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Issue Brief

EHR-Based Care Coordination Performance Measures in Ambulatory Care

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ABSTRACT: Good coordination of care in the ambulatory setting has the potential to reduce unnecessary or duplicative use of health services, prevent hospitalizations for ambulatory care–sensitive conditions, improve patient safety, and potentially reduce costs. Unfortunately, coordination failures are common across the health care system. Using performance measures can drive practice improvement, particularly if reimbursement aligns with measurement. However, there are few well-developed, standardized measures of care coordination. This study sought to develop electronic health record–based measures to assess the quality of coordination during the primary care physician-to-specialist referral process, one of the most common transitions across providers in health care. Using input from interviews with primary care physicians and experts, the authors developed a core set of five electronic measures for use in primary care and specialist settings. Through a preliminary evaluation, they determined that the measures are valid with practicing physicians and two are ready for implementation.

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OVERVIEW

In its recent report to Congress, entitled *National Strategy for Quality Improvement in Health Care,* the U.S. Department of Health and Human Services states that improved coordination and communication across providers is a key area of U.S. health care quality improvement.[1] Other organizations have come to similar conclusions: the National Priorities Partnership, a coalition of 48 diverse stakeholder organizations such as the National Governors Association, AARP, the U.S Chamber of Commerce, the National Institutes of Health, and the AFL–CIO, highlighted care coordination as one of the most critical areas for development of quality measurement and improvement.[2] These influential reports support the premise that improved coordination will have significant benefits for health and safety at many different levels of the delivery system. In addition, recent public and private reform initiatives, such as patient-centered medical homes

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and accountable care organizations, are designed to improve care coordination.

Measurement can drive improvements in practice, but only if reliable and valid measures are available to monitor the quality of care and use in quality improvement initiatives and incentive programs. However, there are few well-developed, standardized measures of care coordination. This issue brief describes a new set of care coordination measures focused on the process of referring a patient from a general health care provider to a specialist. The measures reflect provider actions that are critical to successfully transferring information from clinician to clinician during a typical referral or consultation—one of the most common transitions in health care.

In developing these measures, the authors considered the feasibility of implementing them within electronic health records (EHRs), as EHRs will play an essential role in the performance and measurement of care coordination. This set of electronic measures and recommendations for implementation is based on input from a panel of leading experts and interviews with a national sample of small and large practices with comprehensive EHRs. (For more detail, please see the Methodology.)

A STARTER SET OF MEASURES

This set of measures focuses on closing the referral loop by highlighting key actions that lead to the successful transfer of critical information among the referring primary care provider, specialist, and the patient and his or her family (Exhibit 1). These measures (as described further in the exhibit) assess:

- the transfer of critical information between the primary care physician (PCP) and specialist;
- whether the PCP provided critical information to the patient about the referral;
- whether, after the referral visit, the specialist communicated relevant findings to the patient and his or her family;
- the communication of the results of the referral visit by the specialist to the primary care physician; and
- whether the primary care physician reviewed the results.

In addition to improving communication between PCP and specialist to enhance care continuity, these steps help to ensure that patients are fully informed about and involved in their care throughout the referral process and that PCPs are aware of patients' clinical status and any changes that may need to be made to their overall care management as a consequence of the findings reported by specialists.

Overall, this set of measures is intended to be widely applicable. Patient self-referrals are excluded from these measures, as the primary care provider may be unaware of the referral. For the Primary Care Physician Review of Specialist Report measure, referrals are only excluded if the patient explicitly prohibits the specialist from sharing testing results. Technical definitions of these measures are presented in Exhibit 1.

MEASURES FOUND TO BE CLINICALLY RELEVANT AND FACE VALID

As part of the process of developing the measures, we assessed the clinical relevance and acceptability of these measures with practicing primary care providers (PCPs) selected from a national sample of practices participating in a National Committee for Quality Assurance recognition program. A high proportion of the practicing physicians interviewed rated the project's preliminary measures as clinically important, useful, feasible, and acceptable (Exhibit 2).

The PCP respondents highlighted the integral role specialists have in the referral process. Therefore, a version of the Critical Information Communicated with Request for Referral to Specialist measure that is applicable to the specialist was created. Also based on their input, two other measures were developed to assess the specialist's role in the referral coordination process: percentage of patients seen by specialist and provided with report by the specialist; and percentage of patients seen by specialists for whom the specialist gave a report to the PCP.

Exhibit 1. Final Ambulatory Coordination of Care Measure Set

	From the Primary Care Perspective	From the Specialty Care Perspective
Eligible Population	Number of patients age 18 and older who were sent to another clinician for referral or consultation. Exclusions: Patients who self-refer to a specialist.	Number of patients age 18 and older who were referred to a specialist and seen by that specialist. Exclusions: Patients who self-refer to a specialist.
Referral Loop Opened	**Critical Information Communicated with Request for Referral to Specialist (sent by primary care provider)** Number of patients with relevant clinical information communicated using the Continuity of Care Document (HL7 CCD). This is sent along with the request for referral to specialist. Relevant clinical information is defined as: • activity requested (referral, consultation, co-management); • clinical reason for requesting the referral or consultation; • preferred timing for completion of the referral or consultation; • problem list; • medication list; and • medical history, including relevant test results.	**Critical Information Communicated with Request for Referral to Specialist (received by specialist)** Number of patients with relevant clinical information communicated using the Continuity of Care Document (HL7 CCD) with request for referral to specialist. Relevant clinical information is defined as: • activity requested (referral, consultation, co-management); • clinical reason for requesting the referral or consultation; • preferred timing for completion of the referral or consultation; • problem list; • medication list; and • medical history, including relevant test results.
Patient Informed	**Primary Care Communication About Referral to Patient and Family** Number of referred patients for whom the primary care clinician gave patient written information on reason for referral or consultation. Information must include: • reason for specialist involvement; and • name and contact information for specialist.	**Specialist Communication of Results to Patient and Family** Number of patients seen by a specialist and provided with written results by the specialist.
Referral Loop Closed	**Primary Care Physician Review of Specialist Report** Number of referred patients seen by the specialist for whom the primary care clinician reviewed the results of the specialist report.	**Specialist Report to Primary Care Physician** Number of patients for whom the specialist communicated results in a report to the primary care clinician using the Continuity of Care Document (HL7 CCD). Elements of the report must include: • findings; and • treatment recommendations, including degree of shared management of patient and roles for specialist and primary care clinician. Exclusions: Patients in the eligible population who refuse to allow sharing of results with primary care physician.

Note: The Continuity of Care Document (HL7 CCD) is a standardized summary of the most relevant and timely facts about a patient and his or her health.
Source: K. S. Chan, J. Holzer, S. H. Scholle et al., *The Development and Testing of EHR-Based Care Coordination Performance Measures in Ambulatory Care* (New York: The Commonwealth Fund, Nov. 2011).

Exhibit 2. Primary Care Physicians' Ratings of Measures

Specified Measures	Clinically important	Useful	Feasible	Acceptable
Critical information communicated with request for referral to specialist	100%	80%	80%	87%
Primary care communication about referral to patient and family	87%	73%	73%	67%
Primary care physician review of specialist report	93%	73%	73%	80%

Source: K. S. Chan, J. Holzer, S. H. Scholle et al., *The Development and Testing of EHR-Based Care Coordination Performance Measures in Ambulatory Care* (New York: The Commonwealth Fund, Nov. 2011), Exhibit 1.

EARLY OBSERVATIONS ABOUT FEASIBILITY AND IMPLEMENTATION

Of the final proposed set of five coordination measures, we observed in our seven organizational site visits that two measures (Critical Information Communicated with Request for Referral to Specialist and Primary Care Physician Review of Specialist Report) could be implemented with very modest changes to current practice workflow or information systems. Data elements required to calculate these measures can be found in the electronic charts for most of the health information technology-supported sites visited (Exhibit 3). Furthermore, approximately half of these practice settings already record the data needed for Critical Information Communicated with Request for Referral to Specialist on a routine basis. In addition, five of the seven sites regularly record data needed for Primary Care Physician Review of Specialist Report. Although at least four of six sites can abstract the required data for Primary Care Communication About Referral to Patient and Family from the chart, none regularly record whether the patient has received this information, limiting the feasibility of measure implementation without significant changes to the documentation procedures at the sites we visited.

These preliminary feasibility assessments were encouraging. However, there are important impediments to deriving these measures directly from the EHR. First, there are no uniformly structured data for the elements required by the proposed measures. Even for the Critical Information Communicated with Request for Referral to Specialist and Primary Care Physician Review of Specialist Report measures, none of the sites had structured data available for all the required elements for the referral loop opening and closing measures. Irregular documentation and lack of interoperability pose further threats to the accuracy of measures. For example, data on self-referrals, an important exclusion for all the measures, are not regularly documented at many sites. The lack of EHR interoperability contributes to significant missing data for some elements. For example, many providers at the sophisticated integrated delivery systems we visited still use paper-based processes to exchange information with providers outside their delivery system, whether or not these external providers use paper or electronic health records. These paper-based information exchanges are often only archived as PDFs, without coding or searching capability that makes this information readily available for measure reporting.

POLICY IMPLICATIONS

These new indicators of coordination are processes that can be enabled and measured by health information technology. They are likely candidates for future iterations of the Centers for Medicare and Medicaid Services' EHR Incentive Program, which will offer increased payment to office-based clinicians who are "meaningful users" of EHRs.

Without valid measures, we cannot evaluate how different care coordination processes affect health care costs and patient outcomes, nor can we identify breakdowns in process that could be the target of

quality improvement efforts. To be practical, routine measures of care coordination need to be by-products of the care process. The growing use of EHRs in medical practices offers a tremendous opportunity for addressing this challenging measurement problem. Demonstrating feasibility of measures in time for National Quality Forum endorsement and inclusion in meaningful use criteria for 2013 will address the dearth of care coordination measures, but more importantly, provide measures to guide quality improvement and accountability efforts in the future.

A number of observations emerged during this project that highlights the challenges to care coordination persisting within our health care system. To achieve systemwide improvements in care coordination, we need reimbursement policies that better reward providers for undertaking care coordination activities. In addition, continued commitment by policymakers to fund and to facilitate collaborations by health care organizations and EHR vendors will be needed to improve our nation's information and data exchange infrastructures, including the interoperability of EHR systems. At the practice level, it will be important to develop a system to track referrals and indicate patient and provider responsibilities in the care coordination process.

LIMITATIONS AND FUTURE DIRECTIONS

This project represents the first stage of measure development. Significant additional research and development work will be needed before these measures can be widely implemented. For example, while we examined the availability of key data elements required for our target measures, we know little about the reliability and validity of these data elements when they are present in an organization's EHR.

Our project developed a model to jump-start the measure development process. The measures we propose appear to be valid with practicing physicians, national experts, and key stakeholders involved in care coordination. Collection also appears to be largely feasible within practice settings with established EHRs. However, not all concepts of coordination we had hoped to measure can be captured today, even among leading ambulatory practices with fully operational EHR systems. For example, measuring concepts that reflect actions taken by all parties involved in coordination, such as shared decision-making and shared care planning, will not likely be feasible in the short term. As our nation's HIT systems advance, it will be necessary to further integrate these and other worthwhile concepts into future system development and reporting efforts.

Exhibit 3. Data Elements Required for Measures

Measure	Required Data Elements
All measures	• age • was patient referred? • referral source (self vs. primary care physician)
Critical Information Communicated with Request for Referral to Specialist	• activity requested (referral, consultation, co-management) • reason for referral • preferred timing • problem list • medication list • medical history
Primary Care Communication About Referral to Patient and Family	• reason for referral given to patient • name of specialist given to patient • time frame given to patient
Specialist Report to Primary Care Physician	• specialist report received by primary care physician
Specialist Communication of Results to Patient and Family	• specialist report received by patient
Primary Care Physician Review of Specialist Report	• specialist report viewed by primary care physician

Although this project purposively selected a range of practice settings for the feasibility assessment, our sample was relatively small and drawn from NCQA-recognized practices and integrated delivery systems, which may not be representative of all practices in the country. Empirical evaluation, including more formal validation studies, of these measures in a larger and more diverse sample of practices will be needed.

CONCLUSION

Measures of ambulatory care coordination that are clinically meaningful to practicing primary care providers can be derived using existing EHR systems. The measures and preliminary specifications derived in this study were supported by the physicians interviewed and by national experts and key stakeholders on the advisory panel. While further development of these measures is needed, preliminary feasibility assessments are encouraging. Specifically, two of the proposed measures likely can be implemented with only modest changes to practice workflows and health information technology systems, others will likely need to undergo further development efforts to address some of the technical and organizational challenges identified.[3]

Measures of care coordination will be critical for evaluating the effectiveness of coordination of patient-centered medical homes, accountable care organizations, and other care innovations as they are rolled under health reform. Such measures are an essential starting point if we hope to reap "coordination dividends" for our huge investment in office-based EHRs. There are few domains within the outpatient setting with greater potential for health information technology to transform care.

Notes

1 U.S. Department of Health and Human Services, *Report to Congress: National Strategy for Quality Improvement in Health Care* (Washington D.C.: DHHS, March 2011).

2 National Priorities Partnership, *National Priorities and Goals: Aligning Our Efforts to Transform America's Healthcare* (Washington, D.C.: National Quality Forum, 2008).

3 For further information on the methods, measures, specifications, and preliminary validation process, see K. S. Chan, J. Holzer, S. H. Scholle et al., *The Development and Testing of EHR-Based Care Coordination Performance Measures in Ambulatory Care* (New York: The Commonwealth Fund, Nov. 2011).

METHODOLOGY

Measure Development

We developed a measurement model to guide the measure development process based on a literature review and 12 in-depth, semistructured telephone interviews with primary care practice-based physicians. Of the 12 interviews, eight were from single or small-group and multispecialty practice, and four from integrated delivery system (IDS) settings. Physicians were identified by their affiliation with the National Committee for Quality Assurance (NCQA) Physician Practice Connections–Patient Centered Medical Home program. Generalist specialties including family medicine and internal medicine were eligible for the study. A variety of health record-keeping systems (EHR: N=4; combination: N=3; paper: N=1) were represented.

A national expert panel was convened in the offices of NCQA on May 1, 2009, to provide input into the proposed measurement model. Panel recommendations guided the refinement and prioritization of measures by the project team. The panel comprised experts and stakeholders in quality of health care and care coordination from the American Medical Association, AARP, Bridges to Excellence, the Agency for Healthcare Research and Quality, vendor organizations (Epic Systems Corp., EClinicalWorks, General Electric), and provider and insurer organizations (Billings Clinic, Geisinger Health System, Taconic Health Information Network and Community, Wellpoint).

Measure Evaluation

Face validity was assessed through telephone interviews with 15 practicing primary care providers. To assess the feasibility of implementing the measures, the project team conducted face-to-face interviews and site visits at three integrated health systems, two EHR-networked practices, one regional health information organization, and one paper-based primary care practice. Non-IDS sites for interviews and site visits were selected from among practices that expressed interest in participation to the original recruitment effort for the project. The IDS participants were long-time collaborating organizations that had already agreed to participate in the project.

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