NATIONAL ACADEMY OF MEDICINE

PROCURING INTEROPERABILITY

ACHIEVING HIGH-QUALITY, CONNECTED, AND PERSON-CENTERED CARE

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PERSPECTIVES ON THE ISSUE: AN NAM PUBLIC SYMPOSIUM

In addition to consultations and literature reviews to elicit perspectives and experiences from the field, the National Academy of Medicine convened a daylong listening and discussion meeting among health care delivery system leaders and related stakeholders. The purpose of the meeting was to critically review the current state of interoperability, evaluate the recommendations discussed in the earlier draft of this report, and discuss barriers to and priorities for establishing true digital integration across the nation's health care system. Participants and attendees included representatives of government agencies, health care systems, health IT companies, and other organizations concerned with health care delivery or advocacy. Through this dialogue, health care delivery system leaders explored ways to partner with each other in charting the glide path toward mission- and value-driven health technology acquisition. Meeting participants highlighted the fact that procurement is only one of many factors at play; regulations, incentives, and other market forces have to converge to truly move the needle. Meeting participants also stressed the need to accelerate interoperability to power consumer- and patient-centered care delivery in a cost-effective and equitable fashion. Feedback received from the discussion has been used in producing the final version of this Special Publication. The full agenda and the list of participants are in Appendix B, and the session recordings are available online at https://nam.edu/interoperability.

MEETING SUMMARY

After opening remarks by Victor Dzau and Michael McGinnis from the National Academy of Medicine and Harvey Fineberg of the Moore Foundation, David J. Shulkin, Secretary of Veterans Affairs (VA), offered his support for the goal,

underscoring that the VA is looking at how its own procurement policies can be a model and facilitator of a nationwide solution to interoperability.

> *This conference is coming at a very good time for what we are dealing with at the VA . . . We are looking now at how we, with the largest implementation of electronic medical records in the history of the country, can help drive [national interoperability] . . . We want to be part of the ideas and solutions that you are creating today. We think this is absolutely essential that we get this right, not only for the VA but for the country, and we believe that now is the right time to do this.*
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> — David J. Shulkin, *US Secretary of Veterans Affairs*

Three stage-setting panels in the morning focused on the current landscape for interoperability in health care, the content and recommendations of the draft paper, and system-wide strategic considerations for interoperability. The afternoon panels assessed marketplace contributions, strategic priorities for health care system leaders, and CEO perspectives on the topic. The day ended with a discussion of priority steps. Presented here are representative key points from the day's presentations and discussions.

OVERVIEW OF INTEROPERABILITY IN HEALTH CARE

In setting the stage for the day's discussions, the first panel reviewed definitions and core elements of interoperability; the current status of digital interoperability in health, including roles and the status of existing standards; previous and ongoing initiatives to promote interoperability; and barriers and rate-limiting factors.

Don Rucker, Office of the National Coordinator for Health IT, pointed out that health IT has made great progress in the last decade, moving from almost entirely paper-based medical records to a penetration of 86 percent among office-based physicians and 98 percent among hospitals and health systems (Office of the National Coordinator for Health Information Technology). In addition, 93 percent of hospitals offer patients online access to health information through a portal. Four out of five hospitals allow patients to download their health information, reported Chantal Worzala of American Hospital Association, and a growing number of hospitals offer online prescription refill requests, appointment scheduling, bill payment, and secure messaging with providers (American Hospital Association [AHA], 2018). Much of the progress can be attributed to the regulations and incentives included in the HITECH Act and other government programs, but consumer demand and cost efficiency have also played a role.

Part of the reason why the prevalence of EHRs—and the increasing amount of data within organizations—has not translated into significantly improved clinical decision making or health outcomes is related to the limited capacity for seamless cross-communication and information exchange. Multiple EHR platforms and versions of platforms complicate the sharing of health information across and even within health organizations. Regional Health Information Exchanges have had only limited success on a local level, but even less on a national level. The development of standards such as open APIs, RESTful, JSON, and especially FHIR has helped in some instances, but has not solved the problem. At this point, most interactions involve pushing data—sending a patient's record or aggregate data from one health care entity to another. Some organizations are starting to pull data (query and retrieve), but this has proved to be much more difficult. At points of care, data do not flow easily among the many devices used in patient care both in hospitals and in outpatient settings. Interoperability becomes a potential patient safety and efficiency concern when devices at a patient's bedside cannot talk to each other or to the EHR.

The issue has garnered the attention of Congress, said Rucker. The 21st Century Cures Act passed in 2015 contains language on interoperability to encourage open APIs "without special effort" and establishes penalties for information blocking (114th Congress, 2015).

The demand for interoperability has grown with new models of care that require more granular data sharing and data sharing both within and beyond the health care system. Value-based reimbursement depends on access to outcomes data and improving population health requires information sharing with organizations that address the social determinants of health. Several panelists pointed out that the definition of interoperability may need to be broadened to center less on providers and the health system, and more on making information usable and useful at both the level of the individual patient and at the population level. Although health information sharing had increased each year, significant barriers remain, including cumbersome workflow of information sharing, difficulties identifying the correct patient, increased challenges when exchanging information across different vendors' platforms, and recipients reporting that information is not useful.

Of primary importance to interoperability initiatives is ensuring data security throughout the process. This has been, and remains, a core patient interest, perhaps impeding demand for interoperability. But that may be changing. Although the level of consumer demand and expectation for interoperability has not been as great as in banking and other industries, fluid data exchange is necessary to

benefit patient and population health. More and more, patients and families express frustrations at its failures.

> *Part of the reason we are having problems with interoperability is that we have defined it too narrowly—in a very provider-centric way for a very long time. Historically, it has been from Provider A to Provider B about one patient . . . We need to think about interoperability in a much broader way, not as a onesies game but on a population level.*
>
> — Don Rucker, *Office of the National Coordinator for Health IT, US Department of Health and Human Services*

> *Interoperability is one of the most complex things we are trying to undertake in health care today . . . First, we need to make sure the right regulations and incentives are there . . . We then need to have the structure and technical capability to move information. Even if you were to get the information where it needs to go, the processes need to be in place so people needing to see the information can see it to make a decision. Last but not least, we need to make sure that information is needed, trusted, and accurate to be incorporated into a clinical decision. Each of these levels from the broader environment down to the individual decision makers is all dependent on each other. We've made tremendous progress, but we're trying to do something that's really hard.*
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> — Julie Adler-Milstein, *University of California, San Francisco*

Also considered in the conversation was the issue of needed regulatory actions, clearly necessary for standards but not without consequences. For example, Chantal Worzala of the American Hospital Association reported that nonclinical aspects of regulations cost the hospital industry $39 billion per year, or about $7.6 million per hospital or $1,200 per patient. Health IT ranks third in terms of this regulatory burden, behind billing and coding (American Hospital Association [AHA] 2018). So, interoperability's ability to reduce that burden is an important point needing elaboration.

NAM SPECIAL PUBLICATION ON PROCURING INTEROPERABILITY

Peter Pronovost, co-chair of the project's steering committee, presented the special publication in its draft form, which focused on leveraging procurement to foster interoperability across macro-, meso-, and micro-tiers. Working along

with other forces at play, the vision is to provide consumers a seamless experience that also reduces burden of care on providers, increases patient safety, decreases the number of medical errors, and reduces costs. The five action steps health care administrators can take to ensure interoperability—commit, identify, collaborate, specify, and assess—were presented to the audience, as well as the Technical Supplement, which laid out the framework for using the procurement process to advance interoperability at the institutional, regional, and national level, and included sample RFP language.

The steering committee drew lessons learned from other industries, such as cable television and the military, on how they moved from disparate systems to a more standard-based, modular purchasing model that allowed different segments to communicate more easily. One missing piece in health care is for purchasers of technology to specify their demand for interoperability in clear, technical terms within their purchase agreements and RFPs. By specifying interoperability requirements for new equipment and systems, health care administrators can collectively propel vendors to align around data exchange standards and to design interoperability into their products. The goal of this process is data liquidity, the free exchange of useful data for the benefit of all involved, in particular to patients and families who must be both cocreators and prime beneficiaries of the work.

> *The caregivers at point of care, the people delivering the health care infrastructure, and the people who are receiving health care have to be involved in the design process. We do not need to make the mistake that we made so many times in developing our systems, whether it is reimbursement systems or IT systems. We need the insights of the subject matter experts—in this case, the clinicians and caregivers at the point of care.*
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> — Meredith Karney, *Center for Medical Interoperability*

Panelists from different perspectives offered the business case for making the investment in interoperability, and their thoughts on the recommendations. They pointed out that, in other industries, a perceived crisis pushed leaders into action. Yet such a burning platform has not taken place in US health care despite the fact that nearly 20 percent of GDP spending is in health care while the United States shows poorer outcomes than other developed countries (Council and Population, 2013). Patient safety concerns should also push progress in interoperability. It is time, said Ashwini Zenooz, the VA's chief medical officer of EHR modernization, to all play together on the same field for the sake of patients, effectiveness, and efficiency of care.

SYSTEM-WIDE STRATEGIC CONSIDERATIONS

Interoperability, by its very nature, has wide-ranging implications for all sectors and stakeholders in the health care system. It affects patient safety, patient access to data, provider burnout, and cost of care. In the third panel of the day, health care leaders reflected on some of the system-wide strategic considerations in formulating approaches to interoperability. Several themes emerged:

Patient safety is the key motivator

Today's health care environment requires integrated technologies and rich data to prevent patient harm, enable learning, and transform care delivery models, said Julian Goldman from Partners Healthcare. In an era with new technologies and gadgets generating new data streams every day, health system leaders and administrators should prioritize and plan for interoperability to make our clinical environments safer and less prone to human error, but also to, first and foremost, set the stage for transformational progress in health care performance.

Technology should alleviate, not add to clinician burden

Clinician burnout and dissatisfaction is a critical issue for health care and one contributing factor to the clinician shortage in some parts of the country. One of the leading "dissatisfiers" for physicians is EHRs, reported Laura McGraw of the American Medical Association. She stressed that interoperability solutions should reduce—not increase—the burden on physicians, yet the current state of practice falls far short in that respect. In addition to patient safety concerns, the lack of smart cross-checking among devices at the bedside leads to alarm fatigue among clinicians. When clinicians choose what to record from a patient monitoring device in the EHR, a single number may not adequately reflect what is happening to the patient, said Andy Gettinger of the Office of the National Coordinator for Health IT.

Data liquidity is not merely a technology problem

The goal is to make the right information available at the right time and place to improve clinical decision making—which requires data liquidity. Ed Miller from the Center for Medical Interoperability pointed out that this isn't a technology problem; the capabilities exist. The key, he said, is aligning an ecosystem for facile information sharing.

Cybersecurity and trust affect pace of progress

Security breaches and hacking incidents within and outside of health care in recent years have caused great fear that accelerating data exchange may leave systems vulnerable to cyberattacks. However, the experience in other industries shows that interoperability does not have to compromise security. While demanding clear cybersecurity functionalities in procurement matters, the industry needs to develop and adopt secure data exchange protocols and identity management practices. Contrary to one belief, a participant posited, in many cases data exchanges using open APIs can actually be safer than locking systems down into separate silos.

ACCELERATING MARKETPLACE CONTRIBUTIONS TO INTEROPERABILITY

Access to data is an important part of a learning health system that is continuously moving toward the triple aim of better health, better care, and lower cost—or the "quadruple aim" that also factors in the importance of individual engagement. The different players in the health care ecosystem—including health care providers, software and device manufacturers, payers, and data engineers—can all contribute to hastening the pace of change and pushing the system closer to true interoperability. Representatives from several companies spoke on this topic during a lunchtime panel, sharing their concerns and ideas on how best to move toward interoperability.

Chuck Martel from Anthem, Inc. diagnosed health care with "clinical data disorder," a disease for which the treatment plan is still in development. "Data [represents] the health care system's most valuable and, to date, underutilized asset," he said. Simply digitizing the disorder of paper records is not enough to harness the capabilities of technologies; information must flow in order to be effective for the common good. In collaboration with seven hospital systems and using the FHIR resources, Anthem has established a private health information exchange that allows for aggregating administrative and clinical data into a holistic, longitudinal patient record.

Bram Stolk introduced his company, GE Healthcare, as a manufacturer of "devices that create the data that we're trying to make interoperable." Vendors must come together to start to create a uniform structure—and then not dilute the utility of data by adding proprietary fields. He added that companies like his must sell their products to make a profit, and profits drive action. Echoing the report's call for enhancing procurement specifications, "the only way for vendors to conform is when it's in the purchasing agreement," he said.

David McCallie from Cerner pointed out that reimbursement drives the structure of EHRs. Clinicians cannot enter free notes, because everything needs to be coded for reimbursement. This limits the usefulness of the record for other purposes. Value-based reimbursement—and the emphasis on population health, personalized medicine, and addressing the social determinants of health—reinforces the need for interoperability and widens the network beyond the traditional health care system. Information exchange needs to be incorporated into the workflow so that it can be used for wellness, diagnosis, insights, and decision making, added Rob Klootwyk from Epic. "It's time to move from viewing to doing more with data," said Klootwyk, "for the good of patients and to promote population health."

Google is focusing on interoperability from a population health perspective, Eyal Oren explained. He pointed out that data harmonization—the process by which institutions aggregate and structure data to suit reporting and other purposes—can make raw data less available to machine learning, deep learning, and other emerging large-scale analytic approaches.

> *We have technologies that are able to amass tremendous insights, recommendations, and learnings from data, but how and whether they will actually transform reality for people depends on the fundamental driver, which is always money. We have a lot of technologies that will increase quality, but how and when it actually impacts reality remains to be seen. It all depends on the ecosystem, the reimbursement models, and providers and payers.*
>
> — Eyal Oren, *Google*

STRATEGIC PRIORITIES FOR HEALTH CARE SYSTEM LEADERS

The afternoon started with a discussion among health system leaders on "where they sit and what they see" as they pursue interoperability within their organizations.

Admiral Raquel Bono, director of the Defense Health Agency (DHA), which administers 55 hospitals and 350 clinics in the United States and overseas, talked about how her agency wants to become a market force for interoperability as it works to create a value-based, integrated system of readiness and health. To give a glimpse of the challenge, she explained that 30,000 different types of intravenous (IV) pumps are in use in the DHA system and as many as 4,000 in the Pacific Northwest alone. Only three of these met standards for interoperability and cybersecurity. Having standard, interoperable, and secure equipment helps

ensure that the person using the equipment on the battlefield has the requisite training to use it safely, she noted.

As chief health information officer of a large for-profit health system, Jim Jirjis of HCA Healthcare said his goal is to make it easy for patients to get care and affiliate physicians to give care at HCA's 175 hospitals. He would like to use the vast amount of data captured at HCA's facilities to ensure the quality of care and value for patients and payers and to improve the work environment for the system's 70,000 nurses and other clinicians. Interoperability is a necessary ingredient for making this happen, he said. However, he thought that procurement alone would not be enough to achieve the goal. He also supported both policy and financial incentives for vendors to work together toward common interoperability standards and platform.

> *We're at a crossroads with our company and in health care. Our leadership are awakening to the power of our clinical data. Health care is a highly information-intensive industry; information has to flow . . . There is a real opportunity to use that for real time, just-in-time patient care . . . We are not unique in these subchallenges. I think there will be tremendous alignment with other providers, organizations, and systems that are entrusted with the delivery of highly regulated care.*
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> — Jim Jirjis, *HCA Healthcare*

As Chip Kahn of the Federation of American Hospitals pointed out, the lesson from HITECH is that money and regulation drive action. Although Admiral Bono "didn't disagree" with the need for regulatory guidance on interoperability, she thought that collectively the health care industry could drive and shape the market without relying on regulation.

HEALTH CARE C-SUITE PERSPECTIVES

Continuing the discussion from the C-suite perspective, the last panel of the day featured CEOs and CIOs from Mayo Clinic, Johns Hopkins Medicine, Cleveland Clinic, Montefiore Medicine, and Community Care Network of Virginia. They shared their experiences and perspectives on interoperability and its role in health care improvement.

Stephanie Reel, CIO at Johns Hopkins Medicine, pointed to her institution's emphasis on patient safety. Without interoperability, it is difficult to get a precise view of what is happening with patients and to deliver effective and efficient care, she said. She thought that to capture the attention of health care CEOs,

interoperability must be framed in terms of controlling cost, expanding coverage, improving the patient experience, and—most importantly—delivering safe, effective, and efficient care.

Other considerations that drive the quest for interoperability include the financial pressures on health care. Toby Cosgrove of Cleveland Clinic said the ability to deal with data can help drive efficiencies that can bring costs down. Several panelists and audience members pointed out that upgrading and switching out health IT systems—especially proprietary platforms—can be very costly both financially and in terms of labor. Interoperability has the potential to make the process of switching and upgrading health IT less burdensome.

The CEO of Montefiore Medicine, Steve Safyer, and the CEO of Community Care Network of Virginia, Rene Cabral-Daniels—both of whose organizations serve predominantly Medicaid populations—were excited about the potential to reach beyond the health care system to social service organizations through interoperability, noting that social determinants of health may affect patient outcomes more than health care. But such efforts add another layer of complexity. Cabral-Daniels recounted how Community Care of Virginia tried to share vaccination data with the Richmond school system. Even with willing partners, supportive funders, and adequate technological capabilities, sharing data across organizations and care settings proved difficult. The limited bandwidth at health care institutions may add to the challenge. Panelists agreed that market forces and regulation have to work in sync to drive action and bring about the alignment necessary to achieve interoperability.

SUMMARY SESSION

Reflecting the complexity of these issues, simple solutions were evasive, but several key next steps on the path to interoperability were posited. Attendees recognized that interoperability and data liquidity are a means to an end, rather than a goal by themselves. For purchasers of health information technologies, it is not merely a technical challenge at the organizational level, but a business process and a cultural challenge. However, there is tremendous potential in leveraging our individual and collective technology investment more purposefully toward better patient outcomes, increased health care value, and improved population health.

Health care delivery and its technology infrastructure are at a critical juncture today. Standards development and EHR adoption over the past decades lay a fertile ground for the next era of data liquidity, where key data across the care continuum—and across the life course—can trigger the right actions to the

right person at the right time. In the marketplace, it is also a critical time to make sure that the type of competition among health care providers and among technology vendors is focused on quality and value, rather than on exclusivity and proprietorship of data.

Such movement in the acquisition of health IT requires concerted efforts from many stakeholders represented at the meeting, including health care providers, health IT vendors, societies and associations, standards organizations, federal agencies, and payers. There is a need for one or more neutral convening bodies that can coordinate the generation and dissemination of knowledge as well as practical solutions. More specifically, a testing and certification body is critical in representing a shared resource for health systems and technology innovators large and small to participate in the evolution.

Strategic procurement undoubtedly holds exciting potential to move the health system toward true interoperability, especially when combined with the right policy and market incentives. It takes strong leadership and negotiation among the different players. Using the engineering mind-set to start with the end in mind, health care leaders with different perspectives—such as information management, risk management, or financial—will have to collaborate to ensure they're working toward the same goals. Clinicians and patients must be part of the process, including those who are not part of large, well-resourced organizations, to achieve an equitable, people-centered learning health system.

VI.

PROCUREMENT IMPLEMENTATION: ACTION CHECKLIST

Seamless system-wide digital, structural, and functional interoperability is critically important for health and health care activities to meet their full potential and the fundamental aims for health care set out by the National Academy of Medicine (formerly the Institute of Medicine) in the 2000 report *Crossing the Quality Chasm*–care that is: safe, effective, patient-centered, timely, efficient, and equitable (Institute of Medicine, 2001). Rapidly-developing capacities of the digital infrastructure of health care bring us much closer to the potential for achieving that vision. Our clinicians and our administrative leaders must have access to meaningful information, delivered at the point of care and at the point of decision making, to promote excellence while ensuring affordability. Data liquidity and functional interoperability can help eliminate waste and reduce unwarranted variation in care—a prerequisite for optimally leveraging constrained resources. Seamless inter-provider and inter-facility communication can ensure continuous and well-connected care. Because current circumstances are far short of the potential, achieving the vision requires determined commitment and leadership throughout the health sector, beginning with the choices and requirements of those who directly interact with the patients and families whose care they are stewarding.

Requisite standards and policies are still evolving, and the process will be one of ongoing continuous improvement, but there are many ways to accelerate the progress. Presented next, in checklist form, are opportunities and responsibilities for those who lead health care delivery at the front line, and, to whom the performance of each item is entrusted by their patients and families.

HEALTH CARE ORGANIZATION BOARD AND EXECUTIVE TEAM

- ☐ **Understanding.** Has our organization explicitly and adequately assessed the experiences and potential consequences due to shortfalls in digital interoperability for patients, families, and clinicians?
- ☐ **Commitment.** Has our organization expressly committed to seamless and affordable interoperability and meaningful information sharing as a core element in the care we provide, and in every acquisition action for our systems, services, and tools? Have we devoted resources to initial investment, implementation, and training, as well as to ongoing needs for maintenance and continuous improvement?
- ☐ **Governance.** Have we established an organization-wide safety, security, and interoperability steering group accountable for driving progress and guiding organization-wide procurement activities?
- ☐ **Priorities.** Has our organization inventoried our interoperability shortfalls and established corrective priorities for those areas in which the care experience and outcomes are most vulnerable?
- ☐ **Procurements.** Is our organization participating in/drawing on best available sector-wide language for interoperability specification requirements in procurement agreements for all our systems, services, or tools?
- ☐ **Protocols.** Is our organization adhering to our procurement protocols and thresholds to implement system-wide functional digital interoperability as a requirement of our purchases?
- ☐ **Cooperation.** Is our organization fully cooperating with other health care systems, payers, associations, vendors, and standards agencies in supporting a shared capacity for system-wide digital interoperability testing, clinical use case assessment, and best-practice purchasing specifications and strategies?
- ☐ **Assessment.** Is our organization actively cooperating with other organizations on assessment approaches that measure and incentivize progress in digital interoperability in health and health care, and are we applying them to assessing the core continuity, connectivity, and safety experience of patients, families, and clinicians?

OTHER KEY STAKEHOLDERS

Achieving seamless and affordable system-wide digital interoperability will also require the vigorous commitment and leadership of other central stakeholders:

digital health technology vendors; employers and payers; associations and purchasing cooperatives; and federal government agencies. Corresponding action checklists are presented below.

Digital health technology vendors

- ☐ **Commitment.** Have we clearly committed to the promotion of sector-wide functional interoperability and connectivity as a core performance feature of our products and services?
- ☐ **Transparency.** Do we share with our clients the set of compatible data exchange interfaces and standards, as well as assess and share the interoperability performance of our products?
- ☐ **Cooperation.** Are we fully cooperating with health care systems, payers, associations, other vendors, and standards agencies in supporting a shared capacity for sector-wide digital interoperability testing, clinical use case assessment, and best-practice purchasing specifications and strategies?

Employers and payers

- ☐ **Commitment.** Have we expressly stated our commitment to full digital interoperability as a core feature in the care for which we pay?
- ☐ **Requirements.** Do we require the existence of an interoperability strategy, implementation plan, and milestones as a core feature of our contracts for care?
- ☐ **Patient access.** Have we embedded incentives in our purchasing standards to facilitate access to claims data by patients, families, and developers of patient-facing technologies?
- ☐ **Capacity incentives.** Have we embedded incentives in our purchasing standards for adopting technology with certified capacity for effective and efficient information storage and sharing, including socio-demographic and behavioral data relevant to population health management?
- ☐ **Data sharing.** Do we have operational data-sharing and all-payer claims strategies to improve access, efficiency, and transparency with our data exchange partners, including care coordination managers, clinicians, regulators, and patients?
- ☐ **Cooperation.** Are we fully cooperating with health care systems, other payers, associations, vendors, and standards agencies in supporting a shared capacity for sector-wide digital interoperability testing, clinical use case assessment, and best-practice interoperability purchasing specifications and strategies?

Associations and purchasing cooperatives

- ☐ **Commitment.** Have we expressly committed to full digital interoperability as a core feature of the purchases for which we are the fiduciaries?
- ☐ **Procurements.** Are we drawing on, and contributing to, sector-wide performance specification language for interoperability requirements in procurement agreements for systems, services, or tools?
- ☐ **Cooperation.** Are we fully cooperating with health care systems, payers, associations, vendors, and standards agencies in supporting a shared capacity for sector-wide digital interoperability testing, clinical use case assessment, and best-practice purchasing specifications and strategies for our members?

Federal government agencies

- ☐ **Commitment.** Have we expressly embedded seamless interoperability as a core expectation and priority for health policy, in the standards in which we invest, in the care we deliver, and in the care for which we pay?
- ☐ **Policies, standards, and regulations.** Are our policies, standards, and regulations carefully aligned to ensure the existence of both the foundational starting points for seamless digital interoperability and the strategic vehicles for practical adaptation and continuous improvement?
- ☐ **Facilitation.** Are we fully supporting, encouraging, and facilitating the cooperative work of health care systems, payers, associations, vendors, and standards agencies to develop a shared capacity for sector-wide digital interoperability testing, clinical use case assessment, and best-practice purchasing specifications and strategies?
- ☐ **Care delivery.** In each of our care delivery agencies, and for each of our care delivery facilities, have we established an organization-wide interoperability steering group to drive progress and guide organization-wide and system-wide procurement and implementation activities?
- ☐ **Care payment.** Do we require that each facility receiving our reimbursement for care have an active organization-wide interoperability steering group working intra- and inter-organizationally to drive progress?
- ☐ **Assessment.** Have we established the taxonomy of the features of system-wide interoperability, set in motion to assess progress and identify opportunities for continuous improvement within organizations and across the nation?

The emergence of digital technology as a resource for progress in health and health care will yield transformative progress. That potential is achievable, but will be captured only with the determination of all participants to take the necessary steps for seamless system-wide interoperability. The opportunities embedded in the checklists above represent initial steps on which to build and improve. The dividends for patients, families, and clinicians throughout the nation can be historic.