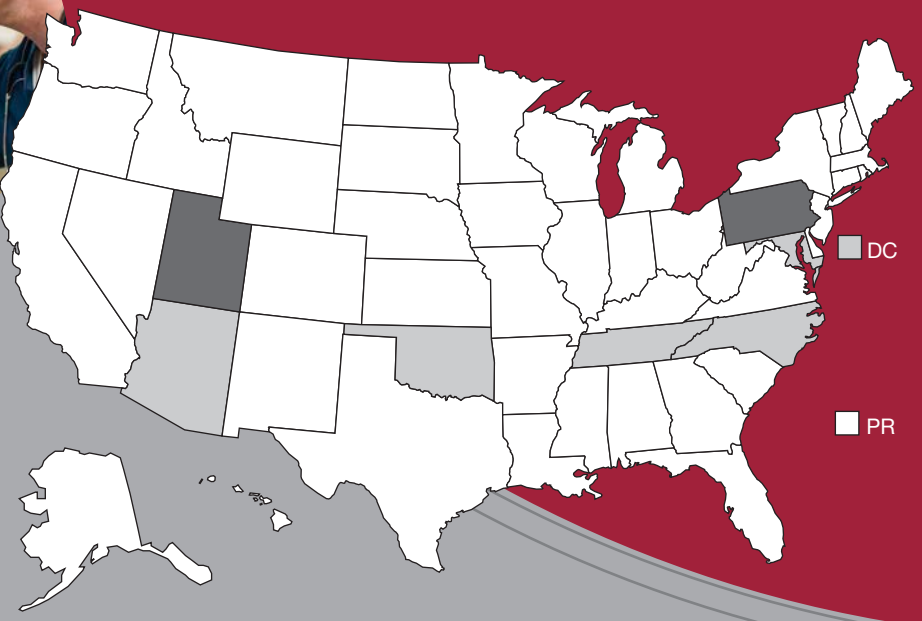
FINAL CONTRACT REPORT

Evaluation of Stage 3 Meaningful Use Objectives: Pennsylvania and Utah



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HEALTH IT

Final Contract Report

Evaluation of Stage 3 Meaningful Use Objectives: Pennsylvania and Utah

Prepared for:
Agency for Healthcare Research and Quality
U.S. Department of Health and Human Services
540 Gaither Road
Rockville, MD 20850
www.ahrq.gov

Contract No. HHSA 290-2010-00031I

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AHRQ Publication No. 15-0026-EF
February 2015

Suggested Citation:
Galantowicz S, Rappaport J, Illa A, Hassol A. Evaluation of Meaningful Use Stage 3 Objectives: Pennsylvania and Utah. (Prepared by Abt Associates Inc. under Contract No. 290-2010-00031I). AHRQ Publication No. 15-0026-EF. Rockville, MD: Agency for Healthcare Research and Quality. February 2015.

None of the investigators has any affiliations or financial involvement that conflicts with the material presented in this report.

This project was funded by the Agency for Healthcare Research and Quality (AHRQ), U.S. Department of Health and Human Services. The opinions expressed in this report are those of the authors and do not reflect the official position of AHRQ or the Department of Health and Human Services.

Preface

This project was one of four task order contracts awarded under the Evaluation of Stage 3 Meaningful Use (MU) Objectives request for task order (RFTO). The purpose of the RFTO was to fund rapid cycle evaluation studies of the implementation of Stage 3 MU proposed objectives of the Medicare and Medicaid Electronic Health Record (EHR) Incentive Programs. Specifically, the evaluations were to yield—

- Proposed strategies for improving the objectives at the policy level.
- Proposed EHR innovations that would better enable providers to meet the proposed objectives.
- Suggestions for hospitals and/or ambulatory practices on how to increase the value to them of MU objectives.

About ACTION II

This project was funded as an Accelerating Change and Transformation in Organizations and Networks (ACTION) II task order contract. ACTION II is a model of field-based research designed to promote innovation in health care delivery by accelerating the diffusion of research into practice. The ACTION II network includes 17 large partnerships and more than 350 collaborating organizations that provide health care to an estimated 50 percent of the U.S. population.

For more information about this initiative, go to http://www.ahrq.gov/research/findings/factsheets/translating/action2/index.html

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Executive Summary

The Medicare and Medicaid Electronic Health Records (EHR) Incentive Programs (i.e., Meaningful Use [MU]) was mandated under the 2009 American Recovery and Reinvestment Act to broaden the use of EHRs across the United States. Abt Associates Inc., in partnership with Geisinger Health System and Intermountain Healthcare, conducted pilot implementation of select Stage 3 MU objectives and certification criteria in the Patient and Family Engagement, Care Coordination, and Interoperability domains. The purpose of the collaboration was to gain feedback on ways to enhance the feasibility and value of these objectives for Stage 3 MU participants. To gain a broader industry perspective, the project team also assembled a panel of senior IT professionals from hospitals and health systems currently working to complete MU Stages 1 and 2.

This report outlines specific recommendations to improve the proposed Stage 3 MU objectives and criteria at the policy level and describes enhancements to EHR functionality that would facilitate their implementation. In addition, it suggests actions and strategies that may help eligible hospitals and professionals meet Stage 3 MU objectives and criteria, as well as maximize their own benefit from implementing them. Many of the findings also align with the conclusions in the recent Office of the National Coordinator for Health Information Technology (IT) report, *Connecting Health and Care for the Nation: A 10-year Vision to Achieve an Interoperable Health IT Infrastructure*, including the need to: improve standardization of electronic health information to increase interoperability; support baseline interoperability functionality while acknowledging a "one size does not fit all" approach for organizational and health IT infrastructure; and ensure privacy and security in the exchange of patient data.[*]

Indeed, many of the dependencies and barriers to fully achieving the overall goals inherent in all stages of MU are already well known and well documented. These include the lack of standardized patient identifiers and of a national provider directory, and the inconsistent capacities of health care providers to exchange data to support true interoperability. These gaps in the national information infrastructure raise several subsidiary issues that deserve attention by the Health IT Policy Committee (HITPC), including:

- In the absence of a standardized patient identifier, health care organizations have developed internal solutions to positively identify patients. These local solutions have considerable merit, and revising them to achieve standardization would require considerable, time-consuming rework. The Stage 3 MU language will ideally be sufficiently flexible to accommodate these local solutions.
- Care coordination (and several other objectives) depends on verifying the treatment relationship between patients and care providers. There is no current consensus as to who should attest to this relationship—providers, patients or both—and health care providers across the country have implemented different approaches. The life-cycle management of the patient-provider relationship, including termination of the relationship in automated systems, warrants more consideration and vendor support. In addition, designating the appropriate primary provider and care team may vary

[*] Source: Connecting Health and Care for the Nation: A 10-Year Vision to Achieve an Interoperable Health IT Infrastructure. Washington, DC: The Office of the National Coordinator for Health IT; June 2014.

according to several factors, including the severity of the patient's condition and the nature of the care episode. Patients can have an important role in defining their own care team. The Stage 3 MU language should ideally consider the evolving approaches to this topic.

- Patient authorization and consent are dependent on local or State regulations and organizational policies. There is variation across providers and localities as to when authorization is required and obtained, and for which data, such as sensitive mental health information, and which transactions. Interoperability functionalities should accommodate these variations in local and organizational policy for consent requirements.
- Interoperability requires "trading partners" (two or more parties in a business relationship) with the capacity to exchange information. Given variations in this capacity, health care organizations and vendors will need solutions that work for the vast majority of patients and partners, and workflows that support these solutions. The front end workflow for sharing information should be consistent, so that providers and administrative staff (users) need not customize their workflows for each of their trading partners. At the same time, back-end functionality will need to intelligently identify and accommodate different partners' electronic capabilities. Discharge processes, for example, should not vary by discharge destination; an EHR system should know how information needs to be encrypted electronically for safe transmission to each specific recipient. In some cases this will involve building a "bridge" solution to compensate for missing functionality. Consequently, certification requirements will need to take into account a pragmatic diversity of back-end approaches. Health care organizations will need automated systems that accommodate the recipients' exchange capability, while not burdening clinical workflows.
- Interoperability also depends on being able to retrieve accurate end-points for data transfer, namely email addresses for providers receiving patient information. In the absence of a national provider directory, Abt's partners suggest the designation of one source—potentially maintained by a single, third- party vendor entity—to consolidate and maintain provider information, rather than relying on a multiplicity of local, partial solutions.

A central goal of the MU provisions is to leverage EHR data and functionality in a "meaningful" way that maximizes benefits for providers, patients and the Federal Government. The Stage 3 MU objectives and criteria raise the bar for what this technology should ideally be able to accomplish, but also need to recognize the varying approaches health care organizations may take to implementing them, depending on their technical capacities. The most elegant solutions may entail sophisticated front- and back-end functionalities in EHR products and systems. Work with two very advanced health care systems suggests that a semiautomated approach, relying on a combination of automation and revised staffing or workflows, may be able to accomplish the Stage 3 MU objectives and criteria until full automation is supported through standards and EHR products. Allowing flexibility in achieving Stage 3 MU could potentially reduce short-term dependency on vendors, allowing for more creative solutions and increasing the likelihood of success.

Realizing the full potential of the Stage 3 MU objectives and criteria will also require cultural and organizational flexibility and change. Just as the Federal Government may need to permit diverse approaches and solutions, so too will health care organizations need to develop policies

and procedures to “trust” the information provided by trading partners, to further the national goal of interoperability and coordination of care across the continuum of providers and settings.

Introduction

The Medicare and Medicaid Electronic Health Record (EHR) Incentive Program (i.e., the MU program) is mandated under the 2009 American Recovery and Reinvestment Act. Abt Associates evaluated the experience of two partner health care organizations, Intermountain Healthcare and Geisinger Health System (described below in Exhibit 1), as they piloted implementation of several Stage 3 MU objectives and certification criteria. This report describes the implementation progress they made and their feedback on the objectives' language, feasibility, and alignment with their own organizational priorities. Findings are organized in three categories:

- Strategies for improving the selected Stage 3 MU objectives and criteria at the policy level;
- EHR innovations that may be required to meet them; and
- Ways in which health care organizations can increase the internal value of implementing these Stage 3 MU objectives and criteria.

Exhibit 1. Implementation at partner health care organizations

Health System	Infrastructure and Capabilities
Geisinger Health System	Integrated delivery system using a heavily customized Epic enterprise EHR; in-house test capabilities and expertise. Also operates a federated health information exchange (HIE) serving providers in more than 40 counties. Coverage includes several eligible hospitals, dozens of clinics, hundreds of eligible professionals. **Senior Staff:** Charles Sawyer, M.D., Chief Medical Information Officer and Jean Adams RN, Associate Vice President of IT
Intermountain Healthcare	Large, multi-State integrated delivery system; In-house developed EHR integrated with multiple vendor applications; extensive customization experience. Works closely with the Utah HIE. Coverage includes 24 hospitals with thousands of affiliated eligible professionals. **Senior Staff:** Peter Haug, M.D., Director of the Homer Warner Center for Informatics Research and Sid Thornton, Ph.D., Medical Informatics Director at the Homer Warner Center for Informatics Research

Intermountain Healthcare and Geisinger Health System selected objectives and criteria to pilot, from three Stage 3 MU domains: Patient and Family Engagement, Care Coordination, and Interoperability. They agreed to attempt implementation during the period from September 2013 to May 2014. Exhibit 2 lists the selected objectives and criteria, and whether one or both partner health care organizations chose to pursue each.[2]

The objectives and criteria were chosen based on language from the January 2013 Request for Comment published by the HITPC.[3]

[2] For complete objective language see Exhibit 5.

[3] Throughout the project, subsequent iterations of the objectives were discussed with the partner health care organizations and, at times, solicited feedback about the revised language, as well as the January 2013 versions. However, unless otherwise indicated, this report describes feedback and recommendations based principally on January 2013 language.

Exhibit 2. Selected objectives and criteria

Proposed Stage 3 MU Objectives and Certification Criteria	Number of Partners Attempting Pilot Implementation
SGRP 204A: Distribution of care summaries	1
SGRP 204B: Submission of patient-generated health information	1
SGRP 204D: Patients can request amendments	2
SGRP 206: Provision of materials in non-English languages	1
SGRP 302: Medication, allergy and problem list reconciliation	2
SGRP 303: Care transition summaries	1
SGRP 308: Notification of significant health care events	2
IEWG 101: Sending and responding to patient queries	2
IEWG 102: Querying provider directories	1

Methods

Abt Associates researchers used biweekly, rapid-cycle data collection (semistructured telephone interviews) to monitor progress, understand implementation challenges in real time, and inform this final report. Abt staff analyzed these data to identify and quantify emerging themes, revising the data collection protocols between the biweekly calls. The team also conducted monthly semistructured conference calls with representatives from both health systems to enhance these data. Researchers took detailed notes during the biweekly and monthly calls, tracking key themes for each Stage 3 MU objective and criterion. This report highlights themes with relevance for more than one Stage 3 MU objective or criterion.

Recognizing that Intermountain Healthcare and Geisinger Health System are considerably advanced in their respective health IT infrastructures, the researchers also solicited input from a panel of senior health IT professionals from hospitals and health care systems currently working on Stage 1 MU and Stage 2 MU; this panel met one time, by teleconference. The panel participants varied in terms of geography, size, and progress on MU. All participants represented multi-institution health systems. Exhibit 3 provides more detail on the panel participants.

In this report, Abt's two partner health care organizations are referred to as "partners," and most findings are based on their input. When findings were reinforced by the Industry Panel, it is noted as "stakeholder" feedback.

Exhibit 3. Industry panel

Panel Participant	Participant's Organization Type/Size	Participant's Title	Geographical Location	EHR Vendor	MU Progress
1	Large, Urban	CMIO	West	Siemens	Stage 1 MU certified for EH; Some Stage 2 MU implementation
2	Large, Academic, Urban and Suburban	CMIO	South	Cerner, GE, eClinical Works	Stage 1 MU certified for EH and EP; targeting a 2014 Stage 2 MU implementation
3	Large, Academic Pediatric, Urban	CMIO	Midwest	AllScripts	Stage 1 MU certified
4	Small, Rural	MU Program Manager	West	Cerner	Partially Stage 1 MU certified (in some practices)
5	Medium, Suburban	CIO	Northeast	Cerner	Stage 1 MU certified; beginning Stage 2 MU attestation in 2014
6	Large, Academic, Urban and Suburban	CMIO	Southwest	Epic	Stage 1 MU certified, Beginning Stage 2 MU tracking in 2014

Findings: Implementation Progress

Below are key findings on implementation progress for each Stage 3 MU objective or certification criterion (Exhibit 4). These are followed by more in-depth findings for the following three areas of interest:

1. Strategies for improving the selected Stage 3 MU objective at the policy level, including feasibility of implementation and any recommendations for exclusions, language changes and proposed thresholds for compliance
2. EHR innovations that would support implementation
3. Recommendations for ways that health care organizations can increase the internal value of implementation (Exhibit 5)

Findings related to each Stage 3 MU objective or certification criterion are detailed in the following section, which includes cross-cutting themes in each of the Stage 3 MU domains.

Abt's partners worked to implement their selected Stage 3 MU objectives and certification criteria between September 2013 and May 2014. In some cases, this was a continuation or acceleration of work initiated prior to September 2013; for a few objectives, implementation work was largely completed prior to this period.

Exhibit 4 includes the following for each objective or criterion:

- Whether implementation efforts began prior to the pilot period
- Progress made during the pilot period
- Alignment with organizational priorities, including health IT priorities

Exhibit 4. Implementation table

Stage 3 MU Objective or Certification Criterion	Number of partners attempting pilot implementation	Completed before Sept 2013	In process as of Sept 2013	Completed by May 2014	Still in process as of May 2014	Alignment with organizational priorities
Patient and Family Engagement						
SRGP 204A **MENU item:** Automated Transmit*: (builds on Automated Blue Button Initiative (ABBI)): Provide 50% of patients the ability to designate to whom and when (i.e., pre-set automated & on-demand) a summary of care document is sent to patient-designated recipient (For example, a one-time request to send information from specialist to primary care, or a standing request to always send an updated care summary when certain events arise, such as a change in medication or the completion of new tests or procedures). EPs[4] should make info available within 24 hours if generated during course of visit • For labs or other types of info not generated within course of visit, it is made available to patients within four business days of info becoming available to EPs • Potential to increase both thresholds (% offer and % use) based on experience in Stage 2	1	0	1	1	0	Aligned with organizational priorities; out of network information exchange has been a focus for the past ten years
SGRP 204B Provide 10% of patients with the ability to submit patient-generated health information to improve performance on high priority health conditions, and/or to improve patient engagement in care (e.g., patient experience, pre-visit information, patient created health goals, shared decision making, advance directives, etc.). This could be accomplished through semistructured questionnaires, and EPs and EHs would choose information that is most relevant for their patients and/or related to high priority health conditions they elect to focus on.	1	0	1	1	0	Aligned with organizational priorities; development was accelerated for the evaluation.

[4] This portion of this objective was not evaluated under this contact.

Stage 3 MU Objective or Certification Criterion	Number of partners attempting pilot implementation	Completed before Sept 2013	In process as of Sept 2013	Completed by May 2014	Still in process as of May 2014	Alignment with organizational priorities
SGRP 204D **Objective:** Provide patients with the ability to request an amendment to their record online (e.g., offer corrections, additions, or updates to the record) through VDT in an obvious manner.	2	0	2	1	1	Aligned with organizational priorities; development was accelerated for the evaluation in one organization.
SGRP 206 **Additional language support:** For the top 5 non-English languages spoken nationally, provide 80% of patient-specific education materials in at least one of those languages based on EP's or EH's local population, where publically available.	1	0	1	0	1	Aligned with existing organizational priorities, with similar functionality already available prior to the evaluation.
Improving Care Coordination						
SGRP 302 **EP / EH / CAH Objective**: The EP, eligible hospital or CAH who receives a patient from another setting of care or provider of care or believes an encounter is relevant should perform reconciliation for: – medications – medication allergies – problems	2	0	2	2	0	Aligned with organizational priorities for both organizations; functionality was already deployed by one partner as a Menu Item under Stage 1 MU.
SGRP 303 **EP/ EH / CAH Objective:** EP/EH/CAH who transitions their patient to another setting of care or refers their patient to another provider of care. Provide a summary of care record for each site transition or referral when transition or referral occurs with available information.	1	0	0	2[5]	0	Aligned with organizational priorities for both organizations, though implemented fully by only one.

[5] Although one partner did not officially implement this objective under the AHRQ Stage 3 MU project, they implemented the objective as a pilot, with limited trading partners.

Stage 3 MU Objective or Certification Criterion	Number of partners attempting pilot implementation	Completed before Sept 2013	In process as of Sept 2013	Completed by May 2014	Still in process as of May 2014	Alignment with organizational priorities
Must include the following four for transitions of site of care, and the first for referrals (with the others as clinically relevant): 1. Concise narrative in support of care transitions (free text that captures current care synopsis and expectations for transitions and / or referral) 2. Setting-specific goals 3. Instructions for care during transition and for 48 hours afterwards 4. Care team members, including primary care provider and caregiver name, role and contact info (using DECAF (**D**irect care provision, **E**motional support, **C**are coordination, **A**dvocacy, and **F**inancial))						
SGRP 308: **EH Objective:** The EH/CAH will send electronic notification of a significant health care event in a timely manner to key members of the patient's care team, such as the primary care provider, referring provider or care coordinator, with the patient's consent if required.	2	1	1	1	0	Aligned with organizations priorities for both organizations, but one organization accelerated implementation for the evaluation.

Stage 3 MU Objective or Certification Criterion	Number of partners attempting pilot implementation	Completed before Sept 2013	In process as of Sept 2013	Completed by May 2014	Still in process as of May 2014	Alignment with organizational priorities
Interoperability						
IEWG 101 **PART 1**: For patients transitioned without a care summary, an individual in the practice should query an outside entity. The intent of this objective is to recognize providers who are proactively querying. Certification criteria: The EHR must be able to query another entity for outside records and respond to such queries. The outside entity may be another EHR system, a health information exchange, or an entity on the NwHIN Exchange, for example. This query may consist of three transactions: • Patient query based on demographics and other available identifiers, as well as the requestor and purpose of request. • Query for a document list based for an identified patient • Request a specific set of documents from the returned document list	2	1	1	1	0	Aligned with organizational priorities for both organizations; accelerated for the evaluation by both.
IEWG 101 **Part 2**: When receiving inbound patient query, the EHR must be able to: • Tell the querying system whether patient authorization is required to retrieve the patient's records and where to obtain the authorization language.* (e.g., if authorization is already on file at the record-holding institution it may not be required). • At the direction of the record-holding institution, respond with a list of the patient's releasable documents based on patient's authorization • At the direction of the record-holding institution, release specific documents with patient's authorization	2	0	1	1	1	Aligned with organizational priorities for both organizations; accelerated for the evaluation by both.

Stage 3 MU Objective or Certification Criterion	Number of partners attempting pilot implementation	Completed before Sept 2013	In process as of Sept 2013	Completed by May 2014	Still in process as of May 2014	Alignment with organizational priorities
The EHR initiating the query must be able to query an outside entity* for the authorization language to be presented to and signed by the patient or her proxy in order to retrieve the patient's records. Upon the patient signing the form, the EHR must be able to send, based on the preference of the record-holding institution, either: • a copy of the signed form to the entity requesting • an electronic notification attesting to the collection of the patient's signature • *Note: The authorization text may come from the record-holding EHR system, or, at the direction of the patient or the record-holding EHR, could be located in a directory separate from the record-holding EHR system, and so a query for authorization language would need to be directed to the correct endpoint.						
IEWG 102 Certification- only Component: The EHR must be able to query a Provider Directory external to the EHR to obtain entity-level addressing information (e.g., push or pull addresses).	1	0	1	0	1	Aligned with organizational priorities; however, solution relies on third-party vendor.

Exhibit 4 underscores that most of the Stage 3 MU functionality that Abt's partners pursued on a test basis for this project was a priority that had already been identified, and in some cases already begun, by their organizations. Project partners did not deploy new teams to implement the objectives, but added some additional staff resources to speed progress during the study period. The fact that some work had already begun enabled project partners to make considerable progress on implementation. Similarly, Industry Panel participants reported they were better able to complete Stage 1 MU and Stage 2 MU objectives when they were able to build off existing functionally and technology. All stakeholders emphasized that Stage 3 MU requirements will ideally take advantage of existing functionality, some of which is fully automated through vendors' EHR products, and some of which represents organization-specific solutions.

Abt's partners depended, at least in part, on their EHR vendors to implement most of the new functionality required for the Stage 3 MU objectives, although they preferred homegrown solutions and customization in some instances. They were technologically challenged by the limitations of their EHR and health information services provider (HISP) vendors' ability to create sophisticated functionalities, especially for objectives that require coordination and communication with outside organizations. Industry Panel members noted that larger organizations have more bandwidth and internal resources to customize their vendor products, but that small health care organizations with fewer resources face difficulties trying to enhance their EHRs without vendor assistance.

Stage 3 MU objectives that required manual data adjudication and reconciliation sometimes prompted hiring or reassigning of staff. The Industry Panel observed that their organizations devoted so many resources to meeting MU requirements that they were unable to make progress on other health IT functionality that was of higher priority for care delivery. In a few instances, stakeholders felt that meeting MU criteria proved to be a downgrade to their existing sophisticated technology.

Findings and Recommendations: Stage 3 MU Objectives and Certification Criteria

Exhibit 5 summarizes findings based on input from Abt's partners and the Industry Panel. It includes both the original Stage 3 MU language from January 2013 and the updated March 2014 language, where relevant; when a recommendation applies to only one version of the Stage 3 MU language it is designated as original (O) or updated (U).

Exhibit 5. Summary of findings

Proposed Stage 3 MU Objectives and Certification Criteria		Key Findings		
Stage 3 MU Language (January 2013)[6] Used in Pilot Implementation Project	**Updated Stage 3 MU Language (March 2014)**	**Strategies for improving language at the policy level**	**EHR innovations to enable compliance**	**Suggestions for health care organizations to increase internal value**
Patient and Family Engagement				
SRGP 204A **MENU item:** Automated Transmit*: (builds on Automated Blue Button Initiative (ABBI)): Provide 50% of patients the ability to designate to whom and when (i.e., pre-set automated & on-demand) a summary of care document is sent to patient-designated recipient (For example, a one-time request to send information from specialist to primary care, or a standing request to always send an updated care summary when certain events arise, such as a change in medication or the completion of new tests or procedures). EPs[7] should make info available within 24 hours if generated during course of visit • For labs or other types of info not generated within course of visit, it is made available to patients within four business days of info becoming available to EPs • Potential to increase both thresholds (% offer and % use) based on experience in Stage 2	*No update to the portion of the objective that was implemented.*	• Define "to whom"", including any exclusions • Allow flexibility to define patient-provider relationship for a given encounter or an episode that comprises multiple encounters • Clarify payment policy on (HISP) fees when patients send secure messages • Set standards to ensure secure data transfer and alignment with HIPAA • Clarify whether "when" includes ad hoc requests or only requests linked to a specific encounter	• Automate integration of patient data from multiple sources/documents to assemble summary of care • Functionality to validate patient identity • Functionality to validate patient-provider relationship prior to sending data • Functionality to segregate specially protected HIPAA data to enable selective transfer of other data without violating privacy • Customized privileges so that selected providers can see specific types of data	• Create communication guidelines for patients on how to make requests in designated formats; and set patients' expectations about when/whether request will be acknowledged and/ or responded to by a provider • Create summary template that presents information in a manner appropriate for patient or caregiver consumption (i.e., interpretive health) • Create analytic tools to measure the impact of patient engagement and access to treatment information • Encourage *a priori* patient-physician conversations about what to expect from their test results to avoid unnecessary worry and confusion from the patients

[6] Stage 3 MU language from January 2013 served as the basis for both implementation and recommendations; not the most updated objective language as of March 2014. Both sets of language are presented for comparison in Exhibit 5.

[7] This portion of this objective was not evaluated under this contact.

Proposed Stage 3 MU Objectives and Certification Criteria		Key Findings		
Stage 3 MU Language (January 2013)[6] Used in Pilot Implementation Project	**Updated Stage 3 MU Language (March 2014)**	**Strategies for improving language at the policy level**	**EHR innovations to enable compliance**	**Suggestions for health care organizations to increase internal value**

SGRP 204B
MENU: Provide 10% of patients with the ability to submit patient-generated health information to improve performance on high priority health conditions, and/or to improve patient engagement in care (e.g., patient experience, pre-visit information, patient created health goals, shared decision making, advance directives, etc.).
 	
This could be accomplished through semistructured questionnaires, and EPs and EHs would choose information that is most relevant for their patients and/or related to high priority health conditions they elect to focus on.
	• **Menu: Eligible Professionals and Eligible Hospitals** receive provider-requested, electronically submitted, patient-generated health information through either (at the discretion of the provider):
	  • Structured or semistructured questionnaires (e.g., screening questionnaires, medication adherence surveys, intake forms, risk assessment, functional status)
	  • Or secure messaging
	• **Low threshold**
		• Consider restricting this objective to Eligible Professionals and a subset of encounters in Eligible Hospitals, such as elective surgeries, as patients are unlikely to submit information for emergent conditions
		• Allow flexibility in modes by which patient can submit information (e.g., SMS texting) for populations lacking computers/internet access
		• Require a "warning label" to alert patients that urgent health needs should not be communicated in this manner; consider adding approximate/maximum response time to be expected
		• Consider eliminating threshold for this objective (U)
			• Ability to insert data received from patient into EHR, "tag" patient-provided data, and reconcile with provider-entered data
			• Ability to prepopulate semistructured questionnaires with relevant contextual/basic patient data from current records at the organization or from outside organizations, to reduce patient burden; allow patients to confirm or change
			• Functionality to validate patient identity
			• Functionality to validate patient-provider relationship prior to sending data
				• Use patient-generated health information to focus on filling gaps in the health record or identifying areas for further follow up, to improve care efficiency and patient engagement

Proposed Stage 3 MU Objectives and Certification Criteria		Key Findings		
Stage 3 MU Language (January 2013)[6] Used in Pilot Implementation Project	**Updated Stage 3 MU Language (March 2014)**	**Strategies for improving language at the policy level**	**EHR innovations to enable compliance**	**Suggestions for health care organizations to increase internal value**
SGRP 204D **Objective:** Provide patients with the ability to request an amendment to their record online (e.g., offer corrections, additions, or updates to the record) through VDT in an obvious manner.	EHR technology should have the functionality to allow providers to receive, review, respond (acknowledge), and record patient generated health data (PGHD), including amendments and corrections Recommended as **certification criteria** only	• Allow flexibility in modes by which patient can submit amendments • Address ambiguity in timeframe and mode for providers to "acknowledge" and "record" data (U) • Clarify payment policy on direct message (HISP) fees • Certification only • Consider postponing this objective	• Ability to use data received from patient to prepopulate existing record o Ability to "tag' patient-entered data and reconcile with provider-entered data • Functionality to visibly segregate patient data that cannot be reconciled • Functionality to integrate data into EHR, and generate any needed provider acknowledgement and response • Ability to create and deploy various modes of amendments (structured form vs. memo) depending on context	• Need a mutually understood agreement between patient and care team regarding how and when the patient's amendment is integrated into the EHR, if at all • Contextual and interpretative materials to accompany the office visit summaries would be more patient-friendly and could reduce amendment requests based on misunderstood (but correct) information • Designated staff needed to manually reconcile and integrate patient requested amendments, ensuring that patient-entered data do not override or conflict with provider-entered data

Proposed Stage 3 MU Objectives and Certification Criteria		Key Findings		
Stage 3 MU Language (January 2013)[6] Used in Pilot Implementation Project	**Updated Stage 3 MU Language (March 2014)**	**Strategies for improving language at the policy level**	**EHR innovations to enable compliance**	**Suggestions for health care organizations to increase internal value**
SGRP 205[8] **Eligible Professionals** provide office-visit summaries to patients or patient-authorized representatives with relevant, actionable information, and instructions pertaining to the visit in the format indicated by the patient • Summaries should be shared in the format of the patient's preference (e.g., telephone, email), if the provider has the technical capability • Recommend that CEHRT draw from existing specified information enabling providers to include and exclude data based upon patient needs • **Threshold:** Medium/High • HITSC to identify what the communication preferences options should be. Providers should have the ability to select options that are technically feasible, these could include: Email, patient portal, regular mail, etc.	• **Core:** EPs provide office-visit summaries to patients or patient-authorized representatives with relevant, actionable information, and instructions pertaining to the visit in the form/media preferred by the patient • **Certification criteria:** EHRs allow provider organizations to configure the summary reports to provide relevant, actionable information related to a visit. • **Threshold:** Medium	• Define "actionable information" and whether it can be accommodated within CCDA or other existing clinical data format • Remove or expand language regarding form/media of patient's preference to allow more flexibility • Clarify payment policy on direct message (HISP) fees • Clarify parameters, if any, for patient-authorized representatives	• Automate integration of patient data from multiple sources/documents to assemble summary of care • For nonprovider recipients, functionality to enable validation of proxy identity and proxy relationship, as well as document and retrieve patient authorization designating proxies • Functionality to validate patient-provider relationship prior to sending data • Functionality to segregate specially protected HIPAA data to enable selective transfer of other data without violating privacy • Allow customization of summary reports	• Create summary template that presents information in a manner appropriate for patient or caregiver to maximize comprehension (e.g., varying reading levels) • Create analytic tools to measure the impact of patient engagement, including appropriate follow-up and self-care based on the office visit summary

[8] While this objective was not chosen by either partner for trial implementation, both partners and the industry panel provided feedback on the revised March 2014 language.

Proposed Stage 3 MU Objectives and Certification Criteria		Key Findings		
Stage 3 MU Language (January 2013)[6] Used in Pilot Implementation Project	**Updated Stage 3 MU Language (March 2014)**	**Strategies for improving language at the policy level**	**EHR innovations to enable compliance**	**Suggestions for health care organizations to increase internal value**
SGRP 206 **Additional language support:** For the top 5 non-English languages spoken nationally, provide 80% of patient-specific education materials in at least one of those languages based on EP's or EH's local population, where publically available.	• Continue educational material objective from stage 2 for Eligible Professionals and Hospitals. • Additionally, **Eligible Providers and Hospitals** use CEHRT capability to provide patient-specific educational material in non-English speaking patient's preferred language, if material is publically available, using preferred media (e.g., online, print-out from CEHRT) • **Threshold**: low, this should be a number and not a percentage **Certification criteria**: EHRs are capable of providing patient-specific educational materials in at least one non-English language.	• Clarify if "preferred media" refers to preference of the patient or the provider (U) • Clarify definition of "publically available material" (e.g., vetted national standards) (U) • Define whether threshold includes measuring *use of* materials, or only provision of materials (U) • Clarify "low" numerical threshold (U)	• Enable storage and "pull" of needed documents • Functionality to selectively "pull" documents based on patient needs, diagnoses, language, and communication mode preference	• Create a process to address any questions patients may have regarding the educational material received, in their preferred language • Create a network of multi-lingual providers/ translators who can support providers on materials in languages they themselves do not speak
Improve Care Coordination				
SGRP 302 **EP / EH / CAH Objective:** The EP, eligible hospital or CAH who receives a patient from another setting of care or provider of care or believes an encounter is relevant should perform reconciliation for: - medications - medication allergies - problems	**No change in objective** • Eligible Professionals, Hospitals, and CAHs who receive patients from another setting of care perform medication reconciliation. • **Recommend** that CEHRT include the ability to use CDS intelligence to assist in maintaining the accuracy of medication lists	• Allow exceptions and bridge solutions when trading partners don't have adequate capability for data sharing • Consider policy for data exchange with other organization types (e.g., long-term care) with limited EHRs and interoperability • Consider improving standard notations or create legend to denote equivalent codes for medication and allergy reconciliation.	• Functionality to document assessment of all three areas separately: medication list, allergy list, problem list • Incorporate any standards for diagnoses and medication codes to alleviate reconciliation burden	• Pharmacists' (or other auxiliary providers') involvement could improve the reconciliation process, pending cost-benefit • Consider internal provider education on data entry standards to ensure consistent notation and frequency of reconciliation records

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SGRP 303 **EP/ EH / CAH Objective:** EP/EH/CAH who transitions their patient to another setting of care or refers their patient to another provider of care. Provide a summary of care record for each site transition or referral when transition or referral occurs with available information. Must include the following four for transitions of site of care, and the first for referrals (with the others as clinically relevant): 1. Concise narrative in support of care transitions (free text that captures current care synopsis and expectations for transitions and / or referral) 2. Setting-specific goals 3. Instructions for care during transition and for 48 hours afterwards 4. Care team members, including primary care provider and caregiver name, role and contact info (using DECAF (**D**irect care provision, **E**motional support, **C**are coordination, **A**dvocacy, and **F**inancial))	EPs/EHs/CAHs provide a summary of care during transitions of care. Types of transitions: • Transfers of care from one site of care to another (e.g., Hospital to SNF, PCP, HHA, home, etc.; SNF, PCP, etc. to HHA; PCP to new PCP) • Consult (referral) request (e.g. PCP to Specialist; PCP, SNF, etc. to ED) • Consult result note (e.g., ER note, consult note) Summary of care may (at the discretion of the provider organization)include, as relevant: • A narrative that includes a synopsis of current care and expectations for consult/transition or the results of a consult [required for all transitions] • Overarching patient goals and/or problem specific goals • Patient instructions, suggested interventions for care during transition • Information about known care team members (including a designated caregiver) *An electronic summary is preferred	• Define "concise narrative" and its intended length (O) • Define any requirement and timeline for acknowledgement and response by recipient • Define intended document format and any overlap between summary of care and CCDA and/or care transition summary • Define care team and allow of flexibility in determining the members on an encounter-by-encounter (or episode) basis • Consider allowing other communication modes, (e.g., smartphone applications, text messages), for sending critical or time-sensitive care information • Consider policy for data exchange with other organization types (e.g., long-term care) with limited EHRs and interoperability	• Automate alerts to ensure providers see documents in a timely manner; consider algorithm to prioritize alerts by acuity/ provider preference • Flexibility to use a hybrid of technologies to populate form • Support customized creation of care summaries from the EHR record • Reconciliation process to incorporate external data into workflow and EHR • Ability to consume data types other than CCD (e.g., laboratory results or radiology image attachments)	• Consider organizational policy on when to send what data, based on needs at recipient site and patient care, to reduce overload • Consider requirement for summary of care recipient to send back information summarizing the patient's visit • Consider hiring/assigning staff to perform manual reconciliation to bridge gaps in fully functional interoperability;

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SGRP 308: **EH Objective:** The EH/CAH will send electronic notification of a significant health care event in a timely manner to key members of the patient's care team, such as the primary care provider, referring provider or care coordinator, with the patient's consent if required	• **Menu: Eligible Hospitals and CAHs** send electronic notifications of significant health care events (SHCE) within 4 hours to known members of the patient's care team (e.g., the primary care provider, referring provider, or care coordinator) with the patient's consent if required Significant events include: • Arrival at an Emergency Department (ED) • Admission to a hospital • Discharge from an ED or hospital • Death • **Low threshold**	• Eliminate four hour timeframe if follow- up action not required (U) • Remove death from list, as immediate alert often not feasible or necessary (U) • Define "known" or "key" members of care team and degree of flexibility in designating members on an encounter-by-encounter (or episode) basis. Replace with "at least one member of the care team" • Define deadlines for providers to acknowledge or react to information in notification • Consider variations in policy depending on patient destination (e.g., other sites of care vs. home) • Suggest this be certification criteria only • Allow flexibility regarding when to send which alerts and to whom	• Functionality to send alerts and support algorithms that determine to whom and when alerts are sent • "Push" functionality to enable SHCE data integration into EHR, and automate provider acknowledgement and response • Ability to pull patient data from the EHR to supplement data in the notification • Back-end functionality to enable validation of patient identity and to authenticate patient-provider relationship • Mechanism to record and retrieve patient consent	• Consider education/ organizational policy on when to send what data, based on needs at recipient site and patient case to reduce information overload • Create standards for what relevant contextual basic information should be sent with SHCE alert and required acknowledgment and response by recipient provider (if any)

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IEWG 101 **PART 1:** For patients transitioned without a care summary, an individual in the practice should query an outside entity. The intent of this objective is to recognize providers who are proactively querying. Certification criteria: The EHR must be able to query another entity for outside records and respond to such queries. The outside entity may be another EHR system, a health information exchange, or an entity on the NwHIN Exchange, for example. This query may consist of three transactions: • Patient query based on demographics and other available identifiers, as well as the requestor and purpose of request. • Query for a document list based for an identified patient • Request a specific set of documents from the returned document list **Part 2:** When receiving inbound patient query, the EHR must be able to: • Tell the querying system whether patient authorization is required to retrieve the patient's records and where to obtain the authorization language.* (e.g., if authorization is already on file at the record-holding institution it may not be required). • At the direction of the record-holding institution, respond with a list of the patient's releasable documents based on patient's authorization • At the direction of the record-holding institution, release specific documents with patient's authorization The EHR initiating the query must be able to query an outside entity* for the authorization language to be presented to and signed by the patient or her proxy in order to retrieve the patient's records. Upon the patient signing the form, the EHR must be able to send, based on the preference of the record-holding institution, either: • a copy of the signed form to the entity requesting • an electronic notification attesting to the collection of the patient's signature *Note: The authorization text may come from the record-holding EHR system, or, at the direction of the patient or the record-holding EHR, could be located in a directory separate from the record-holding EHR system, and so a query for authorization language would need to be directed to the correct endpoint.		• Federal laws addressing Protected Health Information should mirror the most strict State laws, to avoid compliance challenges when exchanging patient information across State lines • Metrics built around query and response could penalize extant solutions designed for local populations	• Functionality to easily extract only certain documents or data points from a record to enable more targeted data sharing • Back-end functionality to validate patient identity and to authenticate patient-provider relationship • Standard method for recording and finding (if querying) patient authorization prior to data exchange • Pre-staging of authorized information for exchange • Define a standard method to communicate as well as document types that can be shared	• Develop internal algorithms and/or thresholds for positive patient identification and matching when receiving inbound queries • Relieving a clinician's operational burden of transforming external data into formats for an organization's internal system • Early focus on provider relationship management and maintenance and accuracy of provider database

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IEWG 102 Certification- only Component: The EHR must be able to query a Provider Directory external to the EHR to obtain entity-level addressing information (e.g., push or pull addresses).		• Consider designating a third-party vendor to create and maintain a directory of addressing end-points as an alternative to creating a Federal national provider database • Develop standards for content and maintenance of a national or third-party provider directory	• Provider look-up functionality	• Implement requirements to maintain updated directories when providers relocate or change practices • Allocate resources to managing error messages when address push or pull is not successful

The sections below supplement the findings and recommendations described in Exhibit 5. Cross-Cutting Findings contains cross-cutting themes that are relevant for multiple domains; Domain-Specific Findings provides a more in-depth discussion of each Stage 3 MU objective or certification criterion, including relevant examples cited by stakeholders.

Cross-Cutting Findings

Overall, stakeholders expressed support for the goals inherent in Stage 3 MU, but identified concerns about the workflow and resource implications of those goals, and their potential impact on vendor development capabilities and focus. In general, the infrastructure and standards necessary for elegant and automated approaches to interoperability will depend heavily on coordinated and robust vendor solutions, and functional health information exchanges. In the absence of such technology and exchange capabilities, organizations participating in Stage 3 MU will need to create hybrid processes to integrate manual and automated solutions. These may in turn disrupt workflows and divert resources from other IT and care-delivery priorities.

Interoperability challenges are evident throughout Stage 3 MU. Different commercial vendor systems used across health care organizations at different stages of MU compliance create an increasingly complex information ecology. Although HIEs and/or enterprise EHRs mitigate this problem to some extent by increasing the number of accessible secure user endpoints, all health care organizations will eventually encounter external partners with whom data cannot be shared. As sophisticated health care organizations (like the partners in this project) create innovative solutions and build customize vendor products to enhance functionality, their capabilities, workflows and data architecture slow convergence with their less-sophisticated trading partners. Over time, it is becoming more challenging and potentially resource-intensive for health care organizations to receive and integrate incoming data. As a consequence, many organizations have created complex manual review and reconciliation cycles to process data received from other organizations, defeating the purpose of true (automated) interoperability. These processes prolong data integration into patient EHRs and increase staff time devoted to data quality checks and reconciliation.

Two important barriers to seamless, secure interoperability are the absence of complete and accurate provider directories and the lack of a single, national patient identifier. In addition, there are inconsistent standards for patient authorization. These barriers were cited repeatedly by Abt's partners, and Industry Panel members. The success of the Patient and Family Engagement objectives, for example, depends on patients being able to add information to their EHRs, and receive information from their health care providers. Patients' identities need to be verified electronically before they can provide information for their records. A third, related issue is the need for EHRs to be able to distinguish patient- and provider-generated content and reconcile inconsistencies as appropriate.

Similarly, Care Coordination objectives require that patients' identities be verified before their data are sent to another provider in their care team. There also must be a way to record and access patient authorization to permit information sharing, and a method to search for and verify the identity of the recipient provider. However, there is no national provider directory and existing local directories are incomplete and sometimes inaccurate. The project partners suggest the designation of one source, such as a national provider directory maintained by a single entity, to consolidate and maintain provider information, rather than relying on a multiplicity of local inadequate and partial solutions.

Secure, accurate data transmission also requires the attestation and maintenance of patient-provider relationships. There is no standardization regarding who should "declare" a

relationship between a patient and a provider or group of providers. Should providers be allowed to simply declare a relationship with a patient or should patient agreement be required? Who severs the relationship between patient and provider, when a patient moves or changes providers? Ownership—or shared ownership—of this relationship has important implications for ongoing information sharing, notifications of health events, and other MU functionality.

Our partners and stakeholders suggested that EHR and other vendors will need to upgrade basic functions to ensure consistent "front-end" data-sharing; MU policies and centralized standards are not likely to be sufficient for true interoperability. Some basic standard upgrades that would support interoperability and its underlying components may include:

- Streamlined patient identification and authorization recording requirements or codes, to simplify querying of data in structured and free-text fields;
- The ability to distinguish and properly integrate patient-generated data in the EHR;
- Increased compatibility to download common files formats for patient data that are exchangeable and viewable across vendor products; and
- Simpler mechanisms or directories to catalogue and maintain patient and provider identification/addressing.

While sophisticated health systems like Geisinger and Intermountain have the capacity to develop at least partial IT solutions independent of their vendors, there is only so far independent health care organizations can customize and innovate, without compromising their EHRs' functionality. Too much customization and too many idiosyncratic solutions jeopardize straightforward vendor upgrades, and pose problems when vendor and customized interfaces no longer align. In addition, sophisticated custom solutions exacerbate the divide between health care organizations that can and do customize and others that do not (or cannot), further constraining interoperability.

Partners and stakeholders repeatedly cited the narrow spectrum of the MU program and the focus on primary care practices and hospitals. They noted that truly safe and coordinated care necessitates data sharing across the entire continuum of care (e.g., long-term and post-acute care providers). At the same time, some standards should not apply equally in all settings or for all situations. It is important that data follow, if not precede, a patient to all settings of care in a transparent, accessible manner.

Our partners emphasized that MU objectives should not prevent health care organizations from using existing local and home-grown functionality, if they meet the needs of the organization and the population they serve. For many health care organizations, "bridge" solutions, including manual elements, are necessary, even as they transition to more automated solutions, to ensure that clinical workflow is minimally disrupted and patient care is optimized. One frequent example cited is the need for individuals (not algorithms) to reconcile potentially conflicting data from two disparate sources. Another example is preventing patient misidentification. Until electronic solutions are improved, the best method to meet some MU objectives may be partially or entirely nonelectronic.

Domain-Specific Findings

Patient and Family Engagement

Implementing the Stage 3 MU Patient and Family Engagement objectives will require better mechanisms for patient identification, data-sharing authorization and attestation of patient-

provider relationships. Stakeholders believed these objectives require flexibility in the modes by which data is contributed by and sent to patients, some of whom may lack computers and internet connectivity. Many health care organizations have patient engagement protocols in place and stakeholders hope to build upon existing functionality and programs, without creating parallel data collection or engagement tools. Stakeholders support the HITPC recommendation to postpone SGRP 204D, as amendment requests are not perceived as adding significant value to EHR content currently. Objectives in this domain may also be improved by developing education materials for patients, to help them better understand how they can participate in their care by providing data for and consuming data from their EHRs. For SGRP 206, stakeholders expressed concerns that providing patient education materials in languages that the provider does not speak may jeopardize the provider's ability to answer patient questions, identify content that is not relevant for a particular patient or otherwise tailor materials to meet individual patient needs.

SRGP 204A: Distribution of care summaries. More clarity regarding "to whom" and "when" in the language of this objective is needed. In addition, stakeholders wanted guidance whether the universe of patient-designated recipients should be limited to members of the care team and family members, or if a designated recipient could be, for example, a lawyer disputing an insurance claim. If the category of recipients is broadened beyond the care team, this could raise privacy concerns and add burden for providers to explain or follow up with "outside" recipients who have questions about care summary content.

Care summaries may not be appropriate for every member of the care team, following every encounter. Patient-centered care, and provider preferences, may require flexibility in designating which care team members should receive care summaries, and under what circumstances. One member of the Industry Panel raised an example of a patient who may consider the physician at their Hepatitis C clinic as their primary care physician, because they see that provider every week, even though that physician has no involvement in other elements of the patient's care (e.g., diabetes management). A process that clearly designates care summary recipients following every encounter is important to prevent information from being sent to the "wrong" provider, such as someone who has not recently interacted with the patient, or who is not involved in the current care episode. Stakeholders expressed their belief that patient-provider relationship validation should be maintained on an ongoing basis. One partner noted that if the relationship between sender (patient) and provider recipient is known and documented within the system for a given encounter, the workflow to annotate consent to treat and authorization to share is relatively seamless. However, data sharing outside the context of a specific encounter, or with an external provider, may require additional data reconciliation tasks or have unintended consequences.

A corollary issue is the need to define whether and when the summary of care will be acknowledged and the timeline for acting on the information it contains. This may vary by provider and recipient type, especially if "to whom" is broadly defined, e.g., primary care providers vs. specialists and care team vs. family members. If a summary of care is sent to another provider, patients will want to know when and if they should expect an acknowledgement, a response, or both. Offering patients the ability to easily change the provider(s) and other care team members who should receive the care summary is important when patients' care (and their follow- up needs) change. This is especially true if an "on-demand" option is offered for sending the care summary after a new or unique situation, such as a post-surgical visit. In addition the "when" requirement raises the question of whether care summary transmission is linked temporally to an encounter, or whether ad hoc requests can also

be made in between encounters. At least one stakeholder noted that their EHR system does not have the ability to support the latter.

Partner organizations also raised the issue of ensuring compliance with privacy regulations when sharing data; this is a concern for many objectives included in this project. The recent Office of the National Coordinator for Health Information Technology (ONC) report *Connecting Health and Care for the Nation: A 10-year Vision to Achieve an Interoperable Health IT Infrastructure* highlights health information privacy and security as one of the five critical "building blocks" for a nationwide interoperable health information infrastructure. As the report notes, in addition to Federal guidance, there may be State- and organization-specific requirements regarding informing patients of what information is transmitted and/or how to obtain authorization for data sharing. Abt's partners specifically raised the issue of State regulations around "opt-in", or affirmative consent, for sharing health data. These policies may apply to data that is considered hypersensitive or federally protected, such as data from federally sponsored rehabilitation. One partner has implemented algorithms to distinguish specially protected data from other data fields. This type of functionality could be relevant for the Summary of Care objective (e.g., if data were being sent from a primary care provider to a podiatrist, a patient may not want rehabilitation information revealed unnecessarily).

However, sending incomplete patient data could raise patient safety concerns. To address this challenge, one of the project partners is collaborating with their HIE to identify and segregate specially protected prior to export, to enable sharing certain data only on an opt-out basis. However, automated identification of this information is subject to error, as such information can reside in both structured and nonstructured fields.

Every EHR and HIE needs to both verify patient identity and record patient authorization for data-sharing. Ideally, authorization could be recorded once and applied to all sharing (a universal authorization rather than separate authorizations for every site of care). It may also be necessary to give patients the ability to designate which data can be shared with whom, and when. The project partners developed internal workflows for verifying patient identity, with significant reliance on manual processes for reconciling apparent duplicates. Master patient indexes, where they exist for an entire community, can support probabilistic matching algorithms and significantly reduce (but never eliminate) the need for human attention to near or true duplicates. When a master patient index is not community-wide, it is more difficult to confirm patient identity before sharing information. Abt's partners have explored creative mechanisms that address the needs of their very different populations. For example, one partner found that identifying patients by their mobile phone number had the highest rate of a positive, unique match. A unique patient portal log-in ID and password also helps confirm identity when patients are entering data remotely. One partner is exploring a biometric (fingerprint) reading mechanism for in-person check-ins, as a long-term solution.

Partners agreed that having a better national standard or best practices for patient identification and matching would support interoperability and identification across sites. As one partner explained, most organizations do not have the resources to dedicate staff to correctly identify and match patients. The data integrity issues that arise when reconciling patient identification data can potentially intersect with 3 or 4 different workflows, a very resource-intensive process. Industry Panel participants agreed that their internal workflows to reconcile patient identity were restricted by lack of resources.

The evaluation also addressed ensuring compliance with privacy regulations. There may be State and organization-specific requirements to inform patients what information is transmitted and/or obtained preauthorization. Specially protected information (HIV, substance abuse, and mental health information) may need to be segregated and sequestered, pending explicit patient

authorization for sharing. This information may exist in structured and unstructured fields. One partner organization implemented customized algorithms that screen for specially protected information (still in the testing phase); these may be needed for all EHR and HIE systems. However there is also a risk in sending incomplete information (e.g., sequestering information about mental health medications) to providers who need this information in order to provide complete and safe care.

Addressing the barriers described above will also require patient education, including: explaining the process of attesting to patient-provider relationships, acknowledging privacy and HIPAA implications, and setting expectations for how quickly providers will respond to patient messages and requests.

SGRP 204B: Submission of patient-generated health information and SGRP 204D: Patients can request amendments. The language for both SGRP 204B and 204D proposes using structured or semistructured questionnaires and/or secure messaging to collect information directly from patients. Abt's partners and Industry Panel participants recommended that the language allow for additional modes of communication with patients, especially for populations that may lack computer and Internet access. For example, an Industry Panel participant explained that his health system serves a primarily urban and low income population, of whom less than 5 percent has access to a computer, limited their ability to use most patient portals. However, at least 80 percent of this population uses cellullar phones, with approximately one-third having access to a smartphone. While a structured or semistructured questionnaire may be difficult to implement via text message, smartphone applications may have more promise.

Obtaining data from patients can create the need for reconciliation. Stakeholders reported that current EHR functionality is often not sufficiently mature to support the import, review, and reconciliation functions that would entirely automate these Stage 3 MU objectives. Workflows are needed to acknowledge and review patient-generated amendments and health information submitted of in response to provider requests. Integrating any of this patient-generated health information into the EHR requires provider validation. It is essential to distinguish patient-generated health information from provider-generated information, especially when the two conflict. The project partners did not have the functionality to tag patient-generated health information, making this a resource-intense manual activity. This is a potential area for vendor development and certification standards.

Transparency and security of data transfer is central to these two objectives. As with SGRP 204A, patient identity must be verified and recorded before confidential patient information is sent and received. The universe of intended data recipients must also be defined, so the right provider is accountable for acknowledging and reviewing incoming patient data. Health care organizations will need to consider policies on proxy access for family members and other surrogates to send/receive information on behalf of a patient.

Partner organizations raised concerns about secure messaging fees charged by some HISP vendors, and whether individual patients or providers would be expected to pay these fees. Health care organizations anticipate the volume of secure messaging growing, and that certainly seems to be the intent of the Stage 3 MU objectives; the associated fees could be substantial. Policy considerations include who pays these fees, their reasonableness, and mechanisms for billing patients (if permissible).

In its most recent recommendations, the HITPC endorsed postponing SGRP 204D (*Patients can request amendments*); stakeholders concurred with this recommendation, in part, because patient-facing data summaries are not yet transparent or simple enough to support meaningful patient engagement. Deliberately designed patient-facing documents, annotated with contextual or explanatory information, or requests for data that are easy for lay recipients to understand may

eliminate amendment or correction requests stemming from patient misunderstanding. Partners viewed patient-generated health information as an opportunity to engage patients, but this can only be accomplished when records are easy for patients to understand, and the format for patients to request amendments is straightforward and comprehensible.

Although stakeholders supported the intent of SGRP 204B (*Submission of patient-generated health information*), they suggested restricting the objective to the EP setting and to elective and nonurgent EH encounters. Stakeholders did not think patients would use online functionality to submit information for emergent circumstances, and did not support encouraging this behavior since patient-generated data cannot be addressed in real time. Patient safety concerns could arise if emergent or even urgent health data were submitted with an expectation of an immediate response. To this end, stakeholders also recommended proving a "warning label" in online communications to remind patients that emergencies should not be addressed online, but should be addressed via a call to 9-1-1 or a visit to the Emergency Department, as appropriate.

SGRP206: Provision of materials in non-English languages. Stakeholders reported that it would difficult to meet the 2013 version of this objective: the top five non-English languages spoken nationally would not always be relevant in a health care organization's service area. In addition, the denominator for the objective is not specified, making it difficult to calculate compliance. It is unclear whether 80 percent of all patients in a network need to be given materials in their language or whether the denominator would be restricted to patients who expressed a preference for non-English language materials. If the latter, EHRs will need to capture patient preferences for language of educational materials, which may be in print, video, or other formats. Stakeholders supported the 2014 revisions that emphasize monitoring patient preference.

The objective does not address accountability for ensuring patients understand the educational materials provided, or whether there should be resources (e.g., translators) available for patients needing clarification. This is an especially important concern when patient and provider do not speak the same language, and providers may be unable to tailor materials for a specific patient or answer questions about the content.

If providers are to disseminate documents in a language they do not speak, they need assurance that these documents are validated and accurate in order to "trust" what they cannot read. One partner organization suggested restricting patient education materials to publically available and approved materials, to ensure consistency and patient safety. This requirement could, however, restrict available materials, bias what is available for patients, and ultimately compromise compliance with the objective. In addition, generic patient-education materials may be of limited value and impact for self-care and condition management. Stakeholders reported that their providers generally use a translator service to bridge the gap between the low English proficiency populations and providers who do not speak their primary language.

Leveraging EHR functionality for this objective requires algorithms to pull from a database of educational materials, based on a patient's preferred language and format and relevant health conditions. Such an algorithm, for example, could retrieve Spanish-language materials on foot care for diabetics at an eighth-grade reading level. Although one of the partner sites is working on such functionality, there is not sufficient material available to populate the database from which such educational material would be pulled. Developing or accumulating such materials for a wide variety of languages and conditions, and validating them for accuracy, is a resource-intensive task. Without such a database of materials, however, the value of this Stage 3 MU objective is likely to be limited.

Improve Care Coordination

Care coordination objectives that require data sharing across settings require identifying patients and providers as secure endpoints for data transfer. Stakeholders emphasized the need for increased standards for medication, allergy and problem list codes, because mismatched notations could compromise patient safety. Specifically, if medications or allergies were not interpreted in the same way by the disparate systems, an adverse reaction could arise. When reconciliation is performed, it also needs to be clearly captured and recorded. Stakeholders also noted that clarity is needed regarding any overlap between a summary of care, notification of significant health care event, and other transition summaries (e.g., CCDs), along with the intended length of these documents. Stakeholders emphasized that data in these summaries must be accurate and relevant and properly integrated into the EHR after being sent/received. Stakeholders were also wary of information overload from too many notifications, and did not think they necessarily could—or should—create or respond to these notifications in the timeframes proposed**.**

SGRP 302: Medication, allergy and problem list reconciliation. Stakeholders agreed that coding or other notations for allergies, problem lists, and medications are not uniform across EHR products. This inconsistency inhibits automated reconciliation in structured data fields. Partners noted that their dependency on vendor-developed formats for noting reconciliation limits their ability to modify how they record this data; developing their own solution would limit interoperability with systems using a vendor-developed version. While it is impractical to require all providers and vendors to record the data using a single standard vocabulary, creating a requirements for system functionality of converting/mapping between different standard vocabularies would be a valuable enhancement. Inconsistency in reconciling diagnosis codes (e.g., ICD-10 or SNOMED-CT for problems; NDC for medications) raises patient safety concerns if information is not interpreted in the same way. When codes are not recognized during automated reconciliation with records from another care site, allergy alerts, for example, could be missed. The current inconsistency in coding and the lack of reconciliation functionality necessitates manual clinical record review to ensure proper data reconciliation. Reconciling different codes for similar but distinct conditions or medications is a time-consuming burden on staff. Partners emphasized that more uniformity in coding/naming standards would significantly ease burden of manual review. For example, widespread implementation of HL7 or other coding standards would promote consistency.

Recording reconciliation can be problematic. One partner's EHR vendor had programmed all three areas of reconciliation with only one "box" to check when medications, allergies and/or problems lists have been reviewed; making it impossible to record partial completion of these tasks. In some products, even viewing the data may record it as "modified", which does not confirm actual reconciliation. Each of the three types of reconciliation must be documented separately, to prevent compliance from being over-stated or under-stated. Stakeholders also discussed the need for standards around integration of data from multiple external sources, to populate fields and automatically update reconciliation. For example, if a patient is admitted to an inpatient unit from an outpatient unit in the same hospital, the medication reconciliation results should be transferred and recorded without requiring double data entry. If data are not automatically transferred in full, providers may not get "credit" for medication reconciliation, even if reconciliation was completed in the most appropriate unit.

SGRP 303: Care transition summaries. For this objective, stakeholders suggested additional clarity on the summary of care document. The 2013 version of the objective referred to a "concise" summary, which is undefined. Partners emphasized that summaries of care

needed to be short and limited to relevant, actionable information that will affect care in a meaningful and timely manner. The project partners also suggested that additional guidance would be helpful regarding the difference between a summary of care and a care transition summary or CCD, and in what circumstances each is relevant. Partners also advised that current CCD architecture contains redundant or irrelevant information, and recommended substituting a simplified summary of care document. One partner noted that while they are required to send a CCD to external providers, the original specifications for this document do not include the discharge summary. The effect of automatic CCD transmission is that the formerly concise transition summary, whose content was customized by the discharging physician, has been replaced by a document that can include dozens of pages of information with varying relevance. For example, one partner noted that a 10-day NICU stay without major complications yielded a CCD over 100 pages long, without organizational aides to guide the pediatrician to the most pertinent and time-sensitive facts. Partners also identified technical limitations of some vendor products. One partner's EHR system does not support non-CCD document formats (e.g., PDF files). Such documents could appear to have been sent to an external provider, but the recipient will not be able to open or read them.

Ideally, EHR technology should pre-populate summary of care documents using existing information that is most relevant to the patient and the encounter or episode; the 2014 update of the objective begins to address this by providing options of data to include in the summary. Automatically including selected EHR data in the transition of care document could mitigate against data overload in alerts; basic information would already be present in the record, available across settings without any need to explicitly share it. Partners also suggested a more precise definition concerning the intended recipients of the summary of care ("the care team") and favored sending the summary of care to a select few providers rather than every person with even peripheral involvement in the patient's immediate care. As with SGRP 204A, flexibility is needed regarding which providers need to receive the care summary, on a case-by-case basis. For both SGRP 302 and 303 stakeholders did not believe that it is realistic to require that a provider receive and acknowledge care summary receipt within a few hours or even days. Although the original language specifying a 48-hour timeframe was deemed too restrictive, realistic timelines are needed for sending, acknowledging, and acting upon received information. Additional messages could help alert providers to summary of care documents in more urgent situations. The significant volume of emailed information inundating providers today suggests the need for filters or a mechanism to flag critical notifications so that they are not missed or delayed. Alternate modes for sending high priority information should be considered. For example, one of Abt's partners has a policy of paging an inpatient's critical values to physicians, regardless of affiliation, through smart phone technology. Another tested notification of care transition summaries with a few physician practices that wished to receive them. Subsequently some providers quickly asked to have the pilot halted because they could not absorb or respond to so many notifications.

It may be necessary to educate providers regarding which data to include in a care summary, and when the summary should be sent. The sending provider may also need the reassurance that the summary s/he sent has been received, especially in more urgent or emergent situations. Sophisticated, content-specific notifications with contextual information on a patient's condition and unresolved issues may be more meaningful than simple admission/discharge/transfer (ADT) notifications. All this functionality will generally require vendor upgrades, limiting what health care organizations can accomplish or customize on their own.

The lack of trading partners with sufficient capacity to use electronic information is arguably the single most important barrier to any inter-organization sharing of patient data and affects all

Care Coordination objectives, as well as Interoperability objectives. Skilled nursing facilities, home health agencies, specialty physicians and providers that are not participating in the MU program tend to have primitive (if any) electronic data capabilities, and will most likely continue to send and receive necessary, useful information about referred/transferred patients in paper form for some years to come.

Finally, sharing patient data across settings of care requires verification of patient identity and authorization for data sharing, and sequestering of specially protected information, as discussed above.

SGRP 308: Notification of significant health care events. As with SGRP 303, the intended difference between notification of a significant health care event and an ADT alert is unclear (as the significant health care events described in this objective comprise the "ADT" functions). Greater clarity could reduce redundancy and specify which type of notification should be sent under which circumstance. The 2013 objective language lacked a definition of the required timeframe, as well as what was considered a "significant health care event"; the revised 2014 language clarified the types of events that are considered significant, but raised additional issues. The number of events for which notifications would be sent, as well as the members of the care team receiving notifications, should be customizable by the organization based on provider type and patient preferences. In addition, the specific significant events are largely redundant of information reported in other forms. Sending alerts for both admission and discharge was seen as potentially redundant for some providers, but not others. For example a home health agency may wish to know when a patient in its care is admitted to the hospital (to avoid sending a nurse to the patient's home) and also when the patient is discharged back to home health care (to ensure that a nurse visits the next day). Other providers however, such as a primary care physician, will be most interested in the discharge notification, to prepare to reengage with the patient. Flexibility regarding which notifications are sent to different members of the care team will avoid saturation with notifications that are not immediately actionable. The language specifying that "Notifications should be automatically sent to the provider of record" does not provide sufficient flexibility to take the event and provider type into account. An alternative would be to send notifications for high-risk patients only, or in an event of a high-risk episode. Ideally, providers would be able to follow an issue across connected organizations through the HIE process, to monitor events of importance/acuity.

The 4-hour timeframe for notifying the care team of significant health events, which was added in the 2014 language, was deemed unrealistic by stakeholders, especially for death notifications, as this is not time-sensitive information. State and local policy requirements also make sending prompt notifications about deaths problematic. While a hospital will know about inpatient deaths, other deaths may require certification by State officials. One partner reported that they would never send a death notification based on informal information (e.g., from a member of the care team or a family member) and would always await certification from the State, which generally arrives days or weeks after the death. For all of these reasons, stakeholders suggest removing "deaths" from the significant health care events that require immediate notification to the care team.

As described above, objectives requiring sending patient data across care settings within a specific timeframe also imply that these notifications will be quickly acknowledged and acted upon. A four-hour window is arguably only meaningful if there is also a process for acknowledging the information on the recipient end. As with other Patient and Family Engagement and Care Coordination objectives, implementation requires an effective mechanism to alert providers of incoming information in a timely manner, differentiating urgent and actionable information (which will likely be provider-specific), and methods to integrate these

notifications into the EHR at each receiving provider site. Again, patient identification and authorization must also be verified before data is sent across settings, along with the definition of the care team and who needs to receive each type of notification.

Interoperability

As reported above, automated solutions for resolving patient identity and managing provider addresses through one or more centralized entities/databases would enhance interoperability. While data-sharing formats are increasingly robust, the HIE and vendor-supported infrastructure is not yet in place to support interoperability. Infrastructure improvements would bolster compliance in all other domains of MU. Health care organizations and their EHR vendors need national infrastructure standards to achieve data exchange and reduce manual reconciliation and review. At the same time, policies concerning interoperability should allow for hybrid and semiautomated customized solutions until trading partners' capabilities become more uniform and HIE infrastructure is more complete nationwide.

The evaluation partners reported that they could meet interoperability objectives by using internal workarounds and manual support, but this is inefficient and contrary to the spirit of MU. More importantly, many essential trading partners (e.g., long term and post-acute care providers) cannot develop and maintain their counterpart workarounds and manual supports. Focusing on a lower common denominator to interoperate with the majority of partners who have less sophisticated systems undermines progress for innovative, early adopters, who may devote extensive resources toward efficient and sophisticated electronic systems. For example, one partner reported that although many of their trading partners are in the process of adopting DIRECT messaging, fewer than 60 percent are expected to have this capacity in the near future. In addition, there are "too many exceptions" to full automation that make it impossible to completely abandon manual solutions. Ideally, it should be possible to send messages through DIRECT to those partners who have DIRECT, and use other secure transmission for those trading partners who don't have DIRECT. This flexibility will be essential for the foreseeable future. This partner can identify recipients that can do not use DIRECT within their larger network but alter any messages to be compatible with the larger network/NwHIN. This is an example of "back-end functionality" enabling "front-end" compatibility. Ideally, vendor products should adjust automatically to the receiving entity's capabilities, so that front-end workflows can be consistent. A clinician should not need to know whether another provider can accept DIRECT messages; the system should be able to adjust and send the same content via DIRECT or fax, depending on the recipient's capability to receive.

IEWG 101: Sending and responding to patient queries. The partners identified inefficiencies within their current capabilities to query internal and external systems that make automatic data retrieval, the goal of IEWG 101, difficult. Currently, querying processes are not fully able to extract needed data, requiring manual querying and retrieval to find relevant data. The partners also reported a lack of functionality to easily extract only certain attachments from a message, or certain values from a record. This is an important function when only certain information has been approved for pre-staging (discussed below). Manually selecting files or data points to send is burdensome; a better query and retrieve function would eliminate this manual step.

Certifying discrete clinical data sent to and from an organization's system does not guarantee enhanced workflow efficiency. For example, one partner organization reported that there are often insufficient metadata to fully understand a reported allergy, such as to Tylenol. Instead, the receiving provider must request more information and follow up with the sending organization.

One partner noted that their State has developed a very rich contextual supplement (including HL7) to the actual laboratory values being exchanged that make the information contextually useful. One senior professional noted that "just pushing data back and forth isn't enough," there needs to be context to that data to make it actionable.

Labor hours supporting interoperability are significant at partner organizations; a staffing burden that would likely be unsupportable for health care organizations with fewer resources. The project partners explained that they rely heavily on EHR and third-party vendors to support interoperability functionality, including DIRECT and locals/State HIEs. However, since improving querying functions and DIRECT message quality are not explicitly part of current MU requirements, this functionality is not a priority for vendor improvement. As a result, health care organizations must devote internal resources to fill the gap. Third-party vendors and HIEs could be required to support necessary functionality, especially when this functionality is out of scope for EHR vendors.

This objective requires functionality to record and query patient authorization. As noted, there is no standard method for recording patient authorization, managing changes in patient authorization, or querying this information. Establishing a requirement for EHR systems to have the ability to record and retrieve authorization is another component of basic functionality that vendors could support. Stakeholders emphasized that the ways in which authorization is recorded and managed will likely vary by vendor: as with methods for sending and receiving patient-reported data, the medium by which information is received is not as important as ensuring there is a mechanism to receive it and update it.

Patient authorization offers a unique example of how State regulations influence compliance. Obtaining and recording patient authorization, and managing changes in authorization, are governed not only by functionality to pull necessary data elements out of the record, but by State laws regarding opt-in vs. opt-out authorization, and use of universal authorizations. Varying State regulations especially complicate sharing of records across State lines. This is an important example where minimum Federal standards and requirements, rather than individual State regulations, would greatly simplify interoperability. National standards could also include minimum privacy requirements for specially protected information, and a standard approach for identifying and sequestering this information during data sharing. Patient authorization includes validating patient identity before sharing data are sent, as well as the treatment relationship between patient and data recipient.

Finally, interoperability capabilities vary greatly by region, depending on the reach and sophistication of local and State HIEs. The many different HIE designs (public utility, orchestrator, capacity builder) and the presence/absence of centralized document stores and record locator services yield a patchwork of functionality across and even within States. In the absence of robust local HIEs, some health care organizations have developed their own HIE solutions. Vendors are also working on interoperability, at least between users of their products, if not with external products. This landscape is becoming increasingly complex, which complicates efforts to achieve MU interoperability. One of the partner organizations that relies on both an enterprise EHR and a regional HIE suggests that given the lack of dependably robust HIEs nationwide, and the necessity for local solutions, exchanging information internally (via HIE or enterprise EHR) should "count" towards MU certification. In other words, systems should not be penalized for high degrees of internal communication and coordination, developed with heavy investment, independent of MU requirements. In addition, early adopters that can exchange information across their own integrated delivery system should not be penalized if there are no external trading partners prepared to share data, and no HIE able to support interoperability. For example, some hospitals allow local nursing homes and home health

agencies temporary, online "read only" access to patient's EHR during care transitions, thus bypassing the need for interoperability. These solutions may be extremely effective and could be exempted from MU interoperability requirements.

IEWG 102: Querying provider directories. The ability to query a national provider directory and send patient data across systems, like the querying functions discussed in IEWG 101, will be important for all the other Stage 3 MU objectives. Not all organizations maintain provider directories to the same degree, or use the same standards, making it difficult to verify secure endpoints for information transfer. Querying an external provider directory is fraught with complications: provider directories lack standards for information that will be in the public domain; provider information in a directory tends to be limited and not up-to-date; and unique contact information may be unavailable for providers in group practices or large institutions. Discovering communication end points has become a high priority for Abt's partners. However, they suggest that provider querying may be more appropriate as a "Menu" item in Stage 3 MU, due to current shortcomings in provider directories. Under DIRECT secure messaging, HISPs can "talk" to one another but the shortfall is in querying provider email addresses across the HISPs, since they do not exchange provider directories. Moreover, there are no adopted standards for health care organizations to share their provider directories securely. The biggest workflow impediment is in querying. Confirming the appropriate address for transmitting a care summary is an ongoing challenge. The default, in some cases, is to print and fax; electronic transmission requires that sender and recipient use the same EHR vendors' products.

A national provider directory, suggested repeatedly by all stakeholders as a critical solution to support all other objectives, would standardize the type of information available for each provider, and could include rules for maintaining accurate, real-time addressing information. Central maintenance of a national provider directory, perhaps by a designated supplier or vendor, would relieve every independent health care organization of the task of maintaining an internal directory. In the absence of a centralized provider directory, each health care organization must deal with error logs from unsuccessful message attempts. When external provider email addresses are not recognized, messages may not be sent or, if sent, never received. One partner noted that their EHR can recognize CCDs but cannot open secure messages or other documents sent from external parties. All of these limitations require significant labor hours to reconcile missing data on the back-end of the systems and to compensate for workflows that are not sufficiently automated.

Conclusion and Recommendations

Successful executing the Stage 3 MU objectives and certification criteria will benefit from a balance between flexibility and standardization, to achieve uniformity and interoperability across settings without abandoning highly functional and customized local approaches.

A lack of common policies and systems creates inconsistent capabilities across settings, in turn limiting the number of trading partners with whom an organization is able to easily collaborate. Abt's project partners are more advanced along the MU continuum than many other health care organizations, but they too can only achieve the full range of Stage 3 MU capabilities if their peers have sufficient capabilities to trading information. This will depend on policies applied uniformly across settings, supporting basic MU standards and requirements. These findings were underscored repeatedly in the data collection and are supported by the June 2014 ONC report *Connecting Health and Care for the Nation: A 10-year Vision to Achieve an Interoperable Health IT Infrastructure*.[9]

During the evaluation, all stakeholders observed that vendors are focusing almost exclusively on MU compliance, limiting their support for individual customers and hence those customers' ability to innovate. This diverted focus has also come at the expense of shoring up and optimizing basic EHR functionalities. Many health care providers are still working on Stage 1 and others are awaiting new releases from their vendors to begin work on Stage 2. The goal of this project was to look ahead to Stage 3 and seek input from the field concerning the feasibility of proposed Stage 3 MU objectives and certification criteria. The partner sites served as test beds, approximating the work that vendors will need to do in the future, based on their greater-than-average internal capacity to innovate beyond vendor functionality. Indeed, the Industry Panel stakeholders confirmed that in many instances they do not have the internal capacity to innovate far beyond the Stage 1 and 2 mandates currently in place. Indeed, the partners, despite their extensive resources, experience and capacity to innovate also relied extensively on vendors to support the functionality implicit in Stage 3 MU.

Stakeholders proposed many concrete EHR enhancements that vendors should support to enable Stage 3 MU compliance. Stakeholders also raised many salient recommendations to improve the objectives at the policy level. Exhibits 6 and 7, below, list key policy and EHR functionality recommendations respectively. These recommendations reiterate findings discussed throughout this report. If EHR priorities reflect functionality that we recommend, vendors should be better poised to support Stage 3 MU and broader goals of interoperability. The policy recommendations below are relevant to the Centers for Medicare & Medicaid Services, ONC and other policymaking bodies in the realm of health information technology.

[9] Source: Connecting Health and Care for the Nation: A 10-Year Vision to Achieve an Interoperable Health IT Infrastructure. Washington, DC: The Office of the National Coordinator for Health IT; June 2014.

Exhibit 6. Key policy recommendations

Overarching Policy Recommendations
Allow "bridge", or hybrid, solutions to meet MU objectives that leverage existing, successful approaches (these may include nonautomated solutions)
Establish standards for the life-cycle management of patient-provider relationships, including ownership, timeline for attestation, and discontinuing the relationship
Establish standards for medication and allergy notation to facilitate reconciliation
Define parameters/ timeframe in which recipient providers need to acknowledge and react to information in notifications, in a way that recognizes differing risk/importance of notifications for recipients
Align certification requirements for EHR systems with interoperability functionalities that accommodate for organizational consent needs.
Consider a centralized national provider directory, potentially through a third-party vendor, with consistent standards for content and maintenance

Exhibit 7. EHR functionality recommendations

EHR Vendor Recommendations
Allow creation of customized summaries of care, with ability to share /view supported file types across settings and vendor platforms
Support functionality to verify patient identity across vendor platforms
Enable segregation of hyper-protected data from other HIPAA-protected data for selective sharing; enable retrieval of specific documents or data elements from larger files (of varying file types)
Support provider address lookup and updating of new provider credentials
Enable functionality to integrate validated incoming data into record
Allow for distinction of provider vs. patient-generated data