Children’s Hospital of Philadelphia CHOP

Igor Yuabov, PhD

Credits: (in alphabetical order)
Box, Barry G; Cici, Lorenc; Jenkins, Jay M; Kaleem, Azfar; Kerr, Dave A; Lobach, Steve J; Nicholson, Eric; Saeed, Muhammad; Williams, James I and many others…

CHOP, the nation's first hospital devoted to children, was established in 1855 and now has 600+ beds.
The CHOP Care Network has 50+ locations in southeastern Pennsylvania and New Jersey.

Shake It Off
A Brand New Day at Children’s Hospital of Philadelphia
From HL7v2 to API based integration at CHOP.

- First HL7v2 P2P ORM/ORU interface implemented in 1991
- First HL7v2 OpenHUB Engine based ORM/ORU interface implemented in 1999
- First API based interface put in Prod in 2013
- First FHIR based API put in Prod in 2021
Integration Landscape

CHOP Rhapsody and MuleSoft Engines

Production Rhapsody (EIE) Architecture
Push vs Pool to enhance FHIR

Realtime EMR to Health Cloud Integration Push/Pull

EMR SOAP/REST \(\leftrightarrow\) Rhapsody/MuleSoft \(\leftrightarrow\) Health cloud

EMR HL7v2 ADT \(\leftrightarrow\) Rhapsody/MuleSoft \(\leftrightarrow\) Health cloud

EMR SOA Events \(\leftrightarrow\) Rhapsody/MuleSoft \(\leftrightarrow\) Health cloud
Practitioner 360
Employee 360

Experience Layer
- Marketing API
- Web API
- Mobile API

Process Layer
- Onboarding Status
- Employee Data
- Employee Emails

System Layer
- Badge Data
- Employee Location Data
- HCM Data
- Contractor Data
- Email Address Data

Systems:
- LENEL:S2
- Serraview
- Workday
- Salesforce
- Windows Active Directory
• T-Cell Therapy Team has strict parameters for reporting on the infusions for the Kymriah drug.

• Reporting process was manual and repetitive for each step of the infusion from patient intake to date infused so T-Cell App was created.

• Limitation of integration capabilities to initiate requests for required information from Epic and other systems attaching to the user workflow.
User enters Patient MRN and Last Name

EPIC then fills in Full Name, Gender, Birth Date, Race, Address, Phone, and Email Address

User then creates a Therapy record related to the Patient to trigger a PO request

Salesforce triggers an email sent to the internal CHOP department to create a PO

When the Cell Therapy team receives the PO# via email, they enter that into Salesforce along with Drug Order Information

Once the Patient has their infusion appointment, EPIC sends the infusion date, Ordering Provider, and Infusion Location to Salesforce
• Salesforce has Patient’s MRN with T-Cell Therapy
• Rhapsody queries this MRN from Salesforce
• Rhapsody uses this MRN to make API calls to EPIC to:
  – Get the patient demographics
  – Find if patient has a specific Drug Order in EPIC
  – Find if patient has been administered this drug
  – Get the date and time of infusion

• Rhapsody submits this info back to Salesforce

API calls to EPIC offers real-time data to Salesforce for only the selected patients, as compared to traditional HL7v2 MLLP interfaces.
• Third-Party App initiates Request (I).
• Interface Engine *Rhapsody* transforms, adds required elements and routes the API request to Enterprise EHR system *Epic* (II).
• Epic responds to *Rhapsody* (III) which transforms and routes to Third-Party App (IV)
• Rhapsody initiates requests continuously on a set schedule (I).
• When specified conditions occur, Orchestration triggers corresponding API calls (II).
• Epic responds to Rhapsody which transforms and routes to T-Cell application (I).
Enterprise API organization.
Gateway, Library of APIs, Orchestration
Patient Dem. update Orchestration Route
MuleSoft HL7v2 Accelerator Listener to API HC
MuleSoft HL7 Accelerator
Transform/Convert to API HC
Household model HC

Account

- Patient – Person Account
- Family - Family
- Household – Industries Household

Account Contact relationship

- Household Account to Patient Relation
- Relationship, Role
- Household Account to Family Relation
CHOP APIs in use counts.

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119 Custom APIs 50 FHIR APIs
Next step:

• CHOP Enterprise FHIR Server Front End
From HL7v2 to API based integration at CHOP.

Questions

Please contact us with any questions or suggestions you may have.

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