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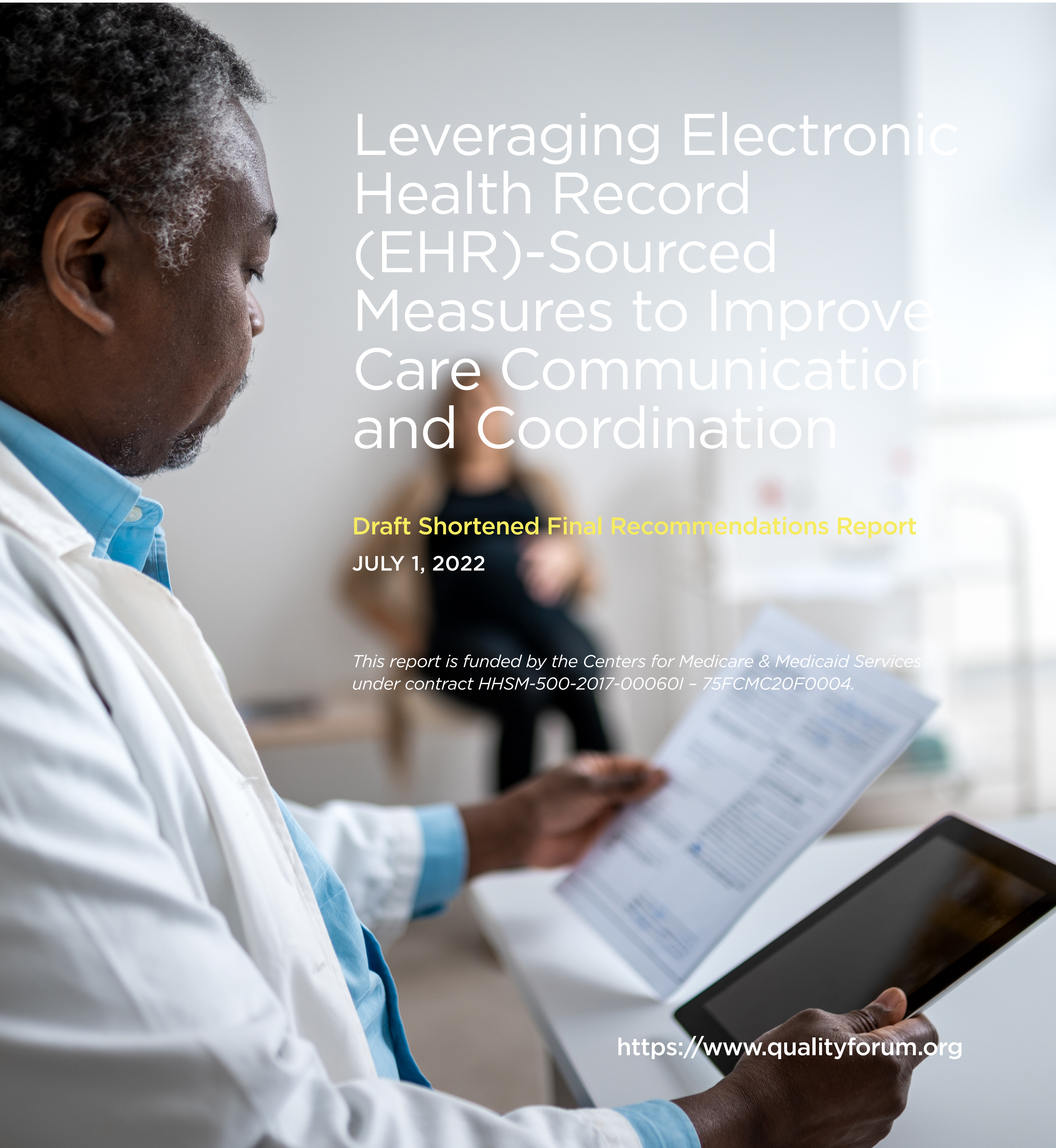

Leveraging Electronic Health Record (EHR)-Sourced Measures to Improve Care Communication and Coordination

Draft Shortened Final Recommendations Report

JULY 1, 2022

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Executive Summary

As healthcare becomes increasingly complex, patients interact with different clinicians in different settings. The entire care team (i.e., clinicians, non-clinicians, patients, and caregivers) must communicate seamlessly to ensure all aspects of care are effective and aligned with patient goals. Care communication and care coordination are central to the experience of patients and caregivers, particularly as they navigate transitions in care between providers and settings. Patients disproportionately affected by social determinants of health (SDOH) factors (i.e., nonmedical risk factors, such as food and housing insecurity) are at increased risk of negative outcomes. Improved care communication and care coordination offer the potential to improve these outcomes and make care more equitable.[1]

Care coordination denotes organizing patient care activities and information to meet patient and family needs and preferences for healthcare and related services. Care communication is the transfer of information for care, a critical component of care coordination. While these concepts are not new, their measurement and improvement are long-standing challenges. It is difficult to attribute improvements in outcomes to a particular intervention, as that intervention may be performed differently across settings, or the data on whether it was performed may not be captured in a standardized way. This also makes it difficult to hold organizations accountable for these interventions.[2,3]

Electronic health records (EHRs), which are now used widely throughout the United States (U.S.),[4] can help overcome some of these measurement and improvement challenges. For example, patient portals enable patients to view test results and communicate with clinicians. Using EHR-sourced measures (i.e., quality measures that rely on EHR data) also has advantages over traditional measurement approaches, such as chart review or insurance claims. EHRs capture detailed information through care delivery that is available electronically in a standardized way that can support automated measure calculation and reduce the burden of chart review and abstraction, which is both time- and resource-intensive. EHRs can also be designed to collect additional data elements that may be used in future quality measures.

In this project, the National Quality Forum (NQF), with funding from the Centers for Medicare & Medicaid Services (CMS), convened a multistakeholder Committee to identify ways that EHRs can improve care communication and care coordination and advance quality measurement. During the first phase, the Committee developed an **environmental scan** that identified definitions for care communication and care coordination and outlined measurement challenges.[5] During the second phase, the Committee developed recommendations for using EHRs to effectively facilitate, measure, and improve care communication and care coordination. **EHR-sourced measurement is critical to driving quality improvement and equitable health outcomes by enhancing care communication and care coordination.** The purpose of this Recommendations Report is to provide an overview of the opportunities for using EHR data to improve the measurement of care communication and care coordination.

The Committee recommended three ways EHRs can facilitate effective care communication and care coordination for patient care and quality measurement:

RECOMMENDATION 1:
Optimize EHR functionalities for care communication and care coordination

RECOMMENDATION 2:
Advance EHR data elements related to care communicaton and care coordination

RECOMMENDATION 3:
Leverage EHR data to fill care communication and care coordination measurement gaps

For these recommendations, the Committee acknowledged both the current and future states of EHR systems with respect to interoperability (i.e., the ability to share information within and between healthcare facilities and settings) and other functionalities. EHR maturity phases (i.e., the level of EHR functionality to support care communication and care coordination) were used to organize recommendations to improve care.[6] Ongoing national initiatives to improve and incentivize interoperability and systematic measurement are foundational to improving care communication and care coordination and provide a critical backdrop to the recommendations in this report.

Improving the measurement of care communication and care coordination is essential, and EHRs are an important vehicle to achieve this. These recommendations lay the groundwork for advancing the use of EHR-sourced data to improve and measure care communication and care coordination in parallel with the national work to advance interoperability and data standardization.

Background on Care Communication and Care Coordination

Over the past several decades, healthcare has become increasingly complex. New treatments, increased specialization, and advanced technology may require patients to receive care from different clinicians in different settings.[7,8,9] A greater recognition of disparities; difficulty in assessing needed services; and more complex, longer treatment regimens for chronic illnesses also add to this complexity. Care teams, including nontraditional providers, such as community health workers,[10] increasingly must effectively communicate with each other and with the patient and family to coordinate care, ensuring all aspects of care are aligned with patient goals and that patients receive high quality care.

Care coordination denotes organizing patient care activities and information to meet patient and family needs and preferences for healthcare and related services. Care communication is the transfer of information for care, which is a critical component of care coordination. An important part of ensuring that healthcare systems and clinicians are communicating and coordinating care effectively is to assess how they are using these functions. Healthcare systems and clinicians can assess their effectiveness internally as part of their continuous quality improvement activities. External organizations can also hold them accountable by tying assessment to levers such as payment and accreditation. Measuring and improving care communication and care coordination using traditional quality measurement approaches have been a long-standing challenge. Care communication and care coordination activities are multifaceted, involving numerous steps across a wide range of clinicians, community health resources, and settings. Therefore, simply measuring whether a particular action occurred, such as patient information being transferred from the hospital to a patient's primary care provider, may not fully capture whether care was delivered effectively. Additionally, a patient's condition and comorbidities might have a greater effect on outcomes (e.g., whether the patient is readmitted to the hospital after discharge) than care communication and care coordination.[11] This makes it difficult to hold healthcare systems and clinicians accountable for the full scope of outcomes that may be related to care communication and care coordination.

EHRs can help untangle some of these challenges. While originally designed to support clinical care and to bill insurance companies, well-designed EHRs can be a tool to improve care communication and care coordination. For example, when EHRs share standardized data across settings and effectively present information to both clinicians and patients, the usability of information increases for the entire care team. The availability of that information shared across EHRs can potentially reduce diagnostic and treatment errors and care fragmentation, improve treatment recommendations, and enhance patient trust.[12,13,14] EHRs can also help the care team identify social risks and assist in linking the patient and their family with services that are foundational to health and productivity, both within the healthcare setting and the community. In addition, EHRs can improve measurement and quality improvement activities by using the detailed data captured during routine clinical care. EHRs can enhance the accuracy and decrease the burden of traditional measurement approaches by:

- capturing comprehensive clinical data in structured fields as opposed to claims-based measures, which use less granular data;
- extracting clinical data automatically as opposed to requiring chart reviews; and
- enabling measures to be calculated in near real time instead of months later.

Using EHRs to better measure and improve care communication and care coordination requires the following:

- EHRs that share health-related data securely and seamlessly with other EHR systems and stakeholders (i.e., EHRs that are "interoperable")
- Industry-wide data standardization (e.g., widespread use of a data standard to ensure a measure calculated from one location is the same as a measure calculated in another).[15]

The federal government and other stakeholders are working to achieve these requirements through multiple initiatives (See Callout Box). CMS and the Office of the National Coordinator of Health Information Technology (ONC) both have rules requiring implementation of these initiatives to support the sharing of health information. The implementation of these and future efforts will ensure that standardized, interoperable data are usable for clinicians, patients, and caregivers. These efforts will also help move the field towards the use of **digital quality measures (dQMs).** The improved data and progress toward dQMs will facilitate the use of EHRs to improve the measurement and efficacy of care communication and care coordination efforts.

Examples of Initiatives to Advance Interoperability and Data Standardization

- **United States Core Data for Interoperability (USCDI)** An ONC initiative that establishes a standard set of health data classes and data elements for nationwide, interoperable health information exchange (HIE) through a new public health application programming interface (API).[6]
- **Health Level Seven International (HL7) Fast Healthcare Interoperability Resources (FHIR)** An internet-based approach to transferring and sharing health information to provide seamless interoperability and patient-centered, data-driven care. It includes specifications for how one system requests and receives data.[16]
- **Gravity Project** A multistakeholder, public collaborative sponsored by HL7 with the goal to develop, test, and validate standardized SDOH data within the EHR using identified coded data elements for several social risk domains.[17]

EHR-sourced measurement is critical to driving quality improvement and equitable health outcomes by enhancing care communication and care coordination. In 2021-2022, NQF, with funding from CMS, convened a multistakeholder Committee to identify ways that EHRs can improve care communication and care coordination and advance quality measurement. The Committee recommended three ways EHRs can facilitate effective care communication and care coordination for patient care and quality measurement:

RECOMMENDATION 1:

Optimize EHR functionalities for care communication and care coordination

RECOMMENDATION 2:

Advance EHR data elements related to care communication and care coordination

RECOMMENDATION 3:

Leverage EHR data to fill care communication and care coordination measurement gaps

This report describes the Committee's three recommendations, presenting a specific rationale for each recommendation, and exemplars for how each recommendation could be implemented in practice. The audience for this report includes policymakers, clinicians, patient advocates, and members of the public. Additional details about these recommendations can be found in the Final Recommendations Report.

RECOMMENDATION 1:

Optimize EHR Functionalities for Care Communication and Care Coordination

Rationale

To develop practical recommendations for the current and future state of EHR development, the Committee considered the concepts of interoperability and EHR maturity to assess an EHR's readiness to support care communication and care coordination. Interoperability is a cornerstone of effective care communication and care coordination because it supports the ability for care teams to have access to complete information at every encounter. A related concept is EHR maturity, which combines the concept of interoperability with the functionality of EHRs. This was modified from the ONC Interoperability Roadmap[18] and the Healthcare Information and Management Systems Society (HIMSS) Electronic Medical Record Adoption Model (EMRAM).[19] The Committee needed to consider both interoperability and EHR maturity because they assess different ways that EHRs can facilitate care communication and care coordination. Additionally, since different settings are at different EHR maturity levels, it allows for clear actions that can be taken to advance these concepts for all settings.

- **Interoperability** is the ability to share information easily between different systems and is essential for effective care communication and care coordination. Without interoperability, there is an increased burden on patients and their caregivers to be the communicator of their care. The movement towards fully interoperable data will facilitate the sharing of information that is essential for care communication and care coordination and should decrease the burden on patients, their caregivers, and the care team.
- **EHR maturity** is the level of functionality within the EHR to support care communication and care coordination. Specifically, it is how advanced an EHR system is in achieving the goals of interoperability, data standardization, usability, and other features, such as tools to improve care communication and care coordination. Differences in maturity are related to healthcare settings using different EHR vendors, leveraging their expertise in clinical informatics, and allocating strategies and budgets to implement and customize EHRs. EHR maturity ranges from simple (e.g., limited clinical documentation, basic communication with ancillary clinical systems) to more advanced functionalities (e.g., complete clinical document, communication with health information exchanges [HIEs] to share data) across a continuum.[20]

To improve care communication and care coordination, stakeholders, including healthcare leadership, EHR vendors, and clinicians, should focus on achieving more advanced levels of EHR interoperability and maturity within and across all healthcare settings. This is important because greater interoperability and higher levels of maturity allow for more advanced and effective tools for care communication and care coordination, making it easier for clinicians to deliver the best care and for patients and families to navigate the complexity of their care. It is important to note that because the phases of EHR maturity are a continuum, it is possible that different aspects of the same EHR system may be at different phases of maturity with respect to different elements of interoperability and functionality related to care communication and care coordination. Examples of the recommended EHR features are provided for each EHR maturity phase because different healthcare facilities use different kinds of EHR systems that have different baseline functionalities. This enables stakeholders to both act on the recommendations with their current EHR system and plan for future advancements.

The Committee developed a series of exemplars to serve as a roadmap for future efforts to ensure the usability of EHRs for care communication and care coordination:

1. **Collect and share standardized data for clinical care**
2. **Optimize usability for patients and caregivers**
3. **Optimize usability for clinicians**

Exemplars

COLLECT AND SHARE STANDARDIZED DATA FOR CLINICAL CARE

Because patients receive care across settings, patient information stored within EHRs needs to be accurate and complete to facilitate effective care. However, the accuracy and completeness of the information depend on an EHR's interoperability and whether the data are standardized. For example, a patient's lab value in one EHR should seamlessly map to a data field for the same lab value in other systems. Additionally, SDOH data must be standardized so that the information can be shared across systems to provide the best care. Below are features of EHRs that should be in place to facilitate the collection and sharing of standardized data and are aligned with the goals of federal initiatives.

Examples of EHR Features for Collecting and Sharing Standardizing Data by EHR Maturity Phase

EHR Feature	Early EHR Maturity	Intermediate EHR Maturity	Advanced EHR Maturity
Interoperability of Patient Information	Data are shared locally within health systems (e.g., between hospitals and affiliated primary care offices) and with local HIEs	Data are shared within and across health systems (e.g., between hospitals and primary care offices that are not affiliated) and with local HIEs	Data are shared within and across health systems and with nontraditional settings (e.g., community-based organizations and wearable health technology, such as heart monitors). Information within local HIEs is available within EHRs.
Standardization of EHR Data Fields	Demographics (e.g., name, address, and date of birth) and diagnoses (e.g., International Classification of Diseases, 10th Revisions [ICD-10] codes)	Additional fields for laboratory results, medications, and chief complaints	Additional fields for interventions (e.g., complex care plans) and social risk and other factors (e.g., SDOH)

OPTIMIZE USABILITY FOR PATIENTS AND CAREGIVERS

EHRs must be usable for patients and their caregivers for them to actively participate in care communication and care coordination. Patients and caregivers have varied health literacy, which may limit their ability to understand complex medical jargon and navigate the healthcare system. EHRs can help patients and caregivers communicate with their care team, particularly if patient-facing EHR-based tools are user friendly. Stakeholders must also identify who controls patient information, enable patients or their caregivers to provide feedback on the information's inclusion and accuracy, and foster trust that the information will be used appropriately and equitably to advance care. Stakeholders should use standardized data elements for patient-entered information, and EHRs should be accessible in a patient's preferred language. Lastly, patient portals should be easy to use, confidential, and allow for direct connection between the patient and the care team and be accessible to at-risk populations. The following features should be in place to optimize the usability of EHRs for patients and caregivers for effective care communication and care coordination.

Examples of EHR Features for Optimizing Usability for Patients and Caregivers by EHR Maturity Phase

EHR Feature	Early EHR Maturity	Intermediate EHR Maturity	Advanced EHR Maturity
Ownership of Patient Information	Commonly clinicians, health systems, and/or EHR vendors are owners	Commonly clinicians, health systems, and/or EHR vendors are owners	Patient owns and controls their information and shares it with providers at their discretion
Patient-Entered Data Fields Into the EHR	No patient-entered data capabilities	Intake forms to collect basic information electronically (e.g., through a patient portal or at a kiosk)	Clinical, SDOH, or engagement questions are entered into the EHR to monitor treatments or be used as patient-reported outcome measures; patients can upload their own information into the EHR and review information for accuracy
Languages of Patient Information	Limited patient information available (e.g., discharge instructions) in some non-English languages	More information available in a limited set of non-English languages	All patient-facing information is automatically presented in a patient's preferred language
Communication Methods Between Clinicians and Patients	Patient and their clinician communicate asynchronously (e.g., through secure emails via the patient portal)	Patient and their clinician communicate asynchronously and synchronously (e.g., through EHR-based telemedicine visits)	Patients and the entire care team (including non-clinicians) can communicate securely through the EHR, both synchronously and asynchronously
Features of Patient Portals	Basic data (e.g., laboratory results, visit summaries) are accessible	Data can be accessed, and there is a focus on developing improved interfaces and enhancing patient engagement; considerations are made for patients with difficulties interacting with the portal	User experience design is implemented to present patient information and to identify care gaps; data are summarized in an understandable level of complexity to be transparent to the patient; prioritized action items are identified for patients (e.g., need for follow-up care); alerts are sent as needed to notify the patient of outstanding actions

OPTIMIZE USABILITY FOR CLINICIANS

EHRs must also be usable for clinicians and non-clinicians (e.g., case managers, community health workers) for care communication and care coordination to occur. EHRs serve various functions in care delivery, including documenting care, ordering tests and obtaining and reviewing results, and prescribing treatments. In addition, the care team can use EHRs to gain insight about diagnoses and patient and caregiver goals; implement best practices; and communicate with patients, caregivers, and other clinicians. EHRs should summarize data elements and care gaps for clinicians. This should be done in such a way that presents clinical data so clinicians can more easily identify plans of care, care trajectories, and gaps in care. In addition, clinicians should be able to retrieve data easily rather than needing to search through multiple documents to find information. Below are features of EHRs that should be in place to optimize the usability of EHRs for the clinician for effective care communication and care coordination.

Examples of EHR Features for Optimizing Usability for Clinicians by EHR Maturity Phase

EHR Feature	Early EHR Maturity	Intermediate EHR Maturity	Advanced EHR Maturity
Data Organization and Summarization in the EHR	Data are in lists in discrete sections of the EHR (e.g., problem lists, medications, other structured data, and PDF documents of signed forms); data are not summarized	Data are organized in sections of the EHRs, which makes it more intuitive to find; data are summarized in intuitive ways that generate clinical insight	User experience design is employed to ensure EHR data are intuitive to clinicians and patients, summarized, and integrated into clinical workflows
Care Team Identification	Clinical and nonclinical members of the care team are identified only based on each record created	Clinical and nonclinical members of the care team are identified only based on each record created	EHRs identify all care team members and provide a summary of the role of the team in clinical activities and contribute to outcomes (i.e., enable attribution)
EHR-Based Clinical Protocols (e.g., Best-Practice Approaches)	Evidence-based, best-practice protocols are available but do not use EHR data	Standardized data are used to populate and calculate clinical risk scores	Compliance with evidence-based, best-practice protocols is assessed and dashboards can be used to improve quality
Clinical, Social, and Rising Risk Identification	Basic risk identification (e.g., highlighting of abnormal lab results, drug interactions)	Focus is on developing tools to identify clinical risks (e.g., worsening of clinical status) and social risks (e.g., SDOH factors that contribution to poorer health)	Useful advanced tools are available to monitor clinical risks and become part of clinical workflows
Ability to Search the EHR	Basic search filters	Search functions and filters available using structured fields	Search functions and filters available using structured and unstructured fields (e.g., able to Google the chart, which can currently be done in some EHR systems)
Customized Tools Created by Clinicians	No customization available	Basic customization is available	Customized tools can be created by clinicians that facilitate care communication and care coordination (e.g., when patient takes a specific action)
Facilitate Shared Decision Making Among Patients and Clinicians	No tools for shared decision making	Basic EHR-based tools are available to guide shared decision making	EHR-based tools are available that use structured data for shared decision making with transparent risk assessment to clinicians and patients (e.g., narrative care plans)

RECOMMENDATION 2:

Advance EHR Data Elements Related to Care Communication and Care Coordination

Rationale

As EHR functionalities continue to evolve and advance, resulting EHR-based data can facilitate care communication and care coordination for clinical care as well as quality measurement. While many existing quality measures use claims-based data, EHRs provide detailed clinical data. Committee discussions highlighted that both types of data are helpful and complementary. For example, claims may be more comprehensive than EHR data when measuring whether billable care events occurred or measuring costs in value-based care programs. However, EHR data may be more comprehensive to assess the effectiveness of care communication and care coordination activities. Used together, these measures can give a clearer picture of the quality of care communication and care coordination and costs of care across settings.

Stakeholders, including CMS and ONC, continue to prioritize transitioning to the use of dQMs, measures for assessing care quality, which use electronic data from EHRs and other digital data sources. A major facilitator of this transition is the United States Core Data Interoperability (USCDI) standardization of data elements across EHRs, which is a vital piece of ensuring measures are reliable and valid. The transition to using EHR-based data in quality measures allows for the development of new measures that were not previously feasible and the revision of existing measures to capture additional, relevant information. EHR data can be used for continuous quality improvement and feedback and for accountability through the assessment of institutional or clinical performance by tracking care outcomes and essential processes. While EHRs provide a large list of data elements that are potentially useful for care communication and care coordination and measurement, additional data elements can be easily captured in EHRs. Several additional data elements were seen by the Committee as high priority to advance both clinical care as well as quality measurement. In particular, gaps exist in data gathering from the patient through the EHR, which the Committee determined could be leveraged to improve care communication and care coordination and feed into novel measures.

Exemplars

The Committee identified several additional data elements that would be beneficial for measuring effective care communication and care coordination, which could be the basis of novel quality measures or used to respecify existing measures to be more specific.

EXAMPLES OF EHR DATA ELEMENTS FOR CARE COMMUNICATION AND CARE COORDINATION

Care Communication and Care Coordination Actions

- Shared decision making
- Elements of care planning

Goals of Care and the Ability to Identify Tailored Goals for the Patient

- To be able to attend a daughter’s wedding
- To run a marathon

Details on Transitions in Care Across Settings

- Problems in care coordination
- Identification of diagnostic errors
- Clinician or team members who are signing off a case

Communication Between Clinicians and Patients

- When test findings are communicated
- To ask questions about a treatment plan

Social Determinants of Health

- Domains within the Gravity Project
- Elements from USCDI, Version 2
- Disability status
- Culture or religion that could affect care delivery

Patient-Entered Data

- Patient engagement (e.g., involvement in shared decision making)
- Perceived correctness of clinical notes
- Care processes (e.g., problems with care navigation)
- Perceived alignment of care or patient participation in developing care plans
- Self-management and activation
- Equity of care
- Trust in clinicians
- Perspectives on specific goals of care
- Preferences and needs for specific care (e.g., advanced directives, details related to how blood is drawn, such as with topical anesthetic or through ultrasound guidance)

RECOMMENDATION 3:

Leverage EHR Data to Fill Care Communication and Care Coordination Measure Gaps

Rationale

The availability of additional EHR data elements related to care communication and care coordination increases the ability to measure these functions using EHRs. Specifically, to improve the measurement of care communication and care coordination, the Committee recommended attention to core areas of care communication and care coordination, including care planning, shared decision making, and initiating and completing communication between involved participants (referred to as closed loop communication). Care planning is the process of clinicians working with patients and caregivers to ensure that all clinicians are aligned when it comes to important decision making, such as advanced directives concerning end-of-life care. The Committee highlighted the importance of including patient-specific care goals within the care plan. There was also discussion about using the EHR to gather additional data from the patient, which could be used for novel quality measures, and to monitor specific clinical actions related to care communication and care coordination, such as whether clinicians are communicating. In addition, measures could assess whether actions related to care logistics and navigation are effective, such as whether the patient was able to follow up after a hospitalization within a recommended time frame. Lastly, the Committee discussed how the EHR could be better leveraged for the patient to communicate with the clinical team through assessments of functional status, SDOH, and whether care communication and care coordination are effective.

Exemplars

The Committee identified specific, high-priority, EHR-sourced measure concepts for care communication and care coordination based on existing measures that could be respecified to be EHR sourced and new measures that should be created (See Callout Box). In addition, several other measure concepts were discussed by the Committee that were determined to be important but of lower priority than the high-priority concepts. Notably, some of the measure concepts do exist today in various forms, such as measures of hospital readmissions and follow-up care. The Committee believed that additional measures could be developed in these areas using EHR data, such as other measures of follow-up care in other settings or with additional details about follow-up care that do not exist today. In addition, existing measures could be improved by adding more detailed EHR data, such as adding a reason for hospital admissions or a 72-hour emergency department (ED) return visit.

EHR-Sourced Measure Concepts

Outcomes of Poor Care Communication and Care Coordination

Highest-priority concepts:

- Frequency of follow-up care that was not completed within the recommended time frame (e.g., a follow-up clinic visit within seven days of discharge)
- Frequency of duplicate, unnecessary testing (i.e., repeat imaging or laboratory tests)
- Frequency of specific medical errors related to care communication and care coordination (e.g., conflicting medications)

Other measure concepts:

- Hospital readmissions within 30 days of discharge
- Unexpected return ED visits within 72 hours of discharge with hospital admission

Outcomes of Effective Care Communication and Care Coordination

Highest-priority concepts:

- Patient engagement with care coordination/clinician communication/care integration
- Assessing whether care goals are met
- Improving outcomes related to social risks (e.g., food insecurity, housing stability, and transportation access)

Other measure concepts:

- Utilization of patient portals and responsiveness of clinicians

Essential, Critical Actions for Effective Care Communication and Care Coordination

Highest-priority measure concepts:

- Patient care plans: creation, availability, and use
- Interventions to address SDOH problems (e.g., food insecurity, housing stability, and transportation access)

Other measure concepts:

- Closing the loop: communication of critical test findings to the care team and patient
- Appropriate handoff/communication performed between clinicians for high-risk transitions

TOP PRIORITIES FOR ADVANCING THE USE OF EHR DATA FOR QUALITY MEASUREMENT

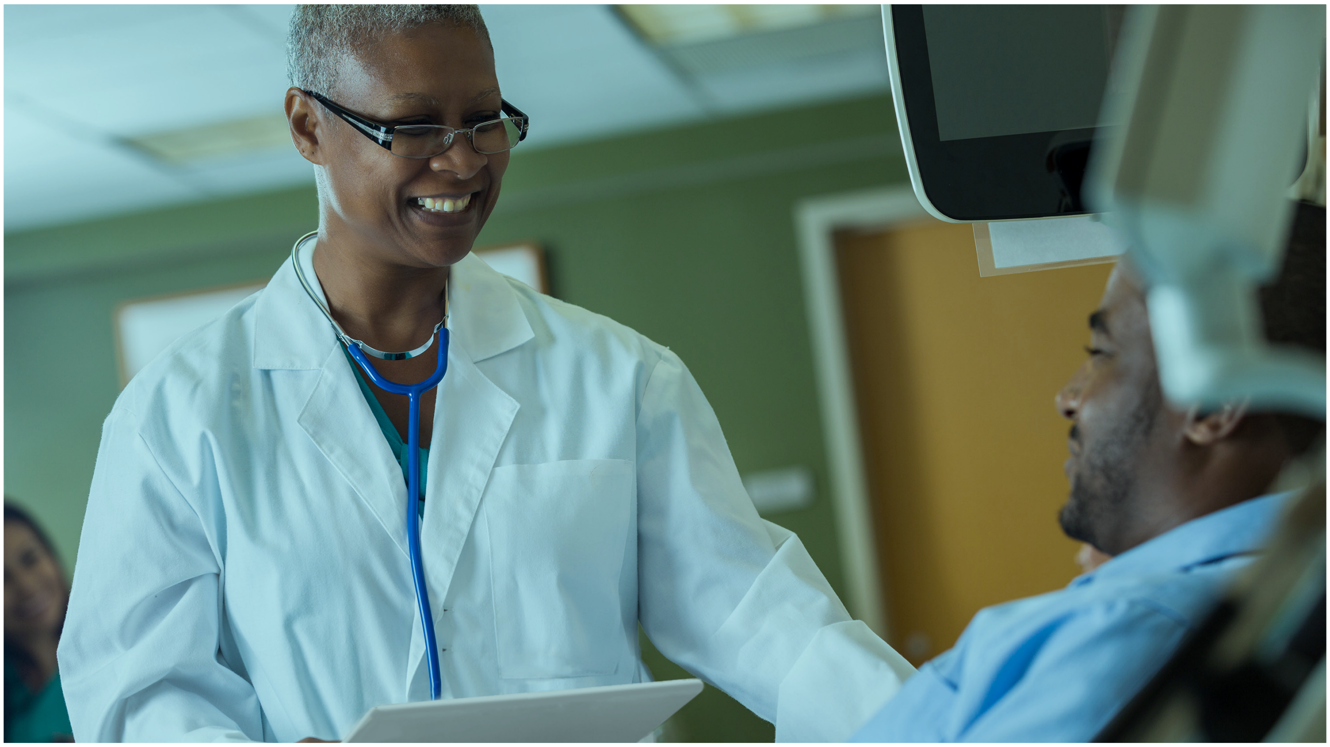
Based on the above recommendations for measure concepts and data elements, the Committee identified three top priorities, which were deemed/determined to have the highest impact in moving the field forward in the short term.

- **Develop an EHR-sourced measure** that identifies specific patient-oriented goals and whether they are being achieved. The Committee also viewed this as a high priority that is different from the care plan and is more specific to the patient. For example, a patient may set a care goal of wanting their depression to improve within a 12-month period, or alternatively, a patient may have a goal about wanting to be able to dance with their daughter at her wedding. EHRs can help design and assess these sorts of patient-oriented goals.
- **Develop an EHR-based SDOH measure.** Specific topical areas could include food insecurity, housing stability, or transportation access. EHR-based SDOH measures could be designed to assess screening, interventions for patients with positive screens, and reassessing whether interventions were effective. The Committee saw this as a high priority due to the large impact of SDOH on clinical outcomes, particularly when it comes to these particular SDOH issues.
- **Improve the specificity of existing measures related to downstream care after an index visit.** Follow-up measures on critical coordination can help reduce fragmentation and ensure that patients are reassessed, particularly at high-risk transitions in care (e.g., duplicate testing and follow-up care after hospital discharge). The Committee viewed this as important due to the limitations of existing measures and the granularity that EHR data would provide to make the measures more specific and actionable.

Conclusion

While improving care communication and care coordination are central goals of healthcare delivery, large gaps remain in how these functions are implemented and measured. EHRs with improved data sharing and standardization are one solution for closing these gaps. Federal programs, such as USCDI, will continue to require new data standardization approaches and facilitate their implementation to enhance interoperability and EHR maturity across settings. The recommendations in this report are intended to complement this work by providing practical solutions for leveraging EHRs to facilitate care communication and care coordination quality measurement. These solutions include specific ways to optimize EHRs functionalities by collecting and sharing standardized data and to be more usable for patients, caregivers, and clinicians to improve care communication and care coordination.

EHRs can improve the measurement of care communication and care coordination for both continuous improvement and accountability purposes. The recommendations in this report include identification of new data elements related to care communication and care coordination measurement and prioritized next steps for advancing measure development. To optimize EHRs for clinical use and quality measurement and to improve care communication and care coordination, stakeholders, including healthcare leadership, EHR vendors, and clinicians, should focus on achieving more advanced levels of EHR maturity within and across all healthcare settings. Stakeholders need to continue to develop incentives to encourage increased adoption of the interoperability and data standards required to measure care communication and care coordination. In addition, stakeholders need to focus on creating novel EHR-based measures, particularly pertaining to care goals, SDOH, and downstream care. Lastly, through the process of improving EHRs for care communication and care coordination and creating measures, it is vital for stakeholders to engage patients, families, and caregivers to amplify their voices and improve disparities in care.



EHR Care Coordination Committee Members

Richard Christopher Antonelli, MD, MS
Medical Director of Integrated Care
Boston Children's Hospital
Department of Pediatrics
Harvard Medical School
Boston, MA

Gerri Lamb, PhD, RN, FAAN
Research Professor
Arizona State University
Phoenix, AZ

Kathleen Balestracci, PhD, MSW
Associate Research Scientist
Yale University
Senior Health Outcomes Researcher
Yale/YNHH Center for Outcomes
Research and Evaluation
New Haven, CT

David Buriank
VP, Quality and Clinical Performance
Help at Home, LLC
Chicago, IL

Brian Buys, RN, MBA
VP, Clinical
PointClickCare
Fairpoint, NY

Sherri Costa, MS, RN, AOCNS
Regional Manager Oncology Support Services
Ascension
Milwaukee, WI

Cynthia Cullen, MS, MBA, PMP
Senior Director
Mathematica
Princeton, NJ

Keith Horvath, MD
Sr. Director, Clinical Transformation
Association of American Medical Colleges
Washington, DC

Joseph Kunisch, PhD, RN-BC, CPHQ
Enterprise Director of Clinical Quality Informatics
Harris Health
Bellaire, Texas

Russell Leftwich, MD
Adjunct Assistant Professor
Vanderbilt University
Cortaro, AZ

Michael Lieberman, MD, MS
Medical Director, Population Health
Oregon Community Health Information
Network (OCHIN)
Portland, OR

Brent Peery, DMin
Vice President for Chaplaincy Services
Memorial Hermann Health System
Houston, TX

Rebecca Perez, MSN, RN, CCM
Sr. Manager of Education and Strategic Partnerships
Parthenon Management Group
Case Management Society of America
Brentwood, TN

Ann Polich, MD, MPH, MBA
Chief Medical Officer
Nebraska Health Information Initiative
(NEHII)
Omaha, NE

Walter Rosenberg, MSW, MHSM, LCSW
Director, Social Work and Community Health
Rush University Medical Center
Chicago, IL

Stacie Schilling
Research Associate
IMPAQ International
Washington, DC

Suellen Shea, MSN, RN-BC, LSSGB, CPHQ, CPPS
Senior Clinical Consultant
Cerner
Kansas City, MO

Colleen Skau, PhD
Assistant Director, Performance and Quality Measures Portfolio
College of American Pathologists
Washington, DC

Alexis Snyder
Patient Advocate
Brookline, MA

Maurine Stuart
Patient Advocate
Snowshoe, WV

Jason Wiesner, MD, MBA
Diagnostic Radiologist
Sutter Health
Sacramento, CA

Dorothy Winningham
Patient Family Advisor
Winn Leadership Group, LLC
Patient & Family Centered Partners
Midlothian, VA

Kim Yu, MD, FAAFP
Regional Medical Director
Aledade
Mission Viejo, CA

Andrew Zinkel, MD, MBA
Associate Medical Director,
Quality Health Partners
Bloomington

Federal Liaisons

Joel Andress, PhD
EHR Technical Lead, eCQM
Measure Development Lead
Division of Quality Measurement, CMS

Kyle Cobb, MS
Branch Chief Tools & Testing
Office of Technology, ONC

Chris Dymek, EdD
Director, Digital Healthcare Research Division
Center for Evidence and Practice
Improvement, Agency for Healthcare
Research and Quality (AHRQ)

Tara McMullen, PhD, MPH
Associate Director
Opioid Safety, US Department of Veterans
Affairs (VA)

Carly Medosch, MBA, PMP
Health IT Lead, Division of Advanced Primary Care
Seamless Care Model Group, Center for
Medicare and Medicaid Innovation (CMMI)

Francine Sandrow, MD, MSSM, FAMIA
Chief Health Informatics Officer
Office of Community Care, VA

Kenneth P. Yale, DDS, JD
Acting Chief
TRICARE Health Plan, US Department of
Defense (DOD)

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NATIONAL QUALITY FORUM
Driving measurable health improvements together

Leveraging Electronic Health Record (EHR)-Sourced Measures to Improve Care Communication and Coordination

FINAL RECOMMENDATIONS REPORT DRAFT #4

July 1, 2022

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Contents

1. Executive Summary

In our complex healthcare system, patients interact with different clinicians and allied health professionals (e.g., medical and behavioral health providers, nurses, case managers, social workers, and community health workers), across different settings and with community resources, such as food banks. To deliver effective care, the entire care team (i.e., clinicians, non-clinicians, patients, and caregivers) must communicate seamlessly to ensure all aspects of care are effective and aligned with patient goals. Care communication and care coordination are critical in all healthcare encounters, particularly during transitions in care between providers and settings. Additionally, patients disproportionately affected by social determinants of health (SDOH) factors (i.e., nonmedical risk factors, such as food and housing insecurity) are at increased risk of negative outcomes. Improved care communication and care coordination offer the potential to improve these outcomes and make care more equitable.[1,2]

The concepts of care communication and care coordination are complementary but not interchangeable. Care cannot be coordinated effectively without successful communication. Care communication is the transfer of information for patient care. Care coordination is the deliberate synchronization of activities and information to improve health outcomes to ensure patients' and families' needs and preferences for healthcare and community services are met over the course of their treatment and care (See Appendix A for additional key terms and definitions).[3] While these concepts are not new, their measurement and improvement are long-standing challenges. It is difficult to attribute improvements in outcomes to a particular intervention, as that intervention may be performed differently across settings, or the data on whether it was performed may not be captured in a standardized way. This also makes it difficult to hold organizations accountable for these interventions.[4,5]

Electronic health record (EHR) use has become widespread throughout the United States (U.S.) in recent years and may help support better care communication and care coordination and improve the measurement of these functions.[6] For example, patient portals enable patients to view test results and communicate with clinicians. Additionally, using EHR-sourced measures (i.e., quality measures that rely on data within an EHR system) has advantages over measures requiring chart abstraction or claims-based data. EHRs capture detailed information through care delivery that is available electronically in a standardized way that can support automated measure calculation and reduce the burden of chart review and abstraction. EHRs can also be designed to collect additional data elements that may be used in future quality measures.

In this project, National Quality Forum (NQF), with funding from the Centers for Medicare & Medicaid Services (CMS), convened a multistakeholder Committee to identify how EHRs can improve care communication and care coordination and advance the measurement of these two critical functions. In the first year of the project, the Committee developed an environmental scan that identified definitions for care communication and care coordination and outlined measurement challenges.[7] During the second phase, the Committee developed recommendations for using EHRs to effectively facilitate, measure, and improve care communication and care coordination. EHR-sourced measurement is critical to driving quality improvement and equitable health outcomes by enhancing care communication and care coordination. The purpose of this Recommendations Report is to provide an overview of the opportunities for using EHR data to improve the measurement of care communication and care coordination.

The Committee recommended several ways EHRs can facilitate effective care communication and care coordination for patient care and quality measurement. The recommendations are classified by theme under these categories:

- Recommendations to Effectively Facilitate Care Communication and Care Coordination With EHRs
    - Theme 1: Collect and Share Standardized Data
    - Theme 2: Optimize Usability for Patients and Caregivers
    - Theme 3: Optimize Usability for Clinicians
- Recommendations to Leverage EHR-Sourced Measures to Improve Care Communication and Care Coordination
    - Theme 1: Advance EHR Data Elements Needed to Improve Measurement
    - Theme 2: Expand EHR-Sourced Measurement
    - Theme 3: Address Priority Measure Gaps

For these recommendations, the Committee acknowledged both the current and future states of EHR systems with respect to interoperability (i.e., the ability to share information within and between healthcare facilities and settings) and other functionalities. EHR maturity phases (i.e., the level of EHR functionality to support care communication and care coordination) were used to organize recommendations to improve care. The ongoing national work to improve and incentivize interoperability and systematic measurement is foundational to improving care communication and care coordination and provides a critical backdrop to the recommendations in this report.

Improving the measurement of care communication and care coordination is essential, and EHRs are an important vehicle to achieve this. These recommendations lay the groundwork for advancing the use of EHR-sourced data to improve and measure care communication and care coordination in parallel with the national work to advance interoperability and data standardization.

2. Introduction

Patient care in the U.S. has become increasingly complex as medical care has advanced and disparities in care have widened. Due to this more complex care, patients often require care from a wide range of primary care and specialty clinicians and allied health professionals across different settings.[8] Widening disparities in care are due to increases in complexity, out-of-pocket costs, and disruptions in care, such as the coronavirus disease 2019 (COVID-19) pandemic, which had an outsized adverse effect on populations disproportionally affected by SDOH factors.[9] Effective care delivery requires seamless care communication and care coordination between settings and clinicians and with patients and caregivers. Yet this process is limited by the intricacy of the healthcare system, which often requires patients, families, caregivers, and clinicians to navigate complex systems and community resources that are not designed to be efficient and seamless. Poor care communication and care coordination lead to care that is discordant with a patient’s goals, directly conflicting with treatments (e.g., unrecognized potentially harmful medication interactions), or unnecessarily duplicative (e.g., repeat imaging or laboratory testing).[10] Additionally, poor care communication and care coordination may lead to missed opportunities to diagnose or treat a patient appropriately if the information is not communicated effectively during transitions in care (e.g., a need for follow-up imaging or outpatient treatment after a hospitalization). Geographic risk factors may also hinder care communication and care coordination. For example, a patient may have limited access to care if they live in a rural area that is far from a specialist who performs certain cancer screenings.

In contrast, enhancing care communication and care coordination can improve outcomes. For example, randomized, controlled studies on interventions related to improving care communication and care coordination have shown reduced rates of medical errors, duplicative care, and readmissions.[11,12] Improving care communication and care coordination also lowers the costs of care by providing resources to manage transitions in care and improve handoffs as patients move within and across different healthcare settings and clinicians.[13] As care communication and care coordination are enhanced, the burden of navigating the healthcare system decreases.[14,15] Care communication and care coordination are also vital for addressing social risk factors. For example, by identifying social risks, a care team can link a patient and their family with specific services (e.g., housing assistance for those with housing insecurity) within the healthcare setting and the community. To provide equitable, quality care to all patients, SDOH must be addressed holistically with other health concerns.

Despite the benefits of effective care communication and care coordination, measuring these functions and linking them to improved health outcomes continue to be challenging.[16] The current set of care communication and care coordination measures is largely limited to claims-based measures that assess outcomes, such as readmission rates and follow-up rates after a hospitalization, and processes, such as the transfer of information between settings and medication reconciliation. There are few or no measures that assess detailed information about whether care communication or care coordination was performed effectively or specifically led to adverse outcomes. These challenges are related to the lack of standardized approaches and interventions and the complexity of linking approaches to outcomes. For example, similar interventions can be deployed differently across settings (e.g., patient portals can vary in their usability for patients), making it difficult to generalize the effectiveness of care communication and care coordination interventions and evaluate their success outside of the specific setting and context in which they were originally implemented and tested.[4] These challenges threaten the ability to perform specific sets of care communication and care coordination processes consistently and effectively, including those that inform process-based quality metrics.[17] Clinicians might perform care communication and care coordination activities but not effectively document the activity, or conversely, might document activities they did not effectively perform.[5] This can result in missing or inaccurate essential information when providing care. It is also difficult to link specific care communication and care coordination processes to more general outcomes that may be affected by many factors. For example, hospital readmission rates can be affected by care communication and care coordination as well as factors such as disease progression, insurance status, and availability of follow-up care.[18] SDOH factors can also challenge data collection, particularly patient-reported data. For example, unreliable broadband internet in rural areas can create a barrier to accessing a patient portal.[19]

EHRs are essential tools to help overcome some of these challenges. While EHRs initially served as a tool for documenting clinical care, ordering tests and treatments, displaying results, and billing insurance companies, they can be used as tools to facilitate care communication and care coordination by serving as a central location to document pertinent activities. Additionally, EHRs contain detailed data that can be used to improve existing quality measures or create new measures for care communication and care coordination. For example, a patient with diabetes may be readmitted to the hospital with very high blood sugar following a hospital discharge for the same condition. Information from the EHR can help distinguish whether the readmission occurred for care coordination reasons (e.g., the patient could not obtain their insulin) or non-care coordination reasons (e.g., the blood sugars worsened despite taking the prescribed medication properly). In addition, EHRs may be used to directly gather information from patients, such as whether they have food insecurity, and assess whether it improves over time after specific interventions.

The timing of this effort is aligned with a national movement toward interoperability and standardized measures—both foundational to improving care coordination and care communication. CMS and the Office of the National Coordinator for Health Information Technology (ONC) are evolving regulations to accelerate the widespread use of interoperable, standardized data that can be shared across provider EHR systems. ONC defines the Health Level Seven International (HL7) Fast Healthcare Interoperability Resources (FHIR) standards that are required for certified EHR technology (CEHRT) through the United States Core Data for Interoperability (USCDI) and the US Core Implementation Guide. Recently, ONC launched a new initiative, USCDI+, to define and advance interoperable data sets for specific use cases, such as the unique programmatic requirements for quality measurement for CMS or surveillance programs for the Centers for Disease Control and Prevention (CDC). The intent of the initiative is to harmonize across federal programs so that a single data element can be consistently used across multiple use cases (e.g., blood pressure collected as part of routine clinical care can also be used to calculate a performance measure or captured for hypertension surveillance).[20] The harmonization of data will assist with leveraging EHRs for the development of care communication and care coordination measures and reduce the burden and costs of data collection. More broadly, harmonizing interoperable, standardized data will move the field towards digital quality measurement, which will leverage electronic data from sources including EHRs, administrative systems, laboratory systems, and instruments such as wearable medical devices.[23]

This report briefly describes the findings from the environmental scan to provide an overview of the current state of using EHR-sourced measures to improve care communication and care coordination. Building from the environmental scan, the report also provides recommendations to further facilitate and improve EHR-based care communication and care coordination quality measurement. The recommendations are classified by theme under these categories:

- Recommendations to Effectively Facilitate Care Communication and Care Coordination With EHRs
    - Theme 1: Collect and Share Standardized Data
    - Theme 2: Optimize Usability for Patients and Caregivers
    - Theme 3: Optimize Usability for Clinicians
- Recommendations to Leverage EHR-Sourced Measures to Improve Care Communication and Care Coordination
    - Theme 1: Advance EHR Data Elements Needed to Improve Measurement
    - Theme 2: Expand EHR-Sourced Measurement
    - Theme 3: Address Priority Measure Gaps

3. Project Background and Objectives

In 2021, NQF, with funding from CMS, convened a multistakeholder Committee to identify best practices to leverage EHR-sourced measures to improve care communication and care coordination quality measurement. The 24-member Committee brings expertise in care communication and care coordination from a variety of perspectives: multidisciplinary clinicians and allied health professionals; measure developers; patients, caregivers, and patient advocates; data experts, informaticists, and EHR vendors; payers; and other perspectives that are critical to the measurement of care communication and care coordination. Additionally, seven representatives from five federal agencies with unique perspectives on care communication and care coordination act as federal liaisons for the Committee (see Appendix B for a full list of Committee members and federal liaisons).

Over two, 12-month phases, NQF convened the Committee for 10 web meetings. During the first phase, NQF conducted an environmental scan that included the research, review, and synthesis of information about EHR-based care communication and care coordination measurement. With input and guidance from the Committee and additional experts, the Environmental Scan Report and Literature Review identified a consensus definition of care communication and care coordination, established the relationship between care communication and care coordination and improved healthcare outcomes, and outlined the benefits and challenges of measuring provider performance on care communication and care coordination. The environmental scan findings are summarized in the section below to provide an overview of the current state of the topic and to set the foundation for the recommendations developed by the Committee during the second phase. Recommendations were developed for the following considerations:

- How EHRs could better facilitate care communication and care coordination
- How to address the collection of SDOH data through EHRs as it relates to care communication and care coordination
- How existing and future development of EHR-sourced measures can help to improve care communication and care coordination
- What possible EHR-sourced measure concepts related to care communication and care coordination could be explored

Unless a fact or recommendation is explicitly attributed to a specific source, the information in this report was based on the Committee’s deliberations and synthesized by NQF.

4. Environmental Scan Findings

Findings from an environmental scan of the literature and existing measures of care communication and care coordination resulted in a summary of the current use of EHR-sourced measures to improve care communication and care coordination quality measurement. The environmental scan focused on the following topics:

- Identifying working definitions of care communication and care coordination
- Exploring the relationship between care communication and care coordination and improved health outcomes
- Examining the impact of SDOH on care communication and care coordination and measurement

- Reviewing the benefits and challenges of measuring care communication and care coordination
- Developing a comprehensive list of existing measures relevant to care communication and care coordination

The environmental scan was conducted using three approaches:

1. A review of the pertinent literature to identify the articles most relevant to care communication and care coordination
2. A scan of existing measures related to care communication and care coordination
3. Discussions with experts in fields related to EHR-sourced measures and care communication and care coordination, including one-on-one expert interviews and targeted discussions during the Committee meetings[7]

4.1 Definitions for Care Communication and Care Coordination

During the literature review, a common definition of care communication was identified: *the transfer of information for patient care*. It includes the information shared between stakeholders (e.g., clinicians, patients, families, and caregivers) using a variety of different communication modalities (e.g., verbal, written, fax, person-to-person, or electronic).[7]

There is not a universal definition of care coordination. As a result, the Committee reviewed and discussed several definitions from the literature review to develop a consensus definition for care coordination. The Committee decided to modify a definition from the 2014 NQF report titled Priority Setting for Healthcare Performance Measurement: Addressing Performance Measurement Gaps in Care Coordination to be more patient focused and include specific examples of care communication and care coordination activities.[3] The consensus definition is as follows: *Care coordination is the deliberate synchronization of activities and information to improve health outcomes to ensure patients' and families' needs and preferences for healthcare and community services are met over the course of their treatment and care*. Examples of care communication and care coordination activities include the following:

- Improving patient and caregiver engagement in the coordination of their care by using activities that facilitate patients and clinicians working together to make decisions that allow for the best possible health outcomes[24]
- Developing and implementing care plans that describe a patient's short- and long-term care needs and how cross-disciplinary clinicians can support individual needs and care goals[25]
- Enhancing transitions in care to improve care communication and care coordination during periods in which information may be lost or misinterpreted as patients move from setting to setting (e.g., hospital to post-acute/long-term care facilities)
- Promoting cross-disciplinary coordination to integrate and improve care between clinicians from different settings (e.g., different medical specialties or allied health professions, such as social work or physical therapy)
- Using closed-loop communication (i.e., when the receiver acknowledges and confirms the information shared to ensure the information was received as intended by the sender)[26] to reduce care fragmentation by having the recipient of critical clinical information acknowledge their receipt and understanding

- Utilizing risk assessments and stratifications to identify and analyze factors (e.g., SDOH) that have the potential to cause harm or place individuals at differential risk (social risk factors) for specific outcomes (e.g., readmissions) and then deploying targeted tactics to at-risk individuals to improve outcomes
- Participating in case management to assess, plan, implement, coordinate, monitor, and evaluate options and services required to meet a patient's individual health and social needs
- Encouraging patients and caregivers to use navigation resources to guide them through complex health information technology (IT) systems to ensure their information is accessible and their questions are addressed over time. This is particularly relevant for patients with recognized barriers to healthcare due to multiple comorbidities or social needs.
- Supporting partnerships between clinicians and patients to allow shared decision making on future tests, treatments, and care plans to set realistic care goals and expectations reflecting the individual patient's values, wants, and needs
- Delivering team-based and individualized care consistently with patients and caregivers as active members of the healthcare team in addition to physicians, nurses, pharmacists, community health workers, nutritionists, and members from community-based resources (e.g., multidisciplinary care for children with special needs and disabilities should include care coordination with schools and mental health professionals)

4.2 Relationships Between Care Communication and Care Coordination, EHRs, and Improved Health Outcomes

Care communication and care coordination interventions contribute to a variety of observable clinical, efficiency, experience, and utilization outcomes. Reduction of unplanned hospital readmissions is a classic outcome of an effective care communication and care coordination activity. When a patient's care is not well coordinated during and after a hospital discharge, there may be gaps in follow-up care, poor communication among clinicians, or poorly executed care plans. This can lead to a patient returning and requiring additional inpatient care (i.e., a readmission). A 2014 systematic review synthesized the evidence from randomized trials of the efficacy of interventions to reduce unplanned hospital readmissions. In the 42 trials reviewed, care coordination interventions were associated with fewer readmissions within 30 days of discharge. More effective interventions tended to have more components, involve more individuals in care delivery, and specifically support patient capacity for self-care.[27]

EHRs can be a key tool to better coordinate care and facilitate communication. Specifically, this occurs when patients, families and caregivers, clinicians, and allied healthcare professionals work together to address outcomes such as reducing unplanned hospital admissions. For example, patient-centered discharge instructions should clearly outline the patient's next action steps in easy-to-understand language and be shared seamlessly with the patient's entire care team. Sources of EHR data that may be useful for care communication and care coordination include data entered by clinicians and the potential for patient-entered data, data from mobile devices, and wearables in the future. To use EHRs effectively for care communication and care coordination, individuals within the healthcare team must use the EHR and EHR-based tools appropriately (e.g., document correctly) and communicate well as a team both within and across settings.[28] Patients must also be able to engage in bidirectional communication with the care team to ensure care is individualized for optimal care delivery and positive patient outcomes.[29]

4.3 Impact of Social Determinants of Health on Care Communication and Care Coordination and Measurement

Health equity is "the attainment of the highest level of health for all people, where everyone has a fair and just opportunity to attain their optimal health regardless of race, ethnicity, disability, sexual orientation, gender identity, socioeconomic status, geography, preferred language, and other factors that affect access to care and health outcomes."[30] To assist with achieving health equity and providing the best care to all patients, care teams must address SDOH. SDOH are "the conditions in the places where people live, learn, work, and play that affect a wide range of health risks and outcomes."[31] Care communication and care coordination play a critical role in addressing SDOH by identifying the SDOH concern (e.g., food insecurity) and linking the patient to associated resources (e.g., food banks, nutrition assistance programs). Using EHRs as part of care coordination and care coordination efforts can further assist with addressing SDOH through the following activities:

- Standardizing SDOH data collection
- Collecting and using standardized data for individual-level and population-level risk assessments and interventions
- Recommending patients for social services (e.g., housing assistance, insurance benefits)
- Facilitating communication with social service providers
- Sharing data directly with social services providers

Despite efforts to promote the collection of nonmedical data, such as SDOH, challenges continue to hinder the collection and use of these data for care communication and care coordination. Challenges include the following:

- Information recorded in unstructured notes, such as clinician general, procedural, or operative notes rather than standard, structured data fields within EHRs
- Digital infrastructure limited in low-income populations or rural areas (e.g., patient difficulties in accessing health data due to a lack of reliable broadband internet)[19]
- Access to care limited in both rural settings (e.g., long distance to emergency departments [EDs] or specialists)[32] and urban settings (e.g., lack of insurance coverage in moderate- and low-income populations) resulting in inability to collect data during visits[33]

To counteract these challenges, the following initiatives promote the development of data standards for sharing health information related to SDOH:

- Interoperability Standards Advisory (ISA): An ONC initiative to catalogue available standards across a wide variety of domains that includes emerging standards on SDOH, including exposure to violence, financial resource strain, food insecurity, housing insecurity, level of education, social connection and isolation, and transportation insecurity.[34]
- USCDI: Version 2 includes data elements for race, ethnicity, preferred language, sexual orientation, and gender identity as well as SDOH-related data elements.[35]
- Gravity Project: An HL7 FHIR Accelerator project that addresses the needs for both semantic and structural level interoperability of electronic SDOH data. The multistakeholder public collaborative is seeking to create terminology workstreams for 17 social risk domains that will create consensus-based representative data sets for screening, diagnosing, goal setting, and intervening.[36]

Additionally, health systems face the challenge of determining who on the multidisciplinary care team will be responsible for collecting, assessing, and addressing SDOH gaps in care.

4.4 Advantages and Challenges of Measuring Care Communication and Care Coordination in EHRs

Using EHRs to measure care communication and care coordination presents advantages. EHRs are at the forefront of strengthening interprofessional care teams.[37] EHRs can serve as a central location to document care communication and care coordination activities and store other electronic data (e.g., from mobile devices and wearable technology). They offer the ability to enhance communication by improving access to patient information for all members of the care team (e.g., through interdisciplinary notes, instant messaging, and delegating task assignments). EHRs can also include clinical decision support systems (CDSS), which support care communication and care coordination to encourage collaboration with shared decision making and are targeted specifically for the patient's goals. Although clinical data may be exchanged in various ways, EHR systems promote and facilitate sharing of patient health information across health settings and allow for easier data retrieval.[38]

Even with these advantages, there are also challenges to using EHRs for measuring care communication and care coordination, including lack of standardized data and interoperability. As noted earlier, interoperability enables the exchange of health information electronically from one user to another. For two EHR systems to be truly interoperable, they must not only be able to exchange, but also convert data into usable and actionable information. Although interoperability has been a challenge in clinical care as well as measurement, new ONC rules will help to transform EHRs and enhance interoperability over the next three to five years.[39] Increased interoperability will make care communication and care coordination activities more quantifiable, allowing for measurement of the activities.[39] ONC also has a new initiative, USCDI+, that will build on the USCDI standard by defining and advancing interoperable data sets for specific federal use cases, such as quality measurement. This initiative will harmonize electronic data elements that can be used across multiple use cases and help move the field towards digital quality measurement.[23] However, while interoperable information is key to care communication and care coordination, it is also important to note that interoperability does not guarantee information accuracy. Patients also need to be able to monitor the accuracy and sharing of their healthcare records because ultimately, sharing inaccurate information in the EHR can lead to inaccurate measurement and preventable errors, and potentially worsen outcomes.

Another significant barrier to measuring care communication and care coordination is limited industry-wide standards specifying data elements, such as blood pressure; data structure, such as structured or unstructured data fields; standard models for querying data; and the technical transfer of data from one EHR system to another.[40] While the industry continues to work towards improving and refining standards for care communication and care coordination, the limited standardization hinders interoperability. It also increases the resources required to carry out care communication and care coordination activities and may even limit or prevent the activities, thus making measurement impractical.[41] One solution for the limited data standards is the development of FHIR standards. The ONC Health IT Certification Program is a voluntary certification program established by ONC to provide the certification of health IT. CMS also incentives eligible clinicians and healthcare facilities to adopt certified health IT to participate in their some of their programs.[42] There are also new standards related to standardizing care plans across EHR platforms.[43] Improving EHR data with these standards will facilitate the evolution of using these data for digital quality measurement.

5. Context for the Recommendations

The environmental scan provided background for the Committee to move into the next stage of developing recommendations. Issues related to interoperability and EHR maturity, which are intrinsic features of the local EHR infrastructure, are foundational to advancing EHRs for care communication and care coordination and for EHR-sourced measures. This section details advances in interoperability and Committee dialogue about how to conceptualize EHR maturity to allow for continued advancement of EHR-sourced measures of care communication and care coordination.

5.1 Interoperability

As noted earlier in this report, the environmental scan identified federal initiatives underway to increase interoperability. As a precursor to making recommendations, the Committee reviewed the current status of these initiatives.

Regulations issued by CMS and ONC, finalized in 2020 and that will take effect by the end of 2022, will begin to make interoperable EHR data available via their new standards-based API requirements fostering applications for patient access, care coordination, clinical research, public health/population management, and quality measurement.[44] In the ONC 21st Century Cures Act Final Rule, health IT developers that are certifying health IT products to new certification criteria are required to map a specific scope of EHR data to FHIR resources and to make those data accessible in the FHIR standard through FHIR application programming interfaces (APIs). Through future rulemaking, as well as ONC's Standards Version Advancement Process (SVAP),[47] the scope of USCDI available through these APIs will continue to expand on an annual basis. The USCDI Version 1 defined the initial scope of required interoperable data for EHRs, and the HL7 US Core Implementation Guide defines the conformance requirements for accessing patient data as defined in USCDI.[46] USCDI Version 2, published in July 2021, added data classes and more detailed data elements related to SDOH and sexual orientation and gender identify (SOGI), and the draft third version proposes the addition and/or reclassification of data elements related to health insurance, health status, demographics, disability, and other areas.[21,48] While these newer versions of USCDI are not yet required for certified health IT, the inclusion of additional data classes and elements lends momentum to the widespread uptake of standardized EHR data and FHIR standards needed to electronically assess care communication and care coordination.

When developing these recommendations, the Committee considered both existing levels of interoperability and the likely future improvements in interoperability as these initiatives advance.

5.2 EHR Maturity Phases

The Committee also considered the concept of EHR maturity to assess an EHR's readiness to support care communication and care coordination. For this report, the concept of EHR maturity was modified from the ONC Interoperability Roadmap[49] and the Healthcare Information and Management Systems Society (HIMSS) Electronic Medical Record Adoption Model (EMRAM).[50]

Interoperability is a critical component of EHR maturity. Other features required for care communication and care coordination are described in Table 1 and include specific EHR functionalities from simple (e.g., limited clinical documentation, basic communication with ancillary clinical systems) to more advanced functionalities (e.g., complete clinical document, communication with health information exchanges [HIEs] to share data) across a continuum.[51] Differences in maturity are related to healthcare settings adopting different EHR vendors, leveraging their expertise in clinical informatics, and allocating strategies and budgets to implement and customize EHRs. Optimizing EHRs for clinical use and quality measurement and improving care communication and care coordination will require stakeholders to achieve more advanced levels of EHR maturity within and across all healthcare settings.

Table 1: Examples of EHR Functionalities Related to Interoperability, Data Standardization, and Other Features to Improve Care Communication and Care Coordination by EHR Maturity Phase

EHR Maturity Phase	Examples of EHR Functionalities Related to Interoperability, Data Standardization, and Other Features to Improve Care Communication and Care Coordination
In early EHR maturity, EHR systems should accomplish the following:	• Provide basic EHR functionality with local customization and specialized tools • Allow patients to retrieve basic data (e.g., discharge summaries) from a portal • Begin to define standardized vocabularies • Allow the healthcare setting to scale existing approaches to exchanging data with different platforms • Exchange query-based health information • Allow the healthcare setting to measure quality retrospectively from structured data fields • Allow for multidisciplinary care planning using tools developed by the healthcare setting
In intermediate EHR maturity, EHR systems should accomplish the following:	• Include early development of more advanced applications and patient-centered tools • Continue to broaden the standardization of data and refine existing vocabularies to align with federal standards • Focus on data integration, expanding data inclusion across other databases and settings and adding information about the participating providers • Integrate data from multi-payer claims and registries • Allow the healthcare setting to measure quality of care and improved clinical decision support from structured data fields • Advance the ability to support multidisciplinary care planning both within the healthcare setting and with different settings
In advanced EHR maturity, EHR systems should accomplish the following:	• Utilize sophisticated user experience (UX) interfaces to improve usability for clinicians • Implement easy-to-use targeted decision support tools to improve care communication and care coordination • Engage patients and their families through the EHR, thereby capturing and measuring their perspective and feedback on care and continuously improving identified gaps in care • Standardized vocabularies that align with federal standards • Integrate increasingly complex data from other health IT systems (e.g., HIEs) on a continuous basis • Allow the healthcare setting to assess the quality of care continuously for improvement • Allow the healthcare setting to collect patient-reported data that can be used for measures • Deliver effective tools to assist the healthcare setting in achieving seamless, dynamic, and multidisciplinary care planning across different settings

It is important to note that because the phases of EHR maturity are on a continuum, it is possible that different aspects of the same EHR system may be at different phases of maturity due to different levels of interoperability and functionality related to care communication and care coordination. For example, an EHR system could be integrated with a local HIE to share lab results but have limited functionality to facilitate multidisciplinary care planning.

The Committee was concerned that gaps in interoperability and EHR maturity would significantly deter advancing care communication and care coordination with EHRs. Therefore, the Committee's recommendations are grounded in the following:

- Recognizing an incremental approach that capitalizes on the current state and builds along with interoperability and EHR maturity (illustrated in Table 1)
- Capitalizing on existing initiatives to standardize data
- Encouraging initiatives currently in place, moving interoperability and standardization forward while emphasizing the filling of major gaps in care coordination and care communication measurement. For instance, considerable work is underway to refine long-standing measures of hospital readmission. Committee members acknowledged the importance of these refinements while highlighting the need for new patient and caregiver measures that currently do not exist.

6. Recommendations to Effectively Facilitate Care Communication and Care Coordination With EHRs

EHR functionalities, such as those shown in Table A, are essential for improving care communication and care coordination. For effective EHR-based care communication and care coordination, data sharing must be comprehensive and seamless (i.e., interoperable), and EHRs must be easy to use by all care team members. With these functionalities in mind, the Committee developed a series of recommendations to guide the effective facilitation of care communication and care coordination for clinical care as well as quality measurement. The recommendations are grouped into three themes:

1. Collect and share standardized data
2. Optimize usability for patients and caregivers
3. Optimize usability for clinicians

Because different healthcare facilities use different kinds of EHR systems that have different baseline functionalities, examples of the recommended EHR features are provided for each EHR maturity phase. This allows stakeholders to both act on the recommendations with their current EHR system and plan for future advancements.

6.1 Theme 1: Collect and Share Standardized Data

Recommendation: Stakeholders, including healthcare leadership, EHR vendors, and clinicians, should focus on advancing interoperability through standardization and advancing EHR maturity to enhance care communication and care coordination.

Gathering and sharing data are central functions of EHRs in clinical care, quality measurement, and care communication and care coordination. The Committee supported and urged continued acceleration of efforts to achieve both. Interoperability and standardization are essential to improving care communication and care coordination. To enable continued growth and improvement of care communication and care coordination, the Committee recommended strategies for each stage of EHR maturity.

Exemplars

To collect and share standardized data related to care communication and care coordination, Committee members identified the importance of the following functionalities:

- **Standardized data that can be shared across EHRs, HIEs, and other electronic databases (e.g., laboratory information system and immunization information systems and registries) in a timely manner with transparent communication to applications that contain healthcare-related information (e.g., wearables, community-based care, and other care coordination services). The data are dynamically updated to ensure relevance and accuracy.**
    - In early EHR maturity, data are:
        - pushed regularly from the EHR to an HIE;
        - interoperable and shared within a health system (e.g., from outpatient clinic to inpatient hospital within the same health system); and
        - in the early phase of being attributed to specific clinicians, non-clinicians, and patients through metadata (i.e., data provenance).
    - In intermediate EHR maturity, data are:
        - interoperable and shared across different health systems (e.g., from a primary care clinic in one health system to an inpatient hospital in a different health system); and
        - attributed to specific clinicians, non-clinicians, and patients through metadata. Specifically, data provenance is standardized locally and for clinical use cases.
    - In advanced EHR maturity, data are:
        - updated and automatically shared using standardized data elements in real time bidirectionally between an EHR and the HIE (bidirectional sharing improves usability for the entire care team, including clinicians, non-clinicians, patients, and caregivers [e.g., Nebraska's HIE integrates admission, discharge, and transfer notifications across their healthcare settings])[52];
        - protected and disseminated with permission from and as directed by patients;
        - collected and shared with nontraditional healthcare settings (e.g., a community pop-up clinic) and community-based organizations to optimize care communication and care coordination;
        - collected and shared from other systems (e.g., immunization registries, independent outpatient laboratories, wearables, and community-based care);
        - assessed by artificial intelligence (AI) and machine-learning systems for consistency across systems, with a focus on ensuring data are accurate (specifically, data are aggregated and de-duplicated to ease administrative burden for patient matching across different systems);
        - used potentially for predictive modeling to predict the outcomes in clinical decision support tools instead of the data being obtained via questionnaires (e.g., Agency for Healthcare Research and Quality [AHRQ] models that use more

    than 150 data elements from EHRs, HIEs, state social service organizations, geocoded data sets, and public health data sources); and
    - attributed to specific clinicians, non-clinicians, and patients through metadata across settings in which the data are entered into the system. The primary intention of the data provenance is for clinical care and can aid in the development of reliable quality measures to enhance clinical care, support positive patient outcomes, and identify population trends.

- **Enable standardized data collection fields with mandatory data collection to facilitate data sharing.**
    - In early EHR maturity, standardized data collection fields are included for demographics, risk factors and diagnoses, laboratory tests, and clinical outcomes.
    - In intermediate EHR maturity, standardized data collection fields are also included for medications, SDOH data, and chief complaints.
    - In advanced EHR maturity, standardized data collection fields can be tailored to interventions that improve care communication and care coordination, including patient goals and care plans. Additionally, natural language processing (NLP) is used to transform unstructured data (e.g., radiology reports, progress notes) into usable data.

Considerations for Data Related to Social Determinants of Health

Recommendation: Stakeholder should incorporate nationally vetted SDOH data in EHRs to directly address health disparities and for measurement, specifically data elements from the Gravity Project and USCDI as well as additional data elements identified by the Committee.

The Committee emphasized the important role that SDOH plays in addressing health, specifically that individual cultural, social, and other SDOH factors be integrated as EHR data. Current efforts to standardize SDOH measures, such as the Gravity Project and USCDI, provide an excellent foundation as it includes detailed recommendations about data fields and how these can be included in EHRs.

The Gravity Project, a multistakeholder public collaborative in which individuals apply to participate was created in 2019 with the goal to develop, test, and validate standardized SDOH data elements for clinical care, care coordination, population management, public health, value-based payment, and clinical research. Several social risk domains have been classified by the Gravity Project. The data elements identified within the domains are specified data standards for patient-level elements involved in screening, assessment/diagnosis, goal setting, and treatment/interventions. USCDI Version 2 includes data elements for race, ethnicity, preferred language, sexual orientation, and gender identity as well as SDOH-related data elements.[35] The Committee believed that the rigor and process of the Gravity Project and USCDI would meet the goal of providing standardized data elements for SDOH data, which could not only be used in clinical care and coordination of care but also for quality measurement. As an example, food insecurity data, captured in a standardized format in the EHR, could be used for quality measures related to screening and implementation of interventions to address food insecurity as well as for improvement as patient-reported outcome performance measures (PRO-PMs). With the inclusion of standardized SDOH data elements built into EHRs, stakeholders will need to consider actions to protect patients against further bias and increasing disparities. Additionally, stakeholders will need to foster trust with patients and caregivers to enable data collection and data utilization most effectively and equitably.

In addition to the Gravity Project and USCDI, the Committee recommended the following data also be captured in the EHR in a structured, standardized manner: disability status and culture or religion that could affect delivery of care. The Committee viewed these data elements as useful because they could be used for both clinical care and quality measurement and to ensure care is aligned with patient goals.

6.2 Theme 2: Optimize Usability for Patients and Caregivers for Care Communication and Care Coordination

Recommendation: Stakeholders should ensure EHRs are easy to use and intuitive for both patients and caregivers to facilitate care communication and care coordination.

The Committee emphasized that EHRs must be usable for patients and their caregivers for effective care communication and care coordination to be fully realized. Patients and caregivers have varied levels of health literacy and may have difficulties understanding medical terminology or navigating the complex healthcare system. Additionally, EHRs can serve as a central location in which patients and caregivers can interact with their care team. Stakeholders must also identify who controls patient information, enable patients or their caregivers to provide input on the information's inclusion and accuracy, and foster trust that the information will be used appropriately and equitably to advance care.

Exemplars

To optimize the usability of EHRs for patients and caregivers for effective care communication and care coordination, Committee members identified the importance of the following functionalities:

- **Patients have the legal right to their healthcare data, can share their information as they choose, and can provide feedback on the quality of the care they receive.**
  - In early and intermediate EHR maturity, clinicians and/or EHR vendors own and control data within the EHR that are only shared with patients with burdensome processes (e.g., completing paperwork to obtain copies of the information).
  - In advanced EHR maturity, patients own and control their data and can easily share information with specific providers, allied health professionals, or health systems without burdensome processes.
- **Standardized structured data fields allow individuals to enter their own data on their expectations of care, engagement in care provided, and responses to clinical questions or other patient-reported outcome data.**
  - In early EHR maturity, there are no options for patients to enter data.
  - In intermediate and advanced EHR maturity:
    - intake forms collect basic data electronically (e.g., demographic information may be submitted via a kiosk or tablet in a waiting room or via a patient portal);
    - simple questions on forms collect clinical or experiential data; and
    - validated questionnaires collect structured, coded data that relate to PROMs.
- **Common language is used to share information that is provided in the patient's and/or caregiver's preferred language.**
  - In early and intermediate EHR maturity, some information is available in a limited number of languages that may reflect the surrounding patient population (e.g., discharge instructions available in English, Spanish, and French).

  - In advanced EHR maturity, the patient or caregiver's preferred language is a data element that is embedded within the EHR with multiple common languages reflecting the patient population and has the capability for automatic updates to patient-facing information in that patient's preferred language.
- **Patients can communicate with their clinicians and nonclinical teams securely with the EHR through asynchronous (e.g., email) and synchronous (e.g., telemedicine visits) communication, in compliance with patient privacy standards. Communication occurs via the patient's preferred method (e.g., telephone or email instead of through a portal).**
  - In early EHR maturity, clinicians and patients communicate via secure email through the patient portal.
  - In intermediate EHR maturity, clinicians and patients communicate via secure email and through telemedicine.
  - In advanced EHR maturity, patients and all members of the care team communicate seamlessly via secure email and through telemedicine, both synchronously and asynchronously.
- **Patient portal interfaces and data within the portal are easy to use and understandable by patients and caregivers.**
  - In early EHR maturity, patients can access basic data (e.g., laboratory results, visit summaries) through a patient portal and are able to review their care plan.
  - In intermediate EHR maturity:
    - patients can access their data and care plan through a patient portal with a focus on improved interfaces and increased patient engagement;
    - patients can review and correct inaccuracies in their health records;
    - information in the portal (e.g., laboratory or radiology reports) is transparent and understandable by patients and their caregivers and should not cause confusion or alarm (e.g., patients should not be required to interpret their own results); and
    - patients who may have difficulty interacting with the portal can still access information (e.g., contingencies for patients with poor internet access).
  - In advanced EHR maturity:
    - patients have full access to their data and care plan, can add data such as social risks and other barriers to care, and can upload their own information (e.g., health records from other healthcare systems) to the patient portal for viewing by their care team;
    - the portal utilizes user experience design to present data in ways that help patients and their caregivers identify care gaps and summarize data in a way that provides an enhanced understanding of the care plan; and
    - patients can access clear and specific, prioritized action items and receive notifications if they do not complete those action items.

6.3 Theme 3: Optimize Usability for Clinicians for Care Communication and Care Coordination

Recommendation: Stakeholders should ensure EHRs are easy to use and intuitive for clinicians and focus on increasing EHR functionality to support care communication and care coordination with an emphasis on improving clinical workflow and evidence-based care.

EHRs must also be usable for clinicians and allied health professionals for care communication and care coordination to occur. Due to the complexities of providing medical care, EHRs serve various functions, including documenting care, gaining insight about diagnoses, implementing best practices, and communicating with patients, caregivers, and other clinicians. EHR usability can be enhanced when EHR-based documentation aligns with clinical workflows.

Exemplars

To optimize the usability of EHRs for clinicians for effective care communication and care coordination, Committee members identified the importance of the following functionalities:

- **Summarize specific data elements for clinicians in an easily accessible, user-friendly, and visually helpful manner to identify care gaps and to gain insight into care coordination.**
    - In early EHR maturity, the EHR provides problem lists, medications, and other structured data.
    - In intermediate EHR maturity, the EHR:
        - provides all healthcare data in one system and summarizes those data for clinicians to gain clinical insights into potential care gaps and other care coordination issues (for example, clinicians can easily access advanced directives and are notified when advanced directives are updated. The SDOH color wheel from Epic is an example of how data can be visually presented to assist clinicians in providing care.)[53];
        - reduces clinician burden of duplicative data entry by sharing common information between data systems; and
        - allows for all care team members, including clinical and nonclinical members, to be identified within the EHR.
    - In advanced EHR maturity, the EHR:
        - summarizes data that are organized intuitively in a user-friendly manner (i.e., data visualization) to gain clinical insights, identify care gaps, and highlight misalignment with the care plan (for example, the EHR should notify the care team when a recommended test or treatment was not obtained [e.g., a medication was not filled, a follow-up appointment was missed or not made]);
        - permits the creation of evidence-based pathways and can assist with assessing compliance with those pathways to ensure provided care is evidence based and standardized and uses a high quality approach (keeping in mind that pathways should remain as clinical suggestions based on the best evidence and guidelines to allow clinicians to use their judgement and ensure the care provided matches the patient's preferences and goals);
        - provides alerts to clinicians to identify early clinical risks that are relevant to patient care (e.g., worsening organ function, depression or anxiety scores, and SDOH concerns);
        - alerts the care team to critical results or trends that have associated increased clinical or behavioral risks (e.g., SDOH data that may have an impact on the patient's clinical outcomes); and
        - allows collection of voluntary user experience feedback from clinicians and other key stakeholders.

- **Allow clinicians to search for relevant data in a user-friendly manner with minimal burden.**
    - In early EHR maturity, EHRs have unstructured lists of files in broad categories and do not have a search function, which may create burden by requiring excessive time to identify specific findings.
    - In intermediate and advanced EHR maturity, clinicians can search and easily find data in a user-friendly manner (i.e., Google the chart) and/or use filters that allow them to find relevant data.
- **Allow clinicians to create customized alert tools for specific clinical results and/or actions based on standardized data elements. These tools should not create new data fields within the EHR that could result in unstandardized data elements.**
    - In early EHR maturity, customized tools cannot be created by clinicians.
    - In intermediate EHR maturity, the focus is on building the ability for clinicians to create basic customized queries, such as specific concerns regarding a patient, such as attention to kidney function changes over time or a focus on SDOH concerns.
    - In advanced EHR maturity, customized tools can be created by clinicians to facilitate care communication and care coordination with patients, caregivers, and their care team. For example, EHRs permit the development and implementation of customized care plans for patients using standard data elements. Advanced EHRs avoid over customization to ensure data integrity.
- **Facilitate shared decision making in which clinicians work with patients to make decisions together about care plans.**
    - In early EHR maturity, there are no tools available for shared decision making.
    - In intermediate EHR maturity, there are EHR-based tools available to guide shared decision making during all care interactions, including inpatient and outpatient (e.g., tools such as the Chest Pain Choice decision aid could be made available in the EHR).54
    - In advanced EHR maturity, EHR-based tools use structured data to facilitate shared decision making by calculating risk and presenting it to the clinician and patient.

7. Recommendations to Leverage EHR-Sourced Measures to Improve Care Communication and Care Coordination

Committee discussions reflected the consensus that both EHR- and claims-based data are helpful for measuring care communication and care coordination. These data should be seen as complementary, with different benefits for quality measurement based on what is being measured and the feasibility of data extraction. Additionally, some stakeholders may only have access to specific types of data in the short term, such as health plans, which have greater access to claims-based data. In the absence of complete interoperability, claims may be more comprehensive when it comes to measuring whether care occurred in settings without EHRs (e.g., primary care clinics, post-acute care/long-term care facilities). Claims may also be more effective at measuring costs of care or assessing certain aspects of value-based care programs that involve costs of care. However, despite some use cases in which claims-based data may be superior to EHRs, the Committee agreed that EHR-based data are the preferred source for measuring care communication and care coordination, given the increased granularity of the data and the ability to observe non-billable events. In addition, EHRs allow for the measurement of care processes with more specificity than claims data. This is because EHRs provide data with more temporal proximity to the delivery of care and also enable real-time assessment of quality improvement.

Quality measurement can use EHR data to assess the performance and quality of care communication and care coordination activities. The result of these assessments can be used for the following:

- Continuous quality improvement and feedback to healthcare providers and organizations. For this approach, EHRs can:
    - assess whether care plans are created and followed and notify clinicians when care deviates from the plan;
    - assist clinicians in assessing reasons why care plans were not followed (e.g., transportation concerns);
    - report the level of patient engagement with their EHR portal or other EHR data;
    - monitor care quality through customized queries and measure outputs with specific numerators and denominators in real time; and
    - ensure that the loop is closed when patients are referred to follow-up care and/or community resources (e.g., food banks, developmental assessment and support services for early interventions for children).
- Accountability through the assessment of institutional or clinical performance by tracking care communication and care coordination outcomes as well as essential processes that link to outcomes (e.g., developing care plans). For this approach, EHRs can:
    - improve measure feasibility by replacing chart review and claims-based data with automated extraction;
    - provide data elements (both existing and novel) to develop new measure concepts related to care communication and care coordination;
    - improve the specificity of existing accountability measures by re-specification with an EHR data source; and
    - export data to measure specific processes and outcomes important to care communication and care coordination.

The Committee developed a series of recommendations to guide the use of EHR-sourced measures to improve care communication and care coordination. The recommendations are grouped into three themes:

1. Advance EHR data elements needed to improve measurement
2. Expand EHR-sourced measurement
3. Develop prioritized EHR-sourced measure concepts

7.1 Theme 1: Advance EHR Data Elements Needed to Improve Measurement

Recommendation: Stakeholders should focus on developing new, standardized data elements in EHRs to document and assess care communication and care coordination.

To leverage the benefits of EHR-sourced data for measurement, the health system must continue to advance the availability of standardized data elements. Initiatives such as USCDI lay the groundwork for this standardization, and the Committee identified additional standardized data elements that could be added to EHRs to facilitate the measurement of care communication and care coordination. The Committee identified gaps in standardized data elements related to the following:

- Care communication and care coordination actions (e.g., shared decision making, tools to facilitate care planning)
- Goals of care that can be entered by clinicians and other team members, as well as the ability to identify tailored patient goals (e.g., to be able to attend a daughter's wedding) and fields for clinicians to assess whether these goals are met
- Reasons for transitions in care across settings (e.g., due to problems in care coordination, a diagnostic error, or a clinician or team member that is signing off a case)
- Communication between clinicians and patients and their caregivers (e.g., during a transition in care, when critical test findings are communicated).

Additionally, the Committee identified the lack of standardized feedback from patients and caregivers as a major data gap within the EHR. This gap could be addressed through the development of standardized data elements entered by patients, family members, and/or caregivers:

- Engagement with care communication and care coordination (e.g., whether shared decision making occurred and was effective, issues with care navigation, such as whether a care manager was assigned)
- Perceived accuracy of clinical notes (e.g., assessing the number of corrections made by the patient or another clinician)
- Ability to enter edits or corrections
- Perceived alignment of care or patient participation in developing care plans
- Assessments of self-management through a validated scale[55]
- Assessment of patient activation through a validated scale[56]
- Perceived equity of care
- Trust in clinicians or non-clinicians participating in care
- Assessment of specific goals of care
- Preferences and needs for specific care (e.g., advanced directives; no blood transfusions for patient with spiritual beliefs that oppose medical interventions; and details related to how blood is drawn, such as with topical anesthetic or through ultrasound guidance)

7.2 Theme 2: Expand EHR-Sourced Measurement

Recommendation: Stakeholders should leverage EHR data elements to expand EHR-sourced measurement by developing new measures or respecifying existing measures using detailed EHR data.

The Committee identified existing measures of care communication and care coordination that could be respecified or improved with EHR-based data and possible measure concepts. Certain measures were also identified as high priority. Importantly, some of the measure concepts listed below are already existing measures using data from outside the EHR. In these categories, the Committee believed that developing additional measures using detailed EHR data elements would advance measurement in care communication and care coordination. The Committee divided these measure concepts into three categories:

- Outcomes of poor care communication and care coordination
- Outcomes of effective care communication and care communication
- Essential critical actions for effective care communication and care coordination

Outcomes of Poor Care Communication and Care Coordination

Highest Priority Concepts

- **Frequency of duplicate, unnecessary testing (i.e., repeat imaging or laboratory tests):** Duplicate, unnecessary testing is common. This novel measure concept would assess the rate of duplicate testing within specific periods of time (e.g., normal laboratory tests on the same day across settings or repeated imaging, such as a computed tomography or magnetic resonance imaging within the same day or week without a clear indication for repeat imaging).
- **Frequency of follow-up care that was not completed within the recommended time frame:** Several existing measures identify specific follow-up periods based on expert opinion. For example, for patients with new antipsychotic medications, a 28-day follow-up appointment is used to assess quality. EHRs give more detail on specific follow-up dates recommended within clinician encounters that could more precisely assess whether an individual patient's recommended follow-up occurred.
- **Frequency of specific medical errors related to care communication and care coordination:** Existing measures of medication appropriateness rely on linking pharmacy claims data to claims or recommend that specific actions (e.g., medication reconciliation) be performed within settings. Outcome measures related to medications could be created, such as the presence of medications with high-risk interactions (e.g., for which there is no clinical justification) or duplicative medication orders (e.g., multiple prescriptions from different providers for similar medications).

Other Concepts Discussed

- **Hospital readmissions within 30 days of discharge:** Readmissions are a common measure of quality in claims data. The Committee discussed that readmissions measures could be respecified to include more detailed data about why the readmission occurred using structured fields completed by the treating clinician and/or patients. Because many causes for readmissions are unrelated to care communication and care coordination (e.g., clinical progression, patient choice, or emergency care unrelated to an original diagnosis), this would allow the measure to be more specific to modifiable processes associated with the measurement of care communication or care coordination.
- **Unexpected return ED visits within 72 hours of discharge with hospital admission:** Following emergency care, gaps in care communication and care coordination may result in another hospital admission within a short period of time.[57] This novel measure concept would involve the creation of an EHR-based measure in which, similar to the readmissions measure, detailed data about why the return ED visit occurred using structured data fields completed by the treating clinician or patients.

Outcomes of Effective Care Communication and Care Coordination

Highest Priority Concepts

- **Patient engagement with care coordination/clinician communication/care integration:** Using standardized data), novel measures could assess patient and caregiver engagement with their care communication and care coordination (e.g., Did the patient perceive that care delivery is aligned with the care plan?).
- **Assess whether care goals are being met from the perspective of the clinician:** A measure could utilize standardized data from patients to assess whether specific care goals are being

met. The types of goals measured could include function- and symptom-related goals (e.g., adequate pain control, functional status, and activities of daily living) or quality of life-related specific goals (e.g., being able to attend a wedding or walk around the home).
- **Assess whether care goals are perceived as patient centered by the patient:** A measure could utilize standardized data from patients to assess whether the care received recognized individual preferences, values, and expectations (e.g., Did the patient feel their beliefs and values were recognized in their care plan?)
- **Improving outcomes related to SDOH:** EHRs can be portals for patients to enter data on SDOH, and outcome measures can utilize these data to assess whether care needs are being met. For example, patients could self-report their food insecurity or other needs, and those reports could be captured as standardized data (e.g., as defined by the Gravity Project).

Other Concept Discussed

- **Utilization of patient portals and responsiveness of clinicians:** EHRs are configured to measure processes related to patient and caregiver engagement with the patient portal. The Committee recommended assessing specific clinician actions in response to patient queries, such as response to emails. Enhancing patient portals currently qualifies as an improvement activity for clinicians in the 2021 Merit-Based Incentive Payment System (MIPS) program.

Essential, Critical Clinical Actions for Effective Care Communication and Care Coordination

Highest Priority Concepts

- **Care plan creation, availability, and use:** Development of care plans are currently assessed as claims-based measures. Detailed EHR-based measures of care plans could include specific information about who created the care plan, availability of the care plan within EHRs, the assessment of use and access of the care plan by clinicians, and the achievement of care goals.
- **Interventions to address SDOH problems:** When patients present with social risk factors that put them at risk for poor health outcomes (such as food or housing insecurity), measures could evaluate whether the care team implemented appropriate interventions to address identified issues.

Other Concepts Discussed

- **Closing the loop: communication of critical test findings to the care team and patient:** While measures do exist for closing the loop for specialist referrals, a novel measure for closing the loop could be developed as a standardized process measure that assesses specific high-risk communications (e.g., lab or radiology results).
- **Appropriate handoff/communication performed between clinicians for high-risk transitions:** EHR data can support a standardized process measure of appropriate handoffs (e.g., relevant information is shared using closed-loop communication) at transitions in care.

7.3 Theme 3: Address Prioritized Measure Gaps

Recommendation: Stakeholders should focus on filling high priority measure gaps as first steps to advance measurement of care communication and care coordination.

The Committee identified these three measure concepts to address critical care communication and care coordination measure gaps:

1. **Develop an EHR-sourced measure that identifies specific patient-prioritized goals and whether they are being achieved.** The Committee viewed this as a high priority that is different from the care plan and is more specific to the patient. For example, a patient may set a care goal of wanting their depression to improve within a 12-month period, or alternatively, a patient may have a goal about wanting to be able to dance with their daughter at her wedding. EHRs can support the design and assessment of these sorts of patient-oriented goals.
2. **Develop SDOH measures.** Specific topical areas could include food insecurity, housing stability, or transportation access. EHR-based SDOH measures could be designed to assess screening, interventions for patients with positive screens, and reassessing whether interventions were effective. The Committee saw this as a high priority due to the large impact of SDOH on clinical outcomes, particularly when it comes to these particular SDOH issues.
3. **Improve the specificity of existing measures related to downstream care after an index visit.** Follow-up measures could be respecified to assess critical care coordination and help identify fragmentation (e.g., SDOH, readmissions, duplicate testing, and follow-up care). The Committee viewed this as important due to limitations of existing measures and the granularity that EHR data could provide to make the measures more specific and actionable.

8. Additional Considerations for Advancing EHR-Sourced Measurement

The presented recommendations may advance the use of EHR-sourced data to improve and measure care communication and care coordination. However, to effectively implement these recommendations, the Committee recognized the importance of the following considerations:

- Trust in providers and the healthcare system so that patients feel comfortable being active participants in their care
- Burden of data collection on clinicians and patients
- Cost of EHR utilization
- Role of incentives related to data collection and use

Broadly, the goal should be to increase the person-centeredness of the EHR by increasing the completeness of data and improving usability for clinicians, patients, and their caregivers.

Trust in the healthcare system is essential for effective EHR-based care communication and care coordination. However, the Committee noted the impact of systemic racism and other forms of bias in creating distrust, and consequently, the importance of the healthcare system taking steps to develop trust. Healthcare stakeholders should prioritize initiatives that could help to develop trust, such as providing sensitivity training to all members of the care team and interacting with patients and their caregivers as people. Additionally, healthcare stakeholders can foster trust by including care team members who are from the same background as patients and their caregivers. Another approach healthcare stakeholders can use to foster trust is to ensure accurate information is collected from patients, reported in clinical notes, and shared with the patient’s permission.

Data collection can create additional burden for clinicians and patients. Healthcare stakeholders, including healthcare leadership, EHR vendors, and clinicians, should carefully structure data collection processes and design workflows that facilitate the collection of the data that can help reduce burden. Healthcare stakeholders should consider the best approach for collecting the data while also allowing for flexibility to allow for patient preferences (e.g., completing a questionnaire versus being interviewed). For particularly sensitive data (e.g., related to SDOH), healthcare stakeholders may also consider using an informed consent approach to explain how the data will be protected and used.

The cost of both implementing and maintaining an EHR system is high and will be a barrier in the implementation of these recommendations. For example, there are costs associated with collecting the various data elements described in the recommendations (e.g., costs associated with translating questionnaires into different languages, lack of reimbursement for time spent addressing social risks). To provide justification for the costs associated with data collection, healthcare stakeholders will need to develop use cases for how the data can be used. The process of using weighted medical codes for billing (e.g., only being reimbursed for a selection of the medical codes inputted) will also need to be revisited as more data enter the EHR since billing is essential for getting reimbursed for care provided. Furthermore, changes in clinical workflows to enhance care communication and care coordination (e.g., time spent responding to emails or transitioning care to another clinician) will also lead to increased costs through clinician payment and payer reimbursement.

Incentives will play an important role in counteracting the barriers related to data collection burden and cost. Solutions could include integrating recommendations in standards and criteria for certified health IT; adding identified data elements to USCDI for implementation, including data elements in quality measures that are required for reporting to encourage their adoption; and aligning new measures with USCDI data elements and/or USCDI+.

9. Conclusion

One of the central goals of healthcare delivery is improving care communication and care coordination. Yet large gaps remain in how these functions are implemented and measured. EHRs with improved data sharing and standardization are one solution for closing these gaps. Federal programs, such as USCDI, will continue to require new data standardization approaches and facilitate their implementation to enhance interoperability and EHR maturity across settings. The recommendations in this report are intended to complement this work by providing practical solutions for leveraging EHRs to facilitate care communication and care coordination quality measurement. These solutions include specific ways that EHRs can be used to improve collecting and sharing standardized data and be more usable for patients, caregivers, and clinicians to improve care communication and care coordination.

EHRs can improve the measurement of care communication and care coordination for both continuous improvement and accountability purposes. The recommendations in this report include the identification of new data elements related to care communication and care coordination measurement, possible EHR-based measure concepts, and prioritized next steps for advancing measure development. To optimize EHRs for clinical use and quality measurement and to improve care communication and care coordination, stakeholders, including healthcare leadership, EHR vendors, and clinicians, should focus on achieving more advanced levels of EHR maturity within and across all healthcare settings. Stakeholders need to continue to develop incentives to encourage increased adoption of the interoperability and data standards required to measure care communication and care coordination. In addition, stakeholders need to focus on creating novel EHR-based measures, particularly regarding care goals, SDOH, and downstream care. Lastly, through the process of improving

EHRs for care communication and care coordination and creating measures, it is vital for stakeholders to engage patients, families, and caregivers to amplify their voices and improve disparities in care.

Appendix A: Key Terms and Definitions

Definitions for several key terms, as they relate to care communication and care coordination, used in this report are provided below. These definitions are based on literature review, prior National Quality Forum (NQF) reports, and the Committee's input. Some of these terms and concepts are discussed in greater detail throughout the report.

- ***Application Programming Interfaces (APIs) –*** A set of defined rules that explain how computers or applications communicate with one another. APIs sit between an application and the web server, acting as an intermediary layer that processes data transfer between systems. They enable entities to open their applications' data and have functionality to external third-party developers, business partners, and internal departments. APIs allow services and products to communicate with each other and leverage each other's data and functionality through a documented interface.[58]
- ***Care Communication –*** The transfer of information for patient care.
- ***Care Coordination –*** The deliberate synchronization of activities and information to improve health outcomes to ensure patient and family needs and preferences for healthcare and community services are met over the course of their treatment and care.[3]
- ***Electronic Clinical Quality Measure (eCQM) –*** Quality measures that use data electronically extracted from EHRs and/or health information technology (IT) systems to measure the quality of care provided. The Centers for Medicare & Medicaid Services (CMS) uses eCQMs in a variety of quality reporting and value-based purchasing programs.[18]
- ***Electronic Health Record (EHR) –*** A longitudinal, real-time electronic record of patient health information generated by one or more encounters in any healthcare delivery setting. They are used to document notes, order tests and treatment, potentially review the activities of other care team members across settings, and bill insurance companies.
- ***EHR Functionality –*** The capabilities and capacities of an EHR to perform various operations, such as serving as a documentation tool, displaying test results, and using evidence-based pathways based on specific clinical use cases (e.g., patient portals).
- ***EHR Maturity –*** The level of functionality within the EHR to support care communication and care coordination. Specifically, it is how advanced an EHR system is in achieving the goals of interoperability, data standardization, usability, and other features. It ranges from simple (e.g., limited clinical documentation, basic communication with ancillary clinical systems) to more advanced functionalities (e.g., complete clinical document, communication with health information exchanges [HIEs] to share data) across a continuum.[51]
- ***EHR-Sourced Measure –*** A quality measure that relies on data that originally come from an EHR but may be evaluated outside of the original EHR system from which the data were collected (e.g., registry, data warehouse, other separate system).[5]
- ***Fast Healthcare Interoperability Resources (FHIR) –*** A set of international standards for transfer of clinical and administrative data between software applications used by healthcare providers. This includes flexible standards, guidelines, and methodologies allowing healthcare systems to communicate. These data standards are guidelines that allow information to be shared and processed in a uniform and consistent manner to share clinical information.[59]
- ***Health Information Exchange (HIEs) –*** Centralized databases or portals that combine EHR data from multiple sources to assist in data standardization and information sharing across settings.[60]

- ***Interoperability –*** Technology that allows for secure and complete access, exchange, and use of electronically accessible patient health information with other health IT (e.g., across different EHR systems).[61]
- ***Measure –*** Tools to quantify healthcare processes, outcomes, patient perceptions, and organizational structure and/or systems that are associated with the ability to provide high quality healthcare.[62]
- ***Measure Concept –*** An idea for a measure that is not fully specified or tested.[63]
- ***United States Core Data for Interoperability (USCDI) –*** An Office of the National Coordinator for Health Information Technology (ONC) initiative that establishes a standard set of health data classes and data elements for nationwide, interoperable HIE through new public health APIs. It sets a foundation for broader sharing of electronic health information to support patient care. The first version of the USCDI was adopted as a standard in the ONC Cures Act Final Rule.[47]

Appendix B: Committee Members, Federal Liaisons, and NQF Staff

EHR Care Coordination Committee Members

Richard Christopher Antonelli, MD, MS
Medical Director of Integrated Care
Boston Children's Hospital
Department of Pediatrics
Harvard Medical School
Boston, MA

Gerri Lamb, PhD, RN, FAAN
Research Professor
Arizona State University
Phoenix, AZ

Kathleen Balestracci, PhD, MSW
Associate Research Scientist
Yale University
Senior Health Outcomes Researcher
Yale/YNHH Center for Outcomes Research and Evaluation
New Haven, CT

David Buriank
VP, Quality and Clinical Performance
Help at Home, LLC
Chicago, IL

Brian Buys, RN, MBA
VP, Clinical
PointClickCare
Fairpoint, NY

Sherri Costa, MS, RN, AOCNS
Regional Manager Oncology Support Services
Ascension
Milwaukee, WI

Cynthia Cullen, MS, MBA, PMP
Senior Director
Mathematica
Princeton, NJ

Keith Horvath, MD
Sr. Director, Clinical Transformation
Association of American Medical Colleges
Washington, DC

Joseph Kunisch, PhD, RN-BC, CPHQ
Enterprise Director of Clinical Quality Informatics
Harris Health
Bellaire, Texas

Russell Leftwich, MD
Adjunct Assistant Professor
Vanderbilt University
Cortaro, AZ

Michael Lieberman, MD, MS
Medical Director, Population Health
Oregon Community Health Information Network (OCHIN)
Portland, OR

Brent Peery, DMin
Vice President for Chaplaincy Services
Memorial Hermann Health System
Houston, TX

Rebecca Perez, MSN, RN, CCM
Sr. Manager of Education and Strategic Partnerships
Parthenon Management Group
Case Management Society of America
Brentwood, TN

Ann Polich, MD, MPH, MBA
Chief Medical Officer
Nebraska Health Information Initiative (NEHII)
Omaha, NE

Walter Rosenberg, MSW, MHSM, LCSW
Director, Social Work and Community Health
Rush University Medical Center
Chicago, IL

Stacie Schilling
Research Associate
IMPAQ International
Washington, DC

Suellen Shea, MSN, RN-BC, LSSGB, CPHQ, CPPS
Senior Clinical Consultant
Cerner
Kansas City, MO

Colleen Skau, PhD
Assistant Director, Performance and Quality Measures Portfolio
College of American Pathologists
Washington, DC

Alexis Snyder
Patient Advocate
Brookline, MA

Maurine Stuart
Patient Advocate
Snowshoe, WV

Jason Wiesner, MD, MBA
Diagnostic Radiologist
Sutter Health
Sacramento, CA

Dorothy Winningham
Patient Family Advisor
Winn Leadership Group, LLC
Patient & Family Centered Partners
Midlothian, VA

Kim Yu, MD, FAAFP
Regional Medical Director
Aledade
Mission Viejo, CA

Andrew Zinkel, MD, MBA
Associate Medical Director of Quality
Health Partners
Bloomington, MN

Federal Liaisons

Joel Andress, PhD
EHR Technical Lead, eCQM Measure Development Lead
Division of Quality Measurement, CMS

Kyle Cobb, MS
Branch Chief Tools & Testing
Office of Technology, ONC

Chris Dymek, EdD
Director, Digital Healthcare Research Division
Center for Evidence and Practice Improvement, AHRQ

Kenneth P. Yale, DDS, JD
Acting Chief
TRICARE Health Plan, DOD

Tara McMullen, PhD, MPH
Associate Director
Opioid Safety, VA

Carly Medosch, MBA, PMP
Health IT Lead, Division of Advanced Primary Care
Seamless Care Model Group, CMMI

Francine Sandrow, MD, MSSM, FAMIA
Chief Health Informatics Officer
Office of Community Care, VA

NQF Staff

Kathleen Giblin
Senior Vice President

Elizabeth Drye, MD, SM
Chief Scientific Officer

Alejandra Herr, MPH
Senior Managing Director

Chelsea Lynch, MPH, MSN, RN, CIC
Director

Chuck Amos, MBA
Senior Director

Carol Sieck, PhD, RN
Director

Udara Perera, DrPHc, MPH
Senior Manager

Monika Harvey, MBA, PMP
Project Manager

Debbie Olawuyi, MPH
Analyst

Jesse Pines, MD, MBA, MSCE
Consultant

CMS Staff

Kimberly Rawlings
Task Order COR

Gequincia Polk
IDIQ COR

Helen Dollar-Maples
Director, DPMS/QMVIG/CCSQ

Marsha Smith, MD, MPH, FAAP
Medical Officer, DPMS/QMVIG/CCSQ

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