“Why Can’t Electronic Health Records Be More Like Smartphones?”

A Call to Action from the Institute for Healthcare Improvement (IHI) Leadership Alliance

Draft: Open for public comment
IHI Leadership Alliance

The Institute for Healthcare Improvement (IHI) Leadership Alliance is a collaboration of major health care organizations that have committed to working with one another, as well as with our patients and our communities, to deliver on the full promise of the Triple Aim: better care for individuals, better health for populations, and lower per capita costs of care.

The Leadership Alliance focuses proactively on change from the “inside out” — on finding, testing, and spreading the best new ideas and solutions — rather than responding reactively to changes driven from the “outside in.” As health care quality leaders, we aim to be a voice for the change we want to see — identifying the key challenges we face in achieving the Triple Aim, shining a light on some of the possible solutions, and leveraging our influence to catalyze transformational change. One of the first issues the Leadership Alliance has chosen to focus on is the electronic health record (EHR).

Why Can’t Electronic Health Records Be More Like Smartphones?

The widespread acceptance and implementation of EHR systems has vast potential to transform and improve health care. Every member of the Leadership Alliance EHR Workgroup uses electronic health records of varying vendors, and we strongly support the potential that exists in health information technology. We are grateful for the pioneers, developers, vendors, and early adopters whose common goal is to improve health care delivery systems and health outcomes. The EHR, however, has yet to achieve its full potential to transform health care. Many struggle with leveraging this integral technology to meet the basic needs of providers, connecting providers to patients, and improving the safety and quality of care for patients. While the visual interface and the intuitive, interactive, application-friendly features of smartphones have rapidly become common, these features and functions are not commonplace in today’s EHRs. What leaders and EHR users are asking for is simple: “Why can’t electronic health records be more like smartphones?”

The Leadership Alliance recognizes that this is a transitional stage, as both health information technology and health care itself are rapidly changing. However, in times of rapid change, traditional rules may no longer apply; each of us needs to challenge, lead, and innovate to create the highly reliable systems of the future. We recognize that health information technology is a combination of people, process, and technology — all must work together. Building on the tremendous efforts of so many individuals and EHR providers, we believe that we are at a point where current electronic health record systems warrant breakthrough improvement and accelerated redesign. To achieve the full potential of EHRs, we need to support new or existing multi-stakeholder collaborations, using new guiding principles to accelerate bold EHR redesign to better meet provider and patient needs while leveraging electronic health records as a key system component in driving quality and safety to achieve the Triple Aim.
Key Design Principles

The Leadership Alliance has developed key redesign principles to provide a framework for change — the “10 New Rules for Radical Redesign in Health Care”:

- Change the Balance of Power
- Standardize What Makes Sense
- Customize to the Individual
- Promote Well-Being
- Create Joy in Work
- Make It Easy
- Move Knowledge, Not People
- Collaborate and Cooperate
- Assume Abundance
- Return the Money

This report explores and discusses redesign principles as they relate to electronic health records and proposes specific recommendations to accelerate transformational change.

Change the Balance of Power

Current Reality

Many providers and patients feel their voices have not been heard in the design and implementation of electronic health record systems. Electronic health records remain a challenge for many to use and serve the primary purpose of documenting services with linkage to billing and reimbursement.

Current EHR systems were not designed with the patient at the center and the patient as the ultimate owner of their electronic health record. Although many vendors have well-developed patient portals, patients’ access to their clinical data varies depending on a variety of factors including owning devices allowing for access, language barriers, and poor interoperability. Emerging incentives to include the patient voice in shared decision making and the shift to value-based payments may help better align providers to communicate with patients electronically or through telehealth. Ultimately, advancing provider culture related to patient’s role within the electronic record precedes any further advances in patient-friendly devices and hardware.

Call to Action

- Put the patient at the center of the process. Develop and adopt a set of unified patient rights for the electronic record (such as the right to view information). Every patient should have the opportunity to state in the electronic record what matters to them, such that the EHR can help create the social context, as well as the medical context, for care. The balance of power needs to shift to the patient and the patient experience, with a fundamental understanding that the electronic record is a patient service. This radically different mindset enables patients to become the inspiration for future change.
Standardize What Makes Sense

Current Reality

Electronic health records have great potential to improve reliability through the standardization of clinical work, data integration, clinical documentation, and reporting. However, many key features of clinical workflow, especially those that support quality standards of care, are not always “standard” or included in “standard” offerings of many EHR systems. Federally mandated core measures, for example, are not standard in every electronic system, and in some cases require modules at an additional cost. Examples include the difficulty in following the Hospital-Based Inpatient Psychiatric Services (HBIPS) psychiatric core measure processes, or the lack of standardization for the sepsis core measures. Predictive analytics and early warning systems such as Modified Early Warning Systems (MEWS) scores are not yet embedded in all systems. In many cases, proprietary interests and health system competition impede the sharing of clinically relevant processes, analytics, and data to improve the health of patients and populations.

Another significant barrier to widespread sharing of information is the lack of national interoperability standards that allow for seamless exchange of data. Health care systems using the same vendor’s electronic health record may be able to share more easily; however, health systems that do not use the same vendor or are not otherwise supported, such as public health agencies or skilled nursing facilities, have a difficult time with easy data exchange. Ironically, such entities must use a labor-intensive manual process to reconcile information from disparate sources.

Call to Action

- Standardize around a single national patient identifier to prevent mistakes in patient identification and wrong information being recorded. National patient identifiers would also allow for longitudinal tracking of patient outcomes.

- Standardize patient portals such that patients can have a uniform and single source of their medical record, as well as a portal for entering and tracking patient-reported outcomes, no matter what vendor an organization uses or which device a patient uses.

Customize to the Individual

Current Reality

Although standardization is vital, electronic records also need to contextualize care to the individual user and individual patient. For the end user, vendors do provide a wide array of customization options — templates, phrases, order sets, and other assistive strategies. Clinical decision support, with alerts and reminders, has the benefit of allowing individualized care suggestions such as allergy notifications. However, these documentation choices and alerts have become so abundant that the system can be difficult to use effectively, and users often suffer from “alert fatigue.” This results in users ignoring tools meant to facilitate best practice, thus diminishing much of their benefit.

For the patient, a computer should be ideally suited to analyzing multiple data sources to suggest the best individualized care pathway. However, not all important points of information are systematically and routinely captured to enable collaborative decision making. Great disparities exist across EHR systems related to their ability to effectively capture and integrate data indicative of particular social determinants of health, patient preferences, genomic history, information from medical devices, and patient direct-entered medical information. Predictive algorithms such as...
calculated Padua scores for venous thromboembolism risk, Charlson predictor scores, or MEWS scores, which may be early predictors of clinical deterioration, are just beginning to be incorporated into vendor technology, but are still not standard across platforms.

Call to Action

- Re-envision medical record documentation to support multi-contributor notes allowing synthesis of information from many points of view.
- Capture and support integration of the multiple other factors of care extending beyond clinical data to include genomic data, social and demographic status, patient-entered information and preferences, and external and home devices in order to give the most comprehensive picture of the true health status of an individual or a population.
- Support an open application programming interface (API) platform for collaboration and sharing and as a mechanism for allowing best practice applications (apps) or modules to link to any EHR system so that end users can choose the one that best meets their needs.

Promote Well-Being

Current Reality

Electronic health records have demonstrated exceptional capabilities for capturing important patient and preventive health data. Many organizations have made gains in improving specific quality measures and preventive health performance with the benefit of EHRs to help manage data flow and integration.

Current electronic health records have been engineered, however, to be more focused on hospital or clinic-based encounters of care, rather than on the entire continuum of care. While many smartphones and other software technologies have revolutionized social connectivity, location-specific information, and population assessment, the current electronic health records are lagging behind in many of these areas. There is a tremendous opportunity to accelerate the use of electronic information to help contextualize care; demonstrate longitudinal health beyond the office; connect patients to providers, and patients to each other; and identify natural clusters of patients who may benefit from learning from each other to improve their health and health care experiences.

Call to Action

- Move quickly to incorporate care outside the traditional hospital or clinic encounter in the electronic health record, including individual devices and patient-submitted data as opposed to just clinical data on episodes of illness.

Create Joy in Work

Current Reality

Despite the promise of better care, the widespread use of electronic health records has disappointed many users who feel burdened and frustrated with current systems. As a result, many clinicians feel that the burden of EHR use has negatively impacted satisfaction and joy in daily work. In many cases, the current electronic health record systems have become a source of immense frustration. Overburdened by electronic record keeping, many users feel as if they are nothing more than data entry clerks. Some users have difficulty finding data and feel computers have even interfered with their relationships with patients and other staff.
There is opportunity to leverage technology that has become common in most smartphones, such as intuitive screens, an easy ability to capture voice commands, the simple display functions that use pictures, color, and video to great advantage, and the ease of interaction with technology. Smartphones have engaged users in mobile platforms that require brevity and simplicity to fit into small screens. Mobility and the ability to access EHRs on tablets and smartphones are essential to accommodate providers’ and patients’ mobile trends.

Frustration associated with electronic health records is not simply a matter of vendors making better software. Health care organizations as a whole have not adequately re-envisioned clinical care for an electronically enabled environment. Current electronic systems have, in many cases, simply tried to recreate electronically what has been longstanding traditional work in paper. Many see this as a lost opportunity to redefine what the electronic record needs to be or could be.

**Call to Action**

- Accelerate the development of platforms that incorporate the many lessons of human factors engineering and current common technologies of smartphones and other software to simplify EHR systems: improved screen design, fewer clicks, fewer screen changes, and toggles to facilitate daily documentation, order entry, communication, and other elements of patient care.

**Make It Easy**

**Current Reality**

As discussed above, electronic health record technology can be cumbersome and non-intuitive to use, and may add to waste and non-value-added requirements. Re-envisioning clinical care for the electronically enabled environment will help reduce some of this waste. However, the concept of “make it easy” extends further, into continuously reducing waste and non-value-added requirements for patients, families, and clinicians (e.g., wasted clicks and redundant steps). Efficiency measures developed by vendors, such as patient direct online scheduling, e-visits, or other telehealth care, are not always widely adopted. Other efficiencies, such as patients being able to directly contribute to their own notes or prefill forms to streamline documentation, engage patients and potentially improve accuracy, but have not been readily adopted.

Reducing waste also includes interoperability — both internal and external. Current electronic records, even within single vendors, are often siloed and do not always coordinate with each other. The siloed nature of health care systems, from registration, to provision of care, to ancillary services, to billing, coding, and data abstraction, is reflected in current electronic health record technology. The silos do not often speak to each other, leading to continued inefficiency. Currently, every organization develops significant custom code, which makes it difficult and expensive to upgrade or share. This does not allow an easy mechanism for best-of-breed innovation and has forced each health care system to invent solutions to common problems.

It appears that there is much to learn from smartphone and other non-health care technology. Current EHR technology does not permit the use of open source applications, which could represent best practices that are specialty or workflow specific. Without an underlying architecture that supports the ability to connect with other applications, true ease of use will be hindered.
Call to Action

- Support an open application programming interface (API) platform for collaboration.
- Customize clinical decision support to the individual patient and provider, and avoid blanket alerts so as to prevent alert fatigue. “Push” information to providers in easier methods to receive, such as phone alerts.
- Encourage universal payer support for electronic visits, telehealth, and multi-contributor notes.

Move Knowledge, Not People

Current Reality

A significant benefit of electronic health records is immediate and shared communication without searching for a paper record. However, many electronic health records are fairly static and often require providers to be tied to a desktop computer, or to open the electronic health record to seek information. Many electronic health records lag behind smartphones and other software technology with their mobile platforms that “push” information, notify immediately, and contribute to a widespread user community instantaneously sharing information in a coordinated fashion and expanding networks of relationships and knowledge.

Moving knowledge also applies to the significant analytic capability and power inherent in electronic health record systems. Many vendors are beginning to leverage this technology for predictive analytics and population management, which should be encouraged and accelerated. Although significant progress has been made on Health Information Exchanges (HIE), most systems remain disconnected from each other, without the easy free flow of information necessary in a mobile environment.

Call to Action

- Foster collaboration across the field, including new partnerships with private industry software technology vendors to leverage their knowledge of mobility, social connectivity, and powerful data analytics.
- Leverage the power of data analytics, real time decision support, and registry capabilities to generate actionable knowledge from data. Use analytics to identify individual and health system practice patterns and trends. Determine which data is useful and design systems to extract and integrate data when and where providers need it.
- Continue to push towards true interoperability, both within and outside of the health care walls, regardless of vendor. All systems need to connect to the HIE.
- Rapidly develop and spread EHR support to areas historically not well integrated with the traditional hospital or clinic encounter such as behavioral health, post-acute care, home care, and community care.
Collaborate and Cooperate

Current Reality

Better outcomes rely on teamwork. Teamwork is necessary to support the multiple disciplines that must work together, including the patient and family, and across the continuum of care from hospital to clinic to skilled nursing facility, home, and community. Current care-based electronic systems do not easily cross the continuum, although medication lists and problem-oriented charting shared across disciplines and settings are important steps.

There is significant collaboration and sharing of best practices among many vendors, including large user group meetings, online sharing, and even state-wide vendor-specific user groups. Yet vendors and health care systems are competitive, and open sharing among vendors is not always encouraged. Electronic health records should not be an arena for competition on quality and safety. We believe that all vendors need to widely disseminate and adopt best practices to accelerate transformation.

Certainly, multiple organizations are working to improve electronic health records, including the vendors and many health care systems, as well as ONC, HIMSS, AHRQ, AMIA, ANIA, AMA, and many others. The IHI Leadership Alliance supports these efforts and believes that even more collaboration among all these organizations, in addition to collaboration with end users and families and with the Silicon Valley technology sector, are needed to promote new ideas and rapid transformational change that more fully leverage electronic health technology.

Call to Action

- Re-design electronic health record systems to seamlessly capture care across the entire continuum, including home, external facilities, and community care. All systems need to connect to the HIE to ensure standardization of shared data.
- Convene multidisciplinary, multi-stakeholder forums that foster collaboration and innovation between and among vendors, health care systems, payers, national organizations, and non-health care technology sectors, supported by expanded research.

Assume Abundance

Current Reality

Electronic health record systems have brought an abundance of many things, including an abundance of discrete data. Yet abundant data has not always brought knowledge or action. Many EHR vendors are investing heavily in analytic capabilities and accelerating their efforts to embed analytic support in their software, in some cases without fully understanding the appropriate context and use case. Health care systems are also investing in external data warehousing and analytic software, building their own capabilities around clinical information from an electronic record in addition to incorporating payroll, HR, customer satisfaction, and finance data to generate truly meaningful and actionable information.
Call to Action

- Accelerate efforts to embed analytic support in EHR systems such that providers have key clinical decision support at the time it is needed, and can also use analytics to identify individual and health system practice patterns and trends.

- Electronic records must provide the ability for health systems to understand and track performance of populations of patients, track utilization, and predict and prevent health problems in order to promote optimal, most efficient care.

Return the Investment

Current Reality

The Triple Aim calls for highest quality and safety of individual experience of care, with improved outcomes for populations, at lower cost. In order to lower costs, systems must decrease all sources of waste, become more efficient, and leverage their technology. There has been tremendous investment of resources — from the government, vendors, health care systems, and individual providers — in the development, implementation, and use of electronic health records. Meaningful Use funding from the federal government helped accelerate the adoption of EHRs across America. Yet few studies have thus far shown an actual return on investment. Health care systems may start seeing the best returns once they more fully leverage the benefits of the EHR, such as when they achieve HIMSS Stage 7.

Call to Action

- EHR vendors must commit to supporting evidence-based and nationally approved best practices, including Core Measures, HEDIS measures, CMS Pay for Performance programs, major national registries, and measures to support AHRQ's safer EHR practice guidelines. Inclusion of all such measures needs to be guaranteed in the commitment of every vendor without additional cost, such that every health care system is able to rapidly achieve improvements in efficiency, quality, and safety.

Summary

The IHI Leadership Alliance strongly supports the transformation of health care to achieve the Triple Aim of improved experience of care, improved health of populations, and improved efficiency to reduce costs, for every patient every time. Leveraging and improving current health information technology offers the promise of achieving this transformation. However, current electronic health record systems fall short and have led to increasing costs, frustrated users, patients at the periphery, and a failure to have seamless communication across all sites and vendors. Despite tremendous efforts, we are at a point where current electronic health record systems warrant breakthrough improvement and accelerated redesign.

This Call to Action uses the IHI Leadership Alliance's “10 New Rules for Radical Redesign in Health Care” as the framework for 20 specific calls to action to rapidly advance the ability to leverage EHR systems and other technologies to bring us closer to delivering the Triple Aim. Actions include simplify for ease of use, standardize yet individualize, co-produce with patients and clinicians, commit to true workflow redesign, support and embed all nationally recognized quality and safety evidence-based practices, support transparency and develop a seamless flow of information across the continuum of care regardless of vendor, and invest in informaticians. Most important, perhaps, is a call to view electronic health records as a patient service.
This Call to Action is not just for vendors to make changes; the solutions for improving technology require a broader perspective. We propose a multi-stakeholder collaboration harnessing the combined efforts of vendors, health care systems, government agencies, payers, regulators, patients, and non-health care technology sectors to improve health care by rapidly advancing technology and its application.

**Call to Action: Summary**

- Put the patient at the center of the process. Develop and adopt a set of unified patient rights for the electronic record (such as the right to view information). Every patient should have the opportunity to state in the electronic record what matters to them, such that the EHR can help create the social context, as well as the medical context, for care. The balance of power needs to shift to the patient and the patient experience, with a fundamental understanding that the electronic record is a patient service. This radically different mindset enables patients to become the inspiration for future change.

- Standardize around a single national patient identifier to prevent mistakes in patient identification and wrong information being recorded. National patient identifiers would also allow for longitudinal tracking of patient outcomes.

- Accelerate the development of platforms that incorporate the many lessons of human factors engineering and current common technologies of smartphones and other software to simplify EHR systems: improved screen design, fewer clicks, fewer screen changes, and toggles to facilitate daily documentation, order entry, communication, and other elements of patient care.

- EHR vendors must commit to supporting evidence-based and nationally approved best practices, including Core Measures, HEDIS measures, CMS Pay for Performance programs, major national registries, and measures to support AHRQ's safer EHR practice guidelines. Inclusion of all such measures needs to be guaranteed in the commitment of every vendor without additional cost, such that every health care system is able to rapidly achieve improvements in efficiency, quality, and safety.

- Support an open application programming interface (API) platform for collaboration and sharing and as a mechanism for allowing best practice applications (apps) or modules to link to any EHR system so that end users can choose the one that best meets their needs.

- Convene multidisciplinary, multi-stakeholder forums that foster collaboration and innovation between and among vendors, health care systems, payers, national organizations, and non-health care technology sectors, supported by expanded research.

- Foster collaboration across the field, including new partnerships with private industry software technology vendors to leverage their knowledge of mobility, social connectivity, and powerful data analytics.

- Continue to push towards true interoperability, both within and outside of the health care walls, regardless of vendor. All systems need to connect to the Health Information Exchange (HIE).

- Leverage the power of data analytics, real time decision support, and registry capabilities to generate actionable knowledge from data. Use analytics to identify individual and health system practice patterns and trends. Determine which data is useful and design systems to extract and integrate data when and where providers need it.
• Standardize patient portals such that patients can have a uniform and single source of their medical record, as well as a portal for entering and tracking patient reported outcomes, no matter what vendor an organization uses or which device a patient uses.

• Move quickly to incorporate care outside the traditional hospital or clinic encounter in the electronic health record, including individual devices and patient-submitted data as opposed to just clinical data on episodes of illness.

• Design for insight into data and reflects health as well as health care, including accepting information from patient devices and patient entered data.

• Rapidly develop and spread EHR support to areas historically not well integrated with the traditional hospital or clinic encounter such as behavioral health, post-acute care, home care and community care.

• Re-envision medical record documentation to support multi-contributor notes allowing synthesis of information from many points of view.

• Capture and support integration of the multiple other factors of care extending beyond clinical data to include genomic data, social and demographic status, patient-entered information and preferences, and external and home devices in order to give the most comprehensive picture of the true health status of an individual or a population.

• Customize clinical decision support to the individual patient and provider, and avoid blanket alerts so as to prevent alert fatigue. “Push” information to providers in easier methods to receive, such as phone alerts.

• Accelerate efforts to embed analytic support in EHR systems such that providers have key clinical decision support at the time it is needed, and can also use analytics to identify individual and health system practice patterns and trends.

• Re-design electronic health record systems to seamlessly capture care across the entire continuum, including home, external facilities, and community care. All systems need to connect to the HIE to ensure standardization of shared data.

• Electronic records must provide the ability for health systems to understand and track performance of populations of patients, track utilization, and predict and prevent health problems in order to promote optimal, most efficient care.

• Encourage universal payer support for electronic visits, telehealth, and multi-contributor notes.

Open for Comment Period

Thank you for reviewing the “Why Can’t Electronic Health Records Be More Like Smartphones?” Call to Action from the Institute for Healthcare Improvement (IHI) Leadership Alliance. The Alliance EHR workgroup would welcome feedback and continued input into this document. Please send comments directly to IHI Executive Director Jill Duncan at jduncan@ihi.org. Thank you in advance for your feedback.
Call to Action Authors and Reviewers

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- Anthony Uy, MD, Associate Chief Medical Officer, Memorial Division CAMC Health Systems, Inc, Charleston Area Medical Center (CAMC)
- Jill Duncan, RN, MS, MPH, Executive Director, Institute for Healthcare Improvement
Appendices

Appendix A: Multi-stakeholder Meeting Attendees and Summary
May 19, 2016, in Washington, DC

Meeting aim: Convene the stakeholder community to provide guidance to ensure we leverage the good and avoid the mistakes of the past while arriving at a future we all can support. The outcome of this meeting was a “Top 10” list of suggested road signs for policymakers to follow on the journey ahead, shared back to ONC, CMS, and vendor community leaders.

Executive leaders from the following groups and organizations participated in this forum:

- Don Berwick, MD, MPP, President Emeritus and Senior Fellow at IHI
- John Halamka, MD, MS, Chief Information Officer at BIDMC
- Leslie Kelly Hall, Senior Vice President at Healthwise
- Eva Karp, RN-C, MBA, Senior Vice President and Chief Clinical Officer at Cerner
- Larry O’Toole, MS, M.Ed., Associate Vice President at Meditech
- Jim Hewitt, Executive Vice President, Solutions Development at AllScripts
- Jessica Mega, MD, MPH, Chief Medical Officer at Verily (previously Google Life Sciences)
- Karen DeSalvo, MD, MPH, M.Sc., Acting Assistant Secretary for Health in the U.S. Department of Health and Human Services; The Office of the National Coordinator for Health Information Technology (ONC)
- Tim Gronniger, MPP, MHSA, Deputy Chief of Staff at Centers for Medicare & Medicaid Services
- Todd Rothenhaus, MD, ASVP athenaClinicals and Chief Medical Officer at athenahealth
- Christopher Alban, MD, MBA, Vice President, Clinical Informatics at Epic
- Chris Wood, MD, Medical Executive of iCentra Innovations at Intermountain Healthcare

Representatives from the IHI Leadership Alliance

- Mark Jarrett, MD, MBA, Senior Vice President, Chief Quality Officer at Northwell Health
- Michelle Schreiber, MD, Senior Vice President and Chief Quality Officer of the Henry Ford Health System
- Steve Tierney, MD, Medical Director/CMIO at Southcentral Foundation
- Angela Shippy, MD, Chief Quality Officer at Memorial Hermann Health System
- Kang Hsu, MD, Providence St. Joseph Health
- Bonnie Lawrence, RN-BC, Vice President Clinical Information and Outcomes at Consulate Management Company
- Pinckney McIlwain, Vice President, Chief Medical Officer at Charleston Area Medical Center
- Stephen Mette, MD, Chief Clinical Officer at University of Arkansas for Medical Sciences
• Kathleen Carberry, RN, MPH, Director for Texas Children's Hospital Outcomes & Impact Service (TCHOIS)
• Kendra Tinsley, MS, CPPS, Executive Director at the Kansas Healthcare Collaborative
• Todd Guenzburger, MD, System Chief Medical Informatics Officer at Providence St. Joseph Health
• Jill Duncan, RN, MS, MPH, Executive Director at IHI

Brief Meeting Summary: How do we shape the future based on lessons learned?

• IHI Leadership Alliance/EHR workgroup should submit a comment letter about MACRA/MIPS to CMS
• Reconciling the tension among developers, government, providers, and patients will require agreement about who is the user/customer, what is success, what is considered a good outcome
• Instead of just interoperability, we need to think about the functionality needed for a collaborative work and a more uniform user experience
• We need to build infrastructure enablers – a catalog of constrained standards, a national patient identifier (or private sector solution, i.e., CHIME challenge/Commonwell/Surescripts/CareEverywhere), a national provider directory, a trust fabric, and uniform consent policies among states
• We need to align economic incentives among stakeholders
• We need to consider the impact of the emerging consumer driven digital ecosystem
• We need to recognize that the EHR is not the center of the universe and enable other tools such as EHR agnostic warehouse solutions
• We need liquidity of claims data
• Documentation/coding rules need to enable team-based care by all clinicians
• We need education to dispel fear of HIPAA and enable a culture of sharing
Appendix B: Exemplars

IHI Leadership Alliance “Why Can’t Our EHRs Be More Like Our Smartphones?”
Workgroup Harvesting Survey

A brief online survey was distributed to all Leadership Alliance organizations with the aim of collecting information about electronic health record (EHR) enhancements and high-leverage practice exemplars across participating Alliance organizations.

The survey included the questions below:

- List EHR vendors in use across your organization
- List EHR enhancement(s) or best practice element(s) implemented across your organization
- Add a description of each EHR enhancement or best practice element, including example of desired outcome related to implementation
- Identify key players within the organization involved in EHR enhancement or best practice element
- Identify categories that best describe each EHR enhancement or best practice element:
  - Clinical decision making
  - Safety best practice
  - Interoperability
  - Communication
  - Data platform
  - Interface
  - Provider usability
  - Patient and family usability
  - Provider contribution to improving EHR
  - Integration of social determinants of health
  - Longitudinal outcomes measurement
  - Patient-reported measures
  - Ability to assess value
  - Other
- List individuals at organization, if any, currently participating in improvement work across key EHR vendors or governing agencies
Appendix C: Survey Results

Included below is a snapshot of the enhancements and high-leverage practices shared as part of the Alliance-wide harvesting survey.

<table>
<thead>
<tr>
<th>Organization</th>
<th>Vendor</th>
<th>Type</th>
<th>Who was involved</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Henry Ford Health System</td>
<td>Epic</td>
<td>Enhancement (clinical decision making)</td>
<td>Implementation led by inpatient medical and surgical Epic leads with CMIO and CQO</td>
<td>We implemented problem-oriented charting in Epic's inpatient application. This approach drives the use/maintenance of the problem list, which in turn drives much of our decision support including suggested order sets and best practice alerts. Under innovations, HFHS is also promoting immediate release of test results to patients. Individuals at organization, if any, currently participating in improvement work across key EHR vendors or governing agencies: Physicians participate in several Epic advisory committees including the safety advisory committee.</td>
</tr>
<tr>
<td>Illinois Hospital Association</td>
<td>Epic</td>
<td>Best practice element (clinical decision making, provider usability, provider contribution to improving EHR, patient-reported measures)</td>
<td>CQO</td>
<td>Ability to create specific protocols that are driven by best practices Individuals at organization, if any, currently participating in improvement work across key EHR vendors or governing agencies: N/A</td>
</tr>
<tr>
<td>Kaiser Permanente</td>
<td>Epic</td>
<td>Enhancement (clinical decision making, provider usability, provider contribution to improving EHR)</td>
<td>CIO, CQO, frontline clinicians</td>
<td>At Kaiser Permanente, we have been embedding a general framework for risk prediction; think of embedding the R in the EMR. Calculations happen within split seconds at scale and we have many (from sepsis to statin prescribing). However, bigger deal probably is self-service authoring by interested clinicians and visualization. Individuals at organization, if any, currently participating in improvement work across key EHR vendors or governing agencies: We participate in several industry forums, vendor discussions, and committees.</td>
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<tbody>
<tr>
<td>Bellin Health: Example 1</td>
<td>Epic, GE, MEDITECH, Allscripts</td>
<td>Enhancement (clinical decision making)</td>
<td>CIO, CEO, EVP</td>
<td>We utilize a third party disease management registry and clinical decision support tool created by Enli Health Intelligence called CareManager. Enli curates evidence-based guidelines and translates the guidelines into logic to reflect the patient’s status at the point of care. That logic is also used to build registries for our Central Care Management Team to help close care gaps through patient outreach.</td>
</tr>
<tr>
<td>Bellin Health: Example 2</td>
<td>Enhancement (Safety best practice)</td>
<td>Enhancement (safety best practice)</td>
<td>CNO, team leaders</td>
<td>We enhanced the Epic MEWS system to create an early warning system that identifies patients at risk for sepsis earlier than ever.</td>
</tr>
<tr>
<td>Charleston Area Medical Center</td>
<td>Soarian for Inpatient and Next Gen for Outpatient; currently converting to Cerner for all EHR</td>
<td>Enhancement (clinical decision making, safety best practice, interoperability, communication, provider usability, provider contribution to improving EHR, ability to assess value)</td>
<td>COO, CQO, CMO, and Board to appropriate funding</td>
<td>VTE advisor — Cerner. Have not implemented yet. This is an enhancement that we have viewed and are trying to purchase. 40% reduction in hospital-acquired VTE by one user’s data. We are hoping for 50+% reduction in hospital-acquired VTE with this tool.</td>
</tr>
</tbody>
</table>
| Texas Children’s Hospital       | Epic                          | Best practice element (integration of different roles in managing the quality of the data. Easy to access data to those that never did have access: communication, data platform, provider contribution to improving EHR, longitudinal outcomes measurement.) | Quality leaders, VP, and Director of Information Services | Creation of a Data Management Strategy through the Quality & Safety Department in partnership with Information Services Department.  

Individuals at organization, if any, currently participating in improvement work across key EHR vendors or governing agencies: We have physicians that are engaged with Epic. |
<table>
<thead>
<tr>
<th>Organization</th>
<th>Vendor</th>
<th>Type</th>
<th>Who was involved</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adventist Health System</td>
<td>Cerner</td>
<td>Enhancement (clinical decision making)</td>
<td>CMO and CMIO</td>
<td>We implemented an alert for nurses and physicians when a patient meets criteria for SIRS or Sepsis. Mortality from sepsis has decreased by one third. Individuals at organization, if any, currently participating in improvement work across key EHR vendors or governing agencies: Adventist Health System has representation on Cerner's ED Client Council.</td>
</tr>
<tr>
<td>Northwestern Healthcare: Example 1</td>
<td>Epic, Cerner</td>
<td>Best practice element (clinical decision making, communication, provider usability)</td>
<td>CIO and CNO</td>
<td>System-wide bed request process with incorporated 48-hour rule</td>
</tr>
<tr>
<td>Northwestern Healthcare: Example 2</td>
<td>Epic, Cerner</td>
<td>Best practice element (clinical decision making, safety best practice, communication, provider usability, provider contribution to improving EHR, ability to assess value)</td>
<td>CIO and CNO</td>
<td>Sepsis Screening Process</td>
</tr>
<tr>
<td>Northwestern Healthcare: Example 3</td>
<td>Epic, Cerner</td>
<td>Enhancement (clinical decision making, safety best practice, communication, provider usability, provider contribution to improving EHR)</td>
<td>CIO and CNO</td>
<td>Massive Transfusion Protocol</td>
</tr>
<tr>
<td>Roanoke Chowan Community Health Center: Example 1</td>
<td>Epic</td>
<td>Enhancement (interface)</td>
<td>CQO</td>
<td>Interface with Midmark EKG/Spirometry</td>
</tr>
<tr>
<td>Roanoke Chowan Community Health Center: Example 2</td>
<td>Epic</td>
<td>Enhancement (HIPAA/confidentiality compliance)</td>
<td>CQO</td>
<td>Epic Release of Information module with the EHR in order to improve HIPAA and patient confidentiality</td>
</tr>
</tbody>
</table>
## Table: Examples of Electronic Health Record (EHR) Improvement Initiatives

<table>
<thead>
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</tr>
</thead>
</table>
| **Memorial Hermann**                | Cerner, eClinicalWorks         | Best practice element (clinical decision making, safety best practice, communication) | CIO, CNO, and CMO         | St. John’s Sepsis Alert
Indians at organization, if any, currently participating in improvement work across key EHR vendors or governing agencies: CQO sits on the Cerner Patient Safety Council. |
| **St. Joseph Health**               | GE, MEDITECH, AllScripts       | Best practice element (clinical decision making)                       | CNO                      | Time Last Known Well (TLKW) tracking                                        |
| **Women’s College Hospital: Example 1** | Epic, GE, Optum, Telus         | Enhancement (communication, patient and family usability, patient-reported measures) | CIO, COO, VP Med Affairs  | Patient-Portal                                                              |
| **Women’s College Hospital: Example 2** | Epic, GE, Optum, Telus         | Best practice element (safety best practice)                           | CNO                      | Enhanced Medication Reconciliation                                           |