

HL7 FHIR is the Future of Interoperability

Collaboration makes it happen

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Chief Executive Officer
HL7 International

AMDIS
Ojai
June 22, 2023

AGENDA

- **The Collaborators**
- **The Implementers**
- **The Government**
- **The Global Landscape**
- **The Innovators**
- **The Futurists**



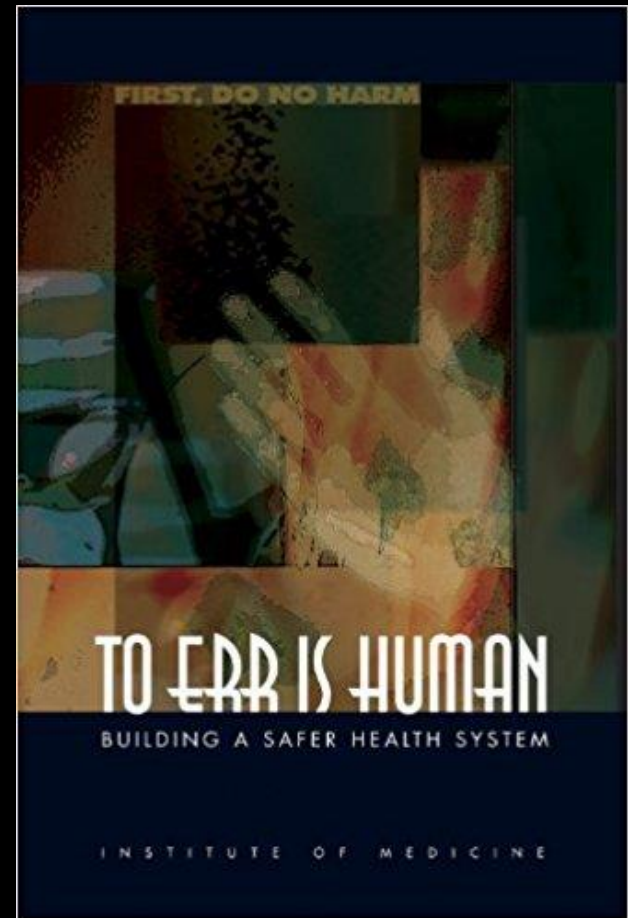
Why me? Why now?

Quality care has always seemed
so difficult to achieve



Two decades ago
the Institute of Medicine
published

To Err is Human



...and we really haven't gotten better since.

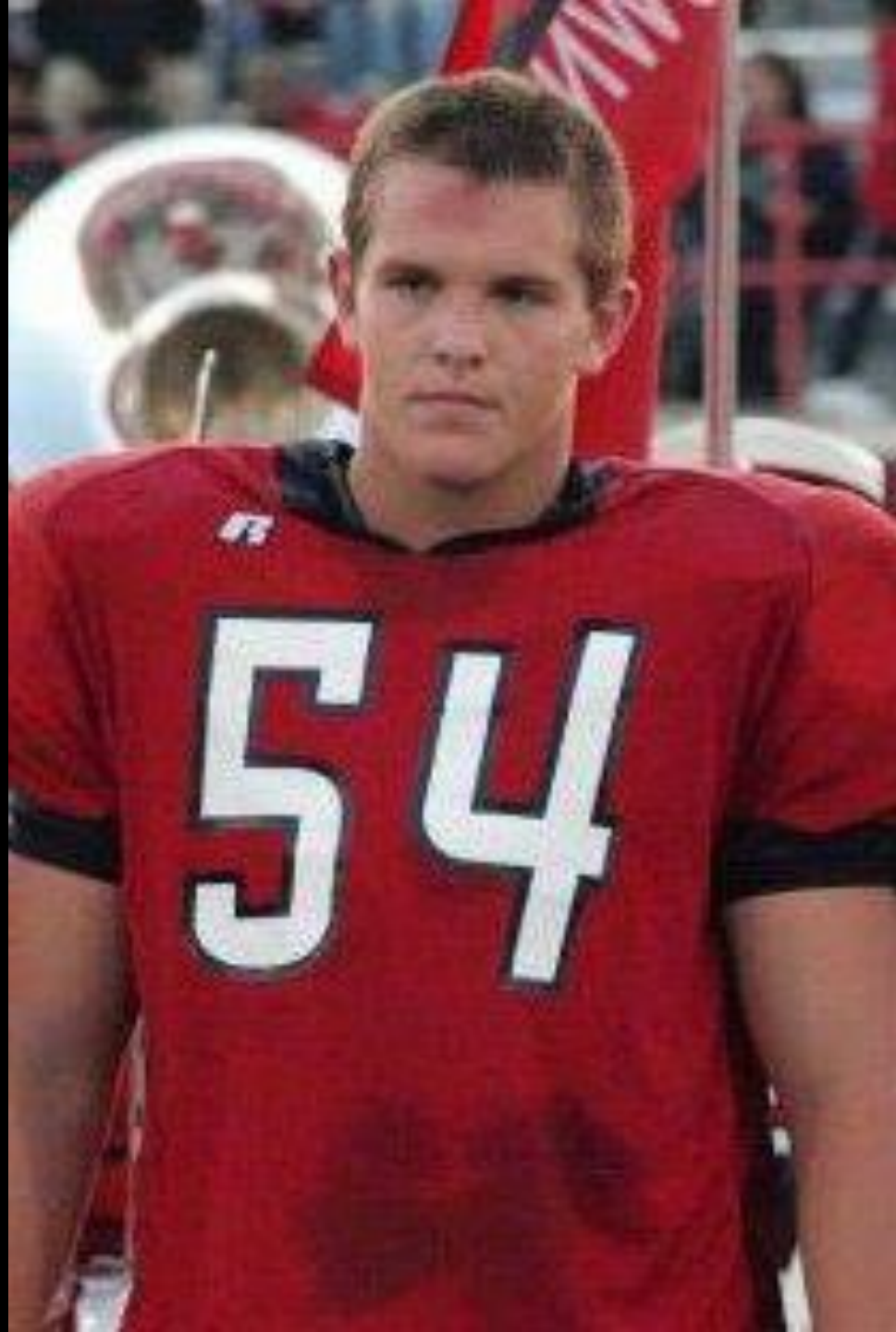
A Johns Hopkins study estimated
that 250,000 Americans die each
year from avoidable medical errors.

It's the third leading cause of death.

*Markey, M & Daniel, M, BMJ 2016 May 3;353



This is Jack's story



This is Jack

Honor student
Sports hero
University bound

Jack complained
to his Family Doctor
about knee pain.

This is what
Jack's knee
looked like,
but his doctor
never saw the
report.





This is Jack's chest x-ray
after I first saw him.

The Pathology Report read
metastatic osteosarcoma

There should be
no more stories
like Jack's.

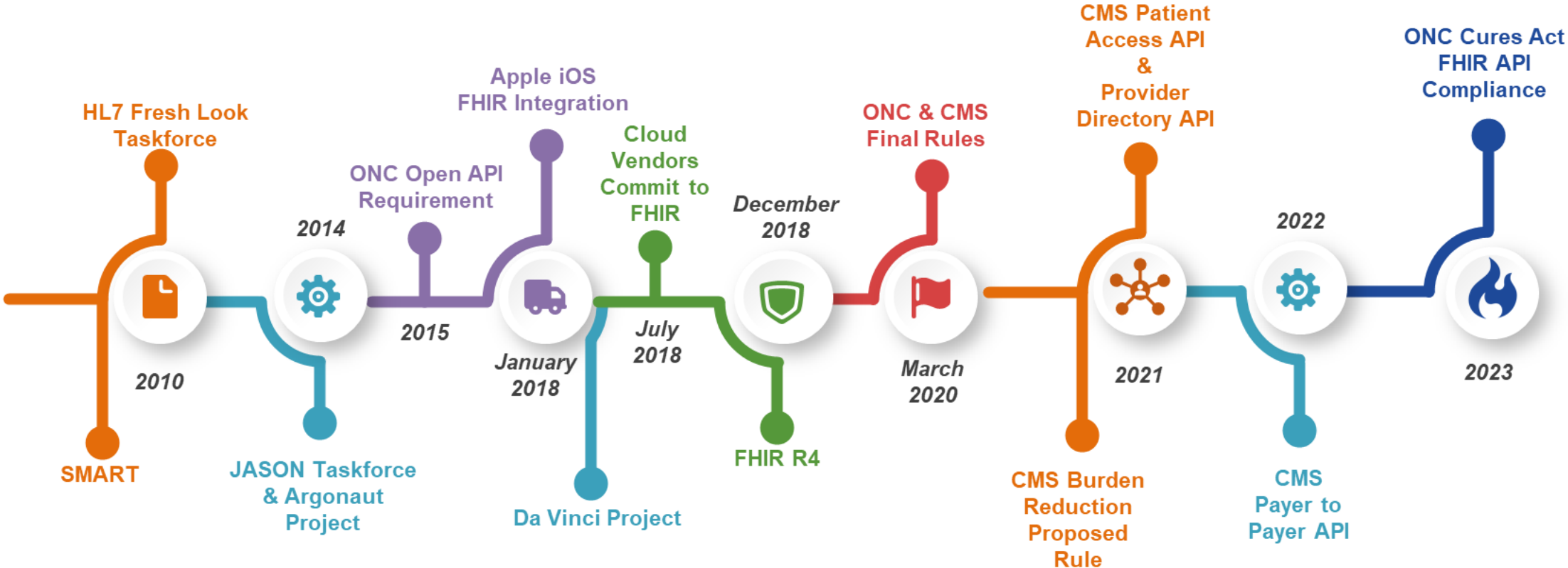
Then, there were
Open APIs
and FHIR.

The FHIR Story Line



- What is FHIR?
- Why FHIR?
- How do you create FHIR?
- When will FHIR be ready?
- Who is transforming the Interoperability Paradigm with FHIR?

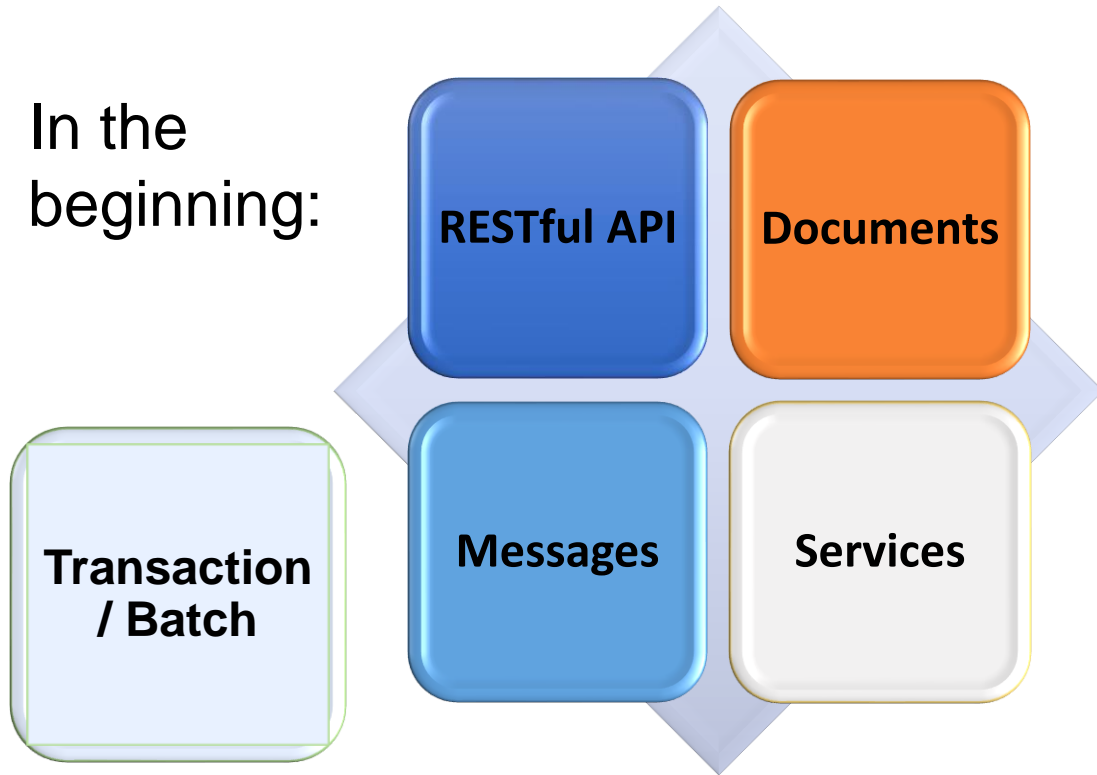
HL7 FHIR Timeline



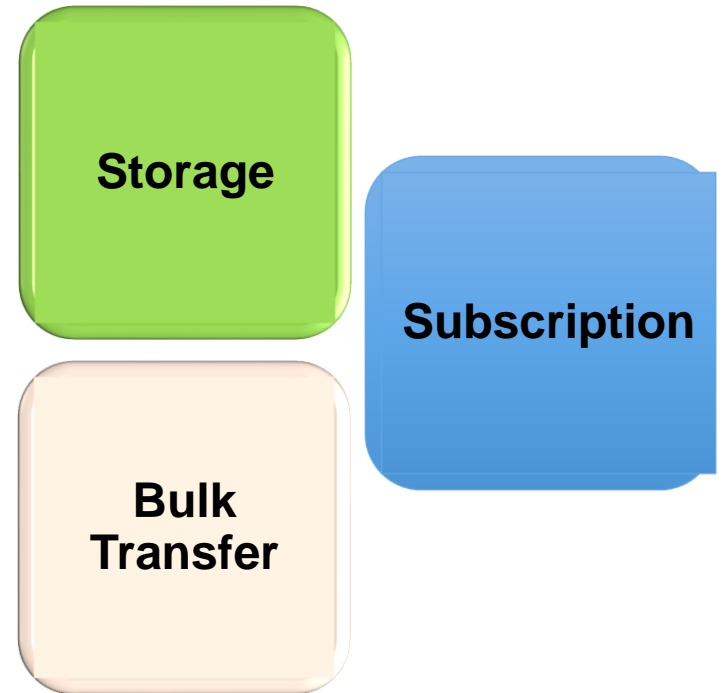
Exchanging Resources

FHIR supports 4 exchange mechanisms, or maybe 8.

In the beginning:



And these emerged (after 2016) because was what the global community needed.



**Collaboration moves
at the speed of trust.**



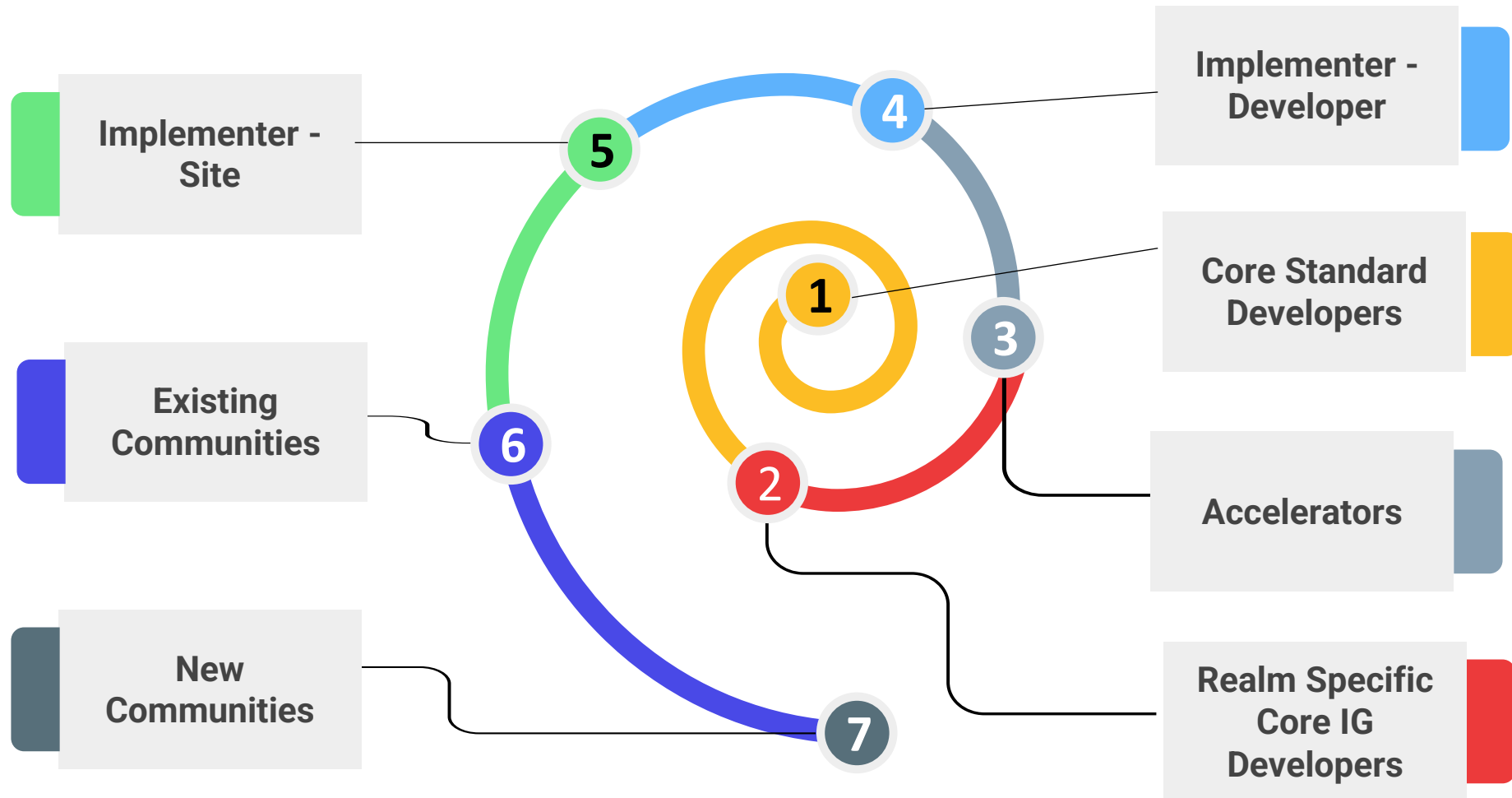
HL7 Collaboration

Nearly 40 collaborations with associations, standards developers, societies, and fellow sojourners in the global community creating public good.

If you work with health data, life will be messy.



HL7 is built by ever-growing Communities



The further from the center, the larger the community, and the more removed from standards development.

FHIR ACCELERATORS

HL7 FHIR Accelerator Program

Begun only 4 years ago, the program assists implementers across the healthcare and research spectrum in the creation of FHIR implementation guides and critical public- and private-sector solutions.





Private sector initiative to advance industry adoption of modern, open interoperability standards.

Argonaut: Changing the Course of FHIR

Historical Projects

- Apple iOS (Healthkit[®])
- Argonaut Data Query
- SMART Web Messaging
- Subscriptions
- Bulk Data
- Questionnaires
- CDS Hooks
- Scheduling

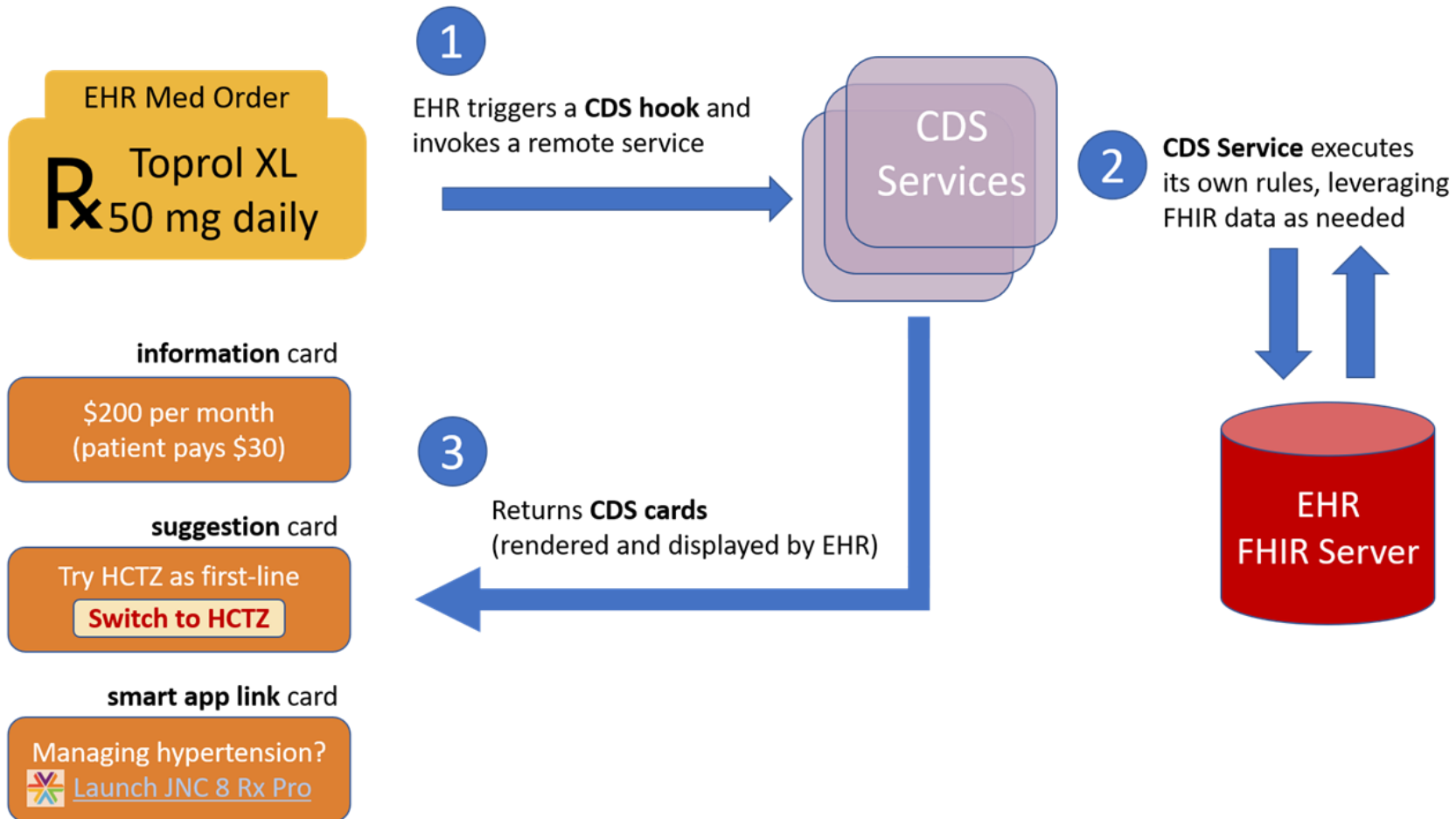
2022 Projects

- Electronic Health Information (EHI) Export
- FHIR Endpoint and Structure
- FHIR Write App State

2023 Projects Proposed

- Provider Directory
- FHIR for Imaging
- FHIR for Secure Messaging

CDS Hooks



<https://cds-hooks.hl7.org/ballots/2020Sep/>



A private sector coalition of providers and payers that addresses the needs of the Value Based Care Community by leveraging the HL7 FHIR platform.

DA VINCI 2023 MULTI-STAKEHOLDER MEMBERSHIP

PROVIDERS



EHRs



PAYERS



VENDORS



INDUSTRY PARTNERS



*Indicates a founding member of the Da Vinci Project. Organization shown in primary Da Vinci role, Many members participate across categories.

For current membership:

<https://confluence.hl7.org/display/DVP/Da+Vinci+Project+Members>

The above listed Blue Cross and Blue Shield companies are independent licensees of the Blue Cross and Blue Shield Association.

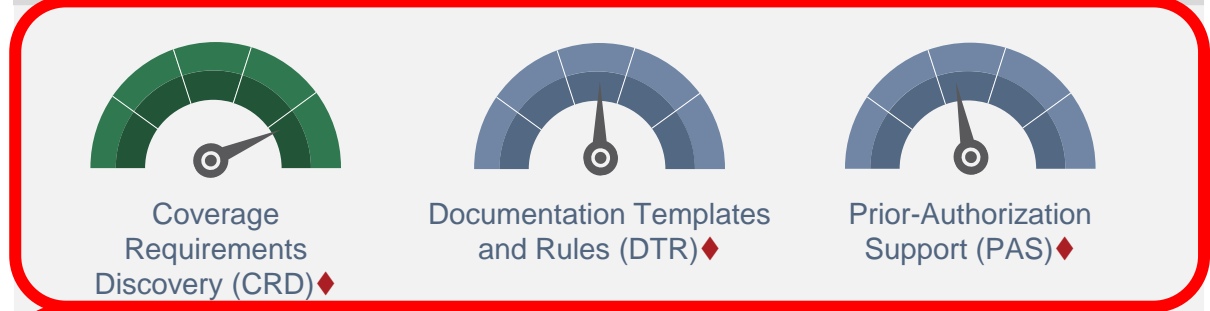
Rev 3/24/23.

Use Case Readiness

Clinical Data Exchange



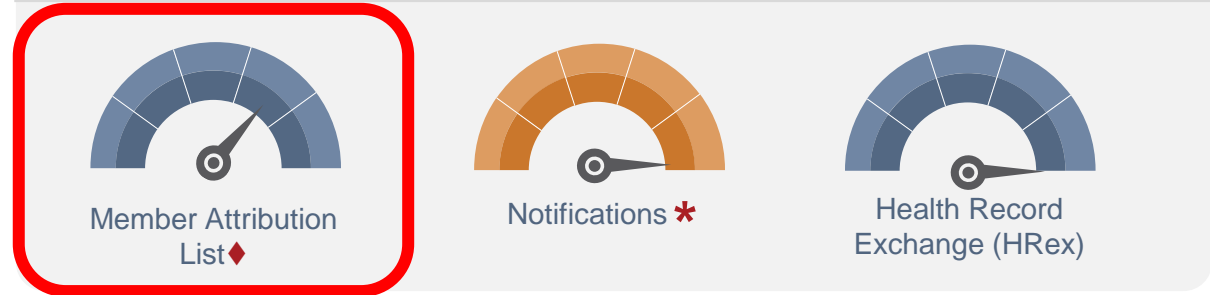
Coverage, Transparency & Burden Reduction



Quality & Risk



Foundational Assets



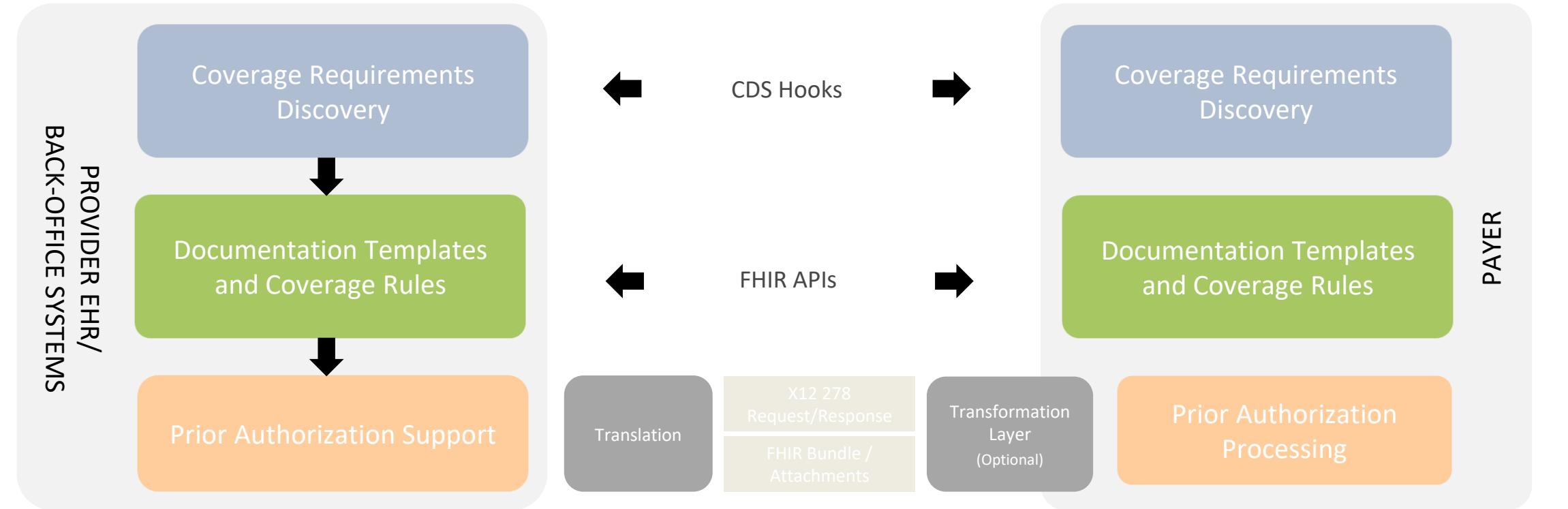
- * Referenced in or supports Federal Regulation
- ◆ Aligned with expected Federal Regulation
- 🕒 Dial denotes progress in current STU Phase



Overall Maturity:



Prior Authorization - Burden Reduction



Improve Transparency
Reduce Effort for Prior Authorization
Leverage Available Clinical Content and Increase Automation

Da Vinci is embracing a **PARADIGM SHIFT**
beyond data interoperability to
WORKFLOW INTEROPERABILITY...



Implications for Clinical Care & Research

- Standardization of data collected and shared across EHRs
- Interoperable applications: FHIR data and APIs (SMART on FHIR)
- Standardized clinical decision support algorithms (CQL)
- Reducing burden of *prior authorization*
- Reducing burden of *quality measure reporting*



Courtesy: Monty Python



Our vision is to rapidly advance the ability for **consumers** and their **authorized caregivers** to easily **get, use, and share their digital health information** when, where, and how they want to achieve their goals.

<https://www.carinalliance.com/>



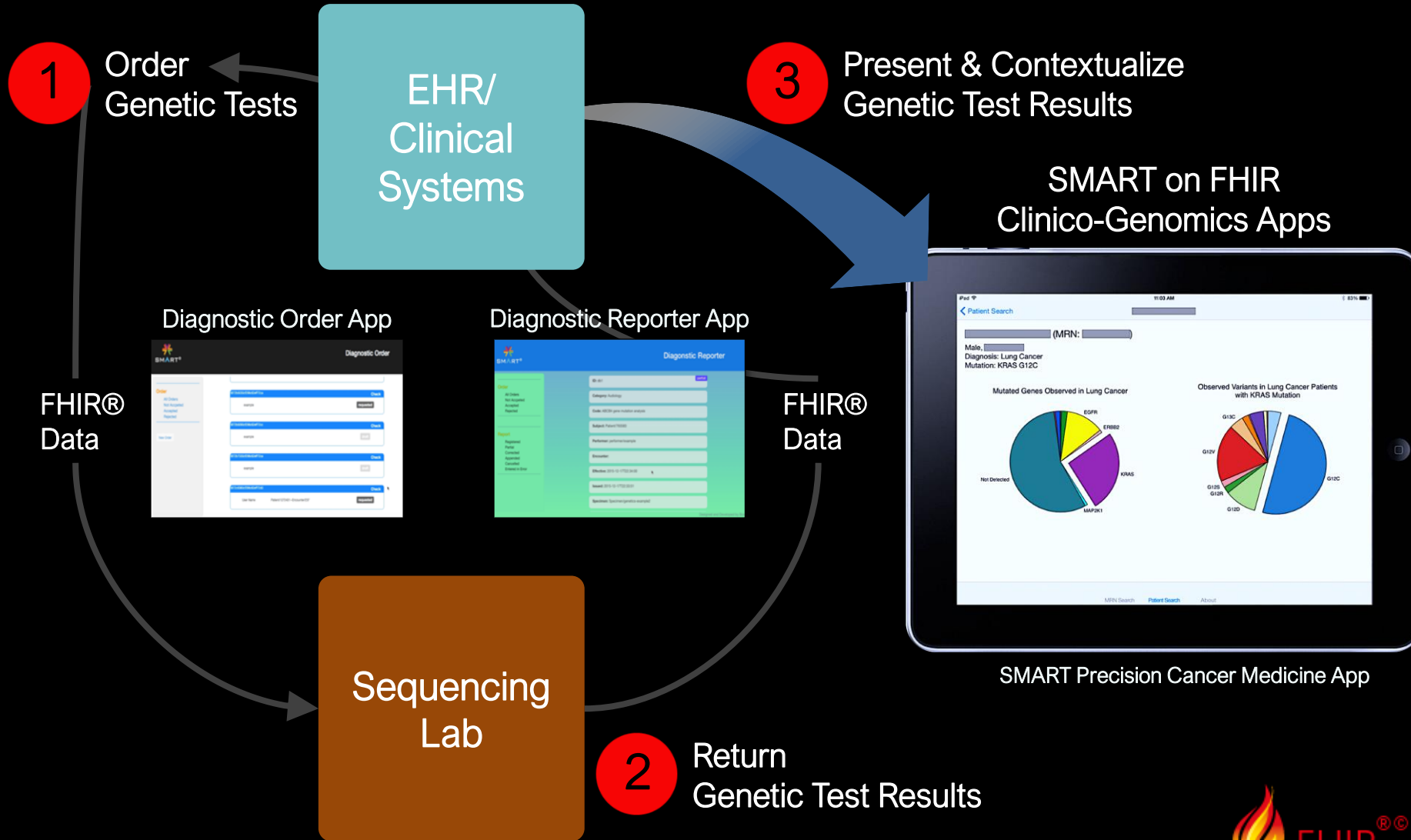
Member-driven HL7 FHIR Accelerator, building a community to accelerate interoperable data modeling and applications leading to step-change improvements in Cancer patient care and research.

CodeX has grown to include Cardiology and Genomics.

<https://confluence.hl7.org/display/COD/CodeX+Home>

Genomics for Precision Medicine

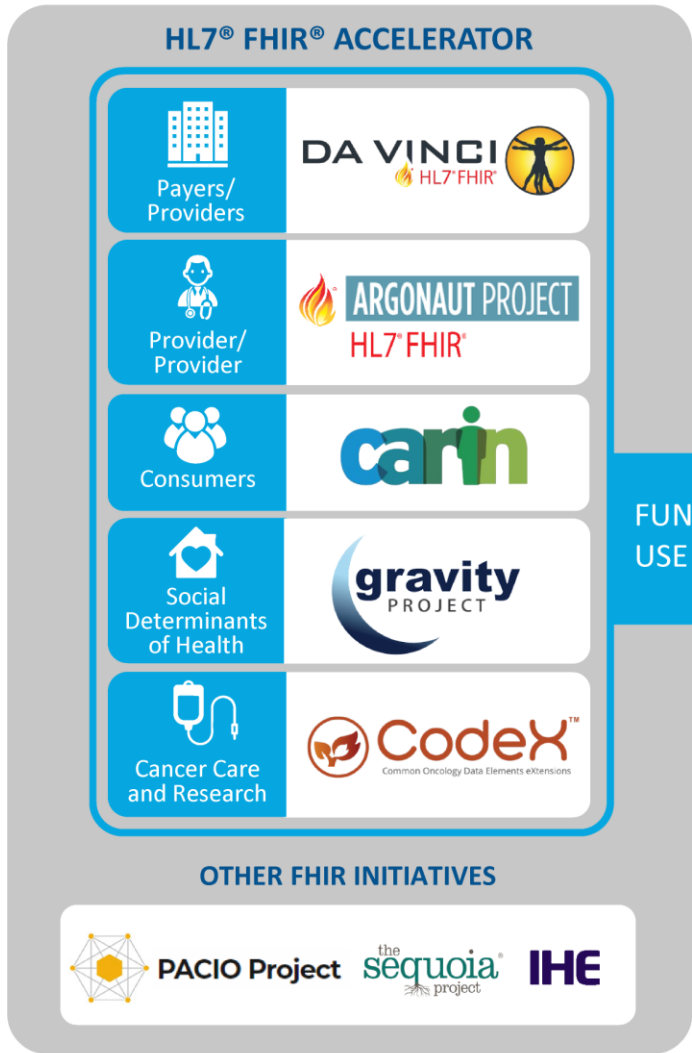
FHIR-Enabled Workflow



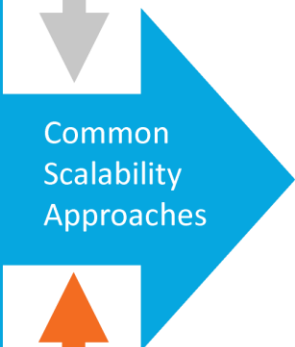
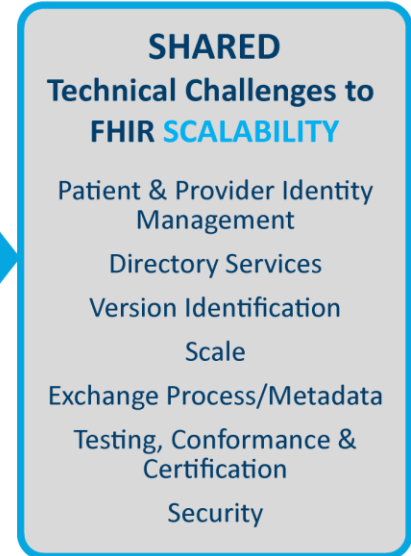


The FAST Accelerator will identify FHIR resources, scalability gaps and possible solutions, as well as analyses that will address current barriers and accelerate FHIR adoption at scale.

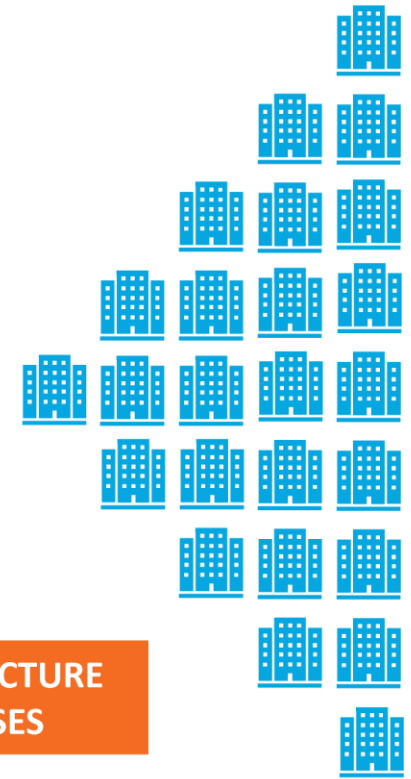
<https://confluence.hl7.org/display/FAST/FHIR+at+Scale+Taskforce+%28FAST%29+Home>



CORE SERVICES



RAPID INDUSTRY ADOPTION OF FHIR-BASED SOLUTIONS





To create and maintain a consensus-building community to expand available SDOH core data for interoperability and accelerate standards-based information exchange by using HL7[®] FHIR[®].

Gravity Project

Pages

Blog

Calendars

SPACE SHORTCUTS

HL7 Documentation & Help

PAGE TREE

Terminology Workstream Dashboa

Technical Workstream Dashboard

Gravity Project Meetings

Gravity Project Events

Consensus Process

The Gravity Project Materials

Gravity Data Principles

Gravity Project Communications ar

Gravity Project Media and Publicat

Gravity Project Executive Committe

Gravity Project Strategic Advisory C

Gravity Project Technical Advisory

Space tools

Dashboard 5,957 views

Edit Save for later Watch 9+ Share

The Gravity Project

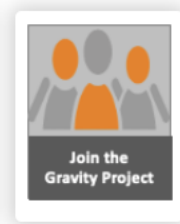
Created by Carrie Lousberg, last modified by Sara Behal about 11 hours ago



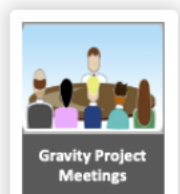
Consensus-driven standards on social determinants of health

Click on the images below to be redirected to your page of interest!

Project Information



Meetings, Media and Communications



Quick Links

Why the Name "Gravity"

Submit Data Element Concepts for Transportation Insecurity, Financial Strain, and Demographics

Gravity Project Events

Join the Gravity Project

Gravity Project Meeting Schedule

Gravity Use Case Package

Housing Instability Master List and Summary Documents

Provide feedback



The goal of Helios is to help overcome barriers to adoption, promote market-based solutions that are compatible with nationwide interoperability priorities, and ensure scalability and long-term sustainability of data modernization

<https://confluence.hl7.org/display/PH/Helios+FHIR+Accelerator+for+Public+Health+Home>

HELIOS PRIORITY AREAS FOR 2022

Make Data in Public Health Systems Accessible in Bulk



Ensure authorized users of immunization information systems can access vaccination data in bulk.

This will help health providers and payers to proactively support their patient populations by addressing gaps in care and preventing redundancies while lowering burden on state public health agencies and on data requestors. Helios members will help create a uniform process for querying immunization data in IIS, leveraging BulkFHIR. Helios members will also assist in developing implementation guidance and open-source code samples, conducting pilots, and participating in Connectathons.

Deliver Aggregate Information to Public Health



Provide public health critical data needed on healthcare resource capacity during emergencies and other events of public health importance.

This will help address a wide range of public health preparedness and data aggregation needs while lessening the strain on health care and public health during times when both systems are most taxed. Helios members will focus on one or two measures (e.g., bed count, supply inventory) and demonstrate ways FHIR can help deliver mission-critical capacity information to public health partners on the front lines both during emergencies and routine operations.

Align and Optimize Public Health Data Sharing



Identify commonalities and assess optimal ways for public health to access data in EHRs that would not be easily available under existing data channels.

This will demonstrate ways in which FHIR can help support public health action and improve the quality and consistency of public health data shared nationwide while saving time, money, and effort. Helios members will identify common requirements and assess various FHIR-based paradigms for accessing and exchanging patient-level data in EHRs. Helios members will also identify opportunities for collaboration and accelerated development with industry and will pilot a subset of the approaches identified. The assessment and pilots will inform a strategic roadmap to help align and advance public health adoption of FHIR moving forward.



...dedicated to connecting clinical research and healthcare

Vulcan brings together stakeholders across the **translational** and **clinical research community** in order to bridge existing gaps between clinical care and clinical research, strategically connect industry collaboratives, maximize collective resources, and deliver integrated tools and resources.



Project	Objectives	Vulcan Lead
Schedule of Activities (SoA)	Represent the schedule of activities in FHIR from a spreadsheet. Enable the consistent description, timing and identification of each activity in a study	Mike Ward (TransCelerate) Geoff Low (PHUSE)
Real World Data (RWD)	Extract data from EHRs in a standardized format to support clinical research and especially submission to Regulators	Scott Gordon (FDA) [Open Position]
Phenotypic Data	To increase the availability of high-quality standardized phenotypic information for genomic research and genomic medicine.	Anita Walden (University of Colorado Anschutz) Shahim Essaid (University of Colorado Anschutz)
Electronic Product Information (ePI)	Define a common structure for product information (monographs) that supports cross-border exchange of data for patients	Craig Anderson (Pfizer) Catherine Chronaki (Secretary General at HL7 Europe)
Adverse Events (AE)	Support standardizing the reporting and format of an adverse event. Improve the maturity of the relevant FHIR resources	Michelle Casagni (MITRE) Ed Millikan (FDA)
FHIR to OMOP	Support the development of FHIR to OMOP data transfer for better analysis of clinical data for research	Davera Gabriel (Johns Hopkins) Catherine Diederich (Duke)

HL7 Collaborators

Collaboration
is not what we do when we
run out of ideas or money.

Collaboration
is where we begin.



SDO Collaboration

The ANSI-accredited standards development organizations partner with HL7 to support healthcare and research data interoperability. We are aided by other organizations that promote implementation, education, safety, coordination, and play key advisory roles.

HL7 could not aspire to a future of seamless interoperability without their participation.



SMART on FHIR

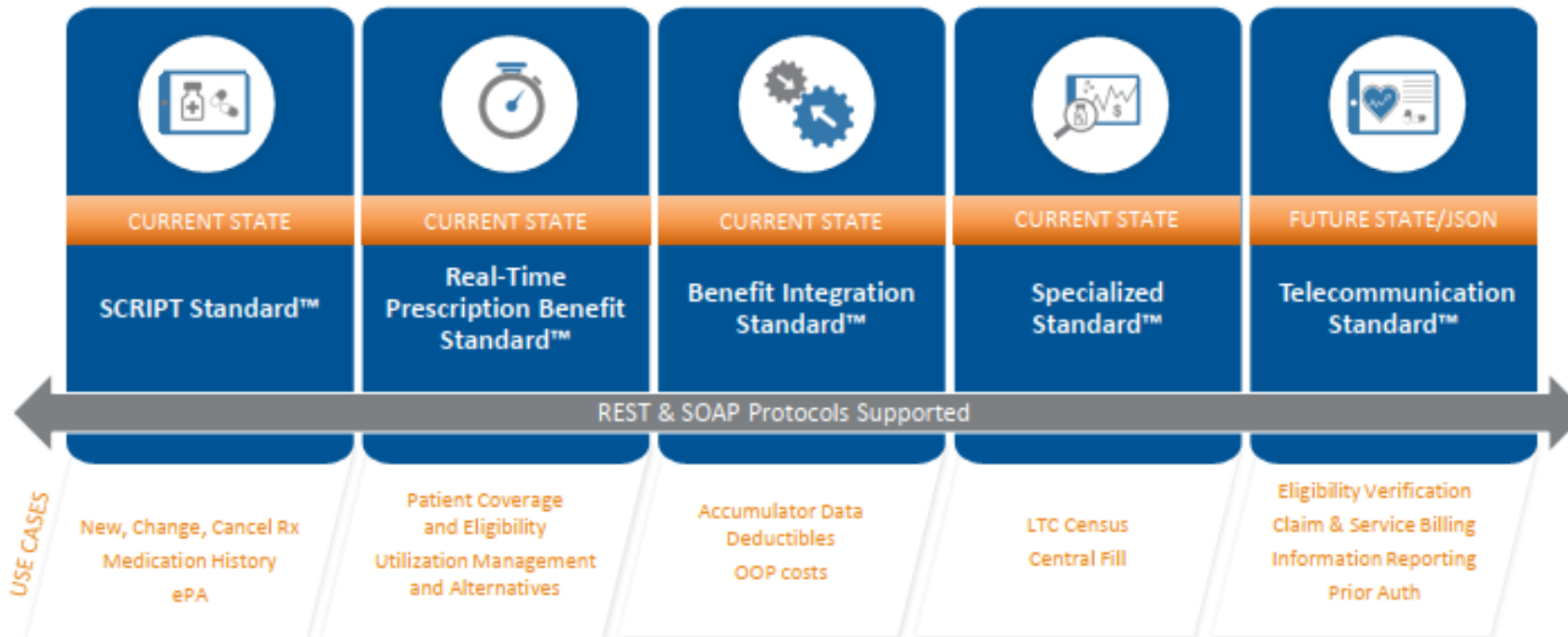
SMART on FHIR[®] – Open Platform Architecture



NCPDP on FHIR

Joint work group initiative to support a broad range of implementations through medication Prior Authorization

NCPDP Supported Member Source™ APIs



OMOP on FHIR

- A collaboration between OHDSI and HL7, begun in 2022, with the objective of harmonizing the FHIR data resources to the OMOP data model.
- An Open-Source FHIR Server built on top of the OMOP Common Data Model.
- A joint project between work groups, supporting both research and patient care.
- Funded by the NCATS (National Center for Advancing Translational Sciences) of the National Institutes of Health.



Government Agency Collaboration

In the US, the government agencies provide much more than regulatory oversight.

We partner on standards development and implementation.

GAs provide grants and extramural funding.

GAs develop invaluable guidance.

GAs partner on education and training.

GAs share insights on standards evolution.

GAs promote standards adoption and integration.

We rely upon them for technical expertise and longitudinal experience.



ONC Technical Standards

HHS Final Technical Standards in the ONC's 21st Century Cures Act Final Rules



HL7 FHIR R4

Health Level 7 HL7 Version 4.0.1 Fast Healthcare Interoperability Resources FHIR Specification
URL: <http://hl7.org/fhir/R4/>



SMART IG / OAuth 2.0

SMART Application Launch Framework Implementation Guide Release 1.0.0, November 13, 2018
URL: <http://hl7.org/fhir/smart-app-launch/history.html>



OpenID Connect

OpenID Connect Core 1.0 Incorporating Errata Set 1, November 8, 2014
URL: http://openid.net/specs/openid-connect-core-1_0.html



Content & Vocabulary Standards USCDI

United States Core Data for Interoperability USCDI, February 2020, Version 1 v1
URL: <https://www.healthit.gov/isa/us-core-data-interoperability-uscdi>



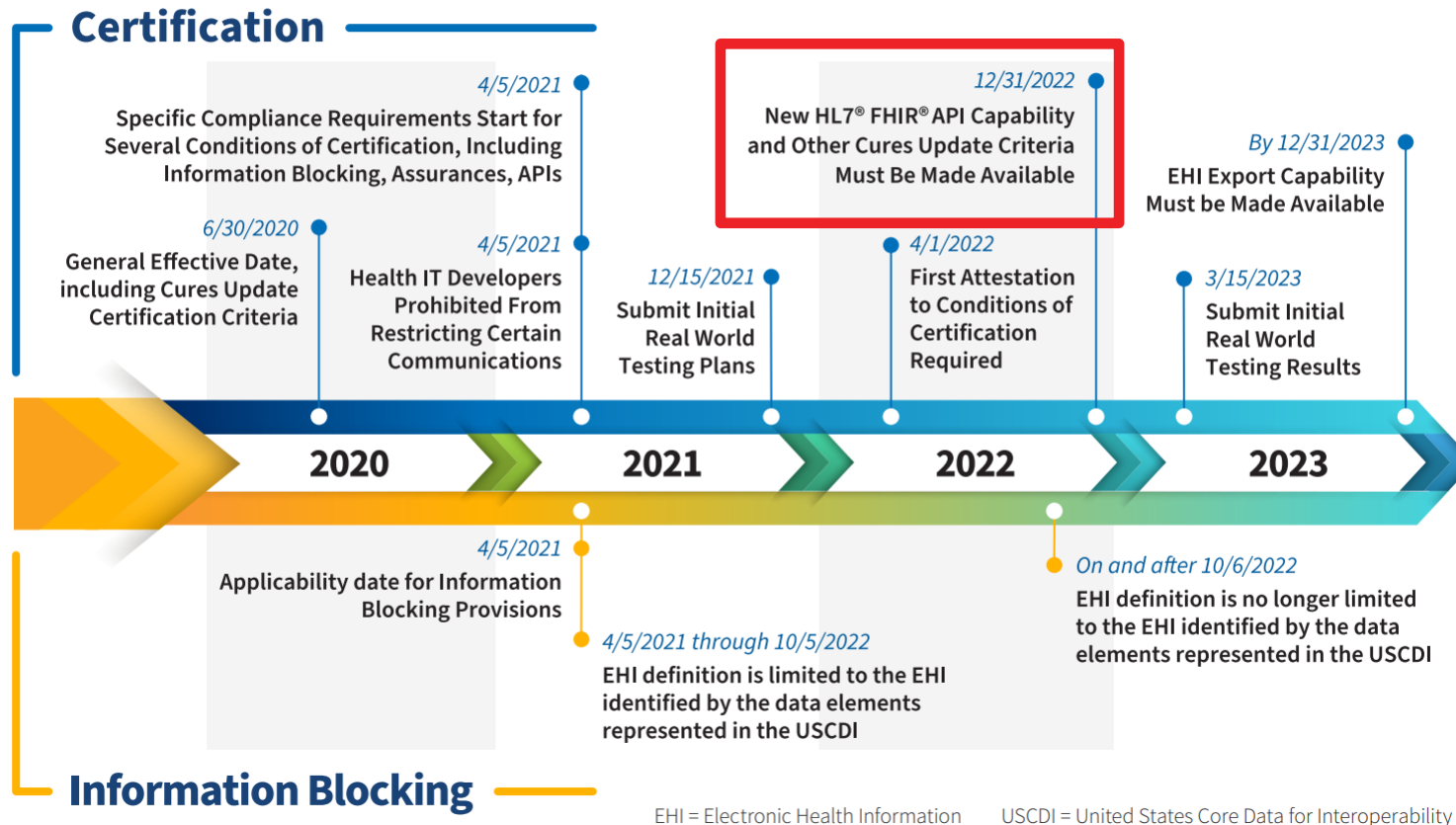
FHIR® Bulk Data Access (Flat FHIR®) (v1.0.0: STU 1)

United States Core Data for Interoperability USCDI, February 2020, Version 1 v1
URL: <https://hl7.org/fhir/uv/bulkdata/STU1.0.1/>

For complete details of certification - <https://www.healthit.gov/test-method/standardized-api-patient-and-population-services>

ONC Cures Act Final Rules Timeline

Information Blocking and the ONC Health IT Certification Program:
Extension of Compliance Dates and Timeframes in Response to the COVID-19 Public Health Emergency Interim Final Rule



CMS Burden Reduction Proposed Rules

Advancing Interoperability and Improving Prior Authorization Processes ([CMS-0057-P](#)):

- Impacted Payers
 - Medicare Advantage, Medicaid and CHIP FFS, Medicaid and CHIP Managed Care, QHPs on the FFEs
- Proposed APIs and Recommended IGs ([more information](#))
 - **Patient Access API** – CARIN IG for Blue Button, Da Vinci PDex IG, Da Vinci PDex US Drug Formulary IG, HL7 US Core IG
 - **Provider Access API** – same set as Patient Access API (+ HL7 FHIR Bulk Data Access IG)
 - **Payer-to-Payer API** – same set as Patient Access API (+ HL7 FHIR Bulk Data Access IG)
 - **Prior Authorization Requirements, Documentation, and Decision (PARDD) API** -- Da Vinci Coverage Requirements Discovery (CRD) IG, Documentation Templates and Rules (DTR) IG, and Prior Authorization Support (PAS) IG
- Proposed Required Standards
 - HL7 FHIR Release 4.0.1, US Core 3.1.1/USCDI v1, SMART IG/OAuth 2.0, OpenID Connect 1.0, FHIR Bulk Data Access 1.0.0
- Proposed Compliance Date:
 - January 1, 2026 (or relevant rating period or plan year beginning on or after January 1, 2026)

Professional Society Collaboration

As the members of professional societies are increasingly voicing alarm over escalating clinical burden, they turn to HL7 for solutions to many challenges.

Traditionally, we have relied upon so many of these individuals for domain expertise, for clinical workflow, and for data element definitions.

Now, we witness an essential collaboration for standards implementation, for clinical decision support, for research prioritization, and for achieving the quadruple aim.



“You can accomplish anything in life,
if you don’t mind who gets
the credit.”

Harry Truman

Agreement with AMA for utilization of CPT

- Current Procedural Terminology (CPT) was created by and is maintained by the American Medical Association.
- The AMA charges a per person fee or a system-wide fee for restricted use.
- Although required in the US, it is widely used globally, currently in 60 countries. Each license is stipulated for a specific country, region or realm.
- We have negotiated an agreement to allow free use of CPT for testing of HL7 standards.

Trade Organization Collaboration

The growth of technology developers has paralleled a growth in scientific advancement and integration of technologies into the practice of medicine and the creation of innovative solutions for healthcare and disease prevention.

Today, these organization provide unique forums for collaboration, for education, and for innovation.

We rely upon them for innovation and for promoting interoperable solutionso.



Technology Vendor Collaboration

To the layman, the technology vendors are the first to mind when advances in healthcare IT are first envisioned.

They are more than the creators of electronic health record innovation.
They are both the creators and the adopters of standards.

They build the bridges to the payer organizations, to the clinical community, to the research innovators, and to the patients themselves.

Unique in our collaboration, they stoke the engines and apply the brakes.
They are our greatest admirers and most strident detractors.



ORACLE Cerner

MEDITECH

surescripts



eClinicalWorks
"Improving Healthcare Together"

HL7
International

“How much easier it is to be
critical than correct.”

Benjamin Disraeli

Consultancy Collaboration

From very large global organizations to boutique firms that specialize in standards, these are just a few of the many consultancies that support HL7 through

- Implementation
- Technical Resources
- Education & Training
- Development collaboration
- Application Development
- Policy Support
- Government Relations



Non-government Organization (NGO) Collaboration

One of the most difficult to define categories of organizations with which we collaborate are NGOs.

The NGOs are more than non-profits. They provide critical support. They provide policy and help to define the ecosystem. They influence decision makers with their ability to define solutions to challenging problems. They oversee very specific domains and very large communities. And, yes, they help to fund our vision.

These are but a very few examples of our collaborators.

MITRE

KLAS
RESEARCH



Cloud Vendor Collaboration

In August 2018 in Washington, the six largest cloud vendors announced their collaboration for implementation of the FHIR API.

Less than two years later, they each announced a collaborative initiative for importing large cohorts of data with Bulk FHIR.



IBM



amazon

ORACLE



Patient Advocacy Collaboration

It is probably accurate to sum up our reason for being by saying that we do it all for our patients.

The care of patients, the prevention of disease, and the striving for wellness are at the very heart of our mission. Our singular focus is to provide information when and where it's needed.

Patient advocates often do not provide the technology. But their commitment to our fundamental processes are invaluable.

Their reach is global. Their goals know no national borders.

There are hundred of organizations and thousands of individuals who provide insights for which there is no measure.

HL7 could not succeed without them.

AI on FHIR

Coalition for Health AI (CHAI)

- Purpose: A community of health systems, private-sector organizations, government officials and expert practitioners of artificial intelligence (AI) and data science to harmonize standards and reporting for health AI and educate end-users on how to evaluate these systems to drive their adoption.
- Mission: To provide a framework for an ever-evolving landscape of health AI tools to ensure high quality care, increase trust amongst users, and meet health care needs.

Coalition for Health AI (CHAI) Members

- Over 100+ Private Sector Organizations: Health Systems, Payors, Device Manufacturers, Technology Companies, Patient Advocates
- Founding Members: Mayo Clinic, Duke Health, MITRE, UC Berkeley, Johns Hopkins, Stanford Medicine, UCSF
- Industry Partners: Change/Optum, Google, Microsoft, SAS
- US Govt Partners: FDA, ONC, NIH, White House OSTP, AHRQ

FHIR Security

HL7 FHIR Security

- DARPA leadership discuss proposed to HL7 to enhance FHIR cybersecurity
- Advanced Research Projects Agency for Health (ARPA-H) program received \$1 billion from NIH budget in FY23
- DARPA wishes to provide resources to support
 - Technical security of the FHIR stack
 - Technical evaluation of the FHIR sandbox (ecosystem)
 - End-user cybersecurity of FHIR endpoints
 - Training of FHIR developers, implementers, and end-users
- A strategic SOU is pending

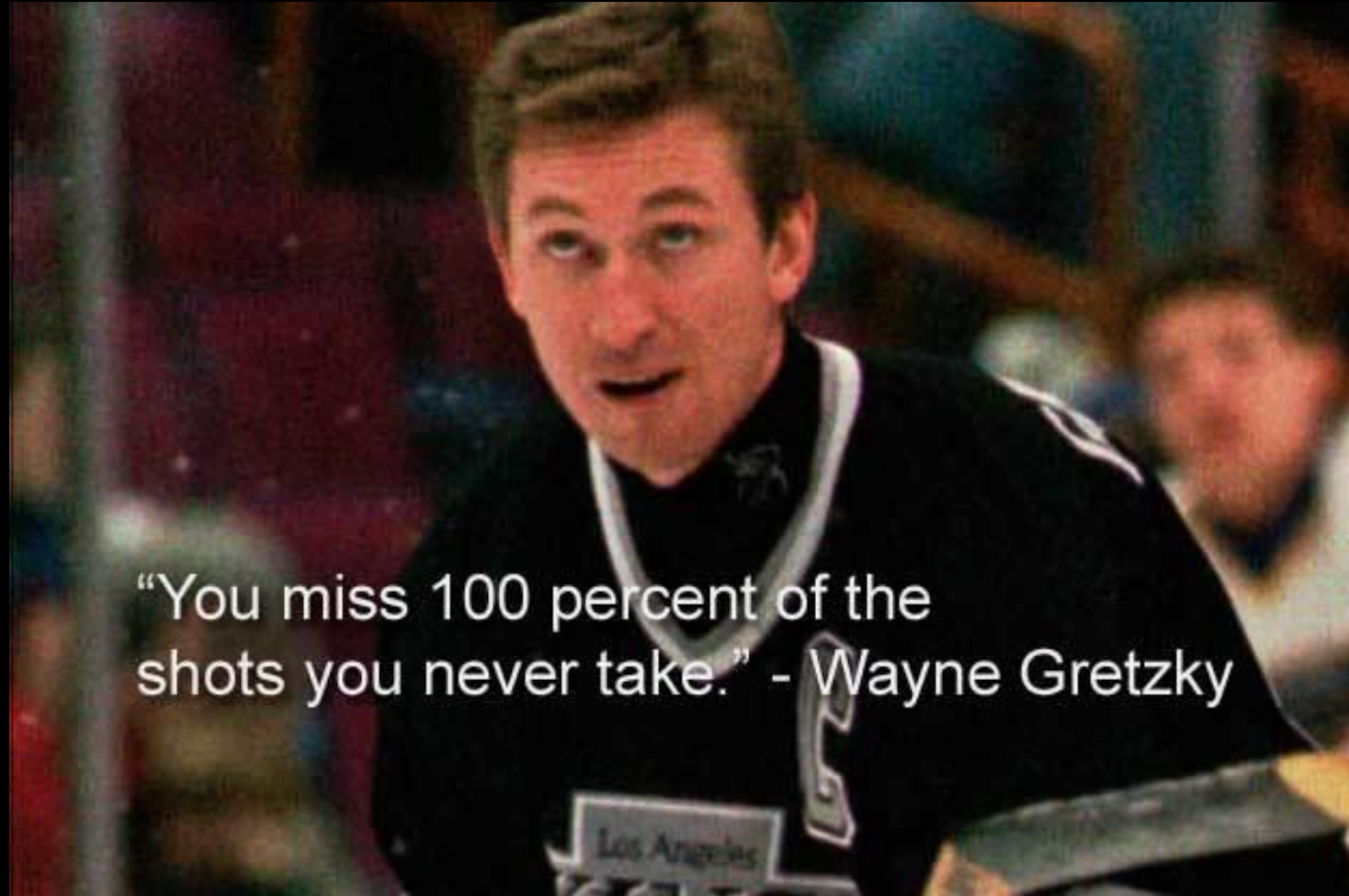


DEFENSE ADVANCED
RESEARCH PROJECTS AGENCY

HL7
International

FHIR Implementation

Change Management



“You miss 100 percent of the shots you never take.” - Wayne Gretzky

SMART Digital Insurance Card Initiative

Technology

- Leverages HL7 FHIR R4.01 and the CARIN Insurance Card IG
- Supported by multiple platforms & EHR implementations
- Smart phone enabled
- QR reader functional
- Integrated into SMART Health Card ecosystem

SMART Health Insurance Card Initiative

A new initiative to:

- Extend the SMART Health QR code standard to health insurance cards
- Demonstrate its use with payers, providers and people
- Promote broad adoption across the healthcare ecosystem

Open Standards:

- [SMART Health Cards](#)
- [SMART Health Links](#)
- [HL7 CARIN Digital Insurance Card Imp. Guide](#)



SMART Digital Insurance Card Initiative

Current participants

- Payers:
 - 20+ For-profit companies
 - Kaiser Permanente
 - CMS notably absent
- Providers
 - University of CA Health (pilot)
 - 30+ health systems
- Tech vendors & integrators
 - Epic, Oracle Cerner
 - Apple, Samsung
 - Amazon, Google, Microsoft
 - AHIP, BCBSA
 - Accenture
 - WEDI
- HL7's (multiple) opportunities
 - Passively support the initiative
 - Actively integrate with SID ecosystem (Foundry & reference implementation)

Payers	Providers	Tech	Associations
Aetna	UC San Diego	Accenture	AHIP
Arkansas BCBS	UC Davis	Amazon	American Hospital Association
Blue Shield of CA	UC Irvine	Apple	BCBSA
BCBS North Carolina	UCLA	Cerner	Consumer Tech Association (CTA)
BCBS Tennessee	UC Riverside	CNSI	The Commons Project
Cambia	UCSF	CPSI	Health Evolution
Centene		Epic	HFMA
Cigna	Boston Children's	Gainwell	Public Health Institute
HealthFirst	Christiana Care	Google	WEDI
HealthNet	CentraCare	Microsoft	
Elevance	CommonSpirit	Oracle	
HMSA	Confluent	PWC	
Humana	CVS Health	Samsung	
Kaiser Permanente	Corewell Health		
Medica	Davita		
Medi-Cal (DHCS)	Express Scripts		
Molina	Hawaii Pacific Health		
Premera	HCA		
SCAN	HSS		
United Healthcare	Mass General Brigham		
Washington Health Care Authority	Mayo Clinic		
	MultiCare		
	Northwell		
	Optum		
	OSF Health		
	Providence		
	Saint Luke's		
	UPMC		

Sync for Social Needs Initiative

- Technical progress
 - FHIR / US Core alignment with input of EHR vendors, SDOH networks and several health systems,
 - Development of a technical approach for sharing social needs screening data (requesting data at the instrument level inclusive of FHIR Observations)
- CMS published draft guidance for Special Needs Plans on options for screening instruments or domain-specific approaches to assist launching a more focused effort across several quality organizations to gather real-world implementation experience
- ONC agrees with the goals of the initiative, and is committed to private-sector leadership.
- Real World Testing:
 - Several leading health systems and the Joint Commission will host a webinar for "early adopters" willing to participate in real-world testing to enable information shareable via FHIR endpoints.
 - Additional organizations have been recruited for their interest in a bidirectional approach (to include "FHIR Write").

“Sometime the road less traveled is less
traveled for a reason.”

- Jerry Seinfeld

FHIR is Global

Example National Regulations Requiring FHIR

Argentina: Ley 27706 PROGRAMA FEDERAL ÚNICO DE INFORMATIZACIÓN DIGITALIZACIÓN DE HISTORIAS CLÍNICAS DE LA REPÚBLICA ARGENTINA

Brazil: RNDS - Rede Nacional de Dados de Saúde

Canada: There are pan-Canadian and Jurisdictional regulations

France: CI-SIS (Interoperability framework of French e-Health agency (ANS))

Germany: Gesundheits-IT-Interoperabilitäts-Governance- Verordnung; ISiK

Netherlands: Wegiz (Dutch, now), EHDS (Europe, near future)

New Zealand: HISO 10083:2020 Interoperability Roadmap

Norway: [standard](#) for data sharing

Peru: Digital Government Law-Norm: DL.Nro. 1412, PCM; Government Interoperability Platform: Interoperability Standards; Digital Government Secretary Resolution; Nro. 002-20019-PCM/SEGDI;

Peru: Directiva Administrativa N° 266-MINSA/2019/OGTI: Directiva Administrativa que regula la Interoperabilidad en los Sistema de Información Asistenciales

Taiwan: myemr

Thailand: The Primary Care HIE specifications

United States: 21st Century Cures + US Core Data for Interoperability

A Glimpse of FHIR Around the World: Early Catalysts

Microsoft, Amazon, other tech giants forge ahead on healthcare data sharing pledge

by James Thorne on July 30, 2019 at 10:00 am



Executives from Amazon, Google, Microsoft and IBM on stage at the CMS Blue Button 2.0 Developer Conference in August 2018. From left: Dean Garfield, Alec Chalmers, Mark Dudman, Peter Lee and Greg Moore. (Microsoft Photo)

This past August, executives from Microsoft, Amazon, Google, IBM, Oracle, and Salesforce **banded together** to promote data sharing in healthcare. Nearly a year later, the world's largest tech companies aren't showing any signs of slowing.

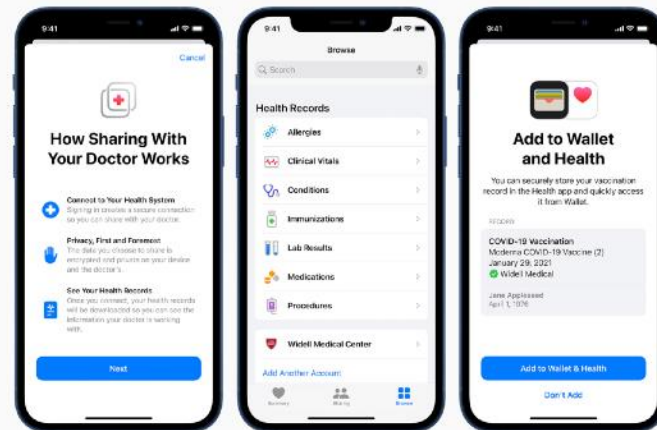
Cloud providers ❤️ FHIR

Big tech vendors were early voluntary adopters and now all have FHIR in their health data solutions

[Geekwire coverage of White House Pledge](#)

Empower your patients with their health data.

The Health app makes it easier than ever for users to be engaged in their health with ways to visualize, securely store, and share their health data. Your patients can aggregate their health records from multiple institutions alongside their patient-generated data, as well as share their health data with a provider to facilitate richer conversations.



Apple ❤️ FHIR

Apple Health Records uses FHIR to enable people to visualize, store, and share their health data

[Apple Health Records](#)

PUBLISHED DOCUMENT

Start Printed Page 25642

AGENCY:
Office of the National Coordinator for Health Information Technology (ONC),
Department of Health and Human Services (HHS).

ACTION:
Final rule.

SUMMARY:
This final rule implements certain provisions of the 21st Century Cures Act, including Conditions and Maintenance of Certification requirements for health information technology (health IT) developers under the ONC Health IT Certification Program (Program), the voluntary certification of health IT for use by pediatric health care providers, and reasonable and necessary activities that do not constitute information blocking. The implementation of these provisions will advance interoperability and support the access, exchange, and use of

DOCUMENT DETAILS

Printed version:
PDF

Publication Date:
05/01/2020

Agencies:
Department of Health and Human Services
Office of the Secretary

Dates:
Effective date: This final rule is effective on June 30, 2020.

Effective Date:
06/30/2020

Document Type:
Rule

Document Citation:
85 FR 25642

Page:
25642-25651 (320 pages)

PUBLISHED DOCUMENT

Start Printed Page 25610

AGENCY:
Centers for Medicare & Medicaid Services (CMS), HHS.

ACTION:
Final rule.

SUMMARY:
This final rule is intended to move the health care ecosystem in the direction of interoperability, and to signal our commitment to the vision set out in the 21st Century Cures Act and Executive Order 13813 to improve the quality and accessibility of information that Americans need to make informed health care decisions, including data about health care services and outcomes.

DOCUMENT DETAILS

Printed version:
PDF

Publication Date:
03/01/2020

Agencies:
Centers for Medicare & Medicaid Services
Office of the Secretary

Dates:
These regulations are effective on June 30, 2020.

Effective Date:
06/30/2020

Document Type:
Rule

US Federal Agencies ❤️ FHIR

Office of the National Coordinator for Health IT and the Centers for Medicare and Medicaid Services regulations require FHIR

[Cures Act Final Rule](#)
[Interoperability and Patient Access Final Rule](#)

A Glimpse of FHIR Around the World: Global Adoption



Our FHIR SDK for Android Developers

This blog was co-authored by Katherine Chou, senior director, product management, Health AI and Sudhi Herle, head of Android Platform Security

For community health workers in low-and-middle-income countries (LMICs), mobile devices have become critical tools for doing community outreach and providing vital health services such as conducting health screenings, distributing medications, and accessing immunization records. Unfortunately, the lack of data interoperability means that patient records are fragmented between different outreach programs or applications, and caregivers have to make decisions for patients using incomplete information.

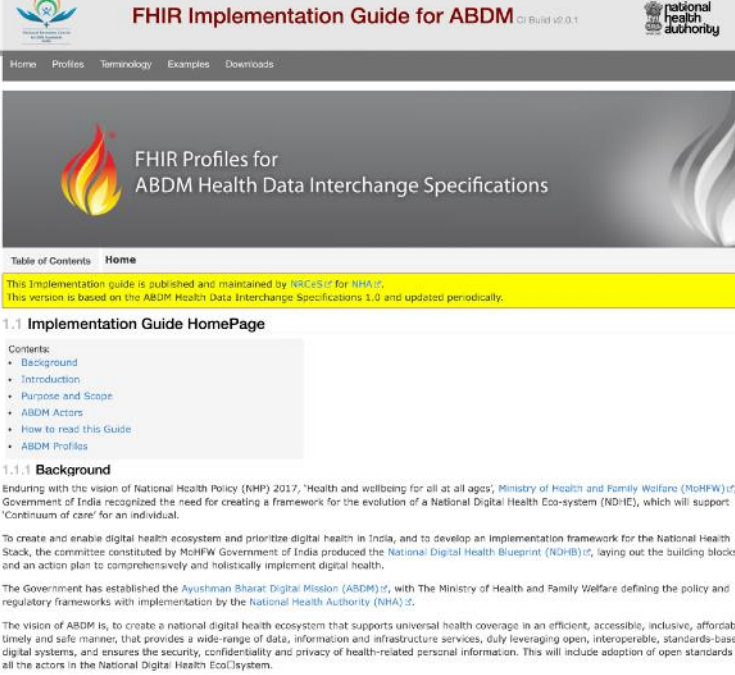
Partnering with WHO to help developers build secure mobile solutions

Last year, we [introduced](#) a collaboration with the World Health Organization (WHO) to build an open source software developer kit (SDK) for creating secure interoperable mobile health solutions. This SDK is designed to

FHIR SDK for Android

Offline-capable, mobile-first FHIR toolkit allows developers to create applications helping community health workers in LMICs.

🌐 [Android FHIR SDK on Github](#)



FHIR for ABDM

From the National Digital Health Blueprint, FHIR adopted as the open standard base for all actors in India's national ecosystem

🌐 [FHIR IG from NRCeS and NHA](#)



Healthpoint is New Zealand's national health services directory. We enable equal access to detailed health service information, supporting people to navigate and better engage with the health sector.

The HL7 FHIR standard Healthpoint API allows applications and health provider websites to easily access provider information to connect patients with services that support their health and wellness.

Healthpoint

New Zealand's national health service directory with a FHIR API, enhanced with all of the COVID testing and vaccination location information

🌐 [New Zealand HealthPoint directory](#)

From the start, HL7 FHIR was a global phenomenon

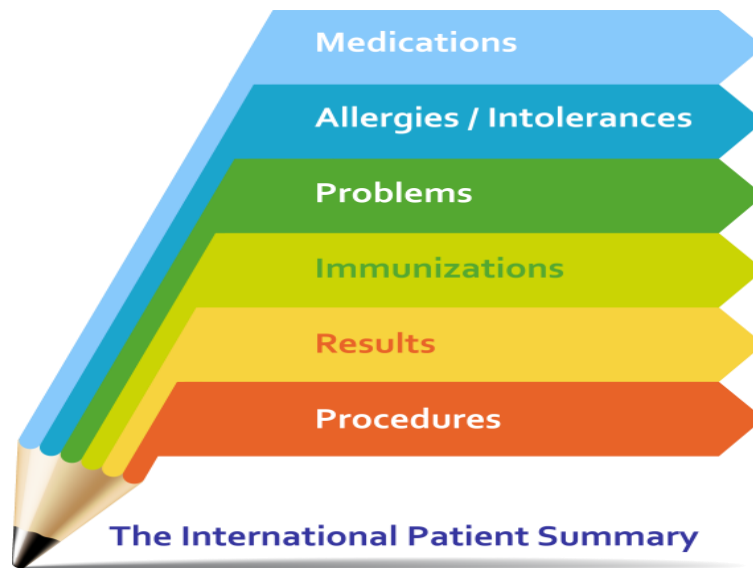
More than 50 countries around the world participate in the development, implementation, support, and education of the FHIR standards.

The communities are more than international.

They are diverse and supportive of an open process and an open standard that is provided free of charge or royalty.

'Global' FHIR Specs: Summaries

International Patient Summary (IPS)



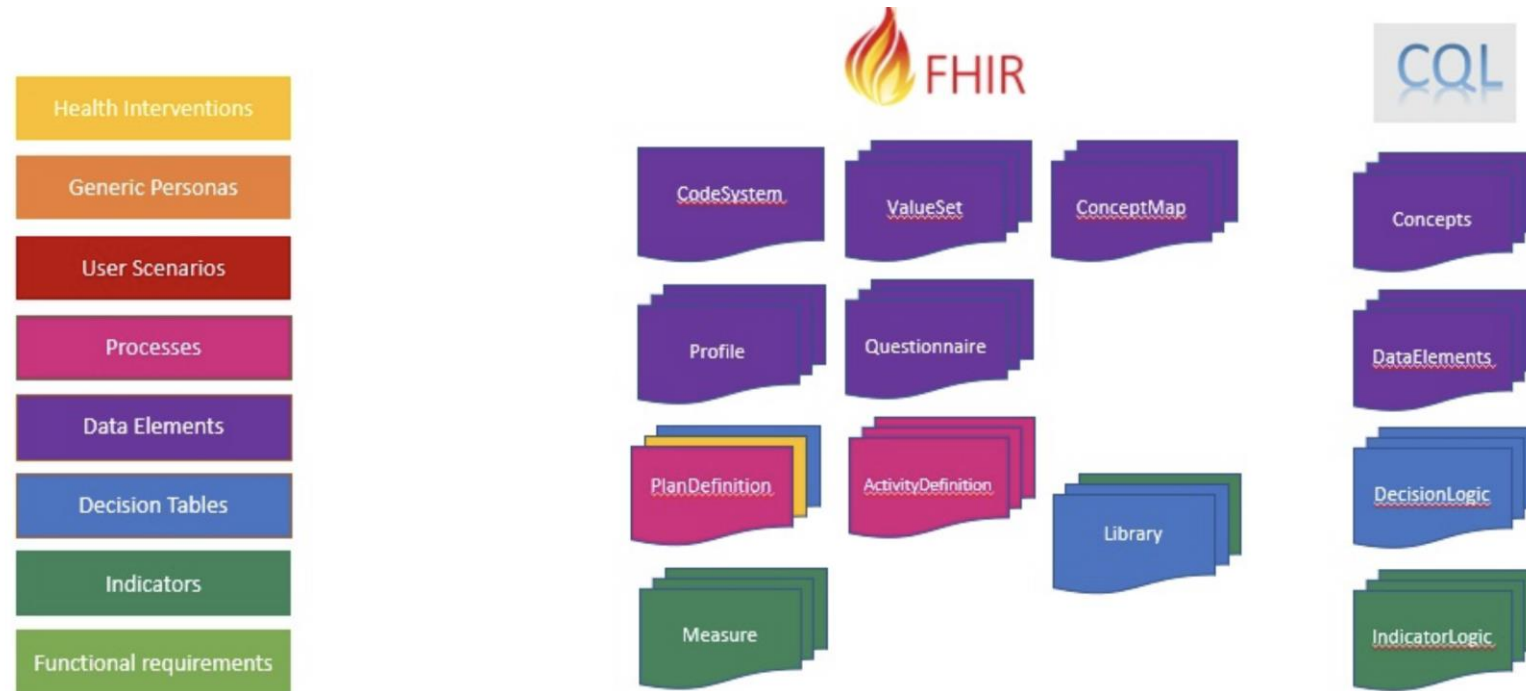
Brief summary for a patient, FHIR/CDA R2 format
'as a document' – with sections, text, care delivery



'Global' FHIR Specs: WHO

WHO: Antenatal Care Computable WHO SMART Guidelines

<https://build.fhir.org/ig/WorldHealthOrganization/smart-anc/>



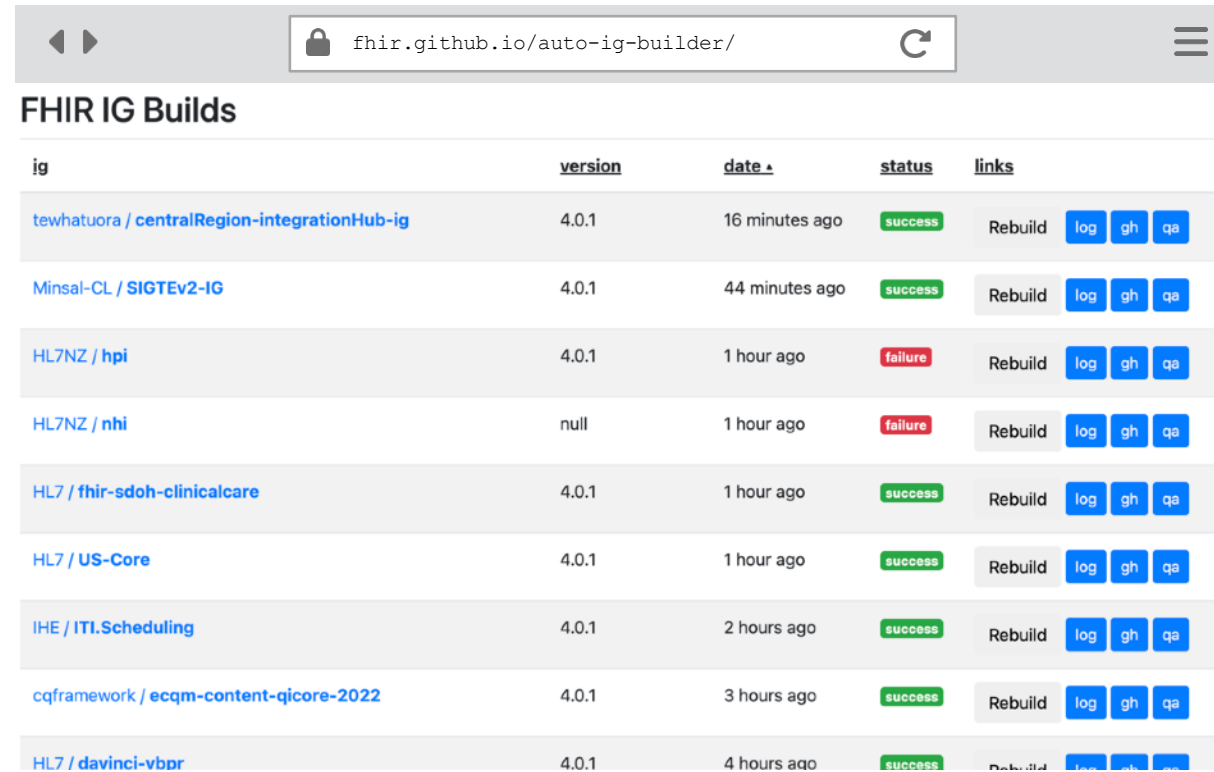
FHIR Tooling

Publishing Software Infrastructure: Auto-Build

350+

*Implementation Guides made using
HL7's IG auto-build infrastructure*

HL7 International, HL7 Affiliates (11), and others



The screenshot shows a web browser at the URL `fhir.github.io/auto-ig-builder/`. The page title is "FHIR IG Builds". Below the title is a table with columns: `ig`, `version`, `date`, `status`, and `links`. The table lists several builds, including successful ones and one that failed.

ig	version	date	status	links
tewhaturora / centralRegion-integrationHub-ig	4.0.1	16 minutes ago	success	Rebuild log gh qa
Minsal-CL / SIGTEv2-IG	4.0.1	44 minutes ago	success	Rebuild log gh qa
HL7NZ / hpi	4.0.1	1 hour ago	failure	Rebuild log gh qa
HL7NZ / nhi	null	1 hour ago	failure	Rebuild log gh qa
HL7 / fhir-sdoh-clinicalcare	4.0.1	1 hour ago	success	Rebuild log gh qa
HL7 / US-Core	4.0.1	1 hour ago	success	Rebuild log gh qa
IHE / ITI.Scheduling	4.0.1	2 hours ago	success	Rebuild log gh qa
cqframework / ecqm-content-qicore-2022	4.0.1	3 hours ago	success	Rebuild log gh qa
HL7 / davinci-vbpr	4.0.1	4 hours ago	success	Rebuild log gh qa

FHIR in the Cloud

Cloud vendors on FHIR

- 2018: Big 6 vendors agree to exchange health data between cloud instances using FHIR
- 2020: Vendors agree to import large data cohorts using Bulk data on FHIR
- 2021: Vendor announce successful implementation of predictive analytics using data imported from health system data lakes
- 2022: ONC requires all certified EHRs to support FHIR import and endpoints

Cloud vendors on FHIR



Google Cloud

<https://cloud.google.com/healthcare>



<https://aws.amazon.com/health>



<https://azure.microsoft.com/en-us/services/health-data-services>



Cloud vendors on FHIR



IBM Cloud

<https://www.ibm.com/products/fhir-server>



<https://docs.oracle.com/health-sciences/health-hdr-81/HDRFG/fhirserverarch.htm>

FHIR R5

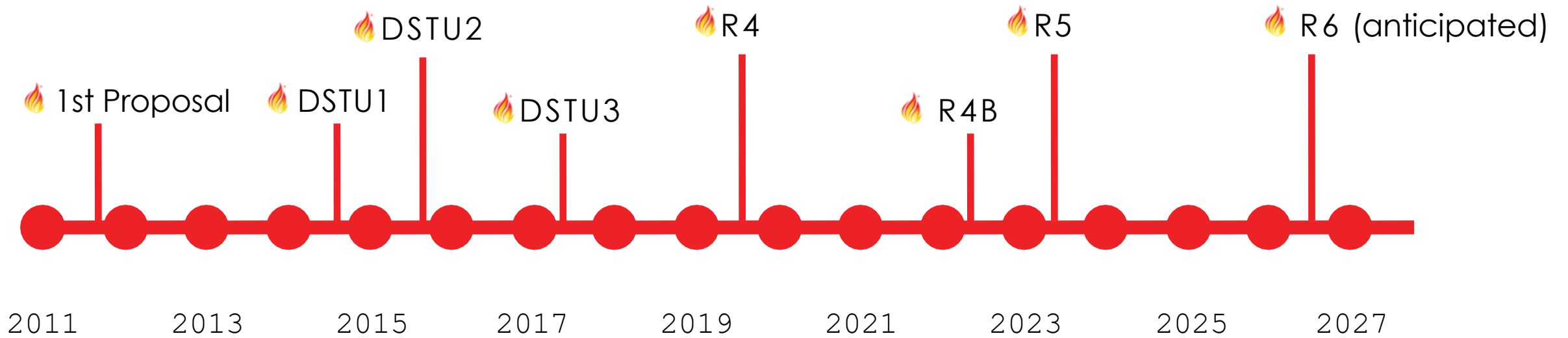


My coach said that I
kick like a girl.


I told him that if he
tried harder, he
could too.

Mia Hamm

FHIR Version Timeline



What is new in FHIR: R5

- What is new in FHIR : R5
 - It's here now. Be alert about the version you are using.
 - **Subscription (framework+resources, draft)**  Pre-adopted in R4b!
 - Patterns (relationships between resources, informative)
 - Evidence Based Medicine (new resources, draft)
 - Permission (new resource, draft)
- Other resources reaching Normative status

Subscriptions - Exchange Mechanisms

SUBSCRIPTIONS: "Let me know when THIS happens"

Ask a FHIR server to **alert another server** when a **resource of a specific type** (Patient, Observation), changes or is added, and **matches some criteria**

IMPLEMENTATION: "How do I make it work?"

RESTful: "FHIR is the internet of health"

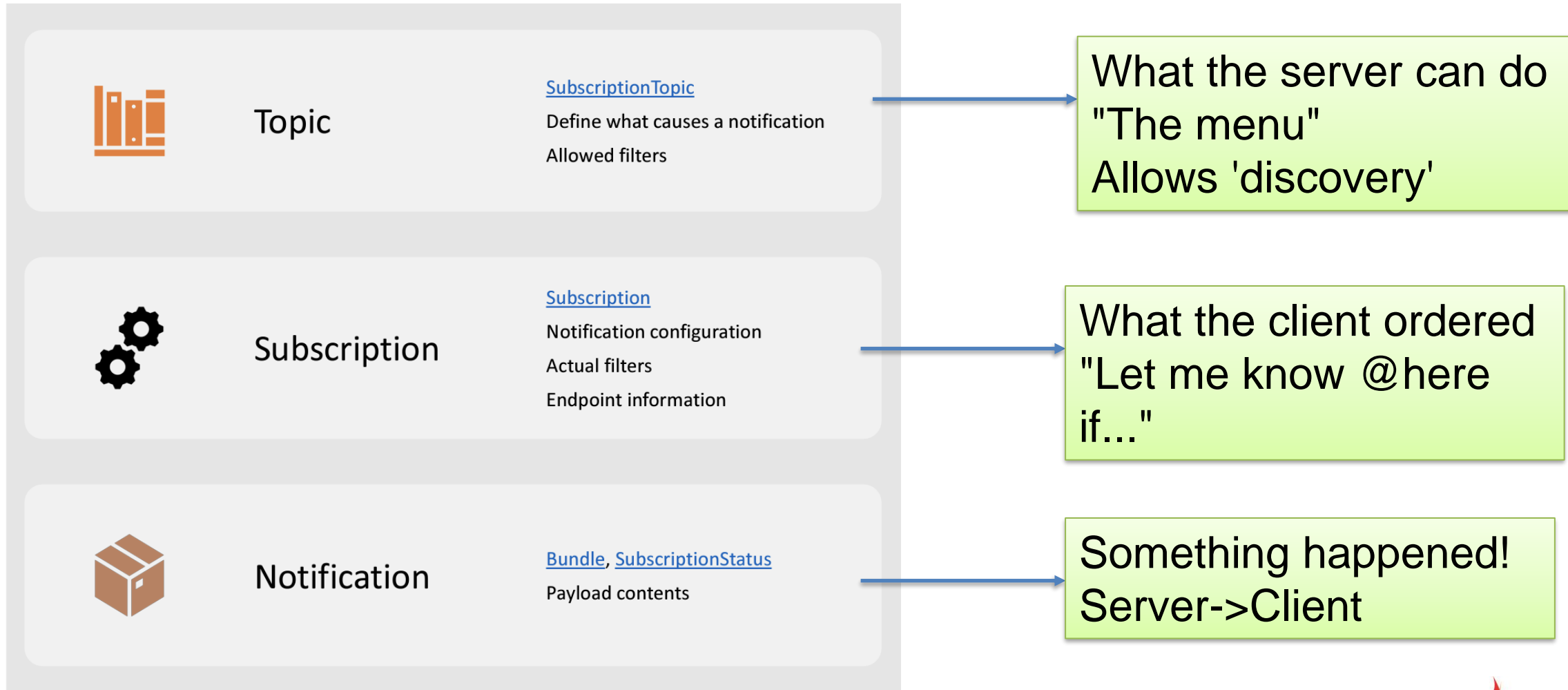
MESSAGES: "Similar to HL7 V2.x/V3"

SERVICES: "Logic applied to Resources"

BULK TRANSFER: "Lab Results from 100,000 patients"



Subscriptions - Resources



Future of FHIR: Beyond R5

- Health data lives in the cloud. FHIR enables its transitions.
- All patient care is driven by evidence. Care is enabled by FHIR-based tools and supported by AI.
- FHIR facilitates a virtuous Learning Health System.
- FHIR enables the seamless integration of clinical care data and public health systems.
- Clinical documentation is supported by FHIR-enabled voice-to-text entry, including patient-reported symptoms.
- FHIR reduces the barriers between patient care and real-world clinical trials.
- Clinical systems support the development of next-generation releases of FHIR.
- FHIR utilization becomes as ubiquitous as other APIs, so that its use no longer will be mandated, but adopted by the universe of end-users.

FHIR Events & Training

Upcoming HL7 FHIR Events

Events	
	HL7 FHIR DevDays Jun 6, 2023 to Jun 9, 2023 - Amsterdam + Online Add to Calendar
	CMS HL7 FHIR Connectathon Jul 18, 2023 to Jul 20, 2023 - Virtual Event Add to Calendar
	HL7 FHIR Security Event Aug 8, 2023 to Aug 9, 2023 Add to Calendar
	37th Annual Plenary, Working Group Meeting and HL7 FHIR Connectathon Sep 9, 2023 to Sep 15, 2023 - Sheraton Phoenix Downtown, Phoenix, AZ Add to Calendar
	HL7 FHIR Connectathon Jan 16, 2024 to Jan 18, 2024 - Online/Virtual Add to Calendar
	January Working Group Meeting Jan 29, 2024 to Feb 2, 2024 - Virtual Event Add to Calendar
	May 2024 Working Group Meeting and HL7 FHIR Connectathon May 18, 2024 to May 24, 2024 - Dallas, TX Add to Calendar



Upcoming HL7 FHIR Training

Online Training & Education



HL7 FHIR Intermediate

Jun 1, 2023 to Jul 13, 2023 - Asynchronous Course

[Add to Calendar](#)



HL7 FHIR Exam Prep

Jun 15, 2023 to Jul 13, 2023 - Asynchronous Course

[Add to Calendar](#)



SMART on FHIR & CDS Hooks

Jun 20, 2023 to Jun 22, 2023 - Online Class

[Add to Calendar](#)



HL7 FHIR Fundamentals

Jul 13, 2023 to Aug 10, 2023 - Asynchronous Course

[Add to Calendar](#)



HL7 V2 to FHIR Mapping

Sep 7, 2023 to Oct 12, 2023 - Asynchronous Course

[Add to Calendar](#)



HL7 Fundamentals

Sep 7, 2023 to Nov 30, 2023 - Asynchronous Course

[Add to Calendar](#)



Free FHIR Seminar Series

- Produced for the University of California Health System
- Freely available
- 10 week recorded program (Summer 2022)
- Individual weeks selectable
- Focused on clinical care and research
- No CME



FHIR Seminar Series in Review

1. Introduction to FHIR: Origins & Growth

- Origins of the FHIR community & the implementation supporting it

2. Introduction to FHIR

- FHIR Building blocks: API and resources

3. FHIR and other standards

- Standards integration: controlled terminologies, standards for research, pharmacy, quality measures, process & billing

4. The FHIR Toolbox

- SMART-on-FHIR, CDS Hooks, CQL, and Bulk Data on FHIR

5. Clinician & Patient Empowerment with FHIR

- New tools (iPhone Healthkit) & new platforms (Blue Button)



FHIR Seminar Series in Review

6. FHIR in Government Regulation

- Adoption of FHIR and inclusion of APIs in regulation by the Federal government

7. FHIR Accelerators, HL7 Implementation Division & Ecosystem

- 8 Accelerators & the implementation trajectory
- Connectathons, Hackathons & a unitary testing infrastructure

8. Public Health on FHIR

- Helios FHIR Accelerator & the changing culture of the CDC

9. Digital Quality Measures on FHIR + FHIR, Clouds & AI

- FHIR-automated approach to quality
- FHIR integration with Cloud computing and AI

10. FHIR Enabled Learning Healthcare System

The Future of FHIR: Technology & Promise

- Clinical care helps to define research and research informs clinical care.

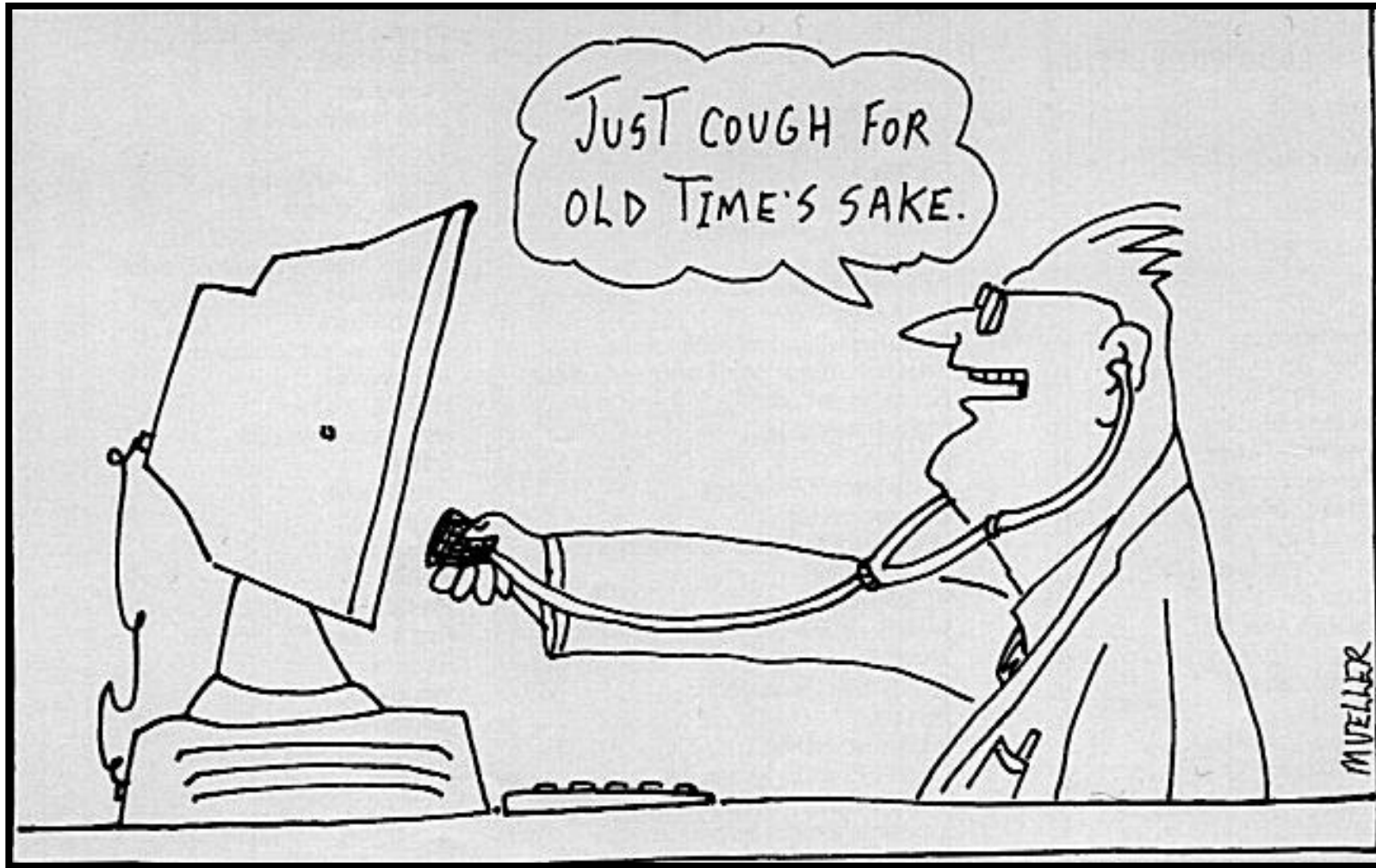




**Change happens
at the speed of trust.**



Questions



cjaffe@HL7.org