Improving Team-Based Care Coordination Delivery and Documentation in the Health Record

Neha Pathak, MD; Anne Tomolo, MD, MPH; and Cam Escoffery, PhD, MPH, CHES

A template developed at the Atlanta VAMC standardizes and captures data about care coordination components in a patient's electronic heath record.

Neha Pathak is a Fee-Basis Staff Physician, and **Anne Tomolo** is Associate Chief of Staff of Education, both at the Atlanta VA Medical Center in Decatur, Georgia. **Cam Escoffery** is an Associate Professor in the Department of Behavioral Sciences and Health Education in the Rollins School of Public Health, and Anne Tomolo is an Associate Professor of Medicine in the Division of General Medicine and Geriatrics, both at Emory University in Atlanta.
Correspondence: Neha Pathak (nehapathakmd@gmail.com)

Chronic diseases affect a substantial proportion of the US population, with 25% of adults diagnosed with 2 or more chronic health conditions.[1] In 2010, 2 chronic diseases, heart disease and cancer, accounted for nearly 48% of deaths.[2] Due to the significant public heath burden, strategies to improve chronic disease management have attracted a great deal of focus.[3,4] Within increasingly complex health care delivery systems, policy makers are promoting care coordination (CC) as a tool to reduce fragmented care for patients with multiple comorbidities, improve patient experience and quality of care, and decrease costs and risks for error.[3-8]

BACKGROUND

The Agency for Healthcare Research and Quality (AHRQ) defines care coordination as "deliberately organizing patient care activities and sharing information among all of the participants concerned with a patient's care to achieve safer and more effective care."[5] Nationally, large scale investments have expanded health care models that provide team-based CC, such as patient-centered medical homes, known as patient aligned care teams (PACTs) within the Department of Veterans Affairs (VA), accountable care organizations, and other complex care management programs.[9-12] Additionally, incentives that reimburse for CC, such as Medicare's chronic care management and transition care management billing codes, also are emerging.[13,14]

While there is significant interest and investment in promoting CC, little data about the specific activities and time required to provide necessary CC exist, which limits the ability of health care teams to optimize CC delivery.[6] Understanding the components of CC has implications for human resource allocation, labor mapping, reimbursement, staff training, and optimizing collaborative networks for health care systems, which may improve the quality of CC and health outcomes for patients. To date, few tools exist that can be used to identify and track the CC services delivered by interdisciplinary teams within and outside of the health care setting. In an AHRQ systematic review of CC literature, evaluation of CC delivery has been studied mostly through surveys of health care staff and patient/caregiver perceptions.[6] One tool described in the literature showed feasibility for recording the duration and content of CC activities in multiple busy primary care pediatric practices, though the documentation did not occur in an electronic health record (EHR).[15,16]

This article describes the development and preliminary results of the implementation of a CC Template that was created in the VA Computerized Patient Record System (CPRS) to identify and track the components of CC services, delivered by a multidisciplinary team, as part of a quality improvement (QI) pilot project. Through use of the template, the team sought a formative understanding of the following questions: (1) Is it feasible to use the CC Template during routine workflow?

TABLE Care Coordination Examples

Case	Template Documentation	
Transition Care Management *65-year-old PIM patient has been hospitalized for the past 3 days for congestive heart failure and is ready for discharge* • NP alerted of admission in CPRS • The NP meets with the hospitalist team: Medical resident (5 min), floor RN (15 min), and calls the home health agency (25 min) to ensure that services will start upon discharge • The NP then alerts the PACT PCP with information about the patient's discharge plan including labs, appointments, and further testing (15 min)	A. Care coordination via 　- Face-to-face session 　- Telephone session B. Indicate time spent in care coordination (≥ 61 min) C. Care coordination with 　- VA services 　　• PACT team (PCP) 　　• Inpatient team (resident, RN) 　- Non-VA services (home health/non-VA)	D. Time was spent to 　- Assist during health care transition (hospitalization/discharge planning) 　- Communicate with PACT PCP/RN 　- Communicate with inpatient team 　- Verify postdischarge contact information 　- Ensure home care services are arranged 　- Ensure follow-up appointments are scheduled 　- Ensure follow-up on lab tests and studies ordered 　- Patient education regarding plan of care and follow-up provided E. PIM team member involved in care coordination (NP) F. Related diagnosis (congestive heart failure) G. Care coordination encounter initiated by PIM
IDT *58-year-old PIM patient with DM, Cognitive impairment, and depression was discussed during IDT meeting for 12 min* • The treatment plan was discussed with patient, and a review of recent consults and upcoming appointments was performed in preparation for follow-up • The NP, social worker, mental health, RN present for discussion	A. Care coordination via IDT meeting B. Indicate time spent in care coordination (11-20 min) C. Time was spent to determine goal of care and track consults/referrals	D. PIM team member involved in care coordination (RN, mental health, social worker, NP) E. Related diagnosis (DM, cognitive impairment, depression) F. Care coordination encounter initiated by PIM

Abbreviations: CPRS, Computerized Patient Record System; DM, diabetes mellitus; IDT, interdisciplinary team; NP, nurse practitioner; PACT, patient aligned care team; PCP, primary care provider; PIM, PACT Intensive Management; RN, registered nurse.

(2) What specific types of CC services are provided by the team? (3) How much time does it take to perform these activities? (4) Who is the team collaborating with inside and outside of the health care setting and how are they communicating? (5) Given new reimbursement incentives, can the provision of CC be standardized and documented for broad applicability?

In complex systems, where coordination is needed among primary, specialty, hospital, emergency, and nonclinical care settings, a tool such as the CC Template offers a sustainable and replicable way to standardize documentation and knowledge about CC components. This foundational information can be used to optimize team structure, training, and resource allocation, to improve the quality of CC and to link elements of CC with clinical and operational outcomes.
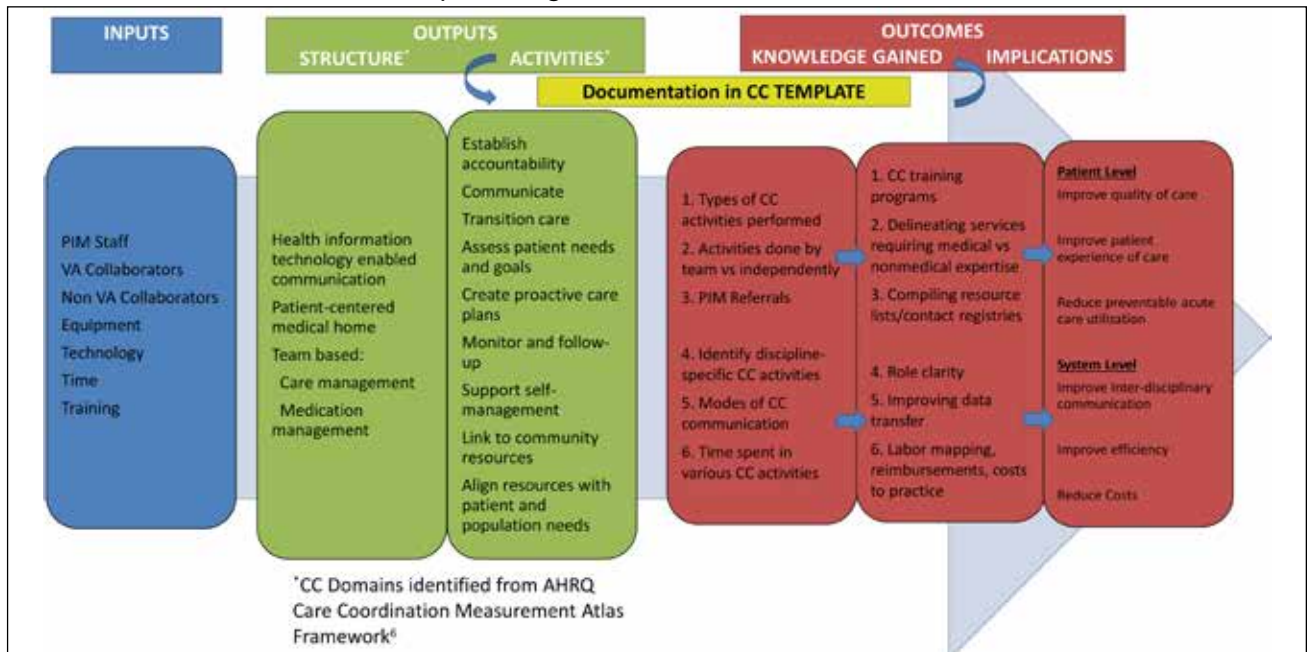
PACT INTENSIVE MANAGEMENT
Despite the implementation of PACT within VA, patients with complex medical conditions combined with socioeconomic stressors, mental health comorbidities, and low health literacy are at high risk for preventable hospitalizations and acute care utilization.[17,18] Due to unmet needs that are beyond what PACTs are able to deliver, these high-risk patients may benefit from additional services to coordinate care within and outside the VA health care system, as suggest by the Extended Chronic Care Model.[19-21]

In 2014, the Office of Primary Care Services sponsored a QI initiative at 5 VA demonstration sites to develop PACT Intensive Management (PIM) interventions targeting patients at high risk for hospitalization and acute care utilization within VA. The PIM program design is based on work described previously, with patients identified for enrollment based on 90-day hospitalization risk ≥ 90th percentile, based on a VA risk modeling tool, and an acute care episode in the previous 6 months.[19] A common component of all PIM programs is the provision of

FIGURE 1 Care Coordination Template Logic Model

Abbreviations: AHRQ, Agency for Healthcare Research and Quality; CC, care coordination; PIM, PACT Intensive Management.

intensive care management and CC by an interdisciplinary team working in conjunction with PACT. The CC Template was developed to assist in documenting and rigorously understanding the implementation of CC by the PIM team.

Local Setting

The Atlanta VA Medical Center (AVAMC) was chosen as one of the PIM demonstration sites. The Atlanta PIM team identified and enrolled a random sample of eligible, high-risk patients from 1 community-based outpatient clinic (CBOC) in an urban location with 7,524 unique patients. Between September 2014 and September 2016, 300 patients were identified, and 86 patients agreed to participate in the PIM program.

In the CC Template pilot, the Atlanta PIM team included 2 nurse practitioners (NP), 2 social workers (SW), and 1 telehealth registered nurse (RN). Upon enrollment, members of the PIM team conducted comprehensive home assessments and offered intensive care management for medical, social, and behavioral needs. The main pillars of care management offered to high-risk patients were based on previous work done

both inside and outside VA and included home visits, telephone-based disease management, co-attending appointments with patients, transition care management, and interdisciplinary team meetings with a focus on care coordination between PACT and all services required by patients.[11,19]

The Atlanta PIM team performed a variety of tasks to coordinate care for enrolled patients that included simple, 1-step tasks, such as chart reviews, and multistep, complex tasks that required the expertise of multiple team members (Table). The team found that the CC workload was not being captured in a standardized manner or accounting for the interdisciplinary, collaborative nature of care provided to PIM patients. Core coordination documentation was scattered throughout multiple different note titles, which led to redundant, inconsistent documentation of time spent in PIM team CC activities.

Additionally, inconsistency in delivery of CC between PIM team members was noted. For example, there was significant variability in CC services provided by different team members in the provision of transition care management (TCM) and coordinating care from hospitalization back to home. Some

PIM staff coordinated care and communicated with the patient, hospital team, home-care service, and primary-care team, while other staff only reviewed the chart and placed orders in CPRS. Additionally, much of the CC work was documented in administrative notes that did not trigger workload credit. This made it difficult to show how to appropriately labor map PIM staff or how staff were spending their time caring for patients.

In order to standardize documentation of the interdisciplinary CC activities performed by the PIM team and account for staff time, the Atlanta PIM team decided to develop a CPRS CC Template. The objective of the CC Template was to facilitate documentation of CC activities in the EHR, describe the types of CC activities performed by PIM team members, and track the time to perform these activities for patients with various chronic diseases.

TEMPLATE DESIGN AND IMPLEMENTATION

The original design of the template was informed by the Atlanta PIM team after several informal focus groups and process mapping of CC pathways in the fall of 2015. The participants were all members of the Atlanta PIM team, 2 primary care physicians working with PIM, an AVAMC documentation specialist and a clinical applications coordinator (CAC) assigned to work with PIM. The major themes that arose during the brainstorming discussion were that the template should: (1) be feasible to use during their daily clinic workflow; (2) improve documentation of CC; and (3) have value for spread to other VA sites. Discussion centered on creating a CC Template versatile enough to:

- Decrease the number of steps for documenting CC;
- Consist only of check boxes, with very little need for free text, with the option to enter narrative free text after template completion;
- Document time spent in aggregate for completing complex CC encounters;
- Document various types of CC work and modes of communication;
- Allow for use by all PIM staff;
- Identify all team members that participated in the CC encounter to reduce redundant documentation by multiple staff;
- Adapt to different clinic sites based on the varied disciplines participating in other locations;
- Use evidence-based checklists to help standardize delivery of CC for certain activities such as TCM; and
- Extract data without extensive chart reviews to inform current CC and future QI work.

Following the brainstorming sessions, the authors performed a literature review to identify and integrate CC best practices. The AHRQ Care Coordination Atlas served as the main resource in the design of the logic model that depicted the delivery and subsequent documentation of high-quality, evidence-based CC in the CC Template (Figure 1).[6] The model offers a framework for evaluation of the implementation process as well as CC outcomes and impacts. The team also adapted discharge strategies from the Re-Engineered Discharge (RED) Toolkit, an evidence-based approach for reducing rehospitalizations, in order to standardize the CC provided and documented by the PIM team during TCM.[22]

After reaching consensus about the key components of the CC Template, the CAC created a pilot version (Figure 2). All of the elements within the CC Template allowed for data abstraction from the VA Corporate Data Warehouse (CDW) via discrete data elements known as health factors. The template design allowed PIM team members to document the details of a variety of CC activities, including chart reviews, interdisciplinary team meetings, and multifaceted interventions requiring participation by multiple team members. The Table shows CC Template documentation for the CC examples described. Through an iterative process, the template was redesigned over the pilot period, as selection options were added or removed based on frequency of use.

Over the course of implementation, the team became more enthusiastic about using the CC template to document previously unrecognized CC workload. Because the CC Template only was used to document CC workload and excluded encounters for clinical evaluation and management, specific notes were created and linked with the CC

FIGURE 2 Care Coordination Template, Computerized Patient Record System View

Template for optimal capture of encounters.

All components of the template were mandatory to eliminate the possibility of missing data. The Atlanta PIM site principal investigator developed a multicomponent training designed to increase support for the template by describing its value and to mitigate the potential for variability in how data are captured. Training included a face-to-face session with the team to review the template and work through sample CC cases. Additionally, a training manual with clear operational definitions and examples of how to complete each element of the CC Template was disseminated. The training was subsequently conducted with the San Francisco VA Medical Center PIM team, a spread site, via video conference. The spread site offered significant feedback on clarifying the training documents and adapting the CC template for their distinct care team structure. This feedback was incorporated into the final CC Template design to increase adaptability.

Implementation Evaluation
The RE-AIM (Reach, Effectiveness, Adoption, Implementation, and Maintenance) framework served as the basis for evaluation of CC Template implementation. The RE-AIM framework is well established and able to evaluate the implementation and potential successful spread of new programs.[23,24] Using RE-AIM, the authors planned to analyze data to explore the reach effectiveness, adoption, implementation, and maintenance of the CC Template use while providing complex care management for high-risk patients.

All data for the evaluation were extracted from the CDW by a data analyst and stored on a secure server. A statistical process control (SPC) chart was used to analyze the implementation process to assess variation in template use.

RESULTS
After implementation, 35 weeks of CC Template pilot data were analyzed from June 1, 2015 to January 5, 2016. The PIM team completed 393 CC Templates over this collection period. After week 23, the CC template was linked to specific CC notes automatically. From weeks 23 to 35 an average of 20.3 CC Templates were completed per week by the team. The RE-AIM was used to assess the implementation of the CC Template.
Reach was determined by the number of patients enrolled in PIM with CC Template documentation. Of patients enrolled in Atlanta PIM, 90.1% had ≥ 1 CC encounter documented by the CC Template; 74.4% of Atlanta PIM patients had ≥ 1 CC encounter documented; 15.5% of patients had > 10 CC encounters documented; and 1 patient had > 25 CC encounters documented by the CC template.
Effectiveness for describing CC activities was captured through data from CC Template. The CC Template documentation by the PIM team showed that 79.4% of CC encounters were < 20 minutes, and 9.9% of encounters were > 61 minutes. Telephone communication was involved in 50.4% of CC encounters, and 24% required multiple modes of communication such as

FIGURE 3 Statistical Process Control of CC Template Completion
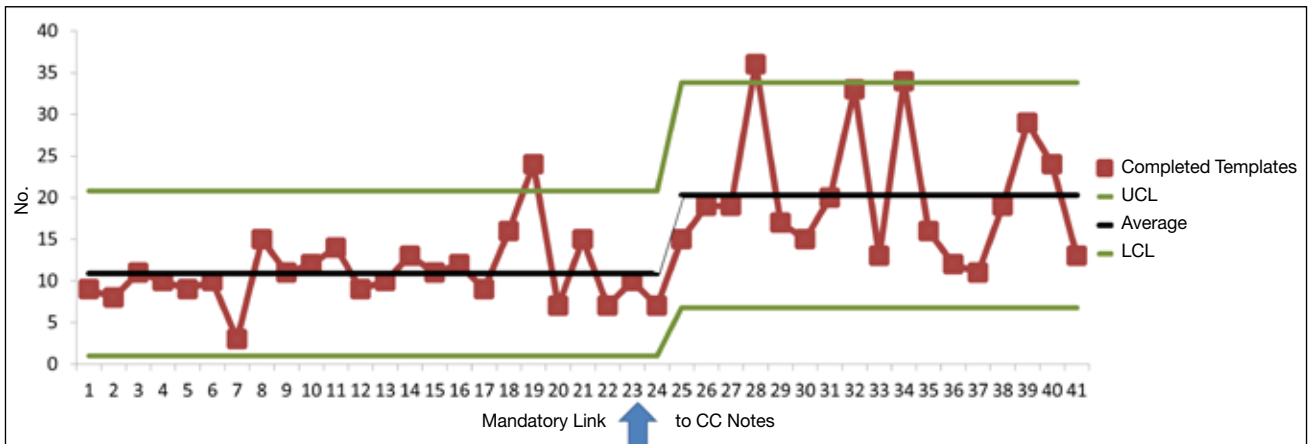
Abbreviations: CC, care coordination; LCL, lower control limit; UCL, upper control limit.

face-to-face, instant messenger, chart-based communication. Care coordination during hospitalization and discharge accounted for 5.9% of template use. Of the CC encounters documenting hospital transitions, 94.4% documented communication with the inpatient team, 58.3% documented coordination with social support, and only 11.1% documented communication with primary care teams. Improving communication with PACT teams after hospital discharge was identified as a future QI project based on these data. The PIM team initiated 83.2% of CC encounters.

Adoption was determined by the use of the CC Template by the team. All 5 team members used the CC template to document at least 1 CC encounter.

Implementation allowed for improvement based on feedback from the PIM team. Mean completion of CC Templates rose from 10.9 per week to 20.3 per week after automatically linking the CC Template to specific CC notes. (Figure 3)

Maintenance was monitored over the course of the pilot. Consistent use of the CC Template over 35 full work weeks of data collection was seen, and mean utilization per week nearly doubled in the latter half of the pilot period.

Because several elements were added to the CC Template over the course of the pilot period, our ability to analyze the data for descriptive statistics about the types of CC services, related diagnoses, collaborators, and PIM staff involved in CC encounters was limited.

DISCUSSION

Though all components of CC encounters could not be assessed during the pilot phase due to continuous improvement of the CC Template, the authors showed that it is feasible to use this tool to document and describe granular details about team-based CC. Pilot data from AVAMC show that the use of the CC Template standardized team CC documentation in a busy clinic setting provided data about the complexity of coordination activities and duration of CC activities. It also informed future CC QI projects, such as improving communication with primary care during the hospital discharge process.

Future evaluation of CC Template data can be used to (1) describe types of CC activities for high-risk PIM patients; (2) quantify the time required to complete CC activities to assist with staff labor mapping; (3) describe staff roles and referrals needed to complete specific CC activities inside and outside VA; (4) describe modes of communication between PIM and collaborators; (5) relate patient demographics and associated diagnoses with quantity of CC encounters; and (6) quantify frequency and time frame of CC after hospitalizations and ED care and subsequent impact on repeat hospitalizations and ED visits. Future research also can explore the link between CC activities and effort with clinical and patient-reported outcomes.

Social network analysis could be used with CC Template data to understand the

network of referrals and collaborators involved in the care of a CC team's patients. This type of analysis would assist teams to strengthen and formalize ties with collaborators as appropriate. For example, if data show that the team frequently collaborates with the cardiology clinic for a large subset of its patients, they may consider creating a CC agreement with formalized modes of communication that would streamline collaboration.

In order to improve the quality of the CC Template and to assess factors that may lead to sustainable use in clinical practice, qualitative assessment through survey, interview, or usability testing with staff would be beneficial to identify strategies to increase its adoption among clinical providers. This type of assessment will add knowledge about the CC Template implementation process, including contextual barriers or facilitators, feasibility of use during day-to-day operations, versatility of template use within construct of team-based care, and overall satisfaction with the template.

Limitations
Though the CC Template offers a large amount of data about the components of CC delivery, the information is based on self-report by staff. Training to ensure that all team members are documenting in the same manner is crucial to maintain the internal validity of the data. The template is limited to the fields currently developed, and future research could explore additional data elements that are critical to include based on feedback from VA staff.

CONCLUSION
To our knowledge, this VA medical center CC Template is the first tool described in the literature that standardizes and captures data about CC components in the EHR. This pilot data show that the template is feasible for use in a busy clinic setting and can streamline the process for capturing CC data that may otherwise not be documented.

During the pilot phase, the CC template allowed the PIM team to identify a small subset of patients within the PIM complex management program who have a high level of CC needs. By identifying these patients, fur-

ther work can be done to understand the specific needs of these higher utilizers and the types of CC activities required to assist them so that resources can be directed appropriately to that smaller subset. Telephone CC accounted for a large proportion of delivery, which has implications for ensuring that staff have access to mobile phones and EHR capability to document this additional workload. The PIM staff maintained use of the template throughout the pilot period and increased documentation when the CC Template was easily accessible and already linked to their CPRS notes, suggesting that in future implementation, ensuring that the template is linked to notes in use by the care team will be important for successful spread.

Additionally, CC Template data identified gaps in high-quality, evidence-based CC that can be addressed in real time, for example during the discharge process. Data from the CC Template showed that only 11.1% of CC encounters had documentation of communication between the PIM and primary care teams during transitions from hospital to home. Improving communication with PACT teams after hospital discharge was identified as a future PIM QI project based on these data. By improving documentation of CC in the EHR, the resulting information is foundational for future work that can improve the quality of team-based CC; plan staffing, team composition, and labor mapping; determine the cost of CC activities and improve reimbursement in certain settings; and assess outcomes of CC.

This tool has potential for application beyond the PIM team in the VA. The CC Template and training manual is scalable to any setting with team-based CC, including PACT, homeless programs, palliative care, Mental Health Intensive Case Management (MHICM) programs, nurse navigator programs, and other complex care delivery models involving care coordinators. Future study of its implementation and data may inform initiatives to develop ongoing team-based care coordination programs.

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