

TECHNOLOGY: PART I

CLINICAL INFORMATION INTEROPERABILITY: HSPC, CIIC, AND THE ROAD AHEAD

Ajay Dharod, MD; Lipika Samal, MD, MPH; David W. Bates, MD, MSc

Dr. Dharod (adharod@wakehealth.edu) is an assistant professor of medicine in the Section of General Internal Medicine at the Wake Forest School of Medicine. Dr. Samal (lsamal@bwh.harvard.edu) is an assistant professor of medicine in the Division of General Internal Medicine at Brigham and Women's Hospital. Dr. Bates (dbates@bwh.harvard.edu) is a professor of medicine and chief of the Division of General Internal Medicine at Brigham and Women's Hospital.

As general internists, we have likely experienced the challenges of caring for patients seen in multiple health systems with multiple medical records. Obtaining information from each of these disparate systems can be frustrating, time consuming, and administratively challenging, and as a result patient care sometimes suffers. To that end, fully integrated electronic health record cross-platform interoperability, herein referred to as “interoperability,” is an essential substrate for delivery of safe clinical care, innovation in health care, quality improvement, and research. Although, there has been progress, interoperability remains elusive, and, in most cases, data do not flow from system to system. This article will describe the recent developments in interoperability and challenges facing interoperability.

In the engineering and IT industries, data and communication standards have been universally accepted and are consistently implemented across vendors, while the healthcare industry lags behind.¹ Consistency of structured health record data capture in coded form (e.g., International Classification of Diseases) and data modeling (e.g., unifying, uniform representation of blood pressure measurement with associated details regarding units of measurement, body location, etc.) across clinical domains is not yet fully functional.^{1,2} Importantly, no single methodology for data modeling has been accepted across the healthcare industry.

The Healthcare Services Platform Consortium (HSPC) and the Health Level 7 (HL7) Clinical Information Interoperability Council (CIIC), have come together to form a new organization and convened a meeting of clinical societies, academics, and government representatives with the goal of achieving full interoperability for healthcare data.³ Technical and clinical representatives included the American Society of Clinical Oncology (ASCO), the American College of Obstetricians and Gynecologists (ACOG), the American

College of Physicians (ACP), the American College of Cardiology (ACC), the American Medical Association (AMA), the American Academy of Family Physicians (AAFP), nursing, quality measurement, federal government (Office of the National Coordinator for Health Information Technology [ONC], Agency for Healthcare Research and Quality [AHRQ], US Food and Drug Administration [FDA]), and many vendors. This meeting was an extension of the work begun in the clinicians' track of the HL7 Partners in Interoperability meetings. The purpose of the CIIC is to obtain stakeholder commitment to work together to develop and use common data models for clinical data elements.

Two keynote presentations from Patti Brennan, PhD, RN, director of the National Library of Medicine (NLM) and Alexandra Mugge, deputy director and interim chief health informatics officer, Division of Health Information Technology at Centers for Medicare & Medicaid Services (CMS) elucidated the roles of the NLM and CMS in promoting interoperability. Among all attendees, there seemed to be a clear consensus regarding the overarching goals and ideal future state.

Challenges in the Journey to Full Interoperability

There are multiple stakeholders nationally and internationally with disparate motivations and priorities. Furthermore, the HSPC CIIC must incorporate business expertise such that the three domains (clinical, technical, business) are all aligned and focus efforts effectively. Currently, the HSPC CIIC has substantial technical expertise available and is developing a stronger base of clinical expertise. Additionally, as noted above, a single methodology for data modeling has not been accepted across the healthcare industry. There have been several efforts at creating common data models, several of

continued on page 2



TECHNOLOGY: PART I (continued from page 1)

which have not been broadly adopted, although, the HL7 Fast Health Interoperability Resources (FHIR) standard and HL7 Consolidated Clinical Document Architecture (C-CDA) have gained some traction. Furthermore, the Substitutable Medical Apps and Reusable Technology (SMART) application platform seems to have broad support. One example of a proof of concept “SMART on FHIR” application is the “Bilirubin Chart” developed by Intermountain Healthcare, which overlays bilirubin results over a time-based risk chart.⁴

NLM and CMS Perspective

Both organizations recognize the importance and potential value of interoperability and have plans to devote resources towards its pursuit. Notably, the NLM has a clearly articulated scope and vision for their involvement in promoting interoperability. Some currently available resources from the NLM include the NLM Common Data Element (CDE) Resource Portal and NLM Value Set Authority Center (VSAC). NIH encourages the use of CDEs in clinical research, patient registries, and other human subject research to improve data quality and opportunities for comparison and combination of data from multiple studies and multiple electronic health records. This portal provides access to information about NIH-supported CDEs as well as the tools and resources needed to assist investigators developing protocols for data collection. The VSAC is a repository and authoring tool for public value sets created by external programs. Value sets are lists of codes and corresponding terms, from NLM-hosted standard clinical vocabularies (such as SNOMED CT®, RxNorm, LOINC® and others) that define clinical concepts to support effective and interoperable health information exchange. The VSAC also provides downloadable access to all

official versions of value sets specified by the CMS electronic Clinical Quality Measures (eCQMs).

CMS resources include Blue Button 2.0 and the Virtual Resource Data Center, both of which are promising programs. Leveraging the HL7 C-CDA standard, Blue Button 2.0 from CMS is an API that contains four years of Medicare Part A, B, and D data for 53 million Medicare beneficiaries. The CMS VRDC is a virtual research environment that provides access to Medicare and Medicaid program data in a more efficient and cost-effective manner. The CMS commitment to the goal of achieving interoperability is clear given the recent focusing of the “EHR Meaningful Use” program towards “Promoting Interoperability.”

SGIM Role and Recommendations

We believe Clinical Informatics is a natural career pathway for clinicians with an interest in General Internal Medicine and promoting interoperability. As front-line clinicians, general internists will realize the benefits from fully integrated health record cross-platform interoperability. Furthermore, in the era of evolving reimbursement models, there may be opportunities for monetizing the development of computer-interpretable clinical guidelines built into EHRs. SGIM could be a leader in this area. By encouraging SGIM members to focus on NLM and CMS priorities and leveraging currently available resources (i.e., NLM Common Data Element Resource Portal and Value Set Authority Center, CMS Blue Button 2.0, and Virtual Resource Data Center) where possible in clinical innovations, quality improvement projects and research proposals, SGIM can maintain a leadership role in pushing these efforts forward. In addition, SGIM has a large role to play in communi-

cating the clinician perspective and should do this in a way that advocates for a reduction in un-coded information (i.e., faxed and scanned documents) and an increase in exchange of structured data in routine clinical care. Most of the benefits of interoperability only accrue if most of the data being exchanged are sent in coded form.

The HSPC CIIC hopes to play the main role in promoting interoperability, although it has competitors. To ensure a voice in shaping the future of interoperability, it seems prudent for SGIM to maintain some degree of involvement in the evolution of the organization. We recommend sending at least one representative from SGIM per year to maintain a voice in the organization and to understand the direction of the organization and encourage progress towards interoperability.

Finally, while interoperability holds great promise, it seems prudent for SGIM leadership to consider optimal timing for resource deployment. Currently, the roadmap towards interoperability appears rocky, and while we think SGIM must be involved, it may be a long-term investment, as it is not clear when interoperability will be achieved. As the roadmap evolves, we recommend SGIM regularly reevaluate investing resources into development of information resources that will affect our practice, such as computer-interpretable clinical guidelines. If interoperability of coded data is achieved, the potential return on investment for our physicians, the profession of medicine as well as our patients, families and communities will be profound.^{2,5}

References

1. Everson J, Adler-Milstein J. Gaps in health information exchange between hospitals that treat many shared patients. *J Am Med Inform Assoc.* 2018;25:1114–21.

continued on page 3

**TECHNOLOGY: PART I** (continued from page 2)

- doi:10.1093/jamia/ocy089.
2. Walker J, Pan E, Johnston D, et al. The value of health care information exchange and interoperability: There is a business case to be made for spending money on a fully standardized nationwide system. *Health Aff (Millwood)*. 2005;24:W5-10-W5-18. doi:10.1377/hlthaff.W5.10.
 3. HSPC. 17th General Meeting of HSPC Joint with CIIC. <https://healthservices.atlassian.net/wiki/spaces/Meetings/pages/278134786/17th+General+Meeting+of+HSPC+Joint+with+CIIC>. Accessed September 28, 2018.
 4. Bilirubin Chart. SMART App Gallery. <https://apps.smarthealthit.org/app/bilirubin-chart>. Accessed September 18, 2018.
 5. Bates D, Samal L. Interoperability: What is it, how can we make it work for clinicians, and how should we measure it in the future? <https://onlinelibrary.wiley.com/doi/abs/10.1111/1475-6773.12852>. Published March 11, 2018. Accessed September 28, 2018.