



The Office of the National Coordinator for
Health Information Technology

ONC Move Health Data Forward Challenge

ONC Tech Lab's Interoperability in Action Day
March 20, 2017

Papia R. Paul, MS MPA
Public Health Analyst | Papia.Paul@hhs.gov



Individuals Experience Gaps in Health Information Exchange

1 IN 3 INDIVIDUALS

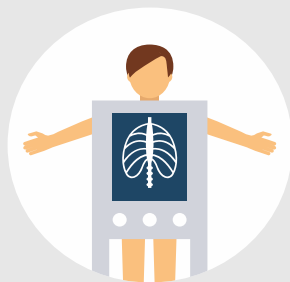
who have seen a health care provider in the last year experienced at least one of the following gaps in information exchange.



Had to bring an X-ray, MRI, or other type of test result with them to the appointment.



Had to wait for test results longer than they thought reasonable.



Had to redo a test or procedure because the earlier test results were not available.



Had to provide their medical history again because their chart could not be found.



Had to tell a health care provider about their medical history because they had not gotten their records from another health care provider.

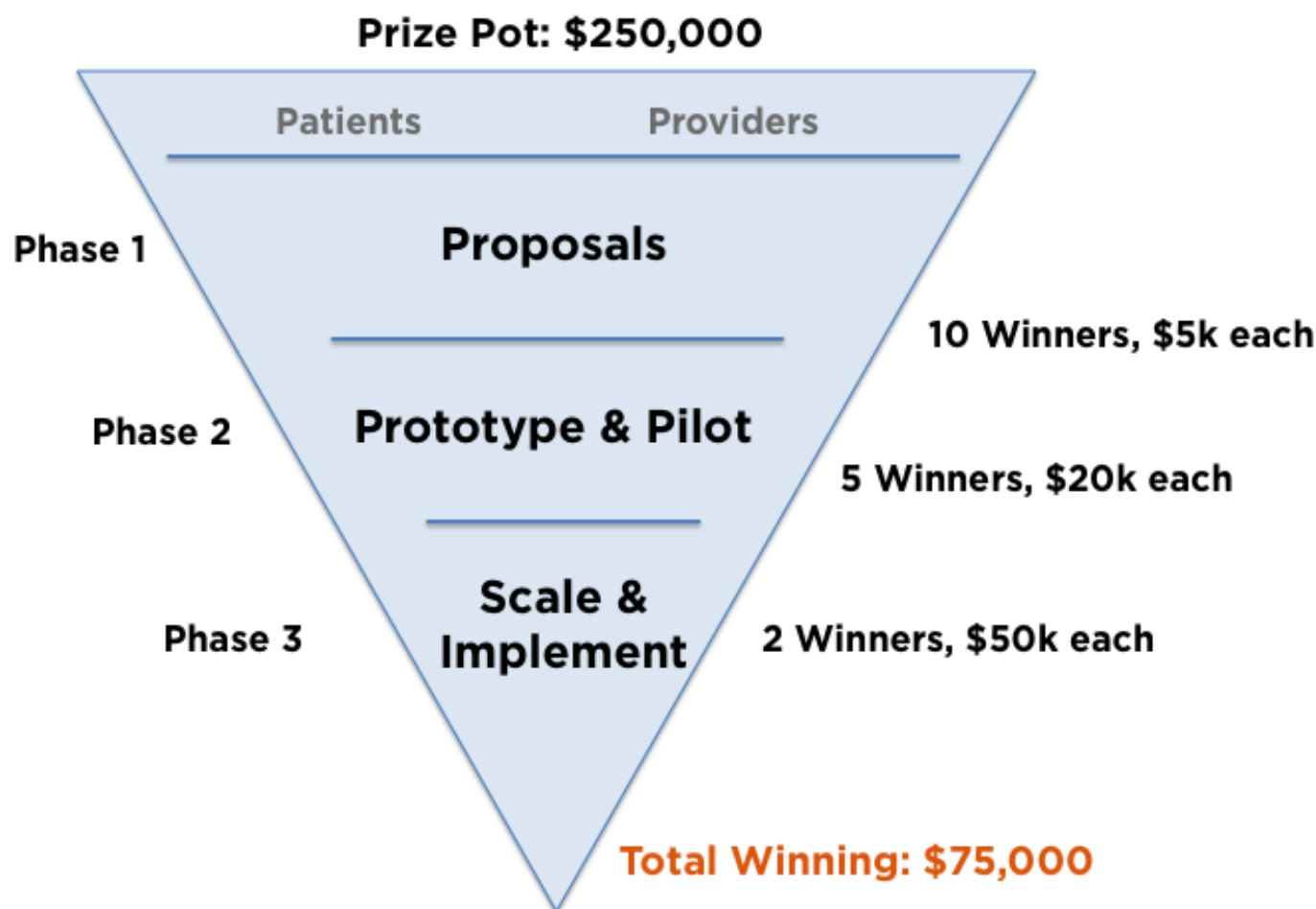
Individuals Can Serve as the Hub of Information Exchange

In a given year, the average Medicare patient visits...



MHDF Challenge Overview

The **Move Health Data Forward Challenge** aims to promote the development of technology solutions that can enable consumers to authorize the movement of their health data to destinations they choose.



General Requirements

- Participants are tasked to develop a technological solution to help authorize the movement of health data.
- Participants are expected to engage people to test the implementation of the Solution and make possible processes for consumers to authorize the release of their health data to a destination they choose.
- The data for the API and solution should be provided by challenge finalists.
- This Challenge encourages applicants to apply independently or team with others including health IT developers, health care providers, and other entities with the appropriate expertise related to this solution.

The HEART WG

- ONC has collaborated to launch the **Health Relationship Trust Working Group (HEART WG)**.
- HEART WG is developing a set of **privacy and security specifications** to empower people to control the authorization of access to health-related data sharing APIs, using the following open standards:
 - OAUTH 2.0
 - OpenID Connect
 - User Managed Access (UMA)
- Challenge teams are testing HEART technology and creating an open API that enables health data sharing.

<http://openid.net/wg/heart/>

Challenge Overview

Phase 1: Proposals

During this phase we sought proposals for solutions that increase consumers' access to and sharing of their information within electronic health record systems.

Phase 2: Prototype

Phase 1 finalists advanced to Phase 2 to prototype and demonstrate the effectiveness of their Solutions and their impact on consumer or provider health records accessibility and data exchange.

Phase 3: Testing

Phase 3 finalists will test the Solution in “real-life” situations, as well as the scalability of the Solution, the feasibility of implementation, and the impact of the intended outcomes.

Phase 1 Summary: Proposals

- ONC received approximately 30 submissions.
- Evaluation criteria included:



- 10 were selected as Phase 1 winners and announced on November 2, 2016.

Phase 1 Winners	
TrustedCare and ARM	kreateIoT, Technatomy, & Koncero
CedarBridge Group LLC	Live and Leave Well, LLC
EMR Direct	SpunJohn Consultants, LLC
Lush Group, Inc.	Thoughtkeg Application Services Corporation
Foxhall Wythe LLC	Resilient Network Systems, Webshield & SAFE Biopharma

Phase 2 Summary: Prototype

- Participants submitted implementation plans and conducted live demos.
- Evaluation criteria included:



- 5 were selected as Phase 2 winners and announced on February 21, 2017.

Phase 2 Winners
CedarBridge Group LLC
EMR Direct
Foxhall Wythe LLC
Live and Leave Well, LLC
Lush Group, Inc.

Phase 3 Summary: Testing

- Phase 3 submissions due May 1, 2017. Participants will report on:
 - Completed Objectives
 - Lessons Learned
 - Commercialization Path
 - Value Proposition
 - Customer Acquisition
- Conduct a live demonstration of their Solutions and results.
- Evaluation criteria includes:



- 2 participants will be selected as Phase 3 and overall Challenge winners.
- Announcement is tentatively scheduled for May 31, 2017.

CareApproveTM

Connecting the Care Team



Alex

CareApprove™
Connecting the Care Team



Image courtesy of Molly's Fund Fighting Lupus

Behavioral Health



Primary Care

CAREAPPROVE™ EHR Plug-in



PracticeFusion

Behavioral Health



Image courtesy of Molly's Fund Fighting Lupus



Behavioral Health



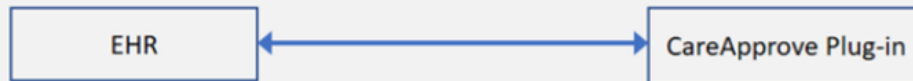
Alex



Primary Care

HEART-Enabled EHR

EHR Security Domain



HEART Actors for CareApprove Services:

- OpenID Identity Provider
- OpenID Relying Party
- OAuth Authorization Server, Resource Server
- OAuth Client
- UMA Resource Server
- UMA Authorization Server (protection API)
- UMA Requesting Party

CareApprove Security Domain

CareApprove Service

CareApprove Authorization Server

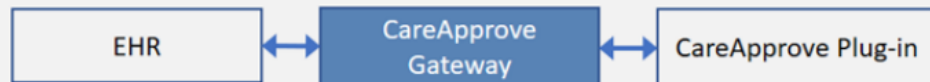
CareApprove Resource Server



<http://openid.net/certification/testing/>

Non-HEART EHR

EHR Security Domain



CareApprove Authorization Server

CareApprove Resource Server

CareApprove Security Domain

CareApprove Service

CareApprove Authorization Server

CareApprove Resource Server

PLEASE REFER TO
SESSION VIDEO FOR
LIVE DEMO



Alex

CareApprove™
Connecting the Care Team



Behavioral Health



Primary Care



Interoperability In Action Day

March 20, 2017

Luis C. Maas III, MD, PhD

CTO, EMR Direct

EMR Direct simplifies healthcare interoperability by developing easy-to-use Healthcare IT software solutions that maintain robust privacy and security while facilitating consumer-mediated exchange and patient engagement. EMR Direct offers Direct HISP service, HL7® FHIR® as a service, identity services including CA/RA, and associated APIs.

Here's the Situation...



- Today, patients manage multiple different patient portals -- "portalitis"
- When patient data is better utilized, better care can be provided
- New ONC 2015 Edition Certification requirements and the interest in FHIR open up a lot of possibilities
- Some missing building blocks were needed to scale this well and avoid portalitis—this is where the Move Health Data Forward Challenge emerged
- Along the way, we'd like to help build that sought-after longitudinal patient record by enabling access to multiple data sources from a single client

What is HealthToGo?



- HealthToGo API helps authorize the secure movement of healthcare data, minimizing the number of accounts to maintain & eliminating redundant grant data storage—paving the way for better patient user experience
- We do this by implementing the HEART Profiles plus our own special extensions, available either within a healthcare organization or for use in a distributed identity environment by other trusted, HealthToGo-enabled identity providers

What is HealthToGo?



- HealthToGo API is used in our client app of the same name that queries FHIR resources & will also soon be Direct Messaging enabled
 - HealthToGo API can also be used on its own for grant management in any client/API context
- About Interoperability Engine:
 - Makes FHIR and Direct services easy—our flagship phiMail made Direct so easy to implement that we helped over 100 EMR vendors certify
 - ONC 2015 Edition Certified for Direct & Application Access APIs
 - We used the HealthToGo client to demonstrate API functionality during our certification testing; our FHIR as a service customers will follow the same model



<http://www.emrdirect.com/onc-hit-2015-edition-hisp-h2-application-access-g7-g8-g9-certification.html>



What does FHIR® data access & grant management look like?

Alice Views Her Data



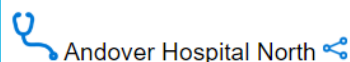
MU3
Data
Categories

Welcome, Alice

My Health Data [Other Data Shared with Me](#) [Sign Out](#)



My Healthcare Providers



Enter dates to filter results (YYYY-MM-DD):

Specific Date: -or- Date Range: to (inclusive)

Available Data Categories

- [Demographics](#)
- [Medication Allergies](#)
- [Unique Device Identifiers](#)
- [Medications](#)
- [Laboratory Tests](#)
- [Laboratory Values Results](#)
- [Problems](#)
- [Vital Signs](#)
- [Procedures](#)
- [Assessment and Plan](#)
- [Goals](#)
- [Health Concerns](#)
- [Smoking Status](#)
- [Care Team Members](#)
- [Immunizations](#)
- [All Data \(CCD\)](#)

Once signed in, users can see their health data at saved providers. This example is simplified to just one saved provider, but Alice can link to all her FHIR-enabled providers.

Alice Clicks to see Problems...

Welcome, Alice

My Health Data [Other Data Shared with Me](#) [Sign Out](#)

HealthToGo™

My Healthcare Providers

 Andover Hospital North [Share](#)

Enter dates to filter results (YYYY-MM-DD):
Specific Date: -or- Date Range: to (inclusive)

Available Data Categories

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- [Assessment and Plan](#)
- [Goals](#)
- [Health Concerns](#)
- [Smoking Status](#)
-  [Care Team Members](#)
-  [Immunizations](#)
-  [All Data \(CCD\)](#)

Alice Views Problems

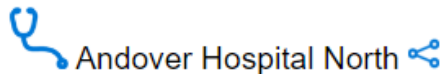


Welcome, Alice

My Health Data [Other Data Shared with Me](#) [Sign Out](#)



My Healthcare Providers



Enter dates to filter results (YYYY-MM-DD):

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- [Unique Device Identifiers](#)
- [Medications](#)
- [Laboratory Tests](#)
- [Laboratory Values Results](#)
- [Problems](#)
- [Vital Signs](#)

Condition/Concern	Status	Onset	Abatement
Essential hypertension	active	2011-10-05	Not specified
Severe Hypothyroidism	active	2006-12-31	Not specified
Chronic rejection of renal transplant	active	2011-12-31	Not specified
Fever	active	2015-06-22	Not specified
Overweight	resolved	2006-12-31	2007-06-01

Alice Clicks to View Grants that allow others access to her Health Data from this Provider...



Welcome, Alice My Health Data [Other Data Shared with Me](#) [Sign Out](#)

HealthToGoTM

My Healthcare Providers

Andover Hospital North

Enter dates to filter results (YYYY-MM-DD)
Specific Date: -or- Date Range: to (inclusive)

Available Data Categories

- [Demographics](#)
- [Medication Allergies](#)
- [Unique Device Identifiers](#)
- [Medications](#)
- [Laboratory Tests](#)
- [Laboratory Values Results](#)
- [Problems](#)
- [Vital Signs](#)
- [Procedures](#)
- [Assessment and Plan](#)
- [Goals](#)
- [Health Concerns](#)
- [Smoking Status](#)
- [Care Team Members](#)
- [Immunizations](#)
- [All Data \(CCD\)](#)

Alice Views & May Edit her Grants

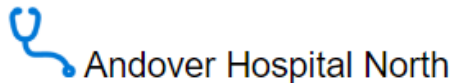


Welcome, Alice

My Health Data [Other Data Shared with Me](#) [Sign Out](#)



My Healthcare Providers



You've shared data with: Data you've shared:

Jeremy Bates	
Rebecca Larson	
John Wright	

Edit Sharing

Share data with another (enter username, email, or Direct Address):

Choose Providers & Data

Finished! (Share all)



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Let's take a look under the hood...

Application Access with HealthToGo API Grant Management enabled



HealthToGo

Or other client app,
using HealthToGo
Grant Management API



EMR Direct
authorization server

HL7® FHIR® + HEART Profiles



Interoperability Engine™

Or other FHIR-enabled
Data Holder



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Alice Clicks to View Data Others have Shared with her...




Welcome, Alice

My Health Data [Other Data Shared with Me](#) [Sign Out](#)



My Healthcare Providers

 Andover Hospital North

You've shared data with: Data you've shared:

Jeremy Bates



Rebecca Larson



John Wright



Edit Sharing

Share data with another (enter username, email, or Direct Address):


Choose Providers & Data

Finished! (Share all)

Other Data Shared with Alice



Welcome, Alice

[My Health Data](#)  Other Data Shared with Me [Sign Out](#)



John Wright's Healthcare Providers

 [San Diego Primary Care Medical Group](#)

Stephan Garcia's Healthcare Providers

 [Mission Community Hospital](#)

Different Use Case: User Stephan Grants Data Access to a Provider, Dr. Tina Jones

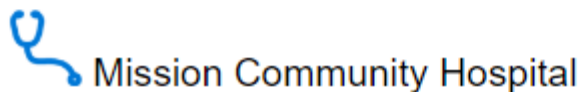


Welcome, Stephan

My Health Data [Other Data Shared with Me](#) [Sign Out](#)



My Healthcare Providers



You've shared data with: **Data you've shared:**

Nobody

None

Share data with another (enter username, email, or Direct Address):

Choose Providers & Data

Finished! (Share all)

This search finds the grantee locally or by looking in a directory of participating OpenID IDPs.

If the identity is not found, an invitation can be sent via email or Direct message.





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Dr. Jones signs in to a Provider View of Stephan's Data; Clicks to View Problems










Welcome, Dr. Jones  My Health Data [Other Data Shared with Me](#) [Sign Out](#)



Enter Patient ID:

Search by Last Name: -and/or- Birthdate: [Retrieve Patient ID\(s\)](#)

Enter dates to filter results (YYYY-MM-DD):
Specific Date: -or- Date Range: to (inclusive)

Available Data Categories	Condition/Concern	Status	Onset	Abatement
 Demographics	Pneumonia	active	2016-12-31	Not specified
Medication Allergies	Methicillin resistant Staphylococcus aureus (MRSA)	active	2011-12-31	Not specified
Unique Device Identifiers	Fever	active	2017-01-01	Not specified
 Medications	Sepsis	active	2017-01-01	Not specified
 Laboratory Tests	Diabetes Mellitus Type 2	active	2017-01-01	Not specified
Laboratory Values Results	Congestive Heart Failure(CHF)	active	2011-10-05	Not specified
 Problems	Essential hypertension	active	2011-10-05	Not specified
Vital Signs				
Procedures				
Assessment and Plan				
Goals				
Health Concerns				
Smoking Status				
 Care Team Members				
 Immunizations				
 All Data (CCD)				

[Show Raw Data](#)

Related Work



- EMR Direct led the effort to bring the [Implementation Guide for Expressing Context in Direct](#) to Draft for Trial Use stage in the Direct Project Implementers Workgroup.
 - Includes a spec for adding patient metadata and RESTful transaction encapsulation capabilities to Direct messages
 - Next Direct Project Implementers Workgroup meeting: 3/21
- Provider-to-provider authorizations: the [UDAP](#) profile written by EMR Direct establishes a method for trust-enabled token validation

Thank you



We're now forming pilots for HealthToGo & Interop Engine!

Please contact us to participate:

- EMR Developers or other data holders interested in FHIR-as-a-service or Direct Messaging (HISP) service
- FHIR Service Providers interested in distributed grant management among trusted identity services

<http://www.emrdirect.com/subscribe-developer>
mail@emrdirect.com

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SESSION VIDEO FOR
Docket DEMO

Let's get in touch.

info@hellodocket.com

Schedule a Demo: Take the grand tour!

Beta Test: Get early access to upcoming features.

Feedback: Influence future development cycles.

Docket™ White Label: Customize for your organization.

Integrating with Docket™ : Ask us about our API.



Interoperability In Action Day

Live & Leave Well
Slides Not Provided

2017 Interoperability in Action Day!

HealthyMePHR

Enables patients to securely and easily manage the sharing of their clinical data with users they choose while maintaining patient privacy.

March 20, 2017

Nancy Lush

Landscape

- The Healthcare industry has long recognized the need for and benefit of patient clinical interoperability.
- FHIR is a new HL7 standard that simplifies clinical data sharing
 - Many EMR vendors have implemented, and FHIR capability is included in current versions already deployed
 - Used within their domain for internal clinical solutions
- HEART standard enables patients to control access of their health data, supporting privacy and security.
 - Secure interoperable clinical data exchange controlled by the patient.

Landscape Reality

- Most organizations, wishing to minimize risk and liability, are not yet willing to allow external users to access their clinical data.
- However, all organizations are obligated to share clinical data with the patient.

Solution

HealthyMePHR will improve patient-mediated information sharing by providing a secure, private method for sharing clinical data while solving today's interoperability challenges.

Patients will directly control with whom they share their data, be it specialists, nursing homes, care managers, college health centers, or family members.

Why HealthyMePHR ?

- The patient can have a portable, personal copy of their clinical data.
- They can then share it as they wish.
- The HEART principles are implemented, and patient directed sharing is enabled.
- Future releases will interface with a wide variety of healthcare applications.

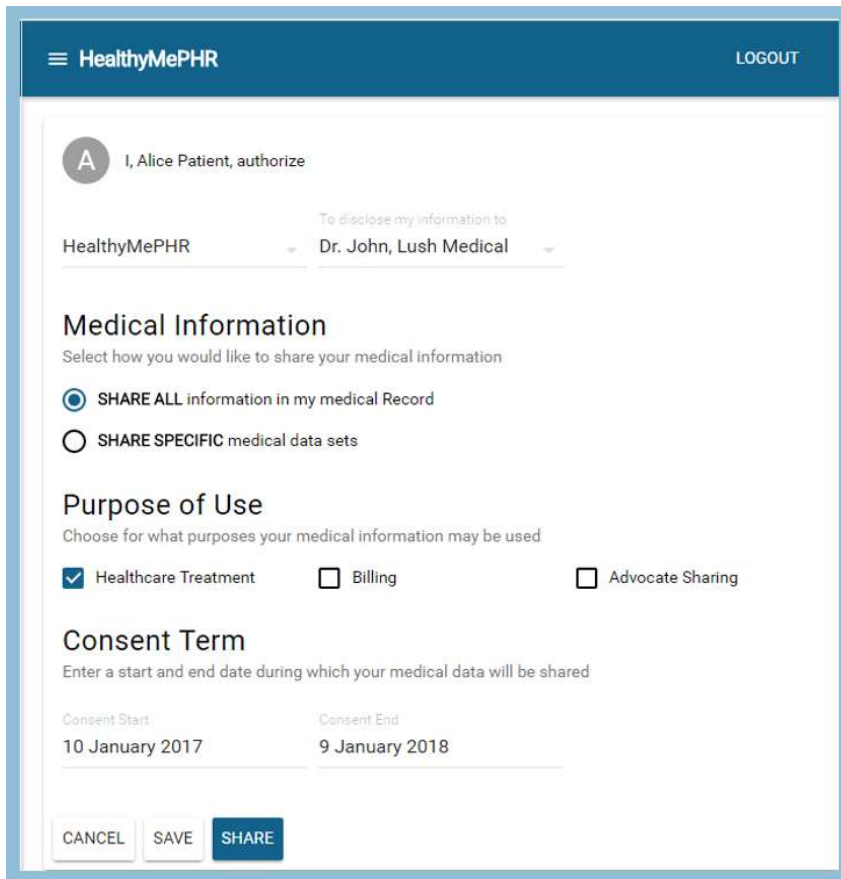
Our approach also positions us to support other organizations in implementing patient directed sharing using HEART tenets.

Ease of Use

- The patient creates individual consent policies for each sharing partner.
 - Create each policy and press 'Share'.
- The receiving party receives an email, clicks the link, enters authentication credentials, then has access to our patient's clinical data.



Patient wishes to share Clinical Data



The screenshot shows the 'HealthyMePHR' patient portal interface. At the top, there is a header with the 'HealthyMePHR' logo and a 'LOGOUT' link. Below the header, a user profile section shows 'A' for Alice Patient, with the text 'I, Alice Patient, authorize'. A dropdown menu is open, showing 'To disclose my information to' with 'Dr. John, Lush Medical' selected. The main content area is titled 'Medical Information' and asks the user to 'Select how you would like to share your medical information'. There are two radio button options: 'SHARE ALL information in my medical Record' (selected) and 'SHARE SPECIFIC medical data sets'. Below this is the 'Purpose of Use' section, which asks the user to 'Choose for what purposes your medical information may be used'. There are three checkboxes: 'Healthcare Treatment' (checked), 'Billing' (unchecked), and 'Advocate Sharing' (unchecked). The 'Consent Term' section asks the user to 'Enter a start and end date during which your medical data will be shared'. It shows 'Consent Start' as '10 January 2017' and 'Consent End' as '9 January 2018'. At the bottom, there are three buttons: 'CANCEL', 'SAVE', and 'SHARE'.

Patient Alice logs into the solution.

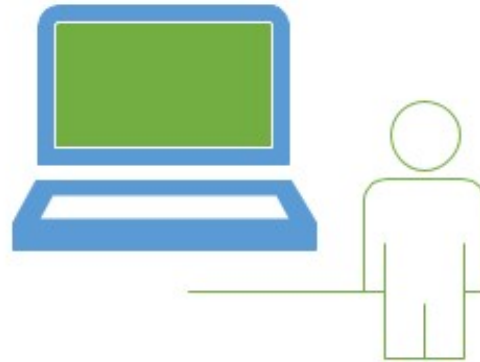
Alice creates a policy to share with Dr. John, customizes to reflect her wishes, and presses SHARE.

SHARE

Patient sharing is easy!



Lush
Group, Inc.



Dr John receives email and authenticates

Provider wishes to view clinical Data

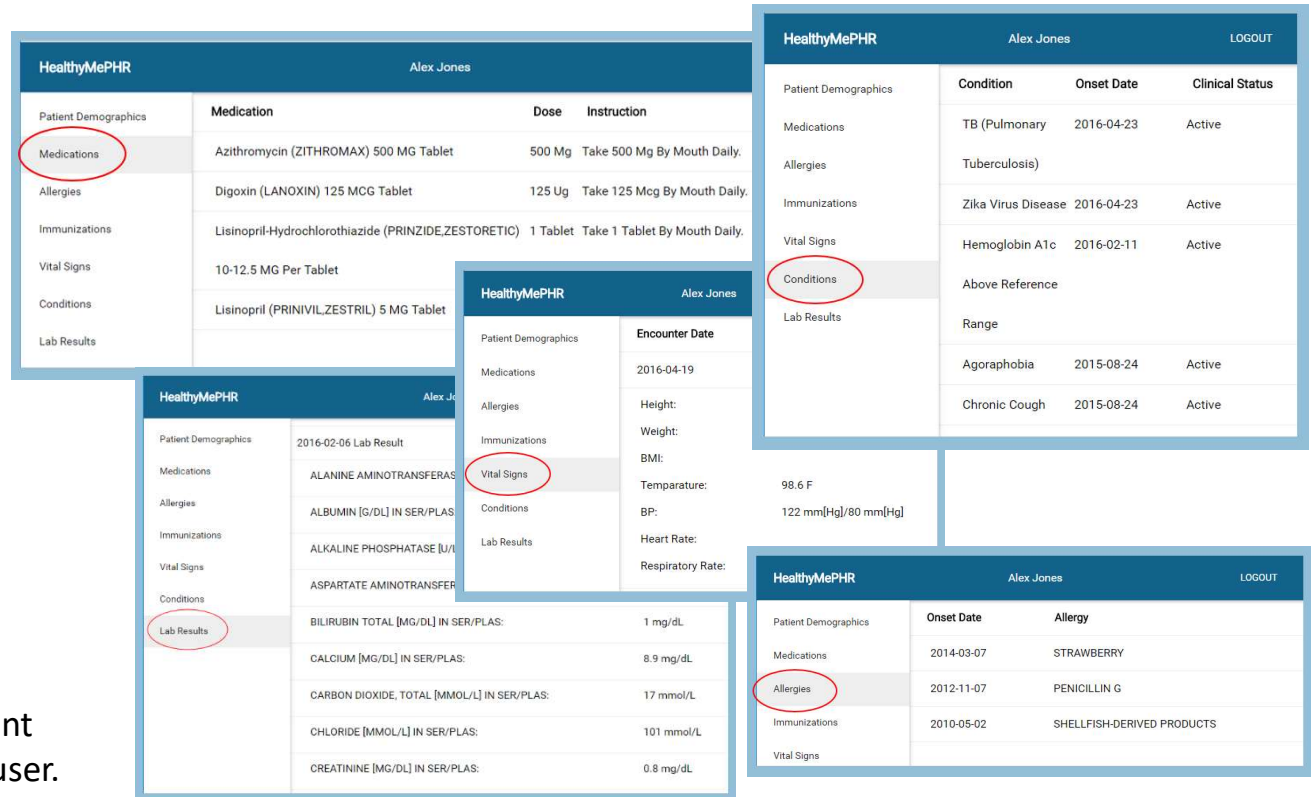


Dr John receives secure email



Dr John Clicks link,
Signs in, and views
Clinical Data

Only the data authorized in the patient consent is available to the provider/user.



HealthyMePDR Alex Jones

Patient Demographics	Medication	Dose	Instruction
Medications	Azithromycin (ZITHROMAX) 500 MG Tablet	500 Mg	Take 500 Mg By Mouth Daily.
Allergies	Digoxin (LANOXIN) 125 MCG Tablet	125 Ug	Take 125 Mcg By Mouth Daily.
Immunizations	Lisinopril-Hydrochlorothiazide (PRINZIDE,ZESTORETIC) 1 Tablet	1 Tablet	Take 1 Tablet By Mouth Daily.
Vital Signs	10-12.5 MG Per Tablet		
Conditions	Lisinopril (PRINIVIL,ZESTRIL) 5 MG Tablet		
Lab Results			

HealthyMePDR Alex Jones

Patient Demographics	Encounter Date
Medications	2016-04-19
Allergies	Height:
Immunizations	Weight:
Vital Signs	BMI:
Conditions	Temperature:
Lab Results	BP:
	Heart Rate:
	Respiratory Rate:

HealthyMePDR Alex Jones

Patient Demographics	Condition	Onset Date	Clinical Status
Medications	TB (Pulmonary Tuberculosis)	2016-04-23	Active
Allergies			
Immunizations	Zika Virus Disease	2016-04-23	Active
Vital Signs	Hemoglobin A1c	2016-02-11	Active
Conditions	Above Reference Range		
Lab Results	Agoraphobia	2015-08-24	Active
	Chronic Cough	2015-08-24	Active

HealthyMePDR Alex Jones

Patient Demographics	Onset Date	Allergy
Medications	2014-03-07	STRAWBERRY
Allergies	2012-11-07	PENICILLIN G
Immunizations	2010-05-02	SHELLFISH-DERIVED PRODUCTS
Vital Signs		

HealthyMePDR Alex Jones

Patient Demographics	2016-02-06 Lab Result
Medications	ALANINE AMINOTRANSFERASE [U/L]
Allergies	ALBUMIN [G/DL] IN SER/PLAS
Immunizations	ALKALINE PHOSPHATASE [U/L]
Vital Signs	ASPARTATE AMINOTRANSFERASE [U/L]
Conditions	BILIRUBIN TOTAL [MG/DL] IN SER/PLAS:
Lab Results	CALCIUM [MG/DL] IN SER/PLAS:
	CARBON DIOXIDE, TOTAL [MMOL/L] IN SER/PLAS:
	CHLORIDE [MMOL/L] IN SER/PLAS:
	CREATININE [MG/DL] IN SER/PLAS:

Provider usage is also easy. The power is in what happens behind the scenes!

HealthyMePHR

Alex Jones

LOGOUT

Patient Demographics

Medication

Dose

Instruction

Medications

Azithromycin (ZITHROMAX) 500 MG Tablet

500 Mg

Take 500 Mg By Mouth Daily.

Allergies

Digoxin (LANOXIN) 125 MCG Tablet

125 Ug

Take 125 Mcg By Mouth Daily.

Immunizations

Lisinopril-Hydrochlorothiazide (PRINZIDE,ZESTORETIC)

1 Tablet

Take 1 Tablet By Mouth Daily.

Vital Signs

10-12.5 MG Per Tablet

Conditions

Lisinopril (PRINIVIL,ZESTRIL) 5 MG Tablet

1 Tablet

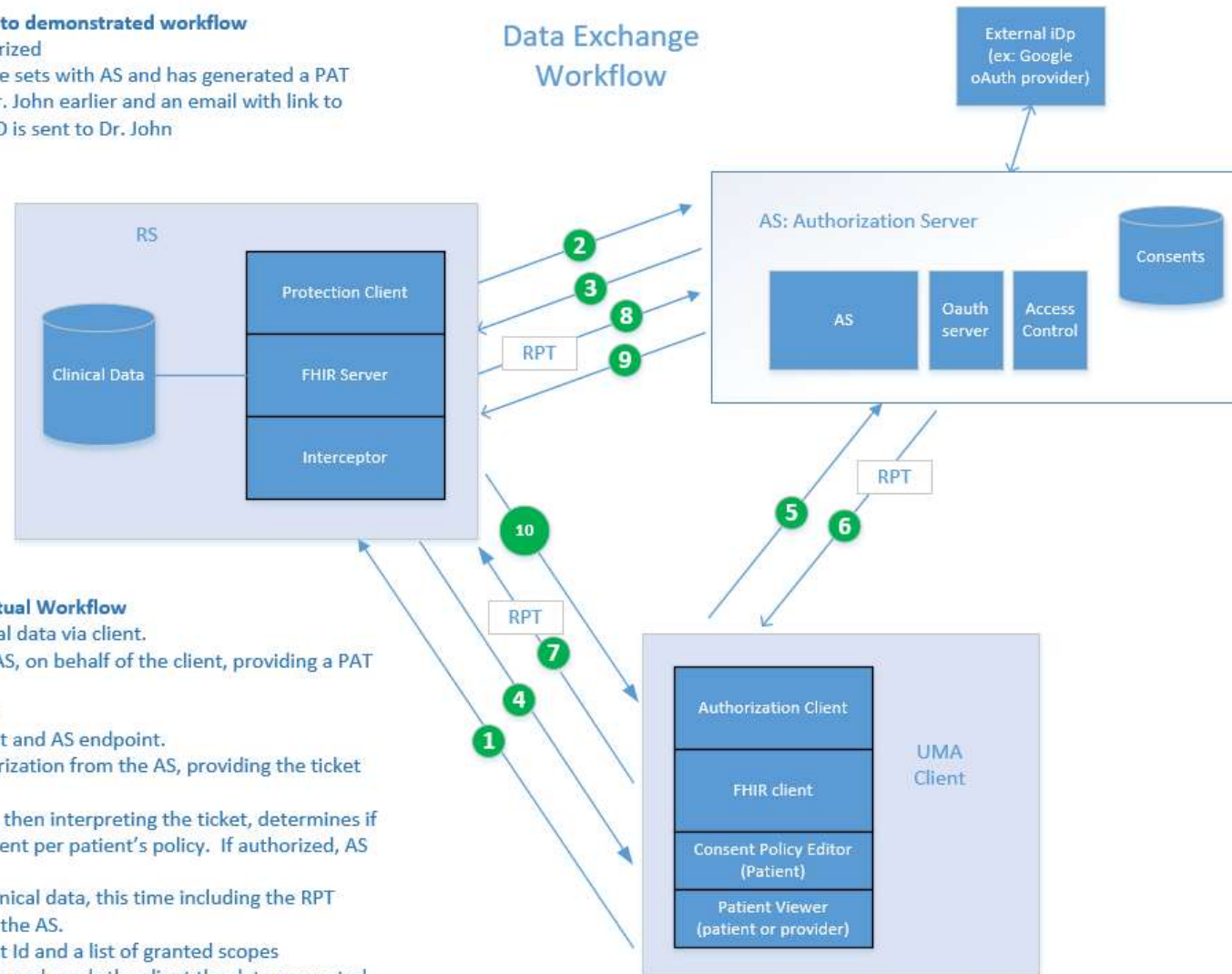
Take 1 Tablet (5 Mg Total) By Mouth Daily.

Lab Results

Assumptions prior to demonstrated workflow

1. Client app is previously authorized
2. The RS has registered resource sets with AS and has generated a PAT
3. Patient creates consent for Dr. John earlier and an email with link to client, RS endpoint and patientID is sent to Dr. John

Data Exchange Workflow



Actual Workflow

1. Dr John requests patient clinical data via client.
2. RS requests permission from AS, on behalf of the client, providing a PAT but no RPT.
3. AS denies, but returns a ticket
4. RS denies but returns the ticket and AS endpoint.
5. The client now requests authorization from the AS, providing the ticket and user credentials
6. The AS authenticates Dr. John, then interpreting the ticket, determines if Dr. John is authorized by the patient per patient's policy. If authorized, AS returns an RPT to the client.
7. The client now requests the clinical data, this time including the RPT
8. The RS introspects the RPT via the AS.
9. The AS returns the resource set Id and a list of granted scopes
10. The RS interprets the response and sends the client the data requested. Dr. John views clinical data.

HealthyMePHR Benefits

- At Lush Group we are passionate about improving health and wellness.
- Studies have shown that when patients are engaged with their data, healthcare quality improves.
- Multiple providers need the same access to the same data to provide consistent care. Too often, care givers that are outside of the organizational domain, do not have current access to patient data.
- Too often, repeat tests are ordered unknowingly.
- Patients often do not remember all of their clinical data points. Too often this leads to omission of critical data exchange.
- Initial reaction to this solution has been very positive.

Design/Implementation Decisions

- One objective was to support a wide ecosystem. We wanted our patient to have the ability to share with ‘anyone’ but needed the ability to authenticate the user. HealthyMe requires that each user must have an openid. We used the google external iDp. This could be replaced by a different component as the industry evolves.
- Much of the prototype effort was R&D, solving the technical challenges. We created a very simple user interface that demonstrated the power of HEART components.

Potential Challenges

- Both FHIR and patient centered sharing are new concepts. The industry will not embrace these overnight. While we plan to quickly show benefits in pockets of need, broader challenges will need to be addressed.
- Our prototype depends on the ability to initially import the patient's data. This is easily done when the patient has a FHIR based portal, soon to be broadly available from many vendors. For early users, they will depend on importing a CDA. During the pilot, we will provide extra support to users toward this effort. Longer term we will simplify the process.
- Our prototype makes assumptions based on the existing HEART specification draft, which may well change before it is finalized. While this will require changes in future versions of our product, we consider this an acceptable risk.

We look forward to moving the dial on secure patient-centered sharing.

Pilot Phase Activities

- Conduct user tests for three use cases
- Continue to recruit additional users and focus on market segments with highest value
- Support users in exchanging data, collecting feedback
- Survey effectiveness and plan to resolve identified issues
- Continue to add key features to core solution

Differentiators

- Any user could start using this solution immediately. Users gain immediate benefits during this transition time while other organizations prepare to adopt.
- Users can authorize apps to integrate with their clinical data, speeding the adoption of this new class of health improvement tools.
- Patients don't need to wait for their organization to adopt the technology
- It can be applied to target markets immediately: Nursing home access, college student sharing clinical data with their college, referring physicians who don't have access.

We look forward to moving the dial on secure patient-centered sharing.

Thank you

Nancy Lush

Nancy.Lush@LGIsoftware.com

401-423-9111