Quality Indicators for Continuity and Coordination of Care in Vulnerable Elders

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Continuity and coordination of care are attributes of medical care that influence its quality. Donabedian described coordination of care as the "process by which the elements and relationships of medical care during any one sequence of care are fitted together in an overall design. Continuity means lack of interruption in needed care, and the maintenance of the relatedness between successive sequences of medicalcare."[1] According to the Institute of Medicine, continuity is "care over time by a single individual or team of healthcare professionals" including "effective and timely communication of healthcare information."[2] Continuity and coordination of care are particularly important for older patients, because they are apt to have multiple medical problems treated by several clinicians. These aspects of care involve the spectrum of healthcare providers and staff and their systems in a wide variety of venues, because the work of continuity and coordination includes roles that physicians often do not perform, such as scheduling, communication, and reminders.

Continuity and coordination of care have several components, including a longitudinal relationship with a single identifiable provider and cooperation between providers and between venues of care.[3] Coordination involves the "availability of information about prior problems and services and the recognition of that information as it bears on the needs for current care."[4] Continuity and coordination depend largely on the system of healthcare delivery, but the Assessing Care of Vulnerable Elders (ACOVE) quality indicators (QIs) focus on how the system affects *what happens to the patient*. Thus, these quality-of-care indicators focus on the following domains of continuity and coordination:[5] continuity of care from the perspective of the patient, information continuity and coordination across and within providers, and continuity and coordination between venues of care.

Continuity of care is often equated with having a primary care physician. Several studies demonstrated associations between physician–patient continuity and satisfaction, reduced utilization, increased efficiency, and better preventive care.[6,7] A structured literature review that evaluated 22 studies, including four clinical trials, found that "interpersonal continuity" was related to greater satisfaction, lower utilization, and generally higher care quality,[8,9] although one study found interpersonal continuity to be associated with higher pharmacy and referral costs.[10]

Nonphysicians, such as case managers, or multidimensional interventions sometimes provide continuity and coordination. Most, although not all,[11,12] interventions to enhance continuity and coordination reduce utilization,[13–18] but these interventions have multiple components[19] that cannot easily be disentangled[20] and often are not tested outside research settings. Structural factors, including disease registries and formal sign-out systems,[21] also can improve continuity and coordination of care,[22] but these structures are not easily measured at the patient level using clinical information. Therefore, this set of QIs focuses on general components of continuity and coordination at the physician level.[23] QIs for condition-specific continuity and coordination of care (e.g., follow-up for newly treated depression and laboratory testing after starting specific medications) are contained in the condition-specific monographs.

METHODS

A total of 1,994 articles were considered in this review: five identified using a Web search and 1,989 through the ACOVE-3 literature searches.

RESULTS

Of the 17 potential QIs, the expert panel process judged 16 to be valid (see the QIs on pages S464–S487 of this supplement), and one was rejected. The literature summaries that support each of the indicators judged to be valid in the expert panel process are described.

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Identification of Source of Care

1. ALL vulnerable elders (VEs) should be able to identify a physician or a clinic to call for medical care or know the telephone number or other mechanism to reach this source of care, **BECAUSE** having a usual source of care facilitates timely medical care and continuity of care.

Supporting Evidence

Access to an identifiable source of medical care is associated with better clinical outcomes.[24,25] The relationship between a consistent, identifiable source of care and better outcomes has been found for a variety of types of care, including preventive health services,[26] asthma care,[27] human immunodeficiency virus care,[28] dental care,[29] and diabetes mellitus care.[30] Not having a regular source of care is associated with greater use of emergency departments (EDs) by elders.[31] This may be particularly important for VEs who are at risk of functional decline or death over a 2-year period. There are many definitions of what constitutes having a usual provider or source of continuity care.[32] This QI equates identifying a specific physician with a usual site of care.[33]

Follow-Up on Medication in the Outpatient Setting

2. IF an outpatient VE is prescribed a new chronic disease medication, and he or she has a follow-up visit with the prescribing physician, **THEN** one of the following should be noted at the follow-up visit:

- medication is being taken;
- patient was asked about the medication (e.g., side effects, adherence, availability); or
- medication was not started, because it was not needed or changed;

BECAUSE newly started medications should be followed up to enhance adherence and to identify medications that were never started.

Supporting Evidence

Although no clinical trial shows that follow-up of medication results in improved patient outcomes, follow-up represents one component of coordinating care. Prior studies have shown that medication adherence is better if the provider schedules a follow-up appointment[34] and if there is a strong physician–patient relationship.[35] Follow-up is important, because some prescribed medications are never started, representing missed therapeutic opportunities.[36] Given the complexities of healthcare delivery, many patients will not have begun new medications by the time of the next visit with their provider. This is particularly true in the setting of restricted formularies and tiered pharmacy systems, which may add obstacles to filling prescribed medications and long-term medication adherence.[37,38]

Continuity of Medication Between Physicians

3. IF a VE is under the outpatient care of two or more physicians, and one physician prescribed a new chronic disease medication or a change in prescribed medication, **THEN** the nonprescribing physician should acknowledge the medication change at the next visit, **BECAUSE** physician knowledge of a patient's medication regimen, including medications initiated or changed by other physicians, is critical to avoid medication interactions and medication prescribing errors.

Supporting Evidence

Only if physicians are aware of all of the medications prescribed for their patients, including those prescribed by others, can they formulate a medication regimen that will avoid medication duplication, adverse drug–drug interactions, and errors.[39] In addition, shared knowledge helps physicians to minimize the complexity of the medication regimen, which in turn enhances patient adherence. A physician may acknowledge a medication initiated by another provider in numerous ways, including listing it in a medication list, using an electronic medical record–generated medication list that includes the medication or by documentation reflecting a check on the use of this new medication.

A retrospective study showed that medication errors increased as the number of prescribed outpatient medicines increased.[40] Errors occur when physicians lack accurate knowledge of a patient's medication regimen. A textbook of geriatric medicine states that physicians "should regularly inquire about other medications being taken (prescribed by other physicians or purchased over the counter)."[41] A review of clinical pharmacy trials to improve medication use identified three outpatient interventions that demonstrated reductions in inappropriate prescribing.[42] Among other components, each intervention included a drug regimen review that incorporated the step of consolidating medication prescription information across providers. This intervention is supported by The Joint Commission on Accreditation of Healthcare Organizations[43] and the Institute for Healthcare Improvement.[44]

Communication Concerning Consultations

4. IF an outpatient VE was referred to a consultant and revisited the referring physician, **THEN** the referring physician's medical record should acknowledge the consultant's recommendations, include the consultant's report, or indicate why the consultation did not occur, **BECAUSE** referring physicians must be aware of consultant recommendations to implement or continue treatments and to avoid medication prescribing errors.

Supporting Evidence

Collaboration between referring and consulting physicians is recognized as a critical component in the care of complex patients.[20] Surveys of physicians reveal that inadequate communication between referring physicians and consultants is a common reason for ineffective consultation.[45] Only 30% of pediatric specialists reported receiving communication concerning a majority of referrals.[46] In another study, two-thirds of specialists indicated that they did not receive clear instructions concerning the nature of a consultation request.[47] Meanwhile, approximately one-third of primary care physicians reported that specialists did not communicate consultation findings to them.[48,49]

The American Medical Association states that the "referring physician should provide a history of the case and such other information as the consultant may need" and that "the consultant should advise the referring physician of the results of the consultant's examination and recommendations related to the management of the case."[50] An

ambulatory care textbook recommends that primary care physicians should, "whenever referring a patient for a service, assure that proper information is given to the person providing the service."[51] Surveyed physicians support these positions; all primary care physicians and 94% of consultants agreed that the referral letter should include a statement of the problem, and 88% of primary care physicians and 94% of consultants agreed that the referral should include "what the general practitioner expects from the referral."[52] A British study found deficiencies in the quality of referral letters and consultation reports.[53] A small trial that implemented a structured consultation note did not yield better consultation communication.[54]

Follow-Up of Diagnostic Tests in the Outpatient Setting

5. IF an outpatient VE was given an order for a diagnostic test, **THEN** one of the following should be documented at the follow-up visit:

- result of the test initialed or acknowledged;
- note that the test was not needed or reason why it will not be performed; or
- note that test is pending;

BECAUSE diagnostic testing must be followed up to affect care, and requested procedures that are not performed may represent missed diagnostic or therapeutic opportunities.

Supporting Evidence

There are no trials showing that follow-up of missed test results improves patient outcomes, but failure to follow-up on diagnostic tests may delay needed care or slow progress in the course of treating an illness or chronic condition. Eighty-three percent of internists reported at least one delay in reviewing test results during the previous 2 months, and only 41% were satisfied with their test result management.[55] One small study of why abnormal test results did not trigger a response in a timely fashion investigated osteoporosis identified using densitometry. For 68% of the abnormal scans that did not receive a clinical response, the scan result was not reviewed in a timely fashion.[56] A survey of primary care clinicians found that 14% of outpatient visits had missing clinical information and that 44% of these missing data could possibly adversely affect patients; for more than half, the missing data caused delays or inefficient care.[57] A lack of provider continuity magnifies difficulties in performing needed diagnostic tests.[58]

Follow-Up of Missed Periodic Outpatient Preventive Care

6. IF a VE misses a required preventive care event that is recurrent with a specific periodicity, **THEN** there should be medical record documentation of a reminder that the preventive care is needed within one full interval since the missed event, **BECAUSE** reminder systems can improve timely provision of preventive care.

Supporting Evidence

A broad literature supports the success of reminder systems in improving the provision of periodic preventive care for a variety of conditions, including pneumonia, cancer, and osteoporosis.[59] Interventions to increase vaccination for pneumococcus, tetanus, hepatitis B, and influenza using postcards, letters, and telephone calls are effective.[60] In the context of a randomized trial, reminder-based increases in influenza vaccination translated into fewer hospitalizations and ED visits.[61] Review of 21 computer-based reminder systems found that 16 (76%) were effective in improving care.[62] Reminder systems are also integral to disease management programs that have demonstrated improved care for hypertension,[63] depression,[64] and medication adherence.[65]

This QI does not dictate what sort of reminder system should be in place but requires evidence of a reminder system in the medical record for missed periodic care. Although preventive care may not always be appropriate for or desired by VEs (see Application of Assessing Care of Vulnerable Elders-3 Quality Indicators to Patients with Advanced Dementia and Poor Prognosis in this supplement, page S457–S463), examples of general preventive care to which this would apply include immunizations, screening for falls and urinary incontinence, and disease-specific preventive care such as ophthalmological examinations for patients with diabetes mellitus.

Continuity in the ED and at Hospital Admission

7. IF a VE is treated at an ED or admitted to a hospital, **THEN** there should be documentation (during the ED visit or within the first 2 days after admission) of communication with a continuity physician, of an attempt to reach a continuity physician, or that there is no continuity physician, **BECAUSE** communication with a continuity physician can yield critical historical information and facilitate efficient care.

Supporting Evidence

No clinical trials evaluating the specific intervention of contacting a continuity provider for ED visits and hospital admissions were identified. Continuity providers are commonly not directly involved in care provided in the ED and inpatient setting, yet communication between caretaking clinicians and continuity providers is essential for several reasons: for the continuity provider to inform caretaking providers of the clinical history, previously performed evaluation, and medication regimen; to inform the caretaking providers about biopsychosocial aspects of care; and to transmit information about the visit to the continuity provider to facilitate follow-up. Such communication to maintain continuity is widely recommended.[66–68]

Observational studies suggest that missed follow-up after ED visits is common, ranging from 46% to 71% in adult, but not necessarily older, patient samples.[69–71] A study that included a post-ED-visit telephone call to enhance follow-up found that 14% of those contacted did not follow up with their continuity physician and that follow-up was more frequent if ED personnel contacted the continuity physician.[72] One study found no record or acknowledgment of ED visits in the primary care medical record of 43% of patients receiving emergency care.[73] No information was found on whether continuity providers were called when their patients were hospitalized.

A variety of postdischarge interventions (mostly telephone calls) to improve follow-up after ED visits demonstrated improvement in follow-up but reported no clinical outcomes.[69,70,74] None of these interventions attempted to increase continuity physician contact *during* the patient's visit. Six trials implemented a continuity component in the

context of a comprehensive ED discharge planning intervention for older patients.[75–80] Taken together, these six interventions, which included geriatric screening and information continuity with a primary care physician, stabilized function. Most also reduced utilization, but one study specifically targeting primary care continuity was unable to significantly increase primary care follow-up.[80] (See QI #8 for interventions to improve continuity after hospitalization.)

Follow-Up After Hospital Discharge

8. IF a VE is discharged from a hospital to home and survives 6 weeks or longer after discharge, **THEN** a physician visit or telephone contact should be documented within 6 weeks of discharge, and the medical record should document acknowledgment of the recent hospitalization, **BECAUSE** follow-up with a provider after hospital discharge is needed for management of the condition that prompted hospitalization and for review of medications and pending test results.

Supporting Evidence

No studies of an isolated intervention of continuity provider follow-up after hospitalization were found. VEs discharged from the hospital to home are likely to need follow-up with their continuity physician for review of the disease process for which they were hospitalized, review of medications or other treatment regimens initiated or changed during the hospitalization, and follow-up on test results that were pending at the time of discharge. After hospitalization, VEs commonly have care needs that require clinician attention. Observational studies (and control groups of clinical trials) suggest that about one-fifth of older patients discharged from the hospital will require rehospitalization within 4 to 6 weeks[13,14,81] or will have medication-related problems.[82] An analysis of posthospital transitions using administrative data found that 13% to 25% of posthospital care was "complicated."[83]

A variety of interventions that begin in the inpatient setting and extend into the home or nursing facility led to improved functional outcomes for older patients. Disease-specific interventions have most heavily focused on heart failure. A meta-analysis of comprehensive discharge planning and postdischarge support for older patients with heart failure found that readmission rates were lower (relative risk = 0.75, 95% confidence interval (CI) = 0.64–0.88) and quality-of-life scores higher with a trend toward greater survival.[84] A second review of heart failure postdischarge continuity interventions found a similar effect on readmissions.[85]

Interventions to improve posthospitalization outcomes for other groups of older patients have also shown benefit. "Supported discharge" increased the odds of continuing to live at home rather than placement in long-term care (odds ratio 1.4, 95% CI = 1.1–2.0)[86], but there was no effect on mortality. Other discharge planning interventions, including home follow-up visits, led to fewer readmissions and lower readmission costs[13,14,87] and reduced nursing home placement, with better functional status.[88]

In contrast to interventions that included home visits after discharge, a systematic review of interventions focused only on discharge planning in the inpatient setting that included 11 RCTs found no effect on readmission rate, mortality, or cost.[89] Although the studies of home-based transition care varied widely in intervention components, they consistently included at least one in-home provider visit, usually by a nurse, that focused on identifying functional needs after discharge, medication review, and ensuring continuity with the follow-up physician. This QI does not require an in-home discharge planning intervention but instead requires follow-up with a continuity physician and medical record acknowledgment of the hospitalization.

The National Library of Healthcare Indicators (NLHI) performance measure on follow-up of hospitalization requires ambulatory-setting follow-up after hospital discharge for patients with diabetes mellitus, hypertension, ischemic heart disease, congestive heart failure, chronic obstructive pulmonary disease, or osteoarthritis,[90] all conditions prevalent in VEs.

Follow-Up of Medication After Hospital Discharge

9. IF a VE is discharged from a hospital to home and received a new chronic disease medication or a change in medication before discharge, **THEN** the outpatient medical record should document the medication change within 6 weeks of discharge, **BECAUSE** knowledge of medications initiated or changed in the hospital is necessary to continue treatment and to avoid medication-prescribing errors.

10. IF a VE is discharged from a hospital to home with a new medication that requires a serum medication level to be checked, **THEN** the medical record should document the medication level, that the medication was stopped or that the level was not needed, **BECAUSE** the need for medication levels may be lost in the transition between the hospital and home.

Supporting Evidence

Medication change is common at hospital discharge. One observational study showed that 1.5 new medications were initiated for hospitalized patients and that 28% of chronic medications were canceled by the time of hospital discharge.[91] A study of older adults showed that, at the time of hospitalization, they were taking a mean of 6.6 medications. Of these, a mean of 2.0 were stopped, and 4.1 new medications were started, resulting in a mean of 8.7 medications on discharge.[16] One week postdischarge, 72% of older patients in a third study were incorrectly taking at least one medication started in the inpatient setting, and 32% of medications were not being taken at all.[92] The Medication Discrepancy Tool found that 14% of older patients experienced medication discrepancies after hospital discharge.[93] An evaluation of 50 patients discharged from a geriatric ward in the United Kingdom found that 45 had medication changes from pre-admission and that 46 did not recall instructions about how to take their medication.[94] Studies of discharged older patients found that 11% had adverse drug events,[95] and 42% had at least one medication continuity error.[96]

No randomized trials of physician acknowledgment of medications postdischarge were identified, but several postdischarge interventions focused on improving the transition of medications from the inpatient to outpatient setting. A review of three RCTs of pharmacist medication review before hospital discharge and then in the home setting with

communication to a continuity physician found fewer readmissions and better medication adherence in one study, more appropriate medication regimens and adherence in a second, and no effect in a third.[43] Furthermore, the medication review step was a prominent part of interventions to improve the transition from hospital to home.[14,81,86–88]

Although no studies characterize the frequency of missed medication serum levels postdischarge, it is a time when medication monitoring is commonly missed, because drug levels are not drawn or the results do not prompt changes in a timely fashion. For medications newly started in the inpatient setting that continue into the outpatient setting and require serum level monitoring, such as intravenous vancomycin, phenytoin, systemic cyclosporine, carbamazepine, theophylline, and lithium, documentation concerning postdischarge levels should be present in the outpatient medical record to ensure proper dosing.

These QIs do not require a formal in-home medication review, because there is no agreement on what constitutes a postdischarge medication review and the small number of heterogeneous interventions provides insufficient evidence to require VEs discharged from the hospital to receive in-home review. Instead, these QIs require acknowledgment of all hospital medication changes in the outpatient medical record and monitoring of medication levels from hospital-initiated medications.

Follow-Up of Pending Test Results and Visits After Hospital Discharge

11. IF a VE is discharged from a hospital to home or a nursing home, and the transfer form or discharge summary indicates that a test result is pending, **THEN** the outpatient or nursing home medical record should include the test result within 6 weeks of hospital discharge or indicate that the result was followed-up elsewhere or why the result cannot be obtained, **BECAUSE** test results may have important implications for patient care.

12. IF a VE is discharged from a hospital to home or a nursing home and the hospital medical record specifies a follow-up appointment for a physician visit or a treatment (e.g., physical therapy or radiation oncology), **THEN** the medical record should document that the visit or treatment took place, was postponed, or was not needed, **BECAUSE** postdischarge treatment continues therapy initiated in the hospital.

Supporting Evidence

Observational studies suggest that missed tests and visits during the postdischarge period are common. One study of 86 patients (mean age 58) discharged from an academic center found that 8% had an error in test follow-up and that 12% did not complete a planned evaluation because of a missed scheduled test or visit.[96] An evaluation of patients discharged from a hospitalist service found that 41% had at least one test result return after patient discharge, of which 9% potentially required action. Of 105 tests returned after discharge that potentially required action, surveyed physicians indicated that they were unaware of 62%.[97]

Missed follow-up of laboratory, pathological, and radiological test results may result in adverse events after hospital discharge.[98] In addition, patients often miss scheduled postdischarge appointments that may be needed to follow up on instability after hospital discharge, to monitor therapies initiated during the hospitalization, or to evaluate or treat new problems detected during hospitalization. Many NLHI performance measures focus on continuity of test results from the hospital to the outpatient care setting.[90] These present QIs limit the tests and visits for which follow-up documentation is required to those described as pending in physician notes or a discharge summary, because there is no reliable method of identifying all pending tests at the time of hospital discharge, and tests listed as pending are likely to have clinical importance.

Medical Record Continuity

13. IF a VE is discharged from a hospital to home or nursing home, **THEN** there should be a discharge summary in the outpatient or nursing home medical record; and

14. IF a VE is discharged from a nursing home to home, **THEN** there should be a discharge summary in the outpatient medical record;

BECAUSE treatment of patients after transfer from a hospital requires communication of clinical information.

15. IF a VE is new to a primary care practice, **THEN** the medical record should contain medical records from a prior care source, a request for such medical records, or an indication that such records are unavailable, **BECAUSE** treatment of patients requires knowledge of a patient's medical history, including information about testing and preventive care details that patients commonly recal inaccurately.

Supporting Evidence

No clinical trials evaluated the effect of a discharge summary or prior medical records on patient care or outcomes, although observational studies show that hospital discharge summaries often do not reach continuity providers. Discharge summaries could be found in continuity provider records for 27% to 77% of patients.[99–101] One study found a trend toward less rehospitalization of patients who saw a physician who had received a discharge summary,[102] yet reviews of discharge summaries found them to be often inaccurate[101] and incomplete.[103]

Discharge summaries are critical to the transfer of information from the inpatient to the outpatient setting, because they include the clinically significant aspects of care, what tests and procedures were performed, clinical conclusions, discharge medications, discharge venue, anticipated procedures and visits, and pending test results. Establishing care for a new VE requires obtaining prior medical records to assemble clinical data about prior care and preventive care received.

Care for Patients with Language Barriers

16. IF a VE is deaf or does not speak English, **THEN** an interpreter or translated materials should be used to facilitate communication, **BECAUSE** interpreters and translated materials help to ensure that information related between physician and patient is understood.

Supporting Evidence

Approximately 2 million Americans are deaf, and more than 10 times that number do not speak English. Although some physicians speak the language of their non-English-speaking patients, many do not, and few are able to communicate in American Sign Language. Thus, physician–patient communication can be substantially impeded if the patient does not speak English or is deaf. Under such circumstances, employment of proper modalities to facilitate communication may not occur because of logistic and time constraints. For example, one survey revealed that, although internal medicine physicians were aware that use of a sign language interpreter was most useful in treating deaf patients, most did not use this modality.[104] A qualitative study revealed that deaf patients perceive their medical care to be adversely affected by physicians' lack of preparation and skill.[105] A randomized trial of a remote translation service[106] and a survey study of non-English speaking patients in an ED[107] demonstrated that communication can be improved by translation. A review including 36 studies found that interpreter services increase the delivery of necessary medical care,[108] although most of these studies were not focused on older patients. There is a legal requirement to provide such service to patients with limited English proficiency.

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