The Fast Healthcare Interoperability Resources (FHIR) specification is gaining widespread attention for its potential to foster innovative approaches to sharing clinical data. As a standard, FHIR (pronounced “fire”) is just getting started; it cannot yet do everything people may want. In fact, like many innovative concepts, hype around the standard far exceeds both what it can actually do today, and what it is intended to do when it does reach maturity.

Nevertheless, FHIR is an important standard for the future of healthcare systems trying to survive in a world of value-based reimbursement, coordinated care and population health management. All such initiatives require collaboration supported by shared health records. FHIR is a prime candidate to become the standard of choice to gather the data for this collaboration, and for mobile and web applications that bring the industry closer to comprehensive, timely health information sharing.

The complex route to clinical interoperability
As the healthcare world has become more digitized, so, too, have opportunities for improved coordinated care. However, seamless communication between providers has been difficult, in part because of the complexity of existing information-sharing standards dating back almost 30 years.

Health Level 7’s HL7™ v2 standard, originally developed in 1989, is still in use today and is still generating cryptic messages that make it prone to implementation errors, according to Matthew Spielman. Spielman is a product manager for HealthShare, a family of health information sharing solutions created by InterSystems, a Cambridge, Mass.-based software and technology provider of solutions for rapid application development, integration and healthcare information systems.

Without any “rules of the road,” Spielman added, there can be a high degree of variability in the implementation of an HL7 v2 interface between the same two clinical systems at different organizations. This results in more costly and lengthy implementation processes and makes it difficult to achieve any economy of scale in integration.

HL7 v3 solved some of those early complexity problems, but it, too, was seen as difficult to implement consistently. Then, about 10 years ago, the same standards body released Clinical Document Architecture (CDA™), which is designed to create portable documents that can shift from one clinical system to another, while still retaining their meaning. CDA helped healthcare organizations meet requirements for the meaningful use of electronic health records (EHRs), but it still required a very specialized skill set and high level of knowledge to use.

A better way
Health information technology pundits believed there had to be a better way to communicate, leveraging existing interoperability standards in a way that was more intuitive to use. So about five years ago, a group of industry experts began to look at the best practices other industries had used in creating consumer applications such as travel management, personal banking and social media across platforms. Thus FHIR was born.

The standard is easier to set up. It is effective at querying one system at a time, and for facilitating point-to-point communications, much like HL7. To create comprehensive views of patients

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– Matthew Spielman
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InterSystems

The standard bodes well for future collaborative care models, even if it’s still in its infancy
across all sources, you also need a health informatics platform to coordinate connections between systems. And to build population health applications, FHIR needs to serve as the conduit to a robust, timely health record repository that spans all information sources, and all information standards.

“FHIR is to interoperability in healthcare what a battery-powered drill is to a screw driver,” Spielman explained. “As the standards community delivers on its promise, FHIR will provide vastly simplified, accelerated and more effective clinical operability between systems, as well as opportunities for tremendous innovations in the industry. But you still need other tools in the toolbox.”

FHIR lowers the knowledge and skills bar so more developers can build information solutions, particularly on mobile and web platforms, for easier data access across different systems, he added. Patients and providers can call up health data more conveniently to determine optimal care options and track compliance.

The biggest challenge with FHIR at the moment is ensuring the greater healthcare community understands what it really can do now, and when new capabilities will come online for practical use. “The healthcare industry – doctors, IT departments and even software developers – has been concentrating on implementing and adopting EHR technology for the federal meaningful use program,” Spielman said. “But that didn’t automatically result in interoperability. No one wants to go through another major implementation cycle to reach that next milestone. So it is appealing to think that if we just got this new standard deployed, our problems would be solved.”

As an example, Leftwich noted that a bank ATM has 10 data elements in one terminology system, while one widely used healthcare terminology system has some 350,000. “The challenge is in defining those data elements precisely in a way everybody can agree on, so we can exchange data interoperably, and have the data mean the same thing to the receiver as to the sender,” he said.

That’s going to take time. Within a decade, Leftwich sees hospitals, clinics and medical practices pulling information from a wide variety of sources into one patient- and provider-friendly shared health-information platform that is securely accessed by mobile devices and apps.

**Widespread adoption is underway**

Russell Leftwich, MD, who serves on the HL7 International board, believes FHIR-based applications will spread rapidly as the standard matures. He likens the standard’s maturity journey to the evolution of the iPhone, where capabilities and use will increase with each successive version. “The potential for what it will be able to support over the next few years is tremendous,” said Leftwich, who is currently senior clinical advisor for interoperability at InterSystems, and serves as an adjunct assistant professor of Biomedical Informatics at Vanderbilt University School of Medicine. “But what it can do right now is fairly limited,” he added.

“FHIR eventually will enable healthcare organizations to search across different servers the way we now look for various types of data using the Internet,” Leftwich said. “What’s missing, but being created, are definitions for the different data elements involved in healthcare. There are a lot more of those than there are for your typical social media and financial transactions.”

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**Lots of potential, no silver bullet**

Spielman said it’s important to stress that FHIR has great potential, particularly with green-field development and a solid infrastructure to support it. “Whether it’s an EHR or whether it’s a health information exchange, there needs to be a clinical platform solution sitting behind it that provides value from the data that FHIR delivers,” he said.

“It’s lightweight and easier and faster to implement and it’s well-suited to different use cases,” Spielman continued. “When we embrace FHIR, and back it up with the robust solutions and platforms available to us, then we can not only move beyond our interoperability woes, but realize the full potential of shared health information.”

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