Services
REST

**RE**presentational State

Google, Twitter, FaceBook

Your favorite travel website
Your favorite travel site

Compare Cheap Flights on these Recommended Sites:

- Expedia
- CheapFareGuru
- CheapOair
- Kayak
- JustaTicket

See Rates
“Resources” are:

- Small logically discrete units of exchange
- Smallest unit of transaction
- Defined behavior and meaning
- “of interest” to healthcare
- Known identity / location
What’s a Resource?

Examples

- Administrative
  Patient, Practitioner, Org

- Clinical Concepts
  Allergy, Condition, Family History, Care Plan

- Infrastructure
  Document, Message, List

Non-examples

- Gender
  - Too small

- History & Physical
  Too big

- Blood Pressure
  Too specific
How many Resources?

Release 1.0: 50 Resources

Release 2.0: 49 Additional Resources

Goal: 100-150 Resources
FHIR Extensions: 80/20 Rule

FHIR Resources have data elements if **80%** of existing systems include them

Extensions are the other **20%**

- Meet specific use cases
- The encoding looks no different, just not in the standard

Do it in your organization, but doesn't scale
FHIR Profiles

Profiles are implementation guides
  Built for specific use cases
  Encompass the entire scenario

Profiles include entire implementation
  Multiple Resources & Extensions
  Vocabulary/terminology/code binding

Everything is still shared, available
  FHIR servers with public access to Profiles
  HL7 hosts HAPI server to share
Everything is on FHIR

**HL7 v2 messages on FHIR**
Mapping v2 message segments to FHIR

**CDA on FHIR**
- mapping CDA documents to FHIR
- construct/deconstruct CDA documents

**SMART on FHIR**
adaptation of Harvard SMART app platform
http://smarthealthit.org/interoperability/
Ah-ha moment on FHIR

Regardless of paradigm the content is the same*

It’s straight-forward to share content across paradigms
  e.g. Receive a lab result in a message.
  Package it in a discharge summary document

It also means constraints can be shared across paradigms
  e.g. Define a profile for Blood Pressure; use same resources in messages, documents, REST and services

* Ah-ha!!
Timeline for FHIR development

- STU* 1.0
  - 2014
- STU 2.0
  - 2015
- STU 3.0
  - Sept 2016

99 Resources

Vocabulary server

FHIR Maturity Model

www.FHIR.org

*Standard for Trial Use
### iPhone Maturity Model

- People purchased and used the iPhone 2
- It did not have all of the features of iPhone 3
- Some features were improved, some were added
- iPhone 6 is even better, but you can still use earlier iPhones

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The Challenge
What if you took scissors and cut a History & Physical into data elements?
Detailed Clinical Models

When is a blood pressure not a blood pressure?

Detailed Clinical Models: Profiles that give data context and semantic interoperability.
HL7 CIMI WG

Clinical Information Modeling Initiative

- Fostered by HL7 in 2010
- Create reference detailed models of clinical data
- Create processes to transform reference model into any one of existing detailed clinical models
The Lifecycle of Standards
Bridging Systems in a Hybrid Environment

Data Transform Platform

- FHIR
- FHIR
- FHIR
- Index
- FHIR Resource Repository
- FHIRETransform
- CDA & CCDA
- HL7v2
- FHIRETransform
- CCDA
- HL7v2
- IHE (XDS.b)

FHIR

HL7v2

CCDA

IHE (XDS.b)
REST Enabled Health Information Exchange

Health Information Exchange Platform

- FHIR-based REST client
- Login
- Search
- PUT/POST
- Data Transform
- Gateway or EHR
- Index
- FHIR Transform
- FHIR Resource Repository
Example: a mobile app

A mobile application for a clinician providing access to data in one’s own hospital systems using a mobile device.

- Collect and present clinical information
- Record information
- Order meds/tests, scheduling
- Get decision support
- Save a summary in a Document Repository
Thank You

Questions?

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