

Ignite API Learning Lab

Putting It All Together



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Standards



**SMART = Substitutable Medical Applications
and Reusable Technology**

A SMART App is a Web App

HTML5 + JavaScript

Typically Embedded in EHR

EHR Data Access is Via FHIR

OAuth2 for Security and Context Passing

**Also Supports Smart-Phone and Patient-
Controlled Apps**



FHIR = Fast Health Interoperability Resources

Created by Health Level 7 International (HL7)

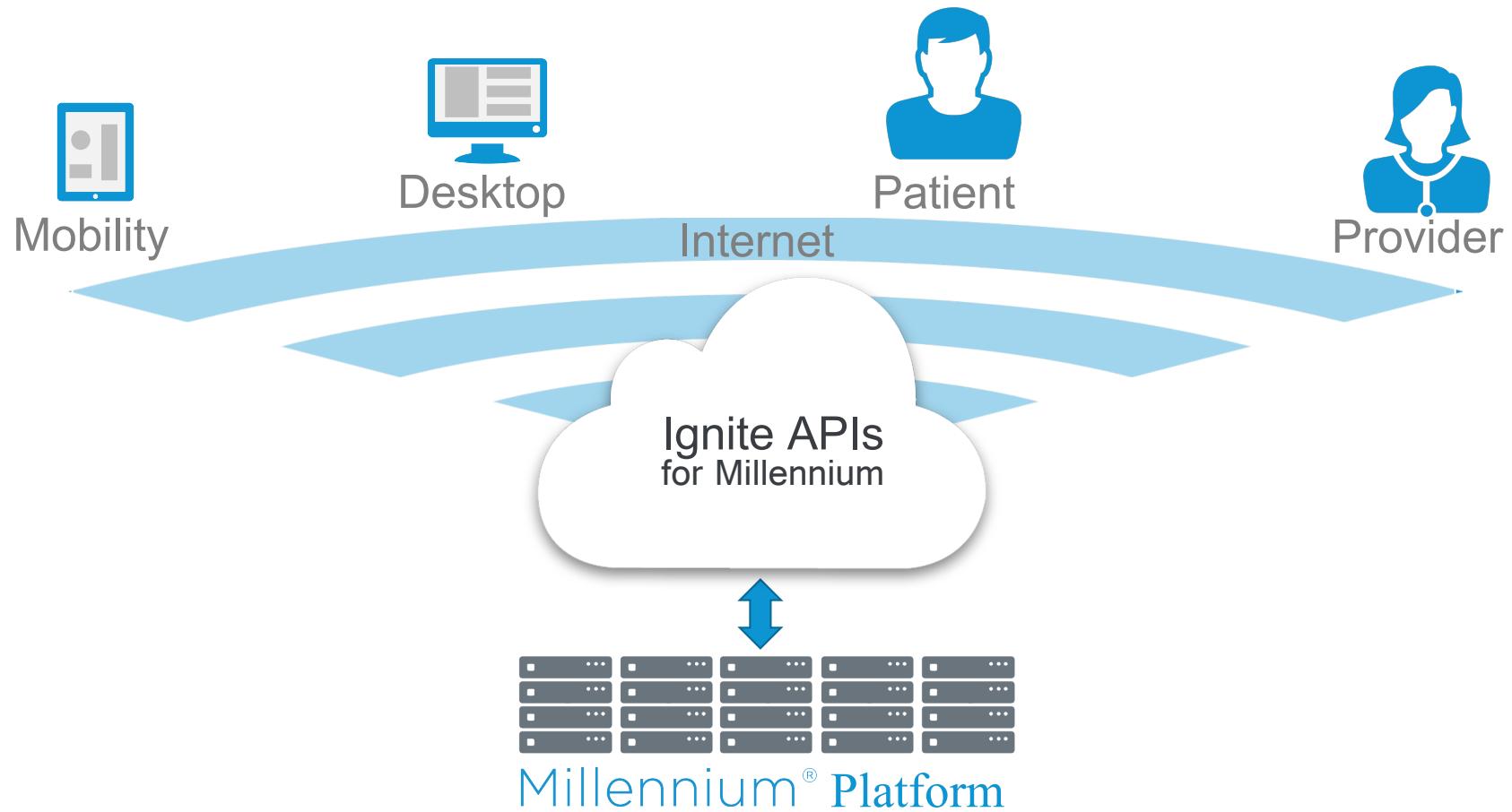
**A Standard for Accessing Health Care Data
(Resources)**

**RESTful API Design Leverages Internet
Standards (HTTP, Etc.)**

**Emerging Support by Most Major HIT Providers
(e.g., Argonaut Project)**

Meets EHR Certification for MU3

Cerner Ignite APIs for Millennium



Benefits of a cloud-based API

- Centrally Managed Security (internet, authentication and authorization)
- Consistent API experience for all clients
- Rapid, agile deployment of updates and enhancements of FHIR standard
- Centralized ontology mapping
- Flexibility – scale capacity to meet application demand (predictable costs)

Ignite APIs
for Millennium

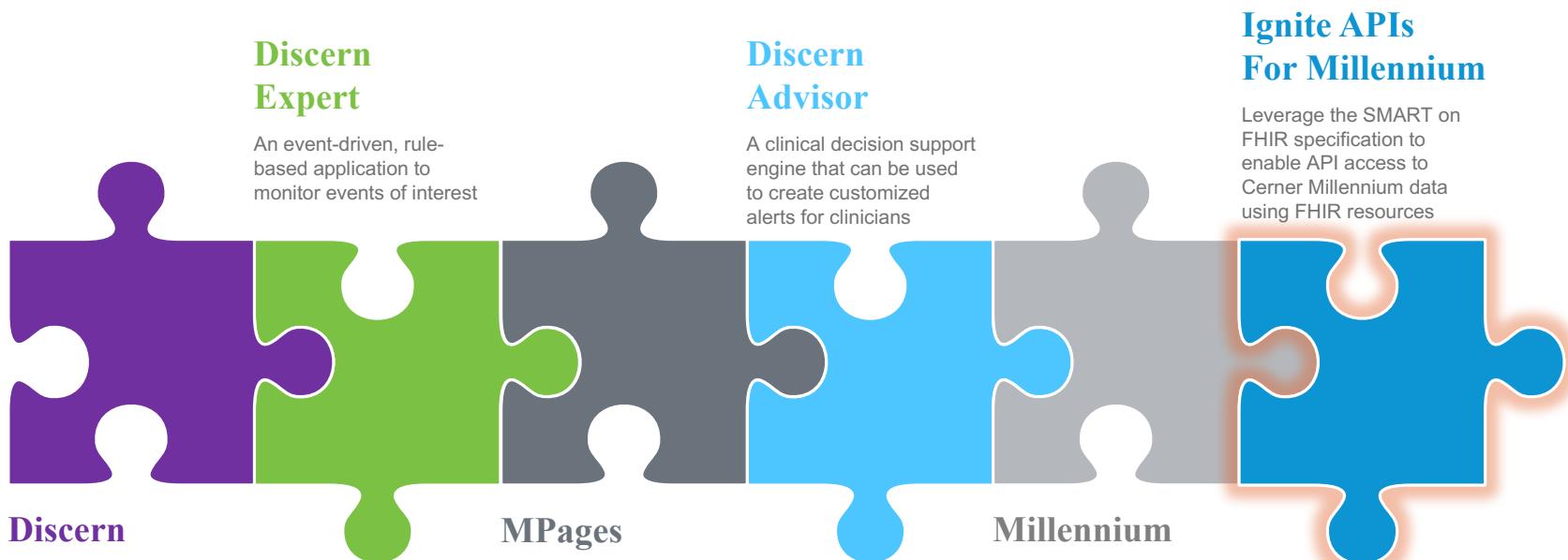
Consumer

Provider

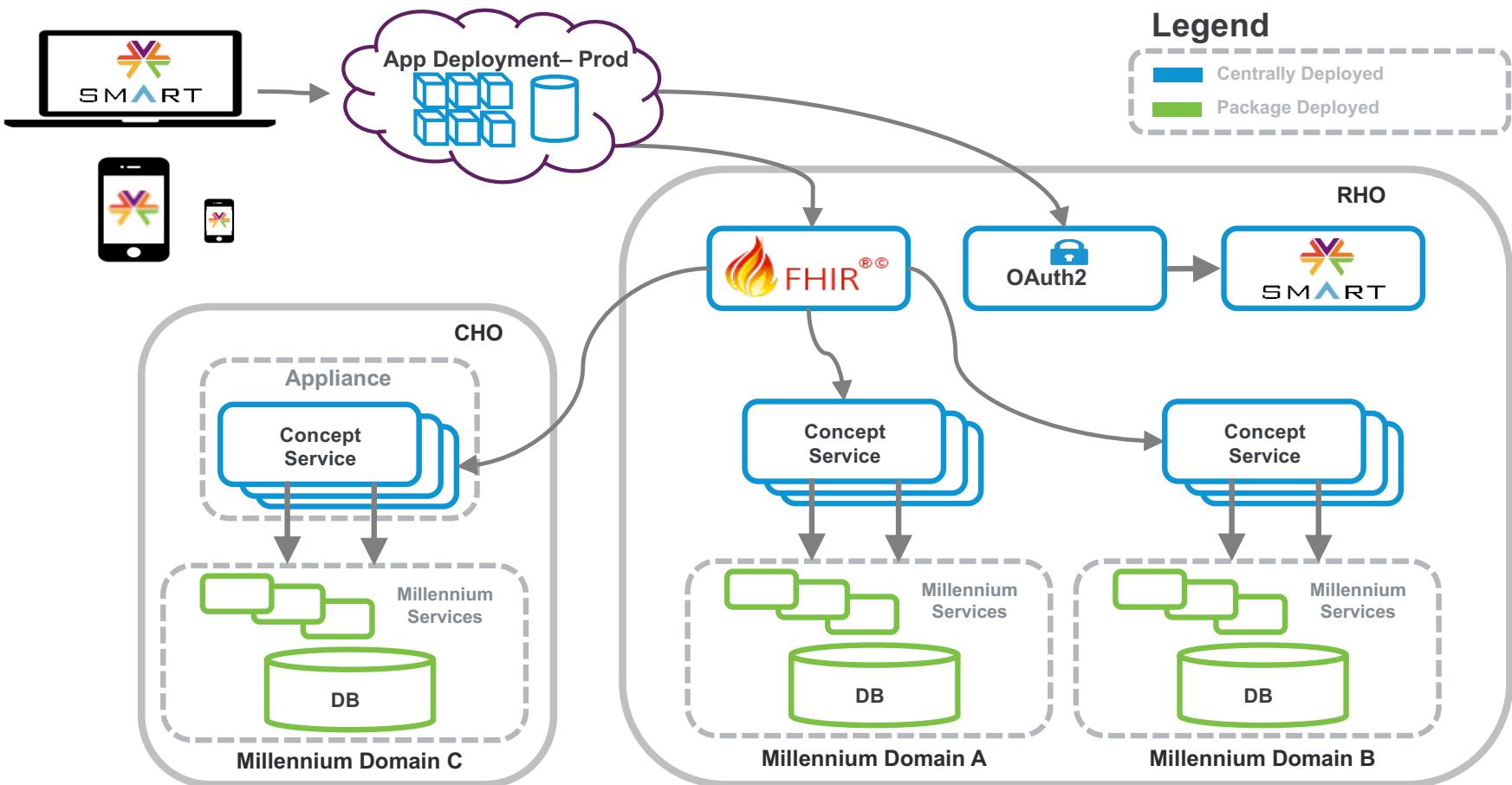
Millennium®



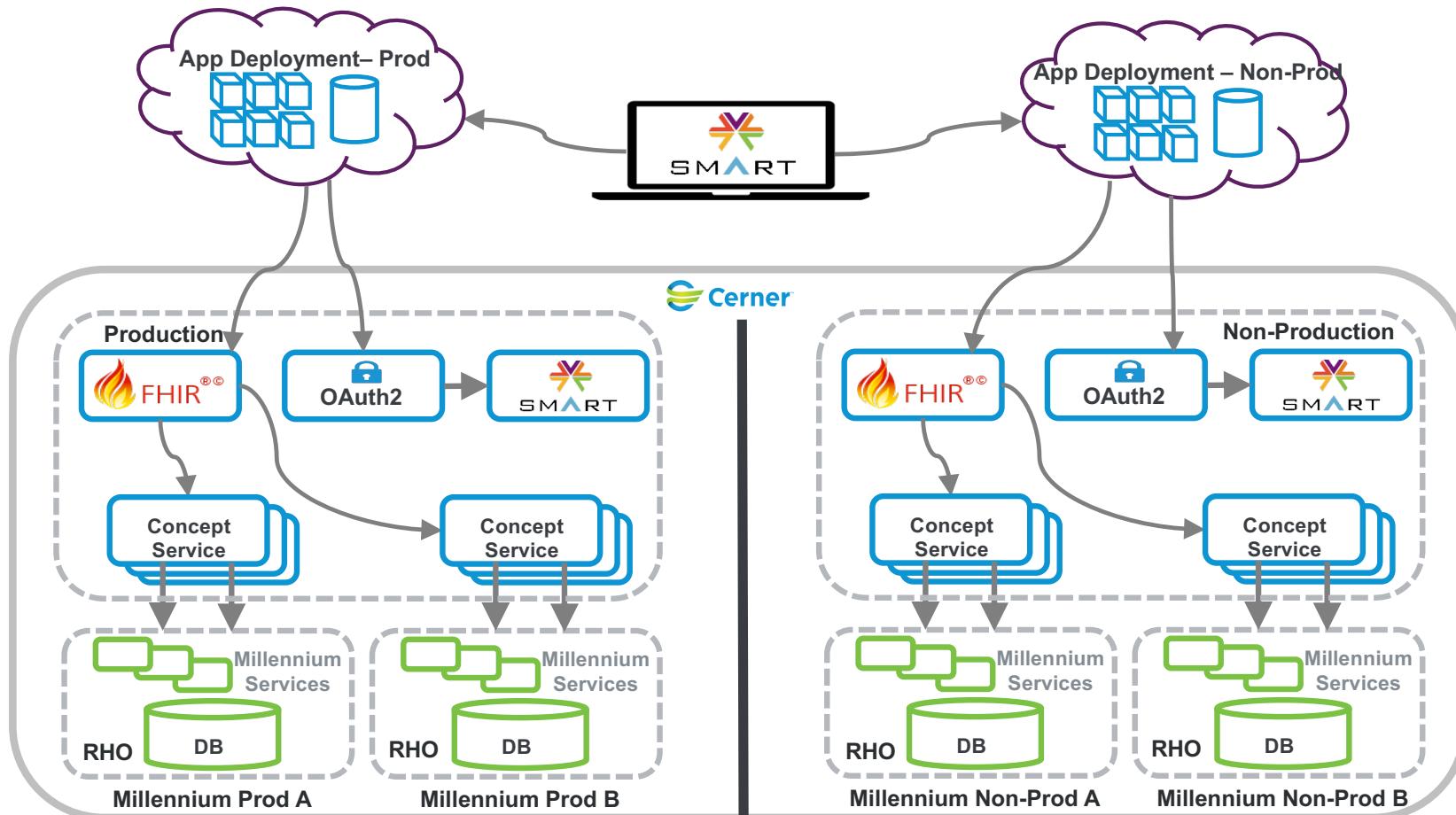
Solutions & Levels of Extensibility



Ignite API Open Platform Architecture

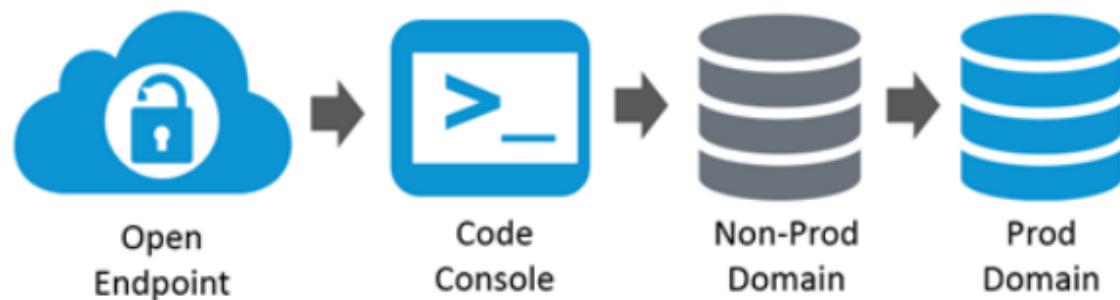


Ignite API Open Platform Architecture



Application Development Progression

- Use the Open Sandbox connection to validate ideas
- Register and test the app in Cerner Sandbox using Code Console
- Provision app for integration testing in your non-prod domain
- Provision app for production use

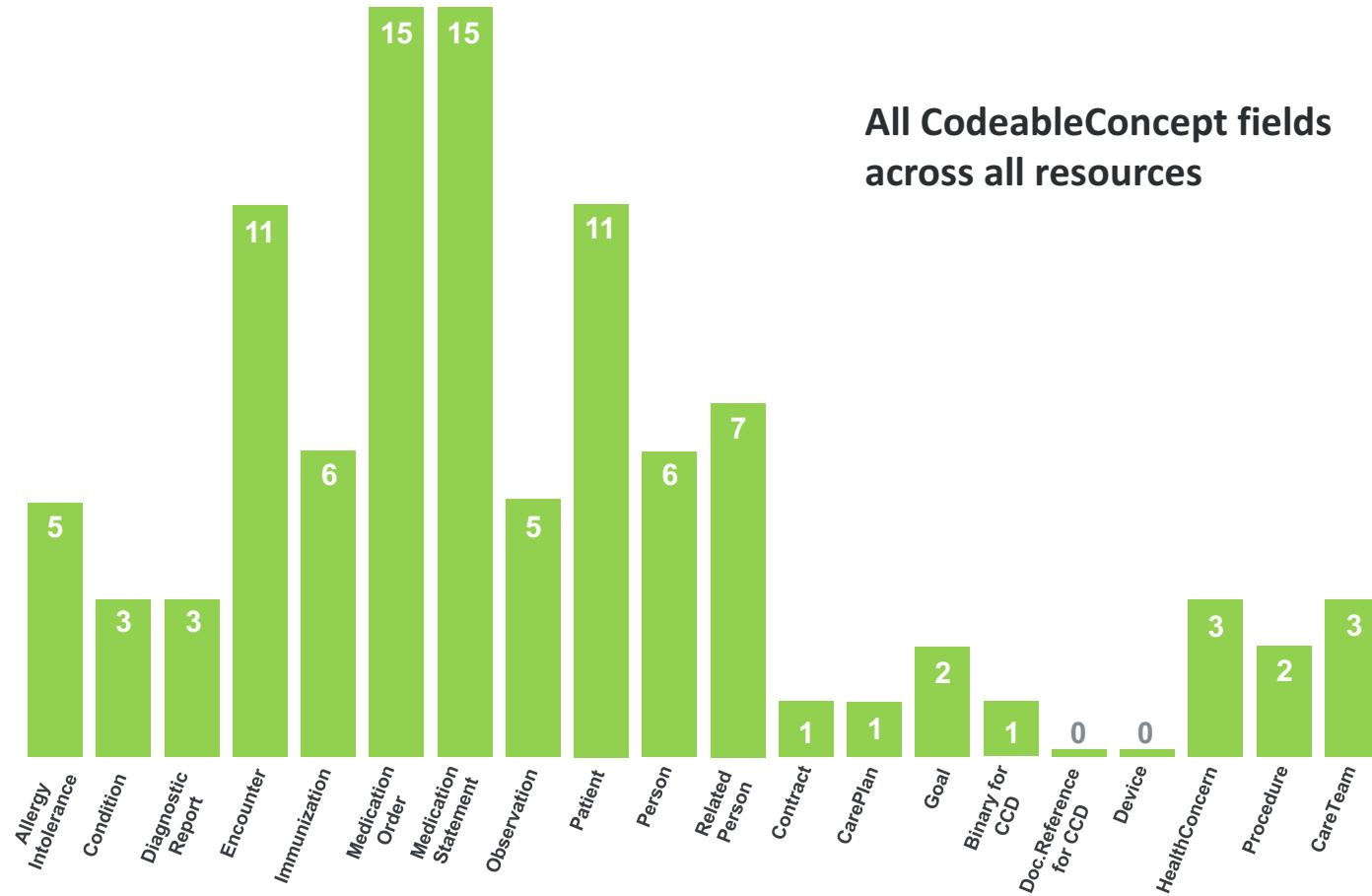


Concept Mapping

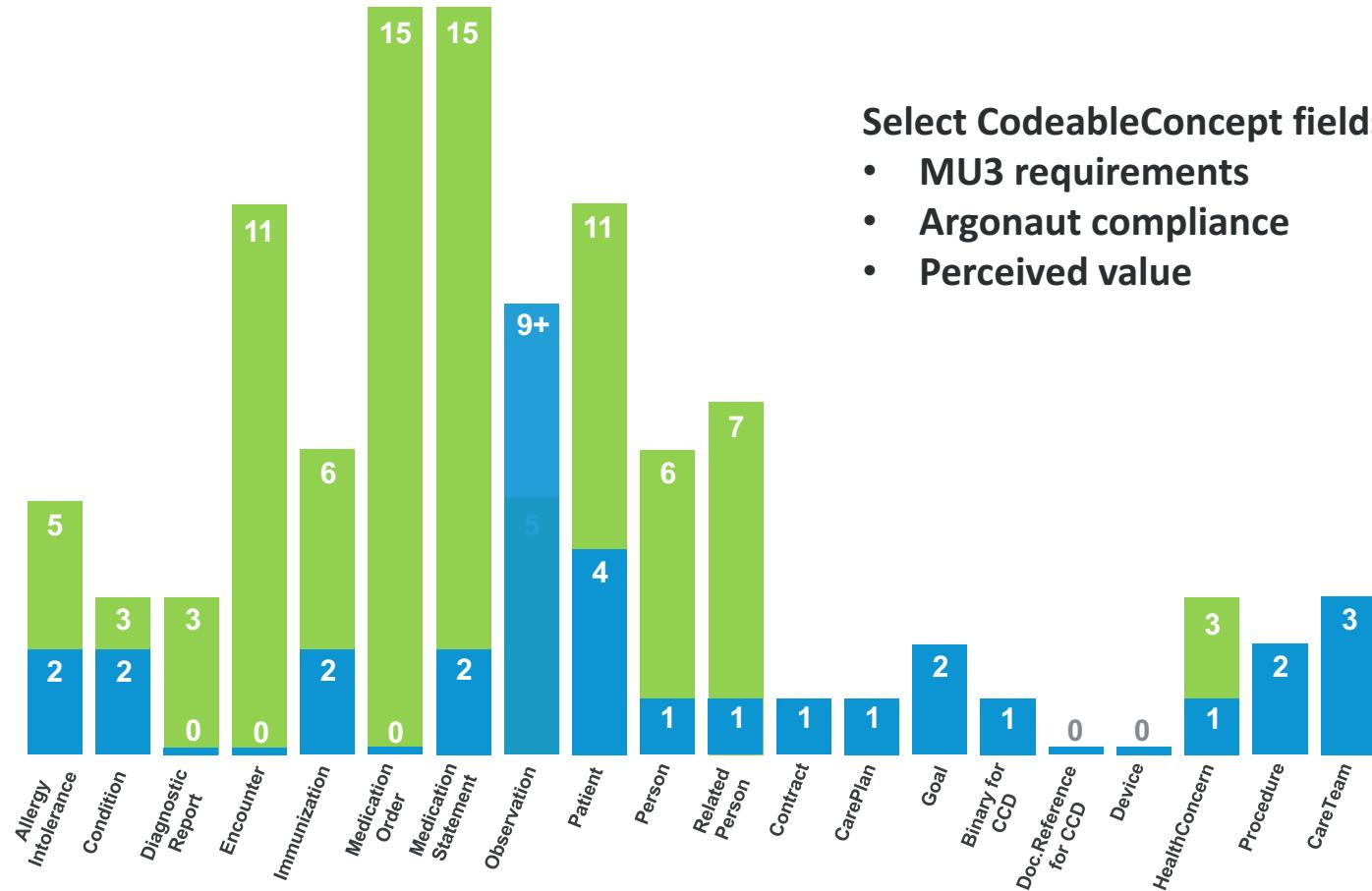
Cerner Ontology mappings bridge the gap between proprietary codes stored in Millennium and standardized codes defined by the HL7 FHIR specification



Mappings | Full Scope



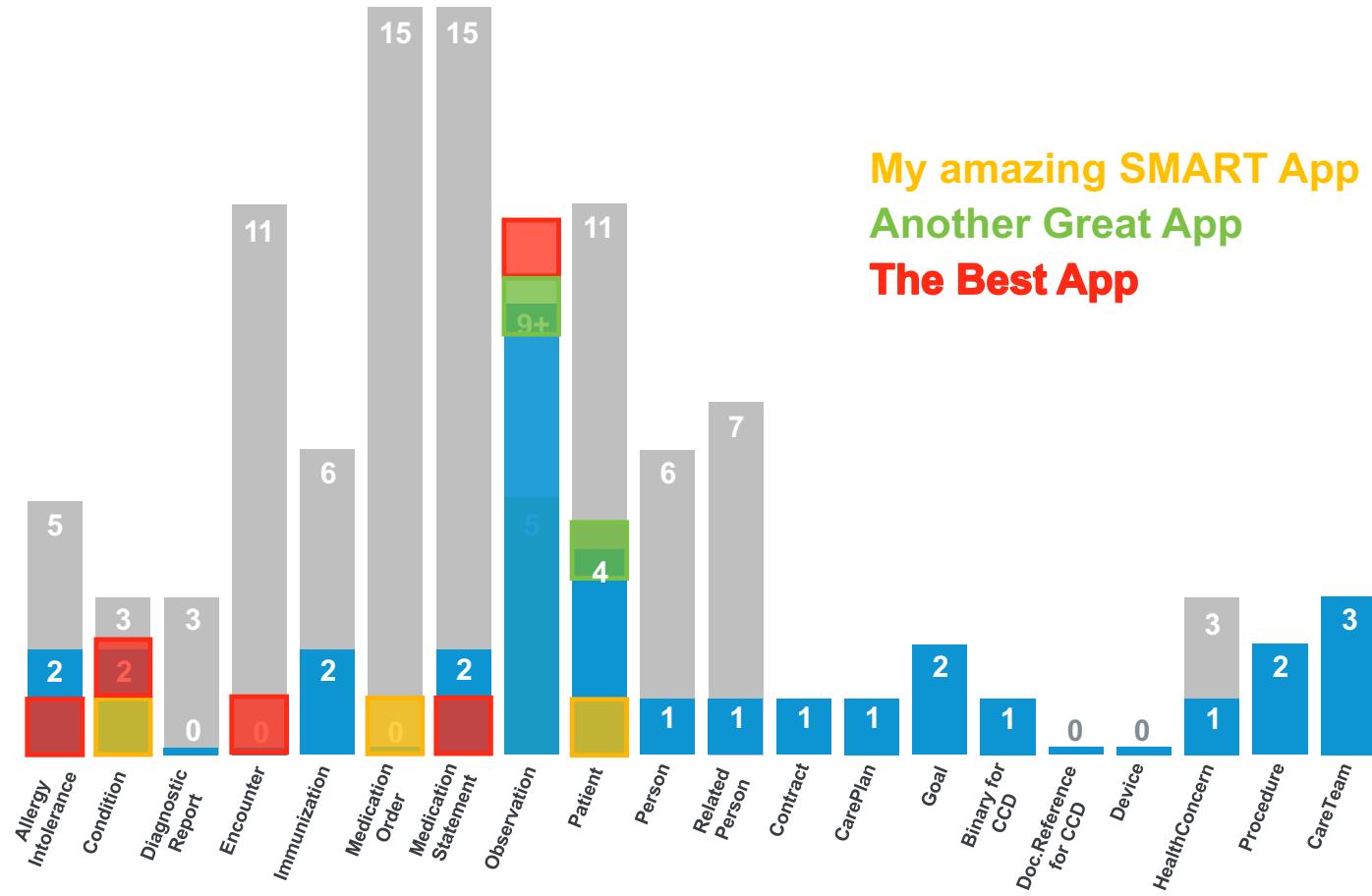
Mappings | Meaningful Use



Select CodeableConcept fields based on:

- MU3 requirements
- Argonaut compliance
- Perceived value

Mappings | App-Specific Mappings



Concept Mapping Example (Med Order Status Code)

Millennium, Code Set 6004

- CANCELED
- COMPLETED
- DELETED
- DISCONTINUED
- FUTURE
- INCOMPLETE
- INPROCESS
- MEDSTUDENT
- ORDERED
- PENDING REV
- UNSCHEDULED
- TRANS/CANCEL
- PENDING
- VOIDEDWRSLT
- SUSPENDED

<http://hl7.org/fhir/medication-order-status>

- **active**
- **on-hold**
- **completed**
- **entered-in-error**
- **stopped**
- **superceded**
- **draft**

Concept Mapping Example (Med Order Status Code)

Outbound Mappings:

Millennium >>> FHIR

ORDERED, PENDING (Pending Complete) >>> active

SUSPENDED >>> on-hold

COMPLETED >>> completed

DELETED, VOIDEDWRSLT >>> entered-in-error

CANCELLED, DISCONTINUED, TRANS/CANCEL >>> stopped

FUTURE, MEDSTUDENT, INCOMPLETE >>> draft



Concept Mapping Example (Med Order Status Code)

Inbound Mappings:

FHIR >>> Millennium

active >>> ORDERED

on-hold >>> SUSPENDED

completed >>> COMPLETED

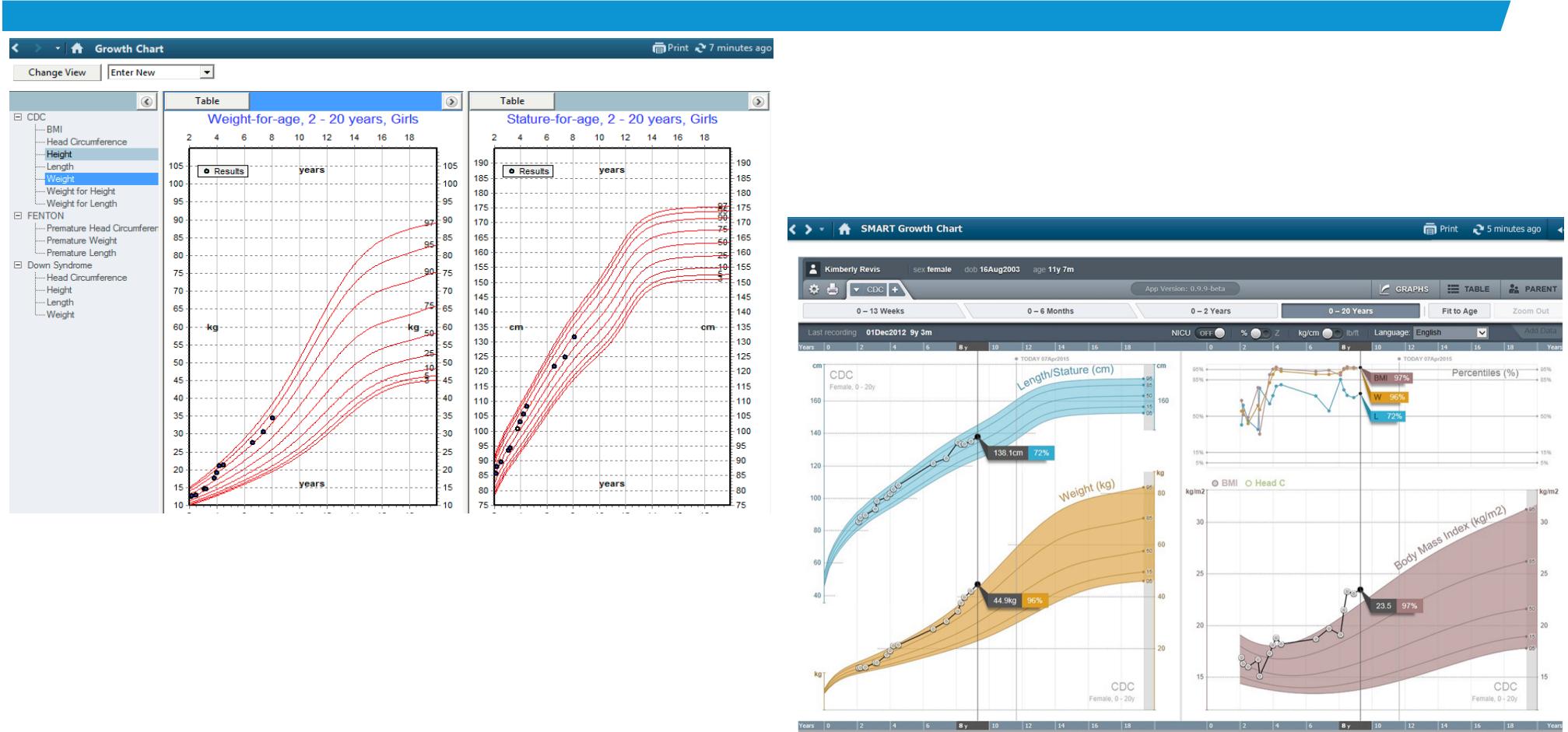
entered-in-error >>> DELETED

Stopped >>> DISCONTINUED

draft >>> INCOMPLETE



Concept Mapping Example (Growth Chart)



Concept Mapping Example (Growth Chart)

Event Sets *(Cerner Millennium)*

Weight

Event Codes *(Cerner Millennium)*

Weight (Dosing)

Weight

Weight Estimated (Non Dosing)

Growth Chart Weight

LOINC Codes

29463-7

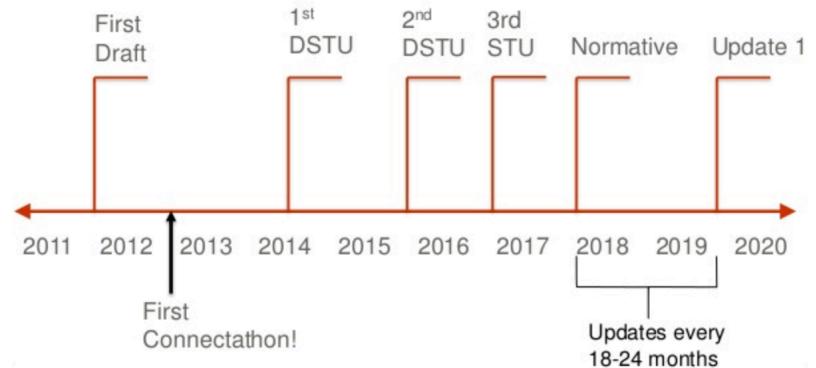
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NA



Common Issues

- FHIR spec maturity & gaps
- Millennium data set discovery
- Query parameters pre-filtering / post-filtering
- Paged queries
- App hosting & access to external resources
- FHIR spec version changes



App Validation



Support Channels

Technical Questions

- Google Group (Open):
<https://groups.google.com/forum/#!forum/cerner-fhir-developers>
- uCern Group (Cerner and Clients Only):
<https://connect.ucern.com/groups/ignite-apis-community>

Business Questions

- Contact your Engagement Leader or Client Results Executive (CRE)

eService

If you have technical issues with your domain or you are ready to move an app into your production or non-production domain, log a service record in eService: <https://eservice.ucern.com/>

For Solution Family, select Open Development Services

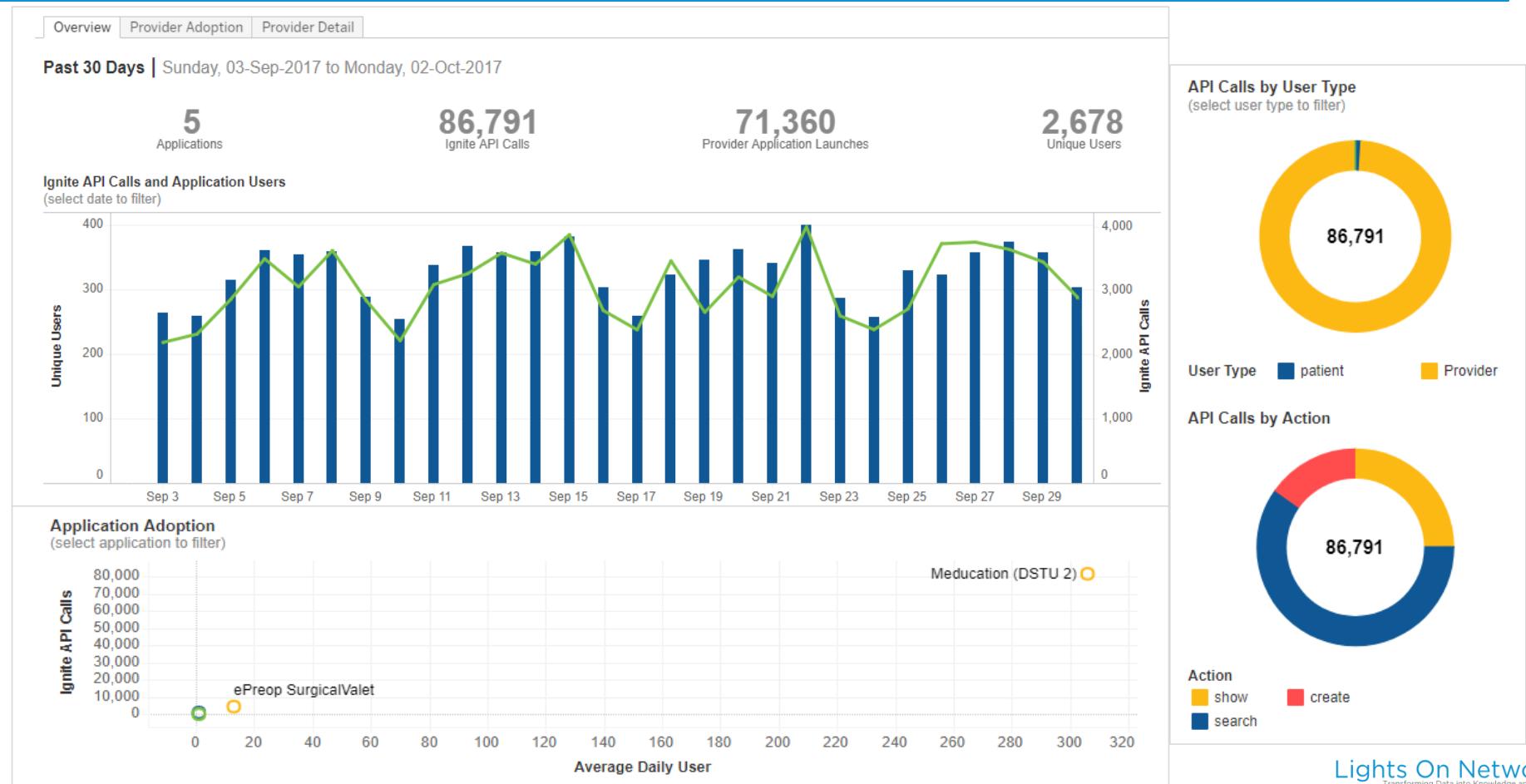
For Solution, select Ignite APIs for Mill

Additional Resources

- SMART specification
 - <<http://docs.smarthealthit.org/>>
- FHIR specification
 - <<https://www.hl7.org/fhir/dstu2/>>
- Cerner Developer Program
 - <<http://code.cerner.com/>>
- Cerner Developer Documentation
 - <<http://fhir.cerner.com/millennium/dstu2/>>
- Cerner Ignite API Tutorial
 - <<http://engineering.cerner.com/smart-on-fhir-tutorial/>>
- Code Console
 - <<https://code.cerner.com/developer/smart-on-fhir/>>
- Developer Community Google Group
 - <<https://groups.google.com/forum/#!forum/cerner-fhir-developers>>
- Cerner Ignite APIs Reference Pages
 - <<https://wiki.ucern.com/display/reference/Cerner+Ignite+APIs+Reference+Pages>>
- uCern Connect Ignite APIs Community
 - <<https://connect.ucern.com/groups/ignite-apis-community>>



Monitor Ignite APIs for Millennium



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Transforming Data into Knowledge and Action

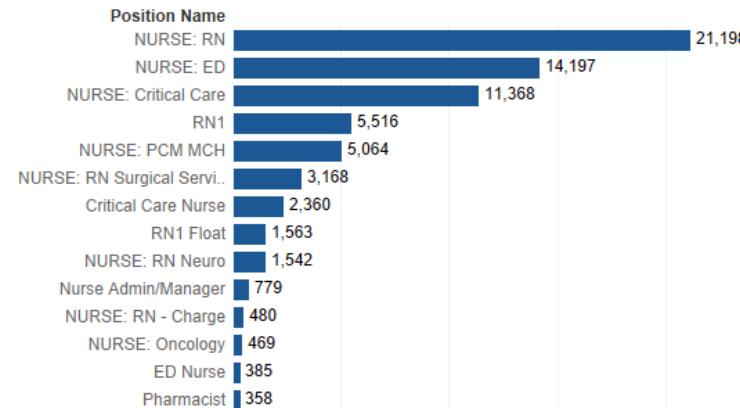
App Adoption by Facility and Position

Medication (DSTU 2)
Unique Providers: 2,514
Application Launches: 67,088

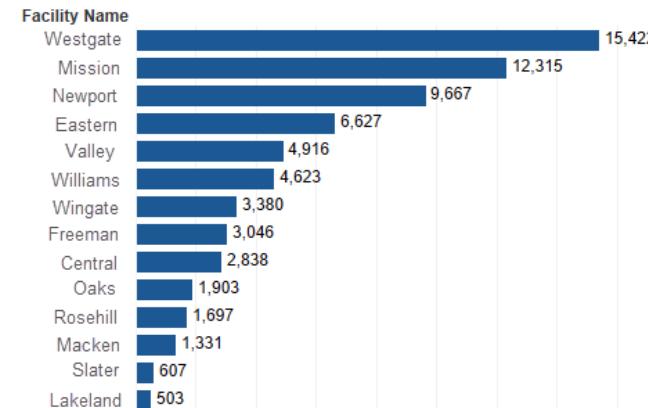
Unique Providers

1 | 2,514

Unique Application Launches by Position
(select position to filter)

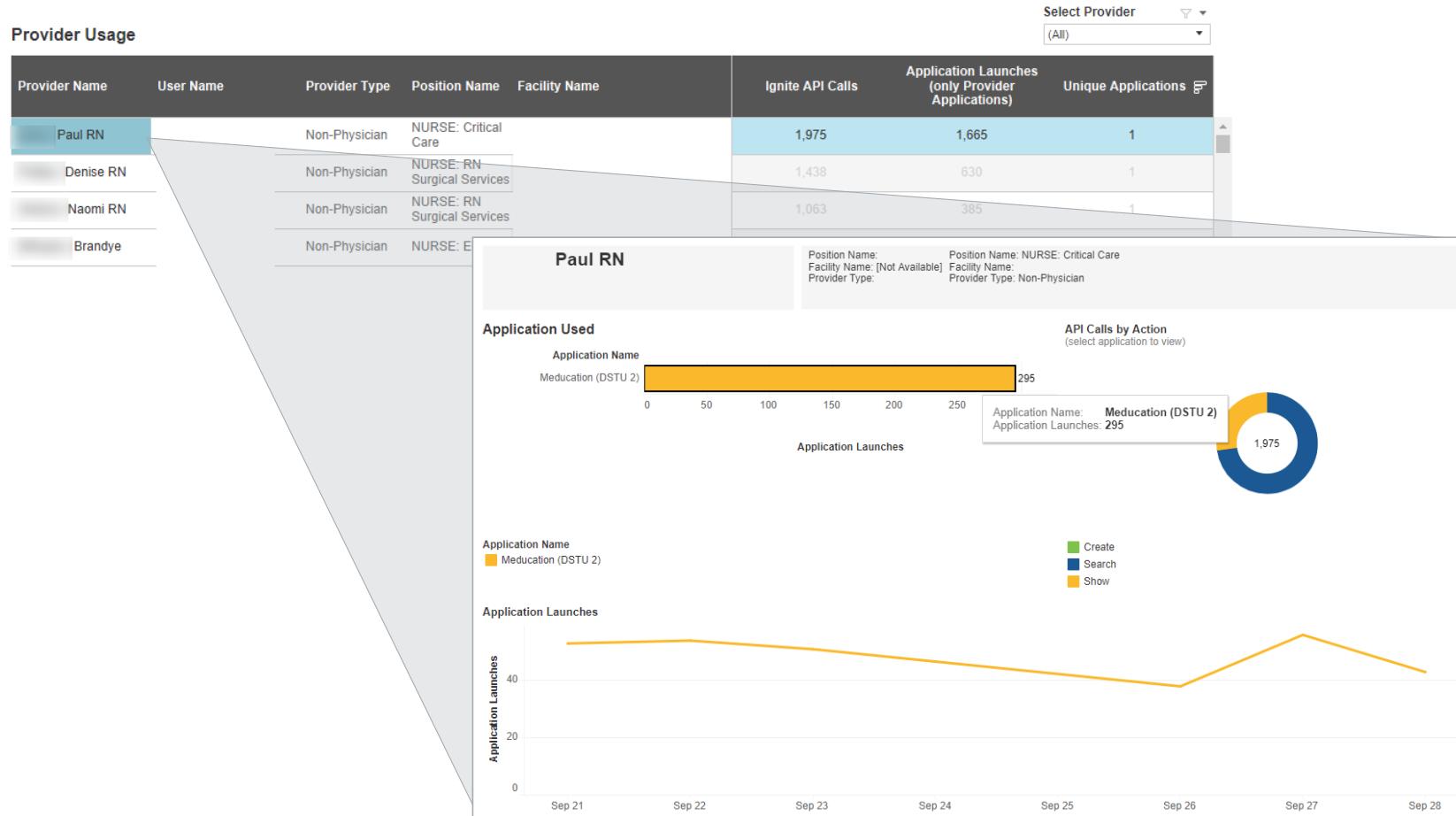


Unique Application Launches by Facility
(select facility to filter)



Provider Details

Provider Usage



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