



The Office of the National Coordinator for  
Health Information Technology

# High Impact Pilots (HIP) and Standards Exploration Awards (SEA) Cooperative Agreement Program

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ONC Interoperability in Action Day  
Monday, March 20, 2017



# HIP/SEA Program Objectives

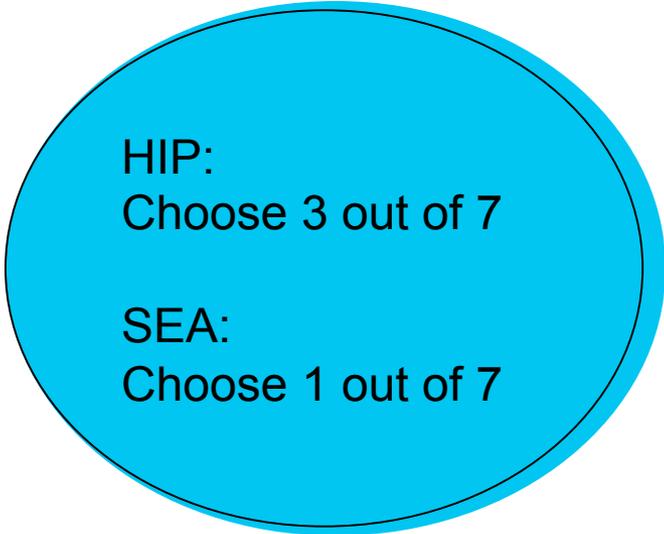
- Focus on addressing interoperability through implementation of Technology Solutions
- Support increased use of health information technology solutions
- Incentivize use of standards from the Interoperability Standards Advisory (ISA) and newly emerging standards
- Lessons learned, and evidence generated, by these Cooperative Agreements will help advance industry understanding of health IT's potential

# Priority Categories and Subcategories:

- Comprehensive Medication Management
  - Drug Cost at Care
  - Opioid
- Care Coordination
  - Care Plan
  - Closed-Loop Referral
- Labs
  - Full-Loop Labs
- Self-Identified

# Impact Dimensions

1. Practice Efficiency
2. Safety
3. Privacy & Security
4. Clinical Quality
5. Patient Experience
6. Cost Efficiency
7. Interoperable Exchange



HIP:  
Choose 3 out of 7

SEA:  
Choose 1 out of 7

# FOA Framework

Priority Category	Sub Category	Impact Dimensions						
		Practice Efficiency	Safety	P&S	Clinical Quality	Patient Experience	Cost Efficiency	Interoperable Exchange
Comprehensive Medication Management	Drug Cost at Care							
	Opioid							
Laboratory Data Exchange	Full-Loop Labs							
	Care Plan							
Care Coordination	Closed-Loop Referral							
Self-Identified	N/A							

**Award Requirements**

High Impact Pilots Awardees must address 3 out of 7 Impact Dimensions (\$100K - \$500K)  
 Standards Exploration Awardees would need to address 1 out of 7 Dimensions (\$50K-100K/award)  
 Must first look to using standards in the Interoperability Standards Advisory and, if not, justify rationale  
 Must complete pilot within 12-month period of performance !

# High Impact Pilots (HIP)

Awardee	Project	Budget
The Health Collaborative	The Heartland Pilot is a partnership between The Health Collaborative and the Strategic Health Information Exchange Collaborative (SHIEC). It will use existing standards to advance a “network of networks” model as part of a Patient-Centered Data Model pilot project.	269,995
Lantana Consulting Group	This project focuses on the implementation, testing, and refinement of the C-CDA and C-CDA on FHIR Care Plan for pharmacists (ePhCP). In this project, Lantana is partnering with the Community Care of North Carolina (CCNC) and two pharmacy management system vendors, PioneerRx and QS/1 to pilot the integration of pharmacist care plans into coordination efforts for patient care across the continuum.	257,013
RxREVU Inc.	This collaborative project between RxREVU, a Denver-based prescription intelligence company, and the Banner Health System plans to leverage patient-specific data shared via FHIR to reduce overall prescription drug spending, provide useful information on patient medication adherence, and operationalize organizational best practices.	315,943
University of Utah	This community primary care project will allow clinicians and the University of Utah’s vascular surgery service that use common electronic health record (EHR) platforms to share information through a novel closed-loop surgical referrals dashboard application. This app will be designed to integrate with commercially available EHRs using the emerging SMART on FHIR.	\$404,110

# High Impact Pilots (HIP) – Continued

Awardee	Priority Category/ Subcategory	Impact Dimensions	Standards
The Health Collaborative	(3) Care Coordination	<ol style="list-style-type: none"> <li>1) Safety</li> <li>2) Privacy and Security</li> <li>3) Interoperable Exchange</li> </ol>	ADT, CCD, IHE
Lantana Consulting Group	(3) Care Coordination	<ol style="list-style-type: none"> <li>1) Clinical Quality</li> <li>2) Practice Efficiency</li> <li>3) Interoperable Exchange</li> </ol>	ePhCP
RxREVU Inc.	(1) Comprehensive Medication Management (i) Price Transparency at the Point of Care	<ol style="list-style-type: none"> <li>1) Clinical Quality</li> <li>2) Cost Efficiency</li> <li>3) Interoperable Exchange</li> </ol>	FHIR
University of Utah	(3) Care Coordination (ii) Close-Loop (surgical) Referrals	<ol style="list-style-type: none"> <li>1) Clinical Quality</li> <li>2) Cost Efficiency</li> <li>3) Practice Efficiency</li> </ol>	SMART on FHIR

# Standards Exploration Awards (SEA)

Awardee	Project	Budget
Arkansas Office of Health Information Technology	The Arkansas project will implement interoperable, bi-directional health information exchange with behavioral health providers.	84,052
Cincinnati Children's Hospital Medical Center	The Cincinnati project will explore the cost efficiencies of integrating healthcare and clinical research systems with the medical center's electronic health record (EHR). This will enable patient data from the EHR to be used for research as well as direct patient care more efficiently.	87,883
Sysbiochem	In collaboration with Boston Children's Hospital, Intermountain Healthcare, and Massachusetts General Hospital, Sysbiochem is developing services to facilitate the integrated flow of data between an EHR, Laboratory Informatics System and an analytic application to help clinicians coordinate care for breast cancer patients.	78,065



# Standards Exploration Awards (SEA) – Continued

Awardee	Priority Category/ Subcategory	Impact Dimensions	Standards
Arkansas Office of Health Information Technology	(3) Care Coordination	1) Interoperable Exchange	CCD
Cincinnati Children's Hospital Medical Center	(4) Self-Identified	1) Cost Efficiency	RFD and FHIR
Sysbiochem	(4) Self-Identified - Genomics	1) Clinical Quality 2) Interoperable Exchange	FHIR

# QUESTIONS?

[ONC.TechLab@hhs.gov](mailto:ONC.TechLab@hhs.gov)



THE HEALTH  COLLABORATIVE

# PATIENT-CENTERED DATA HOME: ONE PATIENT'S JOURNEY

March 20, 2017



Patient-Centered Data Home (PCDH)

**OBJECTIVE: MAKING CLINICAL DATA AVAILABLE  
WHENEVER AND WHEREVER CARE OCCURS**

# Acronyms

- ADT – Admission Discharge Transfer
- CCD – Continuity of Care Document
- HIE – Health Information Exchange
- HL7 – Health Level Seven
- PCDH – Patient Centered Data Home

# Healthcare Shouldn't Have Borders



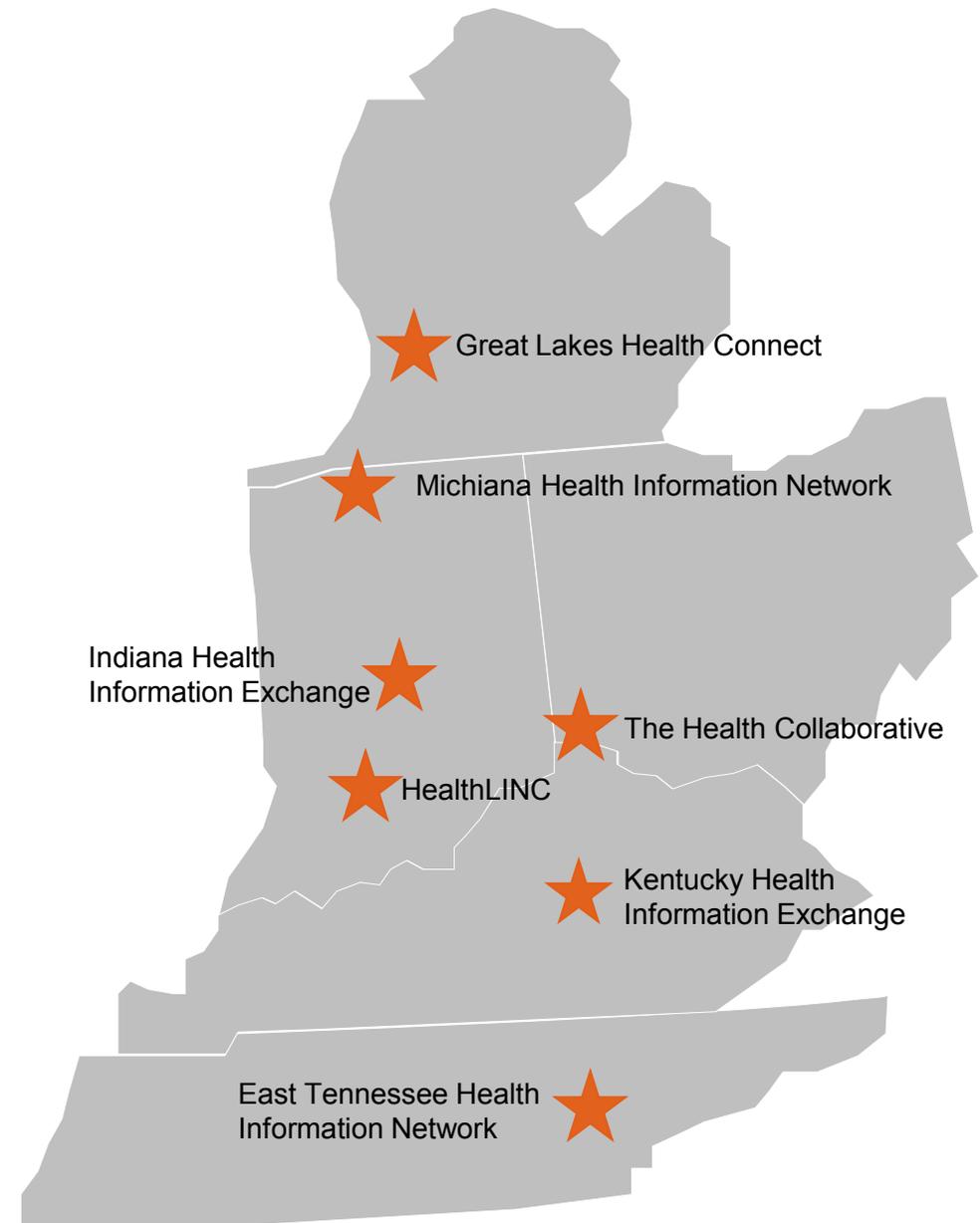
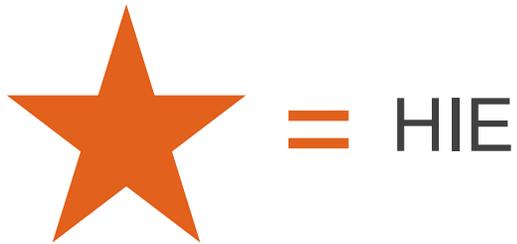
- Patient-Centered Data Home (PCDH) addresses coordination of care
- Allows clinical data to be available when & where care occurs
- 46 million patients annually seek care outside their home state

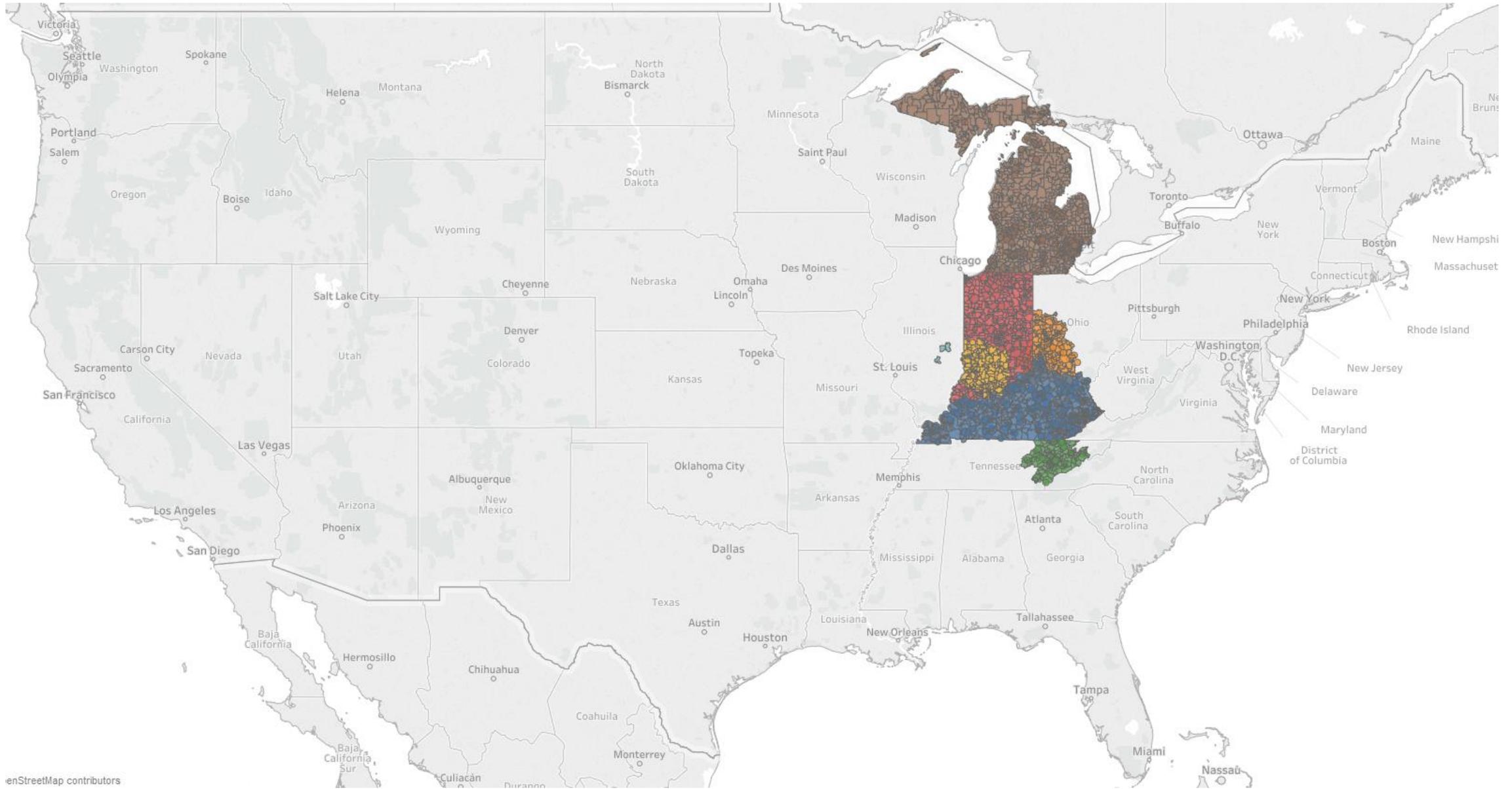
# Heartland Pilot: 7 Participants



- Indiana Health Information Exchange (IHIE)
- East Tennessee Health Information Network (etHIN)
- Great Lakes Health Connect (GLHC)
- HealthLINC (HL)
- Michiana Health Information Network (MHIN)
- Kentucky Health Information Exchange (KHIE)
- **The Health Collaborative - prime fiduciary**

# Heartland Pilot: Geographic Reach





enStreetMap contributors

# Proposed Care Coordination Measurements



- **Safety**

- Increase in allergy data available by sharing inter-HIE data via PCDH

- **Privacy & Security**

- Patient matching rates improved when transacting between 2 or more HIEs

- **Interoperable exchange**

- Measure how many ADT exchanges during the period, how many CCDs were exchanged between participating HIEs

# Metric Targets Highlights

- ADTs Exchanged – 696,000
- CCDs Exchanged – 249,000
- 35% improvement in patient matching rates

# Technologies Used

- Connectivity
  - VPN, Web Services
- Messaging
  - HL7 ADT
  - HL7 CCD
  - IHE Profiles
    - ITI-38 Cross Gateway Query
    - ITI-39 Cross Gateway Retrieve
    - ITI-55 Cross Gateway Patient Discovery

# Challenges & Opportunities

- Technical Challenges
  - Several HIEs going through technology upgrades or data platform changes
  - Variances in format, content of data exchanged and connectivity across the 7 HIEs. Joint specifications took time to complete
  - Specification changes occurred post testing
  - Variety of connectivity methods from VPN to WebServices
- Legal Challenges
  - Ensuring each HIE use of data was compliant with data sources
  - HIEs have a varying length of time to obtain agreement from sources

PLEASE REFER TO  
SESSION RECORDING  
FOR PRESENTATION  
VIDEO

# Thank You! Any Questions?

Jason Buckner – [jbuckner@healthcollab.org](mailto:jbuckner@healthcollab.org)

Megan Scully – [mscully@healthcollab.org](mailto:mscully@healthcollab.org)

Mary Ellen Wheeler – [mwheeler@ihie.org](mailto:mwheeler@ihie.org)

[Link to Video](#)

# INTEROPERABILITY IN ACTION DAY

**March 20, 2017**

Rick Geimer, CTO Lantana Consulting Group

# Lantana Consulting Group

## Our Mission:

- Improve healthcare through health information technology (IT)
- Lead the industry through our consulting and volunteer practice

## Our Services:

- Software & standard development & implementation
- Terminology, data governance, and education
- Strategic advice for health IT planning, design, and purchasing

## Rick Geimer

- Developer of standards & software
- HL7 C-CDA on FHIR Lead
- HL7 Structured Documents Co-chair
- Co-author C-CDA and many other specifications
- Day job: Lantana Chief Technology Officer (CTO)

- **CDA:** Clinical Document Architecture
- **C-CDA:** Consolidated CDA
- **FHIR:** Fast Healthcare Interoperability Resources
- **PhCP:** Pharmacist Care Plan
- **CCNC:** Community Care of North Carolina
- **IG:** Implementation Guide

- Project Overview
- C-CDA and PhCP CDA IG
- C-CDA on FHIR and PhCP FHIR IG
- Bi-Directional Transforms
- Demo
- Next Steps
- Q/A

# Project Overview

**Award:** To Lantana from The U.S. Department of Health and Human Services' (DHHS) Office of the National Coordinator for Health Information Technology (**ONC**) to conduct a High Impact Pilot (**HIP**)

## Goals of the Project

- Create a new standard for electronic pharmacist care plans called “Pharmacist Care Plan”, which is a further constraint on a standard in the Interoperability Standards Advisory (ISA).
- Integrate the pharmacist care plan into coordination efforts for patient care across the health continuum.
- Capture data that is currently missing from the EHR.

Lantana is partnering with the Community Care of North Carolina (CCNC) and six pharmacy management vendors for this pilot effort.

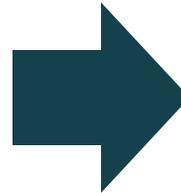
Success is measured by successfully transmitting pharmacist care plan data to CCNC such that they can load the data into their systems and use it to improve patient care.

# ONC HIP: Objectives

- Improve practice efficiency
  - **Eliminate duplication** of documentation in multiple systems.
  - **Incorporate comprehensive medication reviews (CMRs) into Care Plans** so pharmacist can focus on high risk negative outcomes.
- Improve clinical quality
  - **Replace free-text narratives** of patient interactions with structured data.
  - **Share structured data** from patient interactions between providers, pharmacist, and payers.
  - **Gain access** to data that are currently unavailable to electronic health record systems (EHRs), such as pharmacist updates to goals, medications, and interventions.
- Support interoperable exchange
  - **Enable CCNC to receive** PhCPs from pharmacy management systems. (
  - **Provide validation** against the specification. (

# Consolidated CDA

- Care Plan
- Consultation Note
- Continuity of Care (CCD)
- Diagnostic Imaging Report
- Discharge Summary
- History and Physical (H&P)
- Operative Note
- Procedure Note
- Progress Note
- Referral Note
- Transfer Summary
- Unstructured Document



HEALTH  
STORY  
PROJECT



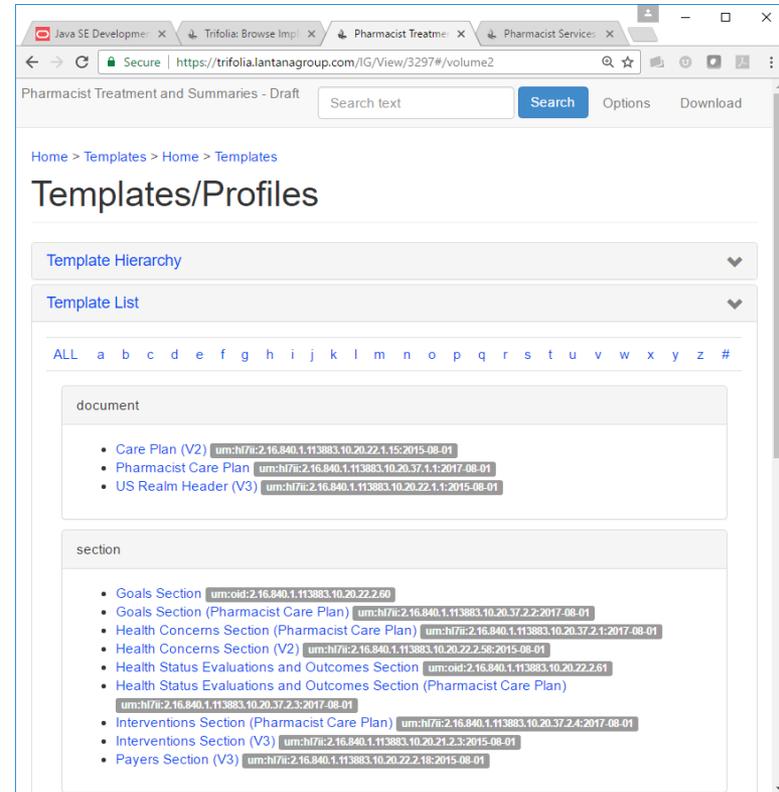
HITSP

Consolidate and harmonize various standalone documents into one master implementation guide for the primary care use case.

# Pharmacist Care Plan for CDA

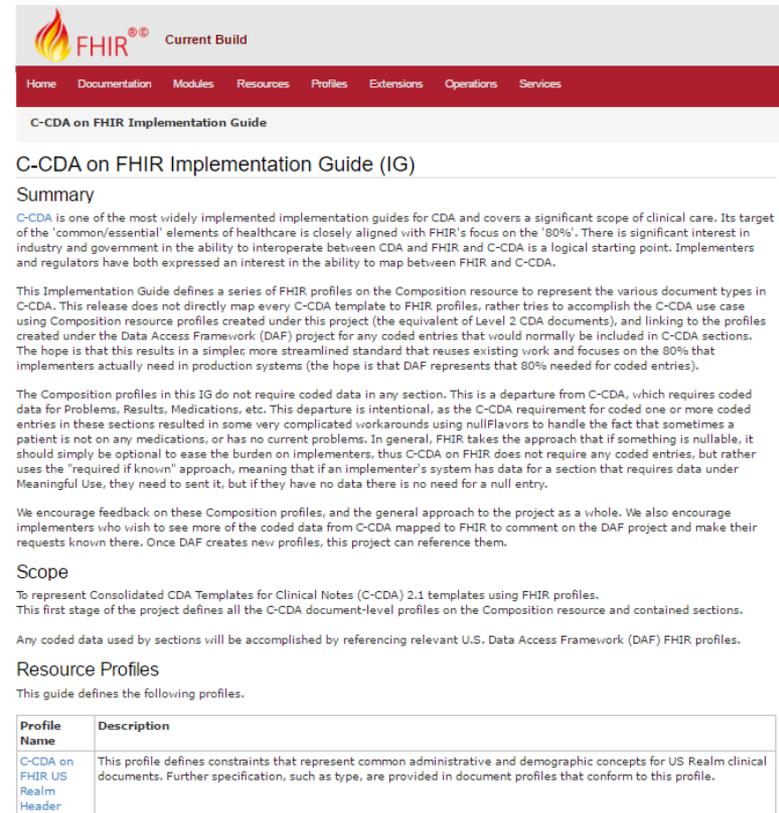
## PhCP CDA IG

- Extends the C-CDA Care Plan for the pharmacy use case
- Constrains existing section and entry templates and adds others as needed



# C-CDA on FHIR

- Implement the C-CDA use case on top of HL7's hottest new standard (FHIR)
- Preserves the best parts of CDA and C-CDA without the overhead of HL7 V3
- Leverages the US Core project for coded data  
<http://hl7.org/fhir/us/core/index.html>



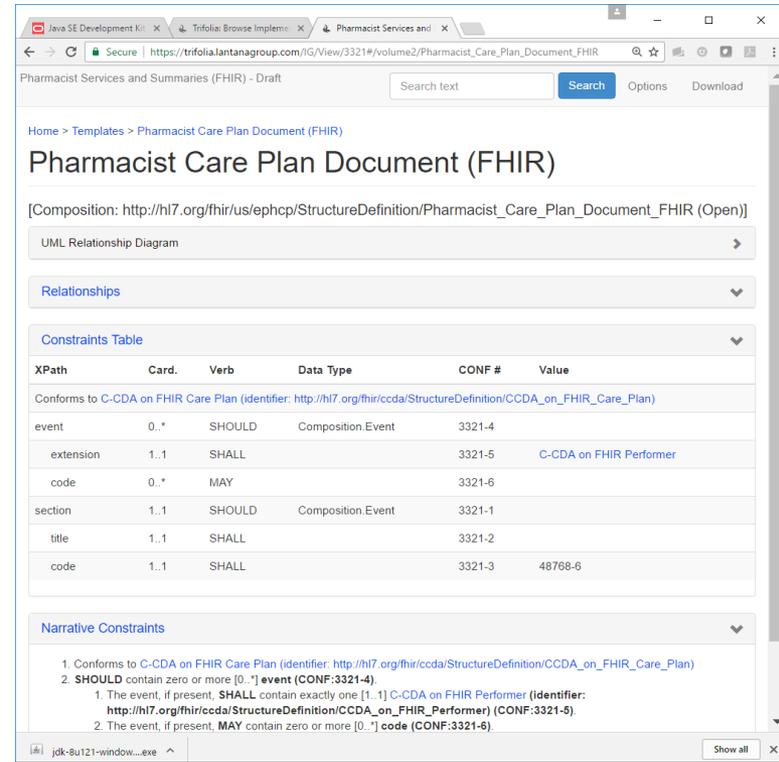
The screenshot shows the FHIR Current Build website. The header includes the FHIR logo and a navigation menu with links for Home, Documentation, Modules, Resources, Profiles, Extensions, Operations, and Services. The main content area is titled "C-CDA on FHIR Implementation Guide" and includes a "Summary" section. The summary text states that C-CDA is one of the most widely implemented implementation guides for CDA and covers a significant scope of clinical care. It also mentions that the implementation guide defines a series of FHIR profiles on the Composition resource to represent various document types. The "Scope" section notes that the project defines all the C-CDA document-level profiles on the Composition resource. The "Resource Profiles" section includes a table with two columns: Profile Name and Description. The table lists the "C-CDA on FHIR US Realm Header" profile, which defines constraints for common administrative and demographic concepts for US Realm clinical documents.

Profile Name	Description
C-CDA on FHIR US Realm Header	This profile defines constraints that represent common administrative and demographic concepts for US Realm clinical documents. Further specification, such as type, are provided in document profiles that conform to this profile.

# Pharmacist Care Plan for FHIR

## PhCP FHIR IG

- Extends C-CDA on FHIR Care Plan document
- Adds Payers section (
- Uses US Core and unprofiled resources for coded data
- Final version likely to need resource profiles beyond US Core



Pharmacist Services and Summaries (FHIR) - Draft

Home > Templates > Pharmacist Care Plan Document (FHIR)

### Pharmacist Care Plan Document (FHIR)

[Composition: [http://hl7.org/fhir/us/ephcp/StructureDefinition/Pharmacist\\_Care\\_Plan\\_Document\\_FHIR](http://hl7.org/fhir/us/ephcp/StructureDefinition/Pharmacist_Care_Plan_Document_FHIR) (Open)]

UML Relationship Diagram

Relationships

Constraints Table

XPath	Card.	Verb	Data Type	CONF #	Value
Conforms to C-CDA on FHIR Care Plan (identifier: <a href="http://hl7.org/fhir/ccda/StructureDefinition/CCDA_on_FHIR_Care_Plan">http://hl7.org/fhir/ccda/StructureDefinition/CCDA_on_FHIR_Care_Plan</a> )					
event	0..*	SHOULD	Composition.Event	3321-4	
extension	1..1	SHALL		3321-5	C-CDA on FHIR Performer
code	0..*	MAY		3321-6	
section	1..1	SHOULD	Composition.Event	3321-1	
title	1..1	SHALL		3321-2	
code	1..1	SHALL		3321-3	48768-6

Narrative Constraints

1. Conforms to C-CDA on FHIR Care Plan (identifier: [http://hl7.org/fhir/ccda/StructureDefinition/CCDA\\_on\\_FHIR\\_Care\\_Plan](http://hl7.org/fhir/ccda/StructureDefinition/CCDA_on_FHIR_Care_Plan))
2. **SHOULD** contain zero or more [0..\*] **event** (CONF:3321-4).
  1. The event, if present, **SHALL** contain exactly one [1..1] C-CDA on FHIR Performer (identifier: [http://hl7.org/fhir/ccda/StructureDefinition/CCDA\\_on\\_FHIR\\_Performer](http://hl7.org/fhir/ccda/StructureDefinition/CCDA_on_FHIR_Performer)) (CONF:3321-5).
  2. The event, if present, **MAY** contain zero or more [0..\*] **code** (CONF:3321-6).

PLEASE REFER TO  
SESSION RECORDING  
FOR PRESENTATION  
DEMO

# Bi-Directional Transforms

**Goal:** Convert PhCP CDA documents to PhCP FHIR Documents

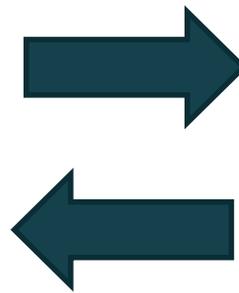
## Status

- Completed C-CDA Care Plan to C-CDA FHIR Care Plan for narrative documents
- Completed most commonly used resources (Condition, MedicationRequest, etc.)
- Completed Pharmacist/CCNC Connectathon
- Needs testing with live data
- Complete resource transforms for lesser used resources and edge cases
- Update for FHIR STU3 and C-CDA on FHIR after publication

# CDA ↔ FHIR Transforms Demo



CDA



FHIR<sup>®</sup> ©

## Next Steps for Standards

- **Pilot** the PhCP CDA and FHIR implementations using live data
- **Update** the CDA and FHIR Implementation Guides (IGs) and transforms based on pilot results
- **Update** the FHIR IG and transforms for FHIR STU3 (April) and the final version of C-CDA on FHIR (June)
- **Prepare** both IGs for an HL7 ballot
  - Note: the ballot itself is not in scope for this project

# Next Steps for Individuals

## Be a Champion

- Serve as the champion health IT leader in your practice.
- Get to know your vendor product and provide feedback on ways to improve interoperability; identify gaps to improve feasibility of standards.

## Get Involved

- Share your clinical expertise at your local HIMSS meetings.
- Volunteer as a clinical expert on an HL7 Work Group (e.g., pharmacy, child health, clinical decision support, patient care)

## Stay Abreast of Industry Changes

- Attend webinars and obtain continuing education credits (CEUs) on health IT topics.
  - CMS Medical Learning Network (MLN) national provider calls and web-based trainings
  - AHRQ continuing education courses
- Participate in Federal Advisory Committee (FACA) public web conferences by the Health IT Policy Committee and the Health IT Standards Committee.

# Further Information

## Organizations and Events

- **HIMSS** Local Chapters: <http://www.himss.org/himss-local-chapters-0>
- **HL7** Work Groups: <http://www.hl7.org/Special/committees/index.cfm?ref=common>
- **CMS MLN**: <https://www.cms.gov/Outreach-and-Education/Medicare-Learning-Network-MLN/MLNGenInfo/index.html>
- **AHRQ** Courses: <http://ahrq.cmeuniversity.com/>
- **FACA** web conferences: <https://www.healthit.gov/FACAS/federal-advisory-committees-facas>

## Contacts

- **ONC**: Tricia Lee Wilkins: [tricia.wilkins@hhs.gov](mailto:tricia.wilkins@hhs.gov)
- **CCNC**: Kim Roberts: [kroberts@n3cn.org](mailto:kroberts@n3cn.org)
- **Lantana**:
  - Courtney Panaia-Rodi (PM): [courtney.Panaia-Rodi@lantanagroup.com](mailto:courtney.Panaia-Rodi@lantanagroup.com)
  - Zabrina Gonzaga (Clinical Lead): [zabrina.gonzaga@lantanagroup.com](mailto:zabrina.gonzaga@lantanagroup.com)
  - Rick Geimer (Technical Lead): [rick.geimer@lantanagroup.com](mailto:rick.geimer@lantanagroup.com)

# RxREVU™

## **Prescription Decision Support (PDS) at Banner Health**

Wes Blakeslee, PhD

Director of Clinical Pharmacology

RxRevu, Inc.

[weston.blakeslee@rxrevu.com](mailto:weston.blakeslee@rxrevu.com)

# Agenda

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- What is Prescription Decision Support?
- Overview of Banner Health
- SMART-on-FHIR
- Research Design
- Implementation

# One poorly informed prescription decision can have startling consequences...

## Drug Cost Driving Total Cost of Care

**\$457 Billion**

Prescription drug spending is now 16.7% of total healthcare spending projected to increase at 6.7% to 2025

## Unsustainable Administrative Burden

**600 Million**

Pharmacy callbacks and thousands of hours wasted on prior authorizations and correcting prescription errors

## Poor Patient Satisfaction

**#1 Issue**

Patient #1 Issue Medication costs. 110 million prescriptions are abandoned at the pharmacy per year

**1% of Decisions Driving  
31.8% of Rx Costs**



# Prescribers are challenged to make the most informed decision

60% of providers are asked to follow specific pathways to guide prescribing decisions. **Yet, less than 10% regularly comply.**

Why aren't more prescribers following protocols?

## **TIME**

The right data is not available without leaving their EHR workflow

## **ACCESS**

Lack of access to guidelines at the point of prescribing

# RxCheck PDS Platform



- ✓ Enable Consistent Prescribing
- ✓ Optimize Pharmacy Spend
- ✓ Improve Patient Care
- ✓ Persistent Reporting of Prescriber Behavior



Banner Health®

- » 29 Acute Care and Critical Access Hospitals
- » Behavioral Hospital
- » Banner Health Network
- » Banner Network Colorado
- » Banner Medical Group and Banner – University Medical Group with more than 1,500 physicians and advanced practitioners and more than 200 Banner Health Centers and Clinics
- » Outpatient Surgery
- » Banner – University Medicine division
- » \$5.4 billion in revenue, 2014
- » AA- bond rating
- » \$457 million in community benefits, including \$84 million in charity care, 2014

# Banner at a Glance



# SMART-on-FHIR

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- Platform for creating apps within an EHR
- Enables vendors to create “substitutable” apps
- Cerner Ignite APIs



# FHIR Example Resources

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- **AllergyIntolerance**
- **Condition (Problem)**
- Procedure
- ClinicalImpression
- FamilyMemberHistory
- RiskAssessment
- DetectedIssue
- Medication
- **MedicationOrder**
- MedicationAdministration
- MedicationDispense
- **MedicationStatement**
- Immunization
- ImmunizationRecommendation
- CarePlan
- Goal
- ReferralRequest
- ProcedureRequest
- NutritionOrder
- VisionPrescription
- **Patient**
- Observation
- DiagnosticReport
- DiagnosticOrder
- Specimen
- BodySite
- ImagingStudy
- ImagingObjectSelection

# Research Design

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- Deploy RxCheck within Cerner Millennium at Banner Health Network
  - Primary care providers
  - BCBSAZ Medicare BlueAdvantage patient population
- Impact Dimension #1 – Clinical Quality
  - Increase medication adherence by 1% (PDC)
- Impact Dimension #2 – Cost Efficiency
  - Decrease PMPM medication spend by 1%
- Impact Dimension #3 – Interoperable Exchange
  - Consistent queries of FHIR

# Phase 1 (Q2 2017) – RxCheck Medication Explorer

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## Medication Reference Tool

- Medication search tool in workflow +
- Cost transparency
- Order creation directly from RxCheck +

## Therapeutic Alternatives

- Suggest lower cost alternatives based on plan design +
- Reduce medication costs for the patient
- Improve patient satisfaction

**CRESTOR (ROSUVASTATIN)  
10 MG TABLET**

**Choose Dosage**

10 mg tablet

**Choose Quantity**

Typical Monthly Quantity (30)

View Cost by: **Cash**

This is a label that would appear in dropdown

Prescribe

Fulfillment Options for Crestor (rosuvastatin) 10 mg tablet	Cost
Banner Pharmacies	<b>\$273</b> per month
90-Day Mail Order	<b>\$284</b> per month

**Alternatives**

# Screenshot of Medication Explorer \*

Fulfillment Options for simvastatin 10 mg tablet	Cost
Banner Pharmacies	<b>\$7</b> per month
90-Day Mail Order	<b>\$5</b> per month

Fulfillment Options for atorvastatin 40 mg tablet	Cost
Banner Pharmacies	<b>\$10</b> per month
90-Day Mail Order	<b>\$12</b> per month

ZZZTEST, MIFUTURE - 28301304 Opened by Ernzen, Nick

Task Edit View Patient Chart Links Notifications Navigation Help

[Patient List](#)
[Care Compass](#)
[Dynamic Worklist](#)
[Home](#)
[Message Center](#)
[Provider Handoff](#)
[mPage Hub](#)
[MPTL](#)
[MyExperience](#)
[PAL](#)
[Tracking](#)
[Appeals Worklist](#)
[Assignment Worklist](#)
[Case Selection](#)

[Revenue Cycle](#)
[Physician Computer Resources](#)
[Patient Education Center](#)
[Patient Choice](#)
[EPSS](#)
[Transfusion](#)
 Remin.: 0 Crit.: 0 Abnor.: 0

[Tear Off](#)
[Exit](#)
[Patient Pharmacy](#)
[Suspend](#)
[Calculator](#)
[Medication Administration](#)
[Patient Education](#)
[Encounter Location History Viewer](#)
[New Sticky Note](#)
[View Sticky Notes](#)
[Charges](#)
[Charge Entry](#)
[AdHoc](#)

ZZZTEST, MI... List Recent

**ZZZTEST, MIFUTURE**  
 Age: 39 years Gender: Male Weight: MRN: 28301304 Encounter: Clinic PCP: Physician DO, X  
 DOB: 05/01/1977 Language: Measured: FIN: 002777242 Location: WRC SurgGen Brush Edison BHN Plan:  
 Allergies: Allergies Not Recorded LOS: 1 days HealthLife Portal: Activated 12/01/16 Readmission Risk:

Menu Full screen Print 0 minutes ago

[Acquired Data](#)  
[Activities and Interventions](#)  
[Acute View](#)  
[Allergies](#)  
**Ambulatory View**  
[Ambulatory Summary \(nursing\)](#)  
[Cardiac Risk](#)  
[Calculators](#)  
[Care Manager](#)  
[Care Manager abbreviated](#)  
[Care Summary](#)  
[Chart Search](#)  
[Chart Summary](#)  
[Clinical Media](#)  
[Clinical Notes](#)  
[Clinical Trials](#)  
[Data Reconciliation](#)  
[Diagnoses and Problems](#)  
[Documentation](#)  
[Form Browser](#)  
[Growth Chart](#)  
[Gynecology View](#)  
[HealthCare](#)  
[HealthRecord](#)  
[Health Maintenance](#)  
[Histories](#)  
[ICU Summary](#)  
[Immunization Schedule](#)  
[Infection Control Advisor](#)  
[Infection Prevention Summary](#)  
[Infusion Billing Report](#)  
[Interactive View and I & O](#)  
[Labor and Delivery Summary](#)  
[Line/Tube/Drain \(s\)](#)  
[MAR](#)  
[MAR Summary](#)  
[Medication List](#)  
[mPages](#)  
[Newborn Discharge Information](#)  
[Obstetrics View](#)  
[Oncology View](#)  
[Orders](#)  
[Patient Information](#)  
[Patient Schedule](#)

**Ambulatory View** 100%

[Ambulatory Summary](#)
[Ambulatory Worklist](#)
[FM/IM QO](#)
[Podiatry QO](#)
[Future Orders](#)

Role/Relationship	Contact	Phone	Service	Team
<b>Cross-Visits</b>				
Primary Care Physician	Physician DO, X	(407) 616-6639	--	--

Alerts Selected visit

No results found

RxREVU RxCheck Orders for Signature (0) Clear Orders

# Screenshot of Medication Explorer \*

**ATOVAQUONE-PROGUANIL 250-100 MG TABLET**  
 View Cost by: **Cash** atovaquone-proguanil 250 mg-100 mg oral Prescribe

**Choose Dosage**  
 250-100 mg tablet

**Choose Quantity**  
 Typical Monthly Quantity

**Fulfillment Options** **Cost**  
 Banner Pharmacies **\$130** per month

AZB PNERZEN March 16, 2017 15:08 MST

# Phase 2 (Q3 2017) – RxCheck Medication Review

## **Medication Reconciliation**

- Analyze currently prescribed medications to optimize patient out-of-pocket costs and standardize prescribing
- Correct prescribing errors
- Improved workflow efficiency vs. Medication Explorer

## **Medication Adherence**

- Identify patients with poor adherence using patient-specific information
- Support CMS Star Rating for adherence

**Phillips, Charles Andrew**  
Allergies: Allergies Not Recorded  
Care Team: <No Primary Contact>

DOB: 12/18/1945  
Dose Weight:  
Loc:

Age: 70 years  
Isolation:  
**CommonWell: Not Enrolled**

Sex: Male  
Resuscitation Status:  
HealthLife: No

MRN: 00200231  
Clinical Trials:  
Advance Dir:

- Menu
- Demographics
- Growth Chart
- Health Maintenance
- Histories
- MAR Summary
- Medication List **+ Add**
- Notes
- SMART App Validator
- SMART Ascend CDS
- SMART Bilirubin Chart
- SMART BP Centiles
- SMART Cardiac Risk
- SMART ClinDat
- SMART Duke PillBox
- SMART EnrGJRheum
- SMART EnrGJRheum QNR
- SMART Growth Chart
- SMART HealthRecord
- SMART HealthRegistries
- SMART Medication
- SMART Premier KDIGO
- SMART RxCheck**
- SMART UpToDate Search
- SMART VisualDx
- Resonance Testing
- Video Visits View

**RxCheck** Search Drugs, Conditions or Patients

demo1@himss.com Admin

## Current Prescriptions

View Cost by: **RxREVU HIX** **+ Add Prescription** **Patient Dashboard**

Condition	Medication	Est. Cost	Actual Adherence
Ventricular Rate Control in Atrial Fibrillation	<b>digoxin</b> 125 mcg tablet <b>65+ High-risk</b> <b>ON Formulary-Tier:1</b>	<b>\$13</b>	<b>73%</b>
<b>⚠ Patient's Creatinine serum/plasma is 2.0 (mg/dL) and cannot be lower than 90.0 (mg/dL) to take this drug.</b>			
Hypertension	<b>Zestoretic (lisinopril-hydrochlorothiazide)</b> 10-12.5 mg tablet <b>OM Triple Weighted</b> <b>65+ High-risk</b> <b>ON Formulary-Tier:2</b>	<b>\$29</b>	<b>56%</b>
<b>⚠ This patient is over the recommended age for this medication.</b>			
<b>⚠ This medication is not recommended for Black or African American patients.</b>			
Depression			



# **Prescription Decision Support (PDS) at Banner Health**

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# Supporting closed-loop surgical referrals with a SMART on FHIR Dashboard

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University of Utah

Interoperability in Action Day

March 20, 2017

# SURGICAL TRANSITIONS OF CARE

- Ensuring that health information is shared effectively between surgical and primary care providers (PCPs) during transitions of surgical care is critical to care coordination.
- Surgeons and PCPs typically are located in separate care settings, communicate via the electronic health record (EHR) and have different expectations of clinical care goals

# LIMITATION OF HEALTH IT

- Care coordination within existing health information technology (IT) systems relies on one-way information exchange, such as reading clinical notes within EHR.
- Health IT systems are not fully interoperable and do not allow for PCPs and surgical providers caring for the same patient to share a mental model of clinical care goals.
- Health IT systems do not allow for the communication loop to be closed between PCPs and surgical providers during the surgical referral episode.

# PROJECT OBJECTIVES

- To develop surgical referral dashboard using SMART on FHIR allowing PCPs and surgeons to share mental model of patient care & support care coordination across entire care episode.
- To implement the surgical referral dashboard within the EPIC EHR system at the University of Utah Health System and pilot use among PCPs and Vascular Surgeons during the referral and follow-up period after surgery.
- To conduct an interoperability assessment using the SMART on FHIR implementation within a different EHR system (Cerner) at Intermountain Health Care.

# PROJECT OBJECTIVES

- To develop surgical referral dashboard using SMART on FHIR allowing PCPs and surgeons to share mental model of patient care episode.
- To evaluate the impact of the dashboard on surgical referral process using EPIC pilot referral.
- To conduct an interoperability assessment using the SMART on FHIR implementation within a different EHR system (Cerner) at Intermountain Health Care.

ONC HIP Priority Categories =  
Care Coordination & Closed Loop Referral

# IMPACT DIMENSIONS & PERFORMANCE METRICS

Impact Dimension	Performance Metric	Baseline Measure
Clinical Quality	Unplanned hospital readmission and ED visits within 30-days of discharge	14.8%
Cost Efficiency	Redundant laboratory tests and imaging studies ordered by surgical providers when patient had the same test performed within 30-days	8.3%
Practice Efficiency	Total encounter time in clinic during the Vascular Surgery pre-operative visit	86.3 min

# DESIGN PROCESS

- Interviews (47 PCPs, surgeons, patients)
- Low-fidelity dashboard prototypes
- Usability heuristics
- Usability sessions with 2 case vignettes and 4 different surgeons
- Iterative design and refinement

# WORKFLOW



- PCP
- Surgery team

# REFERRAL REQUEST

U of U SUP - CVC VASCULAR SURGERY - Hyperspace - BENJAMIN BROOKE

Epic Patient Lookup In Basket Chart Personalize Status Board Study Review Reading Work List Signing Work List Unsigned Studies

Referral request  
Jan 15th 2016

**Reason for referral\***  
e.g., evaluation for AAA

\*Refer to: [dropdown] surgeon (optional) [dropdown]

Goals of care:  
Concerns:  
Special instructions:

**Select important information the surgery team should not miss**

**Problems (select most relevant)**

- Diabetes mellitus type 2
- Hypertension
- Osteoarthritis of the knee

**Labs (select most relevant)**

- HbA1c 6 days
- BMP 6 days
- CBC 6 days
- Lipid panel 180 days

**Imaging (select most relevant)**

- CT scan of the abdomen 30 days
- Chest X-ray, 1 view front 180 days
- Knee MRI 380 days

**Functional status**

Clinical frailty scale [dropdown]

Comments  
e.g., uses a walker

**Social support**

Social support (select one) [dropdown]

Care giver  
e.g., Lisa Lin (daughter)

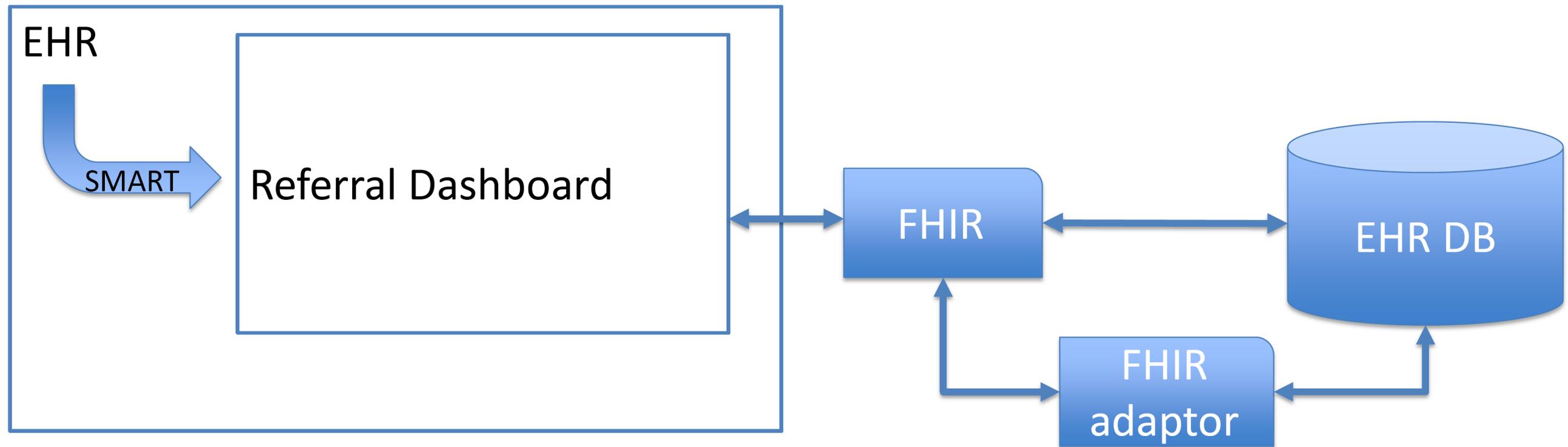
**PCP contact preferences**

801-581-3344 (To contact the patient's PCP Mon-Fri from 8am - 4pm)  
801-581-2233 (For patient appointments & scheduling issues from 8am - 4pm)

Save Submit referral

Referrals

# INTEROPERABILITY ARCHITECTURE



# FHIR RESOURCES

- US Core Encounter
  - US Core Patient
  - Indication: US Core Procedure
  - Participant: Practitioner
- Care Plan

# STATUS

- Design: *completed*
- Mappings: *completed*
- Development:
  - Surgery discharge, PCP follow-up: *completed*
  - Surgery request, pre-surgery visit: *ongoing*
  - Epic integration: *ongoing*

PLEASE REFER TO  
SESSION RECORDING  
FOR PRESENTATION  
DEMO

# QUESTIONS & CONTACT INFO

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