Implementing Boston Childrens Pediatric Growth Chart Application

HL7 Partners in Interoperability
April 27, 2016
Stanley M. Huff, MD
stan.huff@imail.org
Intermountain Healthcare Profile

An Integrated Health System

- 22 hospitals
- 33,000 employees
- 600,000 members
- 25% market share
- 200 clinics
- 1,000 employed physicians

1975
1983
1994
Intermountain Mission

“To help people live the healthiest lives possible.”
Homer Warner and HELP

Intermountain can only provide the highest quality, lowest cost health care with the use of advanced clinical decision support systems integrated into frontline clinical workflow.
Decision Support Modules

- Antibiotic Assistant
- Ventilator weaning
- ARDS protocols
- Nosocomial infection monitoring
- MRSA monitoring and control
- Prevention of Deep Venous Thrombosis
- Infectious disease reporting to public health
- Diabetic care
- Pre-op antibiotics
- ICU glucose protocols
- Ventilator disconnect
- Infusion pump errors
- Lab alerts
- Blood ordering
- Order sets
- Patient worksheets
- Post MI discharge meds
We can’t keep up!

- We have ~150 decision support rules or modules
- We have picked the low hanging fruit
- There is a need to have 5,000+ decision support rules or modules
- There is no path from 150 to get to 5,000 unless we fundamentally change the ecosystem
An Experiment

We wanted to try to import an outside application: Boston Childrens Pediatric Growth Chart
Boston Childrens: SMART Growth Chart
SMART Growth Chart – Parent’s View

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
(or never buy a low serial number)

- 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
Summary and Conclusions

- 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!