HL7 FHIR Solutions in the Real World: The FHIR Applications Roundtable

Wayne Kubick
Chief Technology Officer, HL7 International
wkubick@hl7.com
@WayneKubick
The Premise: There is Far More to FHIR than You Think
A New Kind of Meeting

HL7 FHIR® Applications Roundtable
July 27 - 28, 2016
Harvard Medical School / Boston, MA
The Roundtable Concept

- Academic lecture setting; Level playing field
- Infrastructure & user-facing products for providers, patients, researchers, payers, genomics, decision support, EHRs . . .
- Production or Pilot Use
- 15 Minute rapid-fire sessions in groups of 6-8
- Interactive voting for attendees: best of session, best of show
- Recording and info available on HL7 Education Portal
Creating Discharge Plans with FHIR®

Effective, patient-centered care coordination requires the seamless sharing of the patient’s care plan across the continuum of care settings and providers. In response to the Veteran’s Administration Care Coordination for Improved Outcomes Challenge, Lockheed Martin extended its FHIR®-based application to create a computable hospital discharge care plan.

Using a business process modeling approach, the Enterprise Health Information and Interoperability Platform (eHIIP) allows the care coordinator to gather and reconcile medications, appointments, diet and procedures to create a comprehensive condition-based care plan which can then be shared and updated by other members of the virtual care team.

Presented by:

Viet Nguyen, MD
Chief Medical Officer
Lockheed Martin Information Systems & Global Solutions
FHIR in the Real World: Show and Tell
The Champions
<table>
<thead>
<tr>
<th>Product/Service Name</th>
<th>Description</th>
<th>Contact Information</th>
<th>Reference Links</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diagnotes: The FHIR Advantage for Development and Implementations</td>
<td>Diagnotes is a secure communication platform designed specifically for healthcare. With Diagnotes, care team members collaborate effectively from any location on any device, via voice, text, or video, ensuring compliance while improving team effectiveness. With FHIR, we can securely deliver real-time contextual patient information to providers for a fraction of the implementation cost. FHIR removes the heavy custom interface burden from our clients, offering positive patient identification, better informed clinical discussions, and improved continuity of care – all while providing a great low-cost experience for the project, engineering, and implementation teams.</td>
<td>Jamie Kurtz, <a href="mailto:jkurtz@diagnotes.com">jkurtz@diagnotes.com</a>, (317) 395-7080x204</td>
<td><a href="http://www.diagnotes.com/">http://www.diagnotes.com/</a></td>
</tr>
<tr>
<td>Intermountain Healthcare’s Growth Chart SMART on FHIR App</td>
<td>Pediatric Growth Chart SMART on FHIR app Intermountain Healthcare has enhanced the Pediatric Growth Chart SMART on FHIR app developed by Boston Children’s Hospital. The app is live within the Cerner EMR in Intermountain’s NICUs and ambulatory pediatric clinics. The app displays a child’s height, weight, and head circumference, extracted from the EMR using FHIR resources, against pertinent growth</td>
<td>Scott Narus, PhD, <a href="mailto:scott.narus@imal.org">scott.narus@imal.org</a></td>
<td><a href="https://gallery.hspsc.org/#!/app-gallery">https://gallery.hspsc.org/#!/app-gallery</a></td>
</tr>
</tbody>
</table>

**Access Control**

- Edit

**Implementation Registry**

- View

**Navigation**

- Add content
- Implementation Registry
- Members Page
- Trademark Applications

**Home**

- Dashboard
- Content
- Structure
- Appearance
- People
- Modules
- Configuration
- Reports
- Help

**About fhir.org**

- My account
- Log out

**http://www.fhir.org/implementations/registry**
What We Learned

- A very different kind of meeting
- Extraordinary energy and pacing – even fun
- Need more interactive time with presenters
  - Setting up discussion tables around breaks
- More ways to record comments and feedback
- Main attendee response: Do it again!
SEEING IS BELIEVING

HL7® FHIR® APPLICATIONS ROUNDTABLE

March 7-8, 2017
Duke University School of Medicine, Durham, NC

® Health Level Seven and HL7 are registered trademarks of Health Level Seven International, registered with the United States Patent and Trademark Office.
HL7 FHIR Solutions in the Real World: From Demonstration to Production

- A Dose of Reality: Implementing a SMART-on-FHIR App at Intermountain Healthcare
  - Dr. Stanley Huff, Intermountain Healthcare
Playing with FHIR at Intermountain Healthcare

HIMSS HL7
February 20, 2017
Stanley M. Huff, MD
stan.huff@imail.org
Our Experience

We wanted to import an externally developed application:

Boston Children’s Pediatric Growth Chart
Growth Chart

Author: Boston Children's Hospital

Website: http://smarthealthit.org/smart-app-gallery/pediatric-growth-chart/

Last Update: Saturday, February 20, 2016

Tags: Pediatrics, Diagnosis, Reference, Tech > Open Source, DSTU2, Featured

Try It
Boston Childrens: SMART Growth Chart
SMART Growth Chart – Parent’s View

CARRIE DEMORA
sex female
dob 21Nov2005 age 8y 3m

25Jun2012 6y 7m
1.5cm | 72%
34.4kg | 92%
N/A | N/A

Underweight Healthy Overweight Obese

34.4kg (75lb 13oz)

CARRIE DEMORA is overweight at 34.4kg (75lb 13oz).
Compared to her last weight assessment, she is at risk for becoming obese.
Process

- Downloaded the application source code
- We enhanced and modified the app
- We followed our usual testing procedures
- Installed the app in live parallel testing environment
- We fixed things
- We moved the app to the production environment
- We provided our source code back to the SMART team
Lesson 1: Agreement on terminology is essential

- Lying down height (length) vs standing height (height)
- Weight
  - Clothes on, clothes off? Diapers?
- Gestational age at a point in time
  - Do you accept all methods?
- Gestational age at birth
- Birthdate
Lesson 2: Integrate with workflow

- Are all of the needed data elements available?
- No one was entering gestational age at birth
  - Theoretically, this could be calculated from a point-in-time gestational age and the birthdate
- Needed to add an additional data element that was part of the data entered at time of birth
Lesson 3: FHIR is still new

- FHIR version 2 was available
- The services from Cerner were FHIR version 1
- Do we program to the new or the old?
  - We built the application using FHIR 2, and we made a converter from version 1 to version 2
  - We will take the converter out when we have the FHIR 2 services installed
Lesson 4: Isolate knowledge from the application

- In the original application, the growth charts were hard coded in the application
- Clinicians wanted a choice of CDC, WHO, Fenton
- We needed to design for newer versions of each kind of chart
- Needed to externalize the growth chart knowledge
Lesson 5: Environmental differences

• The first version of the app took 5+ minutes to print
  • Changes in a configuration environment and changes to the print routine reduce the time to ~ 5 seconds
• Printing workflow and architecture is not uniform across platforms
• Integrating the growth chart with graphics for printing was an issue
• The Pediatric Growth Chart app is beautiful!
  • Really well done, appealing graphics
• It took longer to implement than we thought
  • But it was a lot faster than if we had started from scratch!
• We learned a lot (see previous 5 lessons)
• The next app implementation should go much faster based on what we learned
• It was absolutely worth it!
QUESTIONS?

Stan.Huff@imail.org