# Development and Implementation of the Coordinated-Transitional Care (C-TraC) Program

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**Researchers developed the VA Coordinated-Transitional Care (C-TraC) Program as a Geriatric Research Education and Clinical Center clinical demonstration project in order to meet the transitional care needs of high-risk hospitalized veterans at the William S. Middleton Memorial Veterans Hospital in Madison, Wisconsin.**

The transition from hospital to home is increasingly recognized as a time of heightened risk for vulnerable patients, particularly older adults. Poor-quality transitions have been associated with preventable negative outcomes, including postdischarge medication errors, interruptions in care plans, and avoidable 30-day rehospitalizations.[1-8]

Nearly 1 in 5 older adults is rehospitalized within 30 days of discharge at a total combined cost of more than $25 billion per year.[4,9,10] Patient factors likely to contribute to negative postdischarge outcomes include complex comorbid conditions, cognitive and functional impairments, and limited emotional support.[10,11] System-related factors also likely to contribute to poor postdischarge outcomes include poor communication between providers across settings, limited access to services, and inadequate patient and family caregiver education.[8] As a result, patients and caregivers are often unprepared for the realities of taking care of patient needs and recovery at home, which leads to high levels of dissatisfaction, disruptions in care continuity, and an increased risk for adverse outcomes, such as medication discrepancies and rehospitalization.[1,8] Transitional care programs directly address these issues.[3,12-14]

Transitional care programs typically employ nurses or other health care professionals to support and empower patients during the predischarge and early posthospital period, effectively bridging the hospital and home.[3,12-14] Most of these programs incorporate in-home visits soon after the hospital discharge to educate a

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The VHA's Geriatric Research Education and Clinical Centers (GRECCs) are designed for the advancement and integration of research, education, and clinical achievements in geriatrics and gerontology throughout the VA health care system. Each GRECC focuses on particular aspects of the care of aging veterans and is at the forefront of geriatric research and clinical care. For more information on the GRECC program, visit the website (http://www1.va.gov/grecc/). This column, which is contributed to by GRECC staff members, is coordinated and edited by Kenneth Shay, DDS, MS, director of geriatric programs for the VA Office of Geriatrics and Extended Care, VA Central Office, Washington, DC. Please send suggestions for future columns to Kenneth.Shay@va.gov.

**Figure.** The Transitional Nurse Case Manager for the William S. Middleton Memorial Veterans Hospital in Madison, Wisconsin, Coordinated-Transitional Care (C-TraC) Program makes an in-hospital visit.

patient about his or her medication management, to plan for medical follow-up, to look for signs of worsening medical conditions and how to respond to them, and to develop a personal health record.[3,12-14] Research suggests that such transitional care programs can improve patient satisfaction and safety and can decrease rehospitalizations by about one-third.[3,12-14]

Despite these advances, currently available transitional care programs are not appropriate for all hospitals or patients. None of the proven transitional care programs target patients who might have difficulty participating in predischarge education, such as older adults with dementia, and none have been designed for use within a VA system. Also, because it is difficult to send staff great distances to perform in-home visits, transitional care programs with in-home components are not a good fit for hospitals with

patients who come from many miles away, such as those in rural areas. VA hospital settings in particular often serve patient populations with a wide geographic dispersion, limiting the use of existing transition care interventions. The William S. Middleton Memorial Veterans Hospital (MVAH) in Madison, Wisconsin, is an 87-bed general VA hospital with 4,400 admissions annually, serving veterans throughout a 3-state area. About 75% of this patient population lives too far from the hospital to receive home visit services.

Because no existing evidence-based transitional care programs addressed the transitional care challenges faced by the MVAH, researchers developed the VA Coordinated-Transitional Care (C-TraC) Program as a Geriatric Research Education and Clinical Center (GRECC) clinical demonstration project. Based at the MVAH, the GRECC opened

in 1991 and has established numerous clinical, education, and research initiatives that focus on Alzheimer disease and other dementias. C-TraC combines VA telemedicine principles with standard protocols adapted from Coleman's Four Pillars of transitional care.[3] The program launched in 2010 with the overarching goal of improving care coordination and outcomes among high-risk hospitalized veterans discharged to community settings. Through its first 18 months of operation, C-TraC proved to be a low-cost program that harnessed existing VA resources to improve key postdischarge outcomes, such as 30-day rehospitalizations, leading to significant cost avoidances.[15] This article discusses the development and implementation of the C-TraC program.

## TARGETING HIGHLY VULNERABLE PATIENTS
The C-TraC program targets high-risk community-dwelling veterans. To be eligible for C-TraC, veterans had to be hospitalized on medical-surgical wards at the MVAH, be discharged to the community with a working telephone, and have either (1) documentation of dementia, delirium, or other cognitive impairment in their medical chart; or (2) be aged ≥ 65 years and living alone or hospitalized in the past year. Veterans were excluded if their primary diagnosis was alcohol withdrawal or if they were discharged as 24-hour observation stay patients.

The program was considered not to be research by the University of Wisconsin Institutional Review Board and the Madison VA Research and Development Committee. As such, veterans did not complete research informed consent documents. Eligible veterans were invited to participate in person. Remarkably, of the

more than 700 eligible veterans approached during the first 18 months, only 5 refused enrollment, which compared favorably to existing transitional care programs.[16,17]

## THE C-TRAC PROGRAM

C-TraC is a telephone-based, protocol-driven transitional care program carried out by a nurse case manager. The nurse case manager is a full-time senior registered nurse with experience in VA inpatient and outpatient settings and geriatric case management. The C-TraC protocols are standardized algorithmic activities developed and piloted by the study team to meet the following program goals: (1) educate and empower the veteran and caregiver in managing their medications; (2) ensure that medical follow-up is in place and that the veteran is prepared to participate in medical follow-up; (3) educate the veteran and caregiver about symptoms of a worsening medical condition, referred to as red flags; and (4) provide the veteran and caregiver with follow-up information and ensure they know whom to contact if questions arise after discharge.

The nurse case manager carries out the standard protocol for each veteran participant involving these 5 steps: (1) identification of eligible participants and preparation for transition through participation in multidisciplinary discharge rounds; (2) an inpatient hospital visit with each veteran to discuss medication management, medical follow-up plans post discharge, red flags, and contact information; (3) 48-to 72-hour postdischarge telephone follow-up; (4) 1-week postdischarge telephone follow-up; and (5) as clinically indicated, additional follow-up phone calls weekly until medical follow-up occurs, 4 weeks have passed, or patient and nurse case

manager agree that no further telephone follow-up is needed (Figure).[15]

The transitional nurse case manager documents each patient contact, using Computerized Patient Record System templates to promote care coordination and efficiency. The C-TraC protocol steps, example templates, and phone scripts for telephone follow-up visits are documented in detail and available for download free through the University of Wisconsin Health Innovation Program at http://www.hipxchange.org.[15] The C-TraC program operates in addition to all other routine day-of-discharge education and processes typical of VA hospitals (eg, medication discharge counseling by the pharmacist).

## PROGRAM DEVELOPMENT AND IMPLEMENTATION

Before being launched as a clinical demonstration, C-TraC protocols were developed and piloted by an interdisciplinary medical-nursing team under the leadership of Amy Kind, MD, a geriatrician and transitional care researcher within the GRECC. Program leaders conducted an extensive review of the published literature on transitional care programs, which led to the decision to develop a phone-based program, which integrated into the existing VA health system structure and incorporated central tenants of effective care transitions as outlined by Coleman and others.[3,7,12,14] Although many of these programs coach patients to create a personal health record, it was decided not to include that component, because it may be ineffective or overwhelming for a vulnerable patient (particularly a person with cognitive impairment) to handwrite his or her own personal health record, and it would also be challenging to do over the telephone.

Following this review, program leaders engaged an interdisciplinary team with representatives from the hospital administration, geriatrics, social work, and pharmacy to collaboratively draft the initial protocols. Before launching the program on the pilot ward, leaders spent several weeks garnering buy-in from inpatient and outpatient leadership and frontline staff. The initial program protocols were tested over 6 months on the pilot ward. During this piloting phase, many changes were made to the program, specifically in how at-risk hospitalized veterans were identified, establishing both optimal timing for the inpatient meeting between the nurse case manager and the participant and increased integration within multidisciplinary rounds.

Following the initial pilot, C-TraC was launched on a ward-by-ward basis. Before implementing the program on each ward, substantial efforts to bolster buy-in and enthusiasm about the program were undertaken by program leaders. These efforts involved program announcements and face-to-face meetings with all the frontline staff. Concurrent with this sequential rollout, ongoing Plan-Do-Check-Act cycles were carried out, which led to further refinement of core elements of the protocols, including identifying strategies to improve coordination with existing hospital services, enhancing the effectiveness of follow-up telephone protocols in identifying medication discrepancies (ie, focusing on patient-led medication reconciliation), and creating strategies for reinforcing patient education.

Lessons learned through the development and implementation of C-TraC included the critical role of hospital administration support, early communication with the inpatient and outpatient administration and

the frontline stakeholders, the need for patient-led medication reconciliation postdischarge, and integrating (not duplicating) existing discharge processes. The primary challenges involved raising awareness of the importance of dedicated transitional care support and developing approaches to effectively help patients and caregivers prioritize medical information.

Following the evaluation of the first 18 months of the program, hospital leadership decided to continue C-TraC as a permanent program by supporting program fees in the institution's operating budget.

## PROGRAM RESULTS AND NEXT STEPS
The researchers compared outcomes for veterans who participated in C-TraC once the full protocol was initiated with a baseline group of similarly eligible veterans who were identified during the development of the C-TraC Program. During the first 18 months of C-TraC, a total of 500 veterans participated in the program—103 were in the baseline group and the remaining 397 participated in the full program. About one-third had caregivers. Fifteen percent of the patients in the baseline group had a documented diagnosis in their medical record of dementia or delirium compared with 23% in the intervention group. The researchers compared medication discrepancies and rehospitalization between these groups while controlling for the effect of sociodemographics, comorbidities, and functional status.

Throughout its first 18 months of operation, C-TraC patients had one-third fewer 30-day rehospitalizations, leading to a net cost avoidance of > $740,000.[15] Up-front costs for C-TraC included only nurse case manager time and averaged $200 to $250 per patient, depending on the salary of the nurse within the position. Veterans and their caregivers responded well to and actively participated in the C-TraC Program, which suggested that the program's approach and protocols were acceptable to this population and would likely be well received by veterans in other similar hospital systems.

The C-TraC Program directly addresses the VA's goal of "enhancing dementia care continually through the provision of comprehensive, coordinated, evidence-based dementia care throughout the VHA health care system."[18] Given its use of telemedicine and nurse case management resources, C-TraC integrates well with the VA Patient Aligned Care Team model of care. Consideration should be given to the dissemination of the C-TraC Program services to other hospitals within the VA system to assess whether impacts would be similar.

## LIMITATIONS
Initial testing of C-TraC took place in a single VA hospital, and the effect of C-TraC was assessed using a nonrandomized, pre-post design. It is possible that the baseline comparison groups differed in meaningful ways; however, in the analyses conducted, statistical modeling was used to adjust for measurable differences.[15]

An additional limitation that should be addressed in the future is documentation of cognitive impairment in intervention and comparison groups. Because cognitive impairment is greatly undercoded, it is likely that estimates obtained for this study from the medical record greatly underestimate the prevalence of cognitive impairment. Additionally, because the baseline comparison group was established during the program development and piloting phase, initial testing may have underestimated the program's effect, because some change processes may have already occurred.

Additional randomized trials are needed to assess whether C-TraC is feasible in other, non-VA settings and whether similar effects are seen in other patient populations. ●

*All the authors report no actual or potential conflicts of interest with regard to this article.*

## Disclaimer

*The opinions expressed herein are those of the authors and do not necessarily reflect those of Federal Practitioner, Frontline Medical Communications Inc., the U.S. Government, or any of its agencies. This article may discuss unlabeled or investigational use of certain drugs. Please review complete prescribing information for specific drugs or drug combinations—including indications, contraindications, warnings, and adverse effects—before administering pharmacologic therapy to patients.*

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