Healthcare is on  FHIR!

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TECH ADVISORS

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Objectives

- Introduce you to FHIR
  - … without getting too technical!
- Why should you care about FHIR?
- Share what it can mean for the healthcare ecosystem
- Provide examples
- Questions
- … in ~25 minutes

About the presenter…

- Waaaaaay too many years in Health IT (HIT) and Health Information Exchange (HIE)
- Co-Chair of the MN e-Health Initiative Standards & Interoperability Workgroup
- 15+ years of hands-on experience in HIT and HIE standards
  - CCR (Continuity of Care Record)
  - CCD (Continuity of Care Document)
  - C-CDA (Consolidated Clinical Document Architecture) – training and coding
- Involved with FHIR for 3+ years
  - FHIR development education
  - Written FHIR code
  - Participant in a weekend FHIR connectathon in 2018
    - First to model a new national electronic long-term services and supports standard in FHIR
- Evangelizing FHIR within DHS (especially since the CMS NPRM)
- Project Leader for a DHS FHIR-based consent management/care coordination project in Minnesota

- **F**ast (to design and implement)
- **H**ealthcare
- **I**nteroperability
- **R**esources

In short…

- The FHIR (Fast Healthcare Interoperable Resources) standard is managed by Health Level Seven (HL7)
  - HL7 is a Standards Developing Organization (SDO)
- It supports the exchange of data between software applications in healthcare, combining the best features of HL7's existing v2, v3 and CDA product families while leveraging the latest web standards and applying a tight focus on implementability.

Application Programming Interface (API)

- “An application programming interface (API) is a set of subroutine definitions, communication protocols, and tools for building software.
- In general terms, it is a set of clearly defined methods of communication among various components.
- A good API makes it easier to develop a computer program by providing all the building blocks, which are then put together by the programmer.”

https://en.wikipedia.org/wiki/Application_programming_interface

Why FHIR?

- There has been a need to share healthcare information electronically since the introduction of mainframe-based Electronic Medical Records (EMRs) in the 1960s
  - HL7 version 2, which was aimed at the exchange of data between fixed departmental systems within the context of a hospital organization, has its technical roots in the 1970s
- There is increasing pressure to broaden the scope of sharing across organizations and disciplines, mobile and cloud-based applications and to achieve integration in days or weeks instead of months or years

Drivers of FHIR

- Shift in healthcare
  - The patient is in control and owns their medical data
  - There is an increasing pressure to broaden the scope of sharing health data and a growing need for exchange of information across organizations, disciplines and (regional) borders
- Shift from off-line to on-line
  - Recent years have shown the shift from PC to tablet, from web to app, from electronic health record to personal health record, from desktop to cloud
  - FHIR is lightweight, is made for mobile and it enables the data to travel with the patient

Drivers of FHIR (cont.)

- Shift towards data transparency
  - EHRs and other medical systems tend to behave like black boxes
  - Data sits in there, you can't get it out - and if you can, the data is useless because it's incompatible
  - FHIR acts as an 'Open API' to access data in these silo-like EHRs
  - Different aspects of patient data will end up being hosted in different systems
  - New healthcare tools should have the ability to reach out to these systems and use that data in a collaborative manner
- Shift towards analytics
  - Analytics requires data transparency, but also for the data itself to be in a format which is optimized for analysis
  - FHIR uses data structures that allow one to easily slice and dice the data for analytics
  - Unlike CDA, with FHIR there is no need to split documents into more atomic concepts for analytics

What if we started from scratch? What would we do?

- The initial FHIR developers posed this question: What would healthcare information exchange look like if we started from scratch?
- A web search for success markers of modern implementation approaches led to REST-based APIs
  - (“Representational state transfer” – an architecture for how to connect systems in real time)
  - FHIR is a healthcare exchange API based on this approach, which provides a simple and efficient way to discover and consume information across distributed systems.
- HL7, other standards organizations and the United States President's Council of Advisors on Science and Technology (PCAST) came to the conclusion in 2011 that the base unit of exchange when it comes to data should neither be:
  - Too large (yielding unwieldy and overly complex data structures), and
  - Nor too small (it should convey meaningful data)
- FHIR uses small logically discrete units of exchange with a well-defined behavior, meaning and contextual metadata

FHIR:

- Is easier and cheaper than other comparable standards:
  - It is faster to learn, implement and troubleshoot
    - You should be able to “figure it out” over a weekend and the standard is shipped with toolkits and examples
  - It has a vibrant and open source community and has frequently held connectathons
  - It uses modern technologies, the same as used by e.g. **Facebook**, **Twitter** and **Google**
  - There are more people familiar with these technologies
- Is being implemented right now:
  - US: ONC, CMS, SMART on FHIR (SoF), CommonWell
  - Many implementations, many countries
    - UK: FHIR in NHS Digital
      - FHIR is now embedded in most areas of interoperability development within NHS Development
      - Change of emphasis from “why use FHIR” to “why not use FHIR”
      - Adoption of FHIR has now broadened to fully encompass the FHIR ecosystem
- Is likely to significantly impact Health IT:
  - Scales well from simple to complex
  - Flexible, free and fully open

ONC and CMS NPRMs

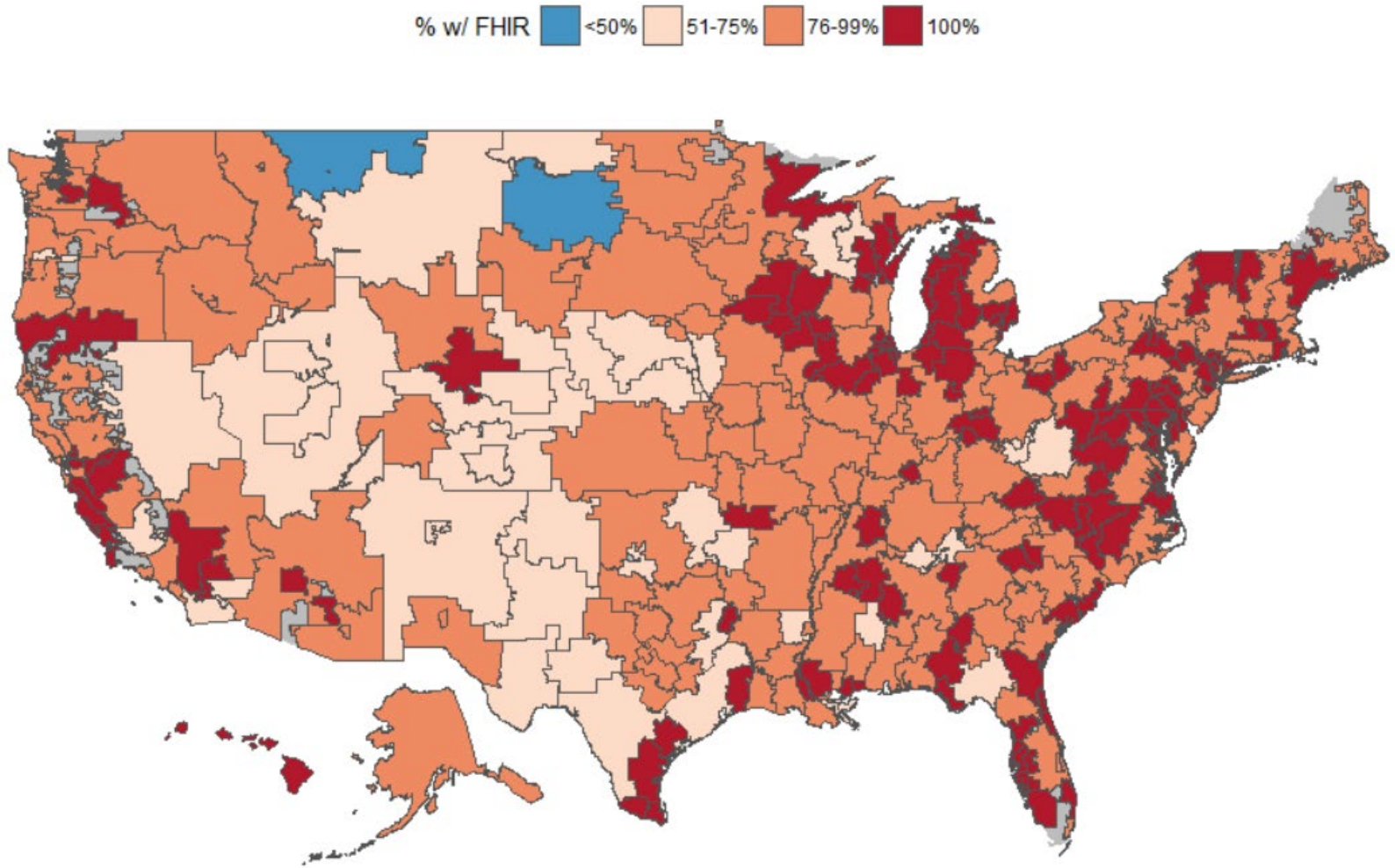
- The Office of the National Coordinator (ONC) and CMS released coordinated, complementary Notice of Proposed Rule Making (2) in 1Q19
- For the first time, these agencies called out FHIR as a specific standard to be used
  - Previously, recommended that “Standards” (like those found in the Interoperability Standards Advisory) be used
  - Now they’re clearly calling out FHIR
- Direct expectations that healthcare organizations will make their data available through a FHIR-based API interface
  - The public comment period for the NPRMs recently closed; we’ll see what the final rule looks like

Adoption of FHIR

- ONC Blogpost from October 2018:

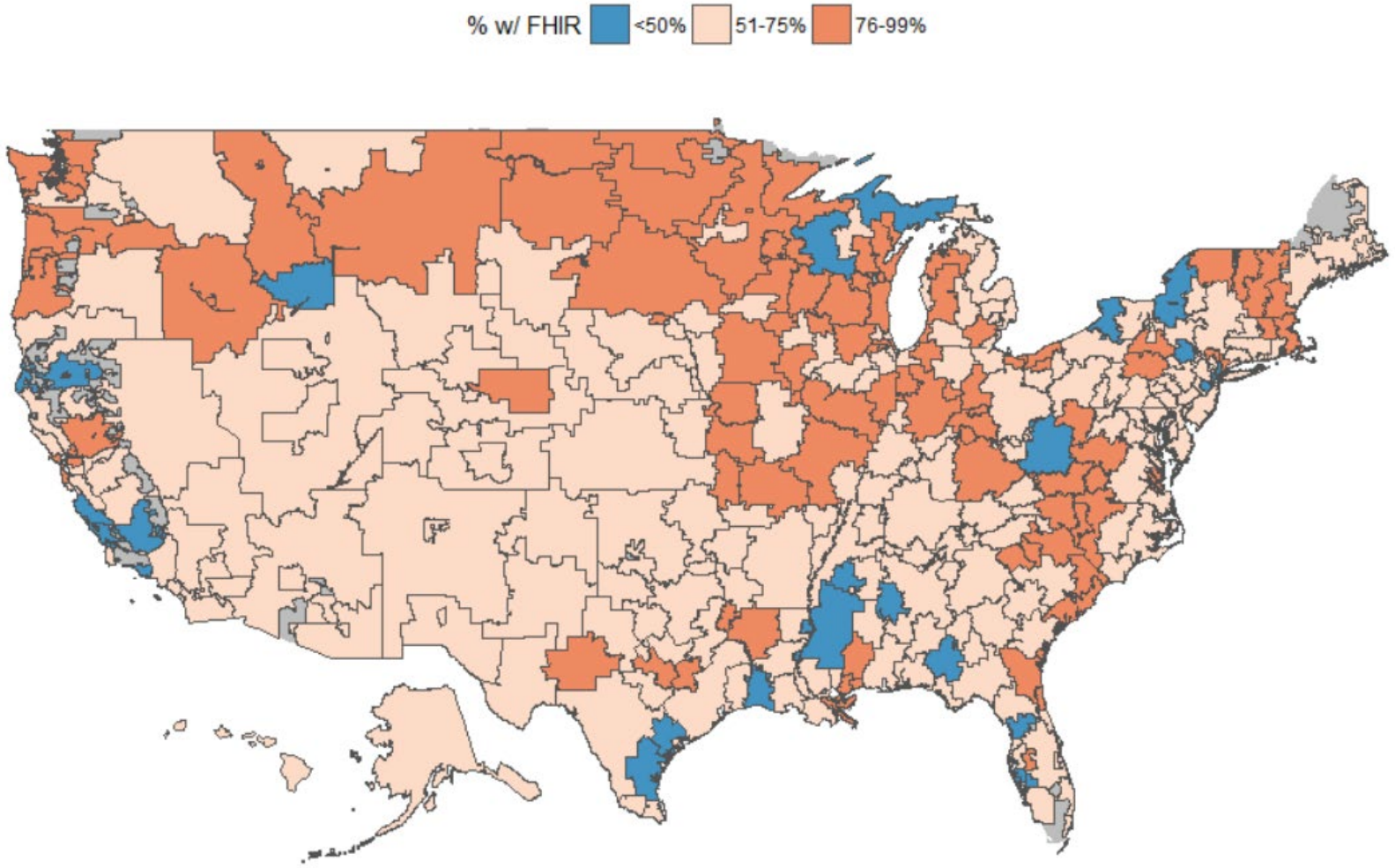
Ten Developers with the Largest Market Share	API standard Referenced	% of Hospitals Report Using	% of Clinicians Report Using
Allscripts	FHIR Release 2	5%	9%
athenahealth	FHIR Release 2	<1%	5%
Cerner	FHIR Release 2	21%	5%
CPSI	FHIR Release 2	10%	—
eClinicalWorks	FHIR Release 3	—	7%
Epic	FHIR Release 2	21%	27%
GE	FHIR Release 2	<1%	5%
MEDHOST	FHIR Release 2	5%	—
MEDITECH	FHIR Release 2	20%	<1%
NextGen	FHIR Release 2	<1%	6%
Total		82%	64%

% of **hospitals** with a 2015 Edition certified-API enabled with FHIR



Source: CHPL; Medicare EHR Incentive Program
Notes: (1) gray areas = HRR with no hospital; (2) The most recent attestations to the Medicare EHR Incentive Program were used to determine EHR installations for all hospitals. These attestations may not reflect the most currently installed technology for all hospitals. In some cases, %'s may be underestimated for HRRs.

% of **clinicians** with a 2015 Edition certified-API enabled with FHIR



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EHRs will become more like “platforms”

- Platforms have transformed other industries
- **EHR-as-Platform**: EHR responsible for:
  - User and patient management
  - Core workflows (orders, etc.)
  - Legal medical record (data persistence)
  - Regulatory requirements
- **Platform extensions** to:
  - Address functional gaps
  - Increase user choice
  - Encourage innovations





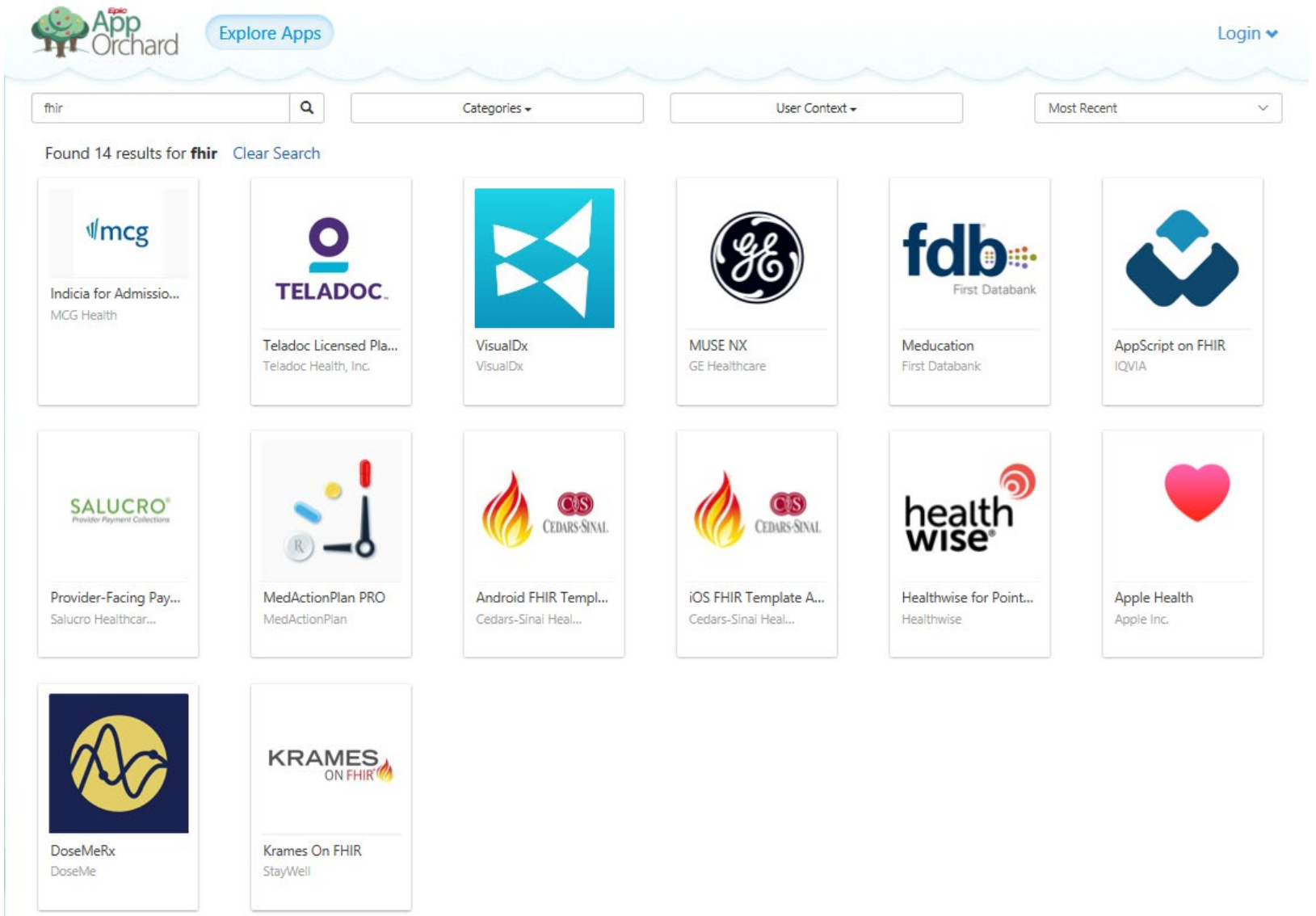
SMART®

HL7® FHIR®

“Substitutable Medical Applications and Reusable Technology”

“Fast Health Interoperability Resources”

Epic App Orchard – 14 FHIR Apps



Application of FHIR

- FHIR is suitable for application in a variety of settings:
  - The classic in-institution exchange of data between systems
  - In a regional setting (like the Connected Networks in Minnesota)
  - On a national scale, e.g. in national health hubs or EHRs
  - In social media and mobile applications

Benefits to Clinicians

- Improved access to more complete, higher quality, patient information including genomics
- Easier to organize investigations and management
- Greater choice and variety of applications and devices to support clinical workflow
- Increased IT development speed
  - Solving business problems faster, in innovative ways
- Improving Decision Support
- Clinicians can get involved in system design
- Time savings

Benefits to Health Care Organizations

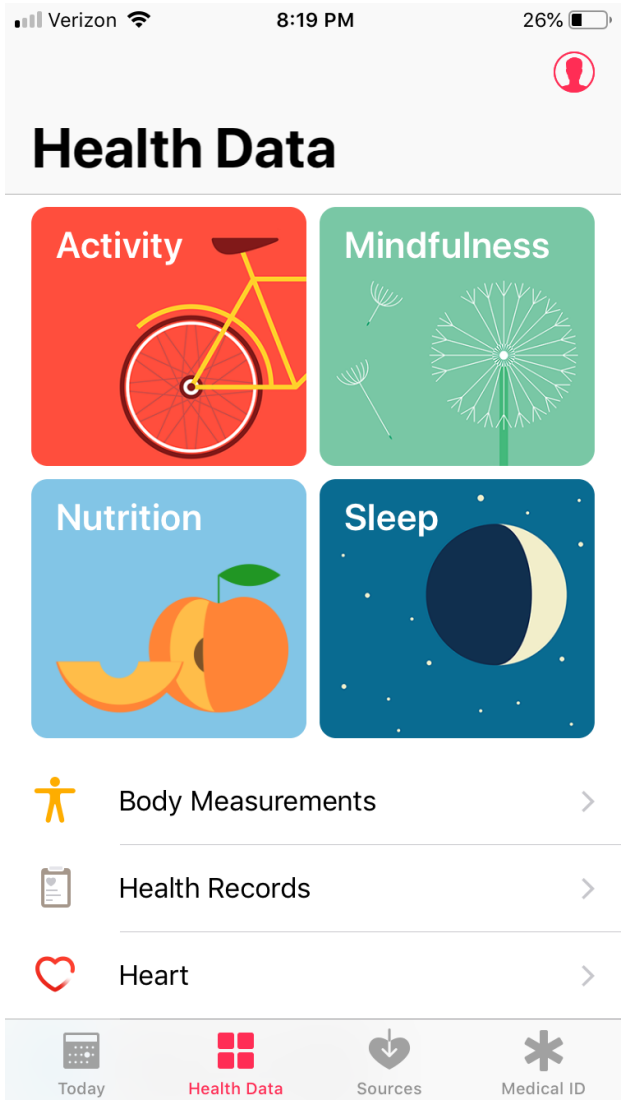
- Most vendors are committed to FHIR
- Should lead to:
  - Faster deployments
  - Lower cost interoperability
  - Reduced vendor lock-in as FHIR is adopted by source systems
- Standards-based APIs to support internal application development
- Capture data for analytics and Decision Support
  - Management
  - Population

Benefits to Consumers

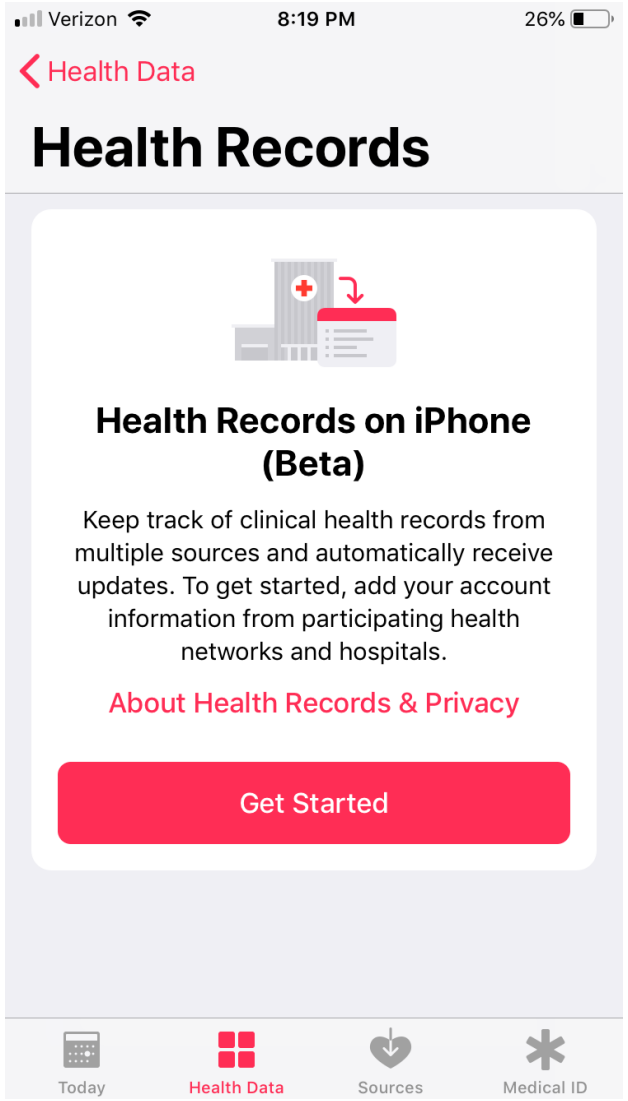
- Prospect of improved patient engagement apps, enabled through FHIR APIs to clinical systems
  - Can engage more deeply
- Clinician has access to a more complete patient record and improved decision making tools, leading to:
  - Better decision making
  - More efficient diagnosis and treatment
  - Higher quality care
- Overall improved patient experience – reducing wasted time

Consumer App Example

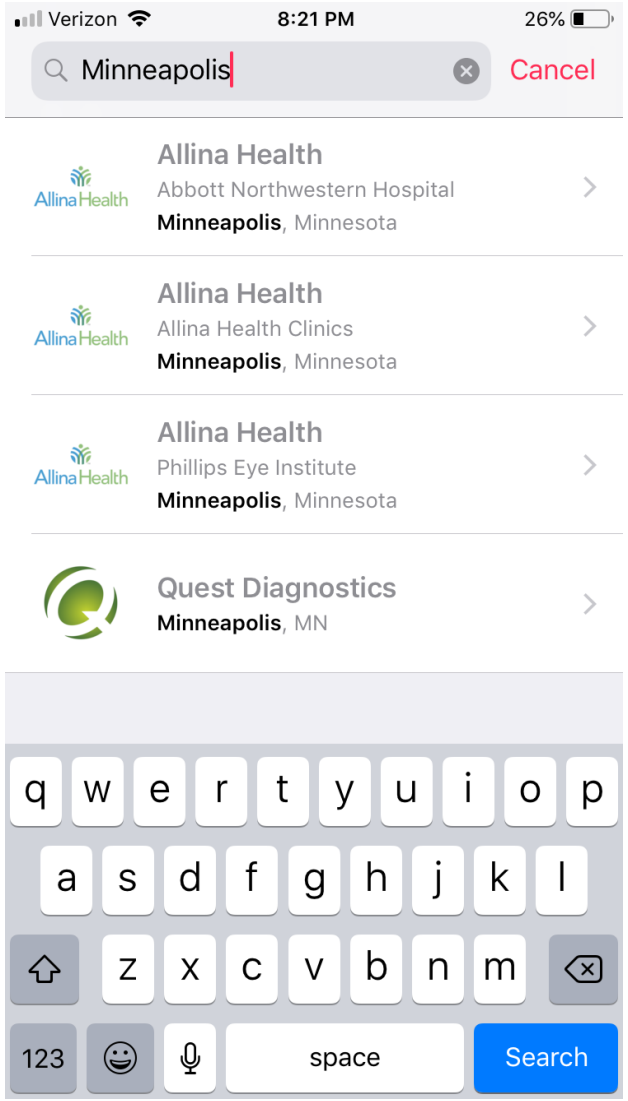
Apple Health iPhone App



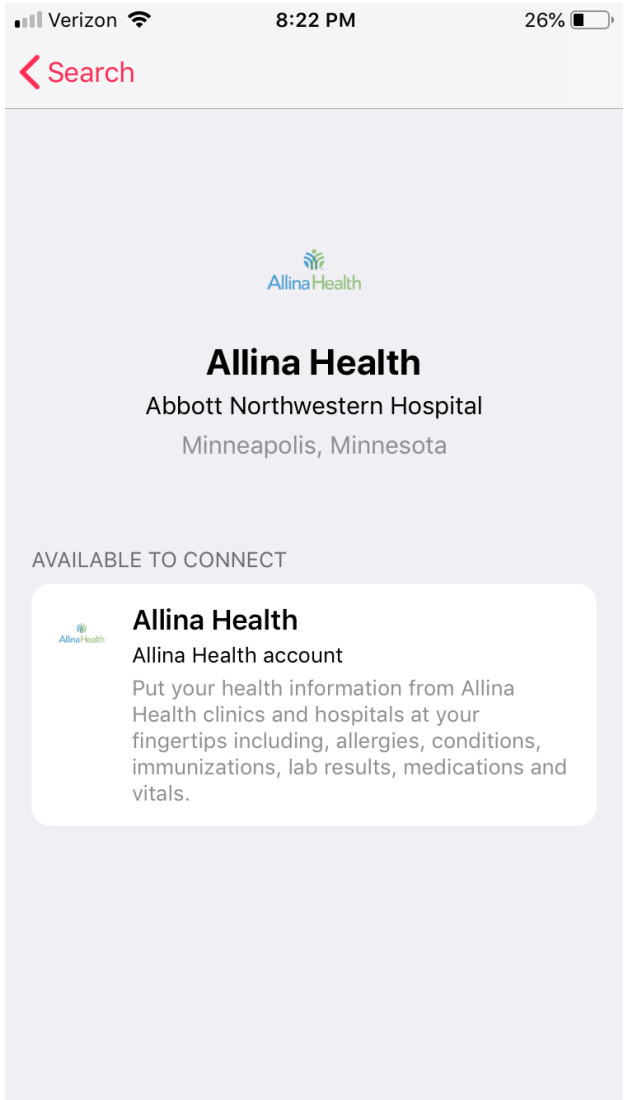
Health Records



Search for providers

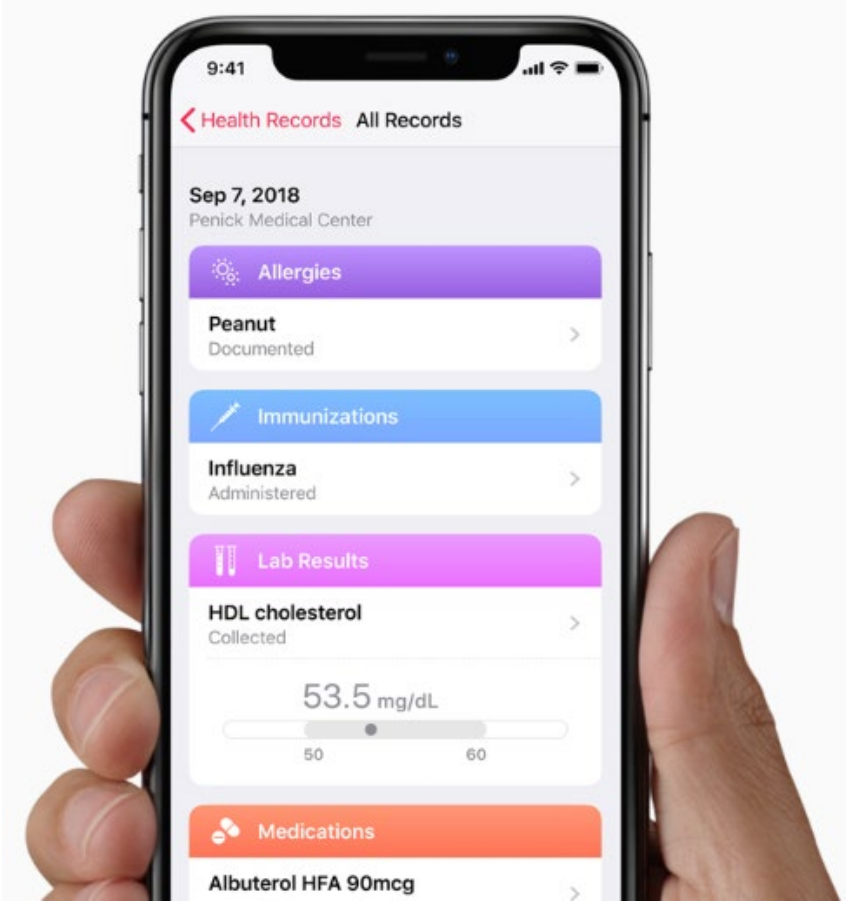


Allina Health example



Apple: Empower your patients with Health Records on iPhone

The Health app makes it **easier** than ever **for users** to **visualize and securely store their health records**. Now your **patients can aggregate their health records from multiple institutions** alongside their patient-generated data, creating a **more holistic view of their health**.



Apple: EHR integration with your iPhone

From your EHR to their iPhone, in a few simple steps.

We've worked closely with Epic, Cerner, athenahealth and others in the healthcare community to make it easy for you to enable this feature.

Built with industry standards.

The connection between your electronic health record (EHR) and a user's Health app utilizes **FHIR (Fast Healthcare Interoperability Resources) standard APIs** as defined by the Argonaut Project.

Supported data types are allergies, conditions, immunizations, lab results, medications, procedures and vitals.

Apple Health: Put your patients at the center of care

Enabling your patients to get their health records on iPhone can **help them more actively participate in their health** and help drive overall awareness of your patient portal.

Engage your patients in their own health.

When your patients have their medical information organized into one view right on their iPhone, it can help them better understand their overall health and provide key elements of their medical history when visiting a new doctor.

Apple: Complement your patient portal

Connecting to the Health app has the **potential** to **drive additional awareness and adoption of your patient portal** because authentication through the Health app can be set to use the same patient login credentials as your portal. **And this can help your patients discover additional services you offer**.

"The ability to obtain your health records from anywhere via your iPhone is nothing less than magic. Apple has put the power in the hands of patients, who are the most important stakeholders."

Dr. Shafiq Rab

Chief Information Officer, Rush University Medical Center

In Summary

- FHIR is the latest HL7 interoperability standard
- Promises to revolutionize sharing of healthcare information
- Enormous interest locally and internationally
- It future-proofs your IT investment
- Is not a silver bullet
- FHIR is disruptive
- FHIR IS in your future

Questions?

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