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

**Final Recommendations Report**

**SEPTEMBER 19, 2022**

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# 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 when care coordination and care communication are suboptimal. Effective care communication and care coordination are therefore urgently needed to improve these outcomes and make care more equitable.<sup>1,2</sup>

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 [here](#) for additional key terms and definitions).<sup>3</sup> 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 between clinicians and across settings, or the data on whether it was performed may not be captured in a standardized way. This makes it difficult to hold individuals or organizations accountable for specific interventions.<sup>4,5</sup>

Electronic health record (EHR) use has become widespread throughout the United States (U.S.) in recent years and may help to support better care communication and care coordination and improve the measurement of these functions.<sup>6</sup> 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.<sup>7</sup> 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 identified five recommendations for how EHRs can facilitate effective care communication and care coordination for patient care and quality measurement:**

### **RECOMMENDATION 1: Collect and Share Standardized Data**

Stakeholders, including healthcare leadership, federal partners, EHR vendors, and clinicians, should focus on advancing interoperability and data standardization. Efforts should aim to enhance EHR functionalities to optimize care communication and care coordination. EHRs should also incorporate nationally vetted SDOH data elements (e.g., from the Gravity Project and United States Core Data for Interoperability [USCDI]) to help identify health disparities to improve equity and for use in measurement.

### **RECOMMENDATION 2: Optimize EHR Usability for Patients and Caregivers**

Stakeholders should ensure EHRs are easy to use and intuitive for both patients and caregivers to improve care communication and care coordination (e.g., through patient portals and other virtual communication).

### **RECOMMENDATION 3: Optimize EHR Usability for Clinicians**

Stakeholders should ensure EHRs are easy to use and intuitive for clinicians to support care communication and care coordination (e.g., by improving clinical workflow and enhancing evidence-based care).

### **RECOMMENDATION 4: Develop Novel EHR Data Elements to Improve Measurement**

Stakeholders should develop new, standardized EHR data elements to document and assess care communication and care coordination (e.g., through expanding patient and caregiver data entry and other data elements).

### **RECOMMENDATION 5: Leverage EHR Data to Fill Measurement Gaps**

Stakeholders should use existing and novel EHR data elements to fill high-priority care communication and care coordination measurement gaps (e.g., through developing new measures or respecifying existing measures).

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. 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 create the opportunity to advance 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.<sup>8</sup>**

Widening disparities in care is 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 disproportionately affected by SDOH factors.<sup>9</sup> It is vital that care delivery involves 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, nonadherent to care standards, directly conflicting with treatments (e.g., unrecognized potentially harmful medication interactions), or unnecessarily duplicative (e.g., repeat imaging or laboratory testing).<sup>10</sup> 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 diagnostic screenings, such as identifying cancer. Ultimately, patients should be able to expect safe, effective, and standardized care from their clinical team.

Enhancing care communication and care coordination is effective in improving outcomes. For example, randomized, controlled studies on interventions related to improving care communication and care coordination have demonstrated reduced rates of medical errors, duplicative care, and readmissions.<sup>11,12</sup> 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.<sup>13</sup> As care communication and care coordination are enhanced, there is a decreased burden for patients in navigating the healthcare system.<sup>14,15</sup> 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.

Effective care communication and care coordination are paramount to ensuring safe, patient-centered care. In many healthcare settings and communities across the U.S., these functions are not optimally performed, leading to worse patient outcomes, inefficient processes, nonadherence to care plans, health complications, and higher costs of care. One of the key steps in improving the accountability of organization to improve care communication and care coordination is using quality measurement. Yet measuring care communication and care coordination and linking these functions to improved health outcomes continue to be challenging.<sup>16</sup> 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. However, there are few or no measures that assess detailed information about whether care communication or care coordination was performed effectively or specifically associated with 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.<sup>4</sup> These challenges threaten the ability to perform specific sets of care communication and care coordination processes consistently and effectively, including those who inform process-based quality metrics.<sup>17</sup> Clinicians might perform care communication and care coordination activities but not effectively document the activity, or conversely, they might document activities they did not effectively perform.<sup>5</sup> 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.<sup>18</sup> 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.<sup>19</sup>

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 now offer the potential to serve 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 have occurred.

To measure care communication and care coordination, both EHR- and claims-based data are helpful. 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, such as health plans, may only have access to specific types of data in the short-term, such as 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, 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 document 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 enable a real-time assessment of quality improvement.

The timing of this effort is aligned with a national movement toward interoperability and standardized measures—both of which are foundational to improving care communication and care coordination. 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 **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).<sup>20</sup> 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.<sup>18</sup> As another example, ONC's Trusted Exchange Framework and Common Agreement (**TEFCA**) establishes a universal floor for interoperability nationwide by creating the infrastructure model and governing the approach for users in different networks to share basic clinical information.<sup>21</sup>

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 that should be urgently implemented to further facilitate and improve EHR-based care communication and care coordination quality measurement. The recommendations are as follows:

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**RECOMMENDATION 1:  
Collect and Share Standardized Data**

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**RECOMMENDATION 2:  
Optimize EHR Usability for Patients  
and Caregivers**

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**RECOMMENDATION 3:  
Optimize EHR Usability for Clinicians**

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**RECOMMENDATION 4:  
Develop Novel EHR Data Elements  
to Improve Measurement**

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**RECOMMENDATION 5:  
Leverage EHR Data to Fill Care  
Measurement Gaps**

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## 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 represented 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 acted as federal liaisons for the Committee (see the 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 the 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<sup>7</sup>

### 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).<sup>7</sup>

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 to include specific examples of care communication and care coordination activities.<sup>3</sup> 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<sup>22</sup>



- 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<sup>23</sup>
- 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)<sup>24</sup> 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 (i.e., 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 an unplanned emergency room visit 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.<sup>25</sup>

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.<sup>26</sup> 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.<sup>27</sup>

### 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.”<sup>28</sup> To assist with achieving health equity and providing the best care to all patients, care teams should collect and provide interventions for SDOH gaps. SDOH are “the conditions in the places where people live, learn, work, and play that affect a wide range of health risks and outcomes.”<sup>19</sup> Care communication and care coordination play a critical role in addressing SDOH by identifying the SDOH concern (e.g., food insecurity, housing insecurity, poverty, rurality, and geography) and linking the patient to associated resources (e.g., food banks, nutrition assistance programs). Using EHRs as part of care communication and care coordination efforts can further assist with addressing SDOH through the following activities:

- Standardizing SDOH data collection, including sociodemographic data, such as race, ethnicity, language, and disability as well as sexual orientation and gender identity (SOGI)
- 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 clinical notes, such as 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)<sup>19</sup>
- Access to care limited in both rural settings (e.g., long distance to emergency departments [EDs] or specialists)<sup>29</sup> and urban settings (e.g., lack of insurance coverage in moderate- and low-income populations) resulting in the inability to collect data during visits<sup>30</sup>

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<sup>31</sup>
  - USCDI: Version 2 includes data elements for race, ethnicity, preferred language, SOGI, as well as SDOH-related data elements.<sup>32</sup>
  - 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.<sup>33</sup>

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 a powerful tool to improve and align the work of interprofessional teams.<sup>34</sup> 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). For example, the CDC's Adapting Clinical Guidelines for the Digital Age initiative strives to implement an integrated process to use EHRs as a tool to develop and implement narrative and computable guidance for FHIRs to improve the use of clinical guidelines in practice through clinical decision support.<sup>35</sup> Using similar clinical decision support tools within EHRs could improve care communication and care coordination by ensuring the best practices and/or guideline recommendations are considered in planning care, encouraging collaboration with shared decision making, targeting decisions specifically for the patient's goals, and using the resulted data for measurement. 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.<sup>36</sup>

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.<sup>37</sup> Increased interoperability will make care communication and care coordination activities more quantifiable, allowing for measurement of the

activities.<sup>37</sup> 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.<sup>38</sup> 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 medical errors, and potentially worsen outcomes.

Another significant barrier to measuring care communication and care coordination is limited standards on 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.<sup>39</sup> 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.<sup>40</sup> 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 incentivizes eligible clinicians and healthcare facilities to adopt certified health IT to participate in some of its programs.<sup>41</sup> There are also new standards related to standardizing care plans across EHR platforms.<sup>42</sup> 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 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 application programming interface (API) requirements fostering applications for patient access, care coordination, clinical research, public health/population management, and quality measurement.<sup>43</sup> In the ONC 21<sup>st</sup> 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 APIs. Through future rulemaking, as well as ONC's Standards Version Advancement Process (SVAP),<sup>44</sup> 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.<sup>45</sup> USCDI Version 2, published in July 2021, added data classes and more detailed data elements related to SDOH and 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.<sup>46,47</sup> 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 potential 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<sup>48</sup> and the Healthcare Information and Management Systems Society (HIMSS) Electronic Medical Record Adoption Model (EMRAM).<sup>49</sup>

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.<sup>50</sup> 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
<p><b>In early EHR maturity, EHR systems should accomplish the following:</b></p>	<ul style="list-style-type: none"> <li>• Provide basic EHR functionality with local customization and specialized tools</li> <li>• Allow patients to retrieve basic data (e.g., discharge summaries) from a portal</li> <li>• Begin to define standardized vocabularies</li> <li>• Allow the healthcare setting to scale existing approaches to exchanging data with different platforms</li> <li>• Exchange query-based health information</li> <li>• Allow the healthcare setting to measure quality retrospectively from structured data fields</li> <li>• Allow for multidisciplinary care planning using tools developed by the healthcare setting</li> </ul>
<p><b>In intermediate EHR maturity, EHR systems should accomplish the following:</b></p>	<ul style="list-style-type: none"> <li>• Include early development of more advanced applications and patient-centered tools</li> <li>• Continue to broaden the standardization of data and refine existing vocabularies to align with federal standards</li> <li>• Focus on data integration by expanding data inclusion across other databases and settings and adding information about the participating providers</li> <li>• Integrate data from multi-payer claims and registries</li> <li>• Allow the healthcare setting to measure quality of care and improved clinical decision support from structured data fields</li> <li>• Advance the ability to support multidisciplinary care planning both within the healthcare setting and with different settings</li> </ul>
<p><b>In advanced EHR maturity, EHR systems should accomplish the following:</b></p>	<ul style="list-style-type: none"> <li>• Utilize sophisticated user experience (UX) interfaces to improve usability for clinicians</li> <li>• Implement easy-to-use targeted decision support tools to improve care communication and care coordination</li> <li>• 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</li> <li>• Standardize vocabularies that align with federal standards</li> <li>• Integrate increasingly complex data from other health IT systems (e.g., HIEs) on a continuous basis</li> <li>• Allow the healthcare setting to assess the quality of care continuously for improvement</li> <li>• Allow the healthcare setting to collect patient-reported data that can be used for measures</li> <li>• Deliver effective tools to assist the healthcare setting in achieving seamless, dynamic, and multidisciplinary care planning across different settings</li> </ul>

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 communication and care coordination 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 for How EHRs Can Facilitate Care Communication and Care Coordination for Patient Care and Quality Measurement

EHR functionalities, such as those shown in Table 1, 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 five recommendations to guide the effective facilitation of care communication and care coordination for clinical care as well as quality measurement.

The recommendations are as follows:

- **RECOMMENDATION 1:**  
**Collect and Share Standardized Data**
- **RECOMMENDATION 2:**  
**Optimize EHR Usability for Patients and Caregivers**
- **RECOMMENDATION 3:**  
**Optimize EHR Usability for Clinicians**
- **RECOMMENDATION 4:**  
**Develop Novel EHR Data Elements to Improve Measurement**
- **RECOMMENDATION 5:**  
**Leverage EHR Data to Fill Measurement Gaps**

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.



**RECOMMENDATION 1****Collect and Share Standardized Data**

*Stakeholders should focus on advancing interoperability and data standardization. Efforts should aim to enhance EHR functionalities to optimize care communication and care coordination. EHRs should also incorporate nationally vetted SDOH data elements (e.g., from the Gravity Project and USCDI) to help identify health disparities to improve equity and for use in measurement.*

Gathering and sharing data through interoperability are central functions of EHRs in driving clinical care, quality measurement, and care communication and care coordination. The Committee supported and urged continued acceleration of efforts to achieve both, as interoperability and data standardization are essential to improving care communication and care coordination. Many stakeholders, including clinicians, allied health professionals, and health insurance providers, have the potential to contribute to improving outcomes that are dependent upon high quality care communication and care coordination. These stakeholders should be able to participate in bidirectional, interoperable data flow for direct patient care activities if patients and caregivers have control over their data and their data are not shared without their permission. To enable continued growth and improvement of care communication and care coordination, the Committee recommended strategies for each stage of EHR maturity.

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, insurance company databases, and immunization information systems and registries) in a timely manner with transparent communication to applications that contain healthcare-related information (e.g., wearables such as cardiac and continuous glucose monitors, 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])<sup>51</sup>;
  - » 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

The Committee emphasized the important role that SDOH plays in addressing health, and recommended integrating data related to cultural, social, and other SDOH factors into the EHR. Current efforts to standardize SDOH measures, such as the Gravity Project and USCDI, provide an excellent foundation since they include 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, and SOGI, as well as SDOH-related data elements.<sup>32</sup> 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 the screening and implementation of interventions to address food insecurity as well as for improvement in 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. However, patients and caregivers need to trust that sharing social risk information will be protected within EHR systems to ensure data collection and data utilization are effective and equitable.

In addition to the Gravity Project and USCDI, the Committee recommended also capturing data regarding cultural or religious ideologies that could affect delivery of care in the EHR in a structured, standardized manner. Additional efforts to standardize SDOH should also be extended to sociodemographic data. The Committee viewed these additional 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 and preferences.

**RECOMMENDATION 2:****Optimize EHR Usability for Patients and Caregivers**

*Stakeholders should ensure EHRs are easy to use and intuitive for both patients and caregivers to improve care communication and care coordination (e.g., through patient portals and other virtual communication).*

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.

To optimize the usability of EHRs for patients and caregivers and promote trust with clinicians and health systems 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 share their experience of care and care needs and identify care gaps, and the portal summarizes 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.

### RECOMMENDATION 3: Optimize EHR Usability for Clinicians

*Stakeholders should ensure EHRs are easy to use and intuitive for clinicians to support care communication and care coordination (e.g., by improving clinical workflow and enhancing 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. Increasingly, team-based care models are being used to share EHR data with a variety of allied health professionals and nontraditional healthcare providers, including care coordinators, home visitors, community health workers, and doulas. EHR usability can be enhanced when EHR-based documentation aligns with clinical workflows for in-person and virtual care, which may also facilitate the collection of EHR data for performance measures.<sup>52</sup>

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 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.)<sup>53</sup>;
  - » 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 without search functions, 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).<sup>54</sup>
    - **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.

**RECOMMENDATION 4:****Develop Novel EHR Data Elements to Improve Measurement**

*Stakeholders should develop new, standardized EHR data elements to document and assess care communication and care coordination (e.g., through expanding patient and caregiver data entry and other data elements).*

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).
- **Public 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.

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 who is signing off of 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<sup>55</sup>
- Assessment of patient activation through a validated scale<sup>56</sup>
- 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 a patient with spiritual beliefs that oppose medical interventions; and details related to how blood is drawn, such as with a topical anesthetic or through ultrasound guidance)

#### RECOMMENDATION 5:

### Leverage EHR Data to Fill Measurement Gaps

*Stakeholders should use existing and novel EHR data elements to fill priority care communication and care coordination measurement gaps (e.g., through developing new measures or respecifying existing measures).*

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 identified three priority measurement areas to address critical care communication and care coordination measure gaps (Table 2) and divided other identified measure concepts into three categories:

- Outcomes of poor care communication and care coordination
- Outcomes of effective care communication and care coordination
- 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 performing specific actions (e.g., medication reconciliation) 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.<sup>57</sup> 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 could be collected 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 is 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 the use of and access to 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.

**TABLE 2: Priority Measurement Areas to Address Critical Care Communication and Care Coordination Measure Gaps**

Measurement Area	Description
<b>Develop an EHR-sourced measure or measures that identify the solicitation of patient-prioritized goals and reflect whether they are being achieved</b>	The Committee viewed this as a high priority that may be an adjunct to the care plan and is more specific to what the patient perceives as their needs. 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. The Committee emphasized that the intent is to assist the patient to set realistic goals with guidance from their care team. EHR functionality could be leveraged to create this patient-prioritized goal, and EHR-sourced measures should not place additional burden on clinicians. Importantly, capturing the outcome of a patient-prioritized goal would be critical to ensure equitable and optimal health outcomes.
<b>Develop SDOH measures</b>	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.
<b>Improve the specificity of existing measures related to downstream care after an index visit</b>	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 the limitations of existing measures and the granularity that EHR data could provide to make the measures more specific and actionable.

## 7. 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 sharing sensitive social information and 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 are entered into 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 and will be needed for all stakeholders involved in improving care communication and care coordination. Approaches for incentives include integrating recommendations in standards and criteria for certified health IT; using payment incentives; highlighting non-monetary benefits, such as decreased burden and increased convenience; 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+.

## 8. 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 for patient care and 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. The recommendations in this report also include the identification of novel EHR data elements that would be needed to improve measurement and prioritized next steps for leveraging EHR data to fill measurement gaps. 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 patient-prioritized 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, improve clinical outcomes, and reduce disparities in healthcare.

### RESOURCES

**SHORTENED FINAL RECOMMENDATIONS REPORT**

**KEY TERMS AND DEFINITIONS**

**PUBLIC COMMENTS AND COMMITTEE RESPONSES**

**REFERENCES**

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