
In Brief

Diabetes is a common coexisting chronic condition among older adults that can complicate a hospitalization and transition back to the community. The Transitional Care Model, which offers a set of time-limited, hospital-to-home services coordinated by a master's-prepared advanced practice nurse, is one option that could improve outcomes for patients with diabetes. A descriptive case study is presented.

Transitions in Care from the Hospital to Home for Patients With Diabetes

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Approximately 27% of patients ≥ 65 years of age have diabetes.¹ Diabetes is a common coexisting chronic condition among older adults.^{1,2} In 2007, 22% of all inpatient hospitalization days were incurred by people with diabetes, and for 13%, diabetes was the primary reason for hospitalization.³ These episodes of care are fraught with problems and often involve multiple transitions between the hospital and other care settings (e.g., short-term stays in skilled nursing facilities or rehabilitation centers) that can result in fragmented care coordination, inadequate symptom management, and poor outcomes.

Transitional Care Model

The Transitional Care Model (TCM), designed by a multidisciplinary team of colleagues at the University of Pennsylvania (Penn) and refined and rigorously tested during the past 20 years, is a proven, widely recognized model of care that transitions patients from the hospital to home (sometimes including an interim stay in a skilled nursing facility) through an episode of acute illness.⁴ The TCM has been endorsed by the National Quality Forum⁵ as one of 25 national preferred practices for care coordination, as well as by the Coalition for Evidence-Based Policy,⁶ which, in

2010, recognized the TCM as a “top tier” evidence initiative—a designation used by federal officials to identify social programs meeting a congressionally enacted standard.

The TCM uses master’s-prepared nurses with advanced knowledge and skills in the care of complex, chronically ill patients. Using an evidence-based care management approach, these advanced practice nurses (APNs) provide comprehensive in-hospital planning starting within 24 hours of admission and lasting on average through 2 months of follow-up after the index hospital discharge. APNs work closely with patients and family caregivers, physicians, nurses, social workers, and other members of the health care team to implement a transitional care protocol. The protocol focuses on developing a patient- and family-centered plan of care, educating and training of patients and their caregivers to self-manage complex care needs, interrupting health status and quality of life decline, and disrupting patterns of frequent hospital and emergency department (ED) visits. APNs provide individualized care, guided by the goals set by patients and families and standard practices, through visits in the hospital and home, visits with patients to their primary care providers (PCPs) or specialists, and telephone availability 7 days/week. Key features of the TCM are outlined in Table 1. Additional information and training on the TCM can be accessed online from <http://www.transitionalcare.info>.

To date, the Penn team has completed three National Institutes of Health-funded randomized, controlled trials (RCTs)⁷⁻⁹ and one comparative effectiveness study¹⁰ of the TCM with chronically ill older adults. Findings from these studies have consistently shown that, compared to standard care⁷⁻⁹ or alternative, less intensive, hospital-based care interventions,¹⁰ the TCM resulted in benefits to older adults, providers, and payers throughout episodes of acute illness. For example, in the most recently reported RCT,⁹ physical functioning, quality of life, and satisfaction with care were significantly improved among patients who received care through the TCM compared to control subjects. In addition, the time to first rehospitalization was lengthened (median length of time to event: 241

days [TCM] vs. 131 days [control], Kaplan-Meier log-rank, $P = 0.026$), and all-cause hospitalizations were significantly reduced through 12 months after the index hospital discharge (rehospitalizations/patient/year: 1.18 [TCM] vs. 1.79 [control], $P < 0.001$) at a mean cost savings per older adult of \$5,000.⁹

Diabetes is often one of several chronic conditions requiring self-management.¹¹ For treatment of diabetes to be effective, patients must make changes to their daily routines (e.g., performing self-monitoring of blood glucose [SMBG] or calculating insulin doses) and be able to manage diet and exercise. Given the growing number of older adults with diabetes¹ and the risk of poor post-hospitalization outcomes for older adults with multiple, complex chronic conditions,^{2,3} the provision of services that incorporate a holistic approach to care is an essential component to engaging patients in managing their health.

In past and ongoing work,^{8,9,12} the TCM has been used with patients with diabetes either as a primary or coexisting condition (7–38% of subjects in each study). The following case study illustrates the use of the TCM with such patients and describes the application of the TCM in transitioning a patient with newly diagnosed diabetes from hospital to home.

TCM Case Study

Mr. B. was a 62-year-old African-American man who was newly diagnosed with diabetes requiring insulin therapy. His only relevant medical history was for hypertension, which he reported was diagnosed an unknown number of years before the hospitalization and for which he was prescribed a medication he cannot name and is not regularly taking. One week before his hospitalization, Mr. B. was seen in the ED for an upper respiratory infection.

On the day of the hospitalization, he awoke with “flu-like” symptoms and returned to the ED for evaluation. In triage, his vital signs were stable, but his blood glucose was 954 mg/dl. An A1C ordered during his ED visit was 15.2%. An insulin drip was initiated and transfer to a telemetry bed was facilitated to best manage his gross hyperglycemia. During assessment by the APN, Mr. B. denied ever being told he had “sugar diabetes” and reported no family history of diabetes.

Mr. B. was identified as a good candidate for the TCM program and was seen during the hospitalization by the APN, who initiated a comprehensive needs assessment, including patient activation (e.g., ability to change), health literacy, and current or previous depression, all of which could significantly affect his successful transition back to the community. The APN talked with Mr. B. about his goals for care and learned that he wanted to better understand what was happening to him and how to prevent this from happening again so that he could resume seeking employment.

Mr. B. was hospitalized for 7 days. He, the APN, and the hospital care team agreed to delay hospital discharge to maximize the probability of his success after transition because of concerns regarding available social support and access to outpatient care over a holiday weekend. The APN visited him every day during his hospitalization and collaborated with his hospital-based care team to streamline the plan of care and design and coordinate an ongoing plan based on his identified goals. The APN maximized hospital resources to provide this highly motivated patient with the tools to master SMBG and to gain understanding of how his eating and physical activity patterns would affect his insulin requirements.

The APN assessed Mr. B.’s preferred learning method and tailored hospital-specific written educational materials to his learning needs. The hospital educational television channel was also used to reinforce general diabetes education. The APN collaborated with the hospital-based diabetes educator, the unit-based clinical nurse specialist, and staff nurses providing direct care to Mr. B. to ensure that consistent, tailored education was provided and to reduce unnecessary duplication of efforts. In addition, the APN worked to provide Mr. B. with a basic understanding of the 12 new medications he was prescribed to treat his diabetes, his previously diagnosed but untreated hypertension, and newly diagnosed high cholesterol and gastroesophageal reflux disease (GERD). The APN worked to integrate all necessary education into a unified whole and to incorporate all monitoring, dietary restrictions, and medication-taking or monitoring behaviors into a holistic action plan.

Table 1. 10 Essential Features of the TCM

1. An APN is the primary coordinator of care throughout the entire episode of care to ensure consistency of the provider within and across settings.
2. Comprehensive assessment starts during the hospitalization to develop an evidence-based plan of care with the patient.
3. Regular home visits and telephone support (7 days/week) are provided by the APN through an average of 2 months after discharge.
4. The APN collaborates with older adults, family caregivers, and team members to implement a streamlined, evidence-based plan of care designed to promote positive health and cost outcomes.
5. Continuity of care between the hospital and follow-up with PCPs and specialists is facilitated by the APN through joint visits with the patients and physicians.
6. The model incorporates active engagement of patients and their family caregivers with a focus on education and support.
7. Emphasis is placed on patients' early identification and response to symptoms and health care risks to avoid adverse events contributing to acute service use (e.g., ED visits or rehospitalizations) and to achieve longer-term positive outcomes.
8. The model features a nurse-led multidisciplinary provider approach that includes patients and their family caregivers as part of a team.
9. Strong collaboration and communication occurs among patients, family caregivers, and the health care team across the episode of care and in planning for the future (e.g., palliative care).
10. The institution provides ongoing investment in optimizing transitional care via performance monitoring and improvement.

APN, *advanced practice nurse*; ED, *emergency department*.

Adapted from Transitional Care Model: Essential Elements. Available from <http://www.transitionalcare.info/essential-elements>. Accessed 30 May 2014.

The hospital-based care team identified that Mr. B.'s insurance coverage had lapsed because he had exhausted his unemployment insurance benefit and that he had had no specific PCP for more than 10 years. The APN, in collaboration with the hospital discharge planning department, took initial steps in addressing these challenges, which would affect Mr. B.'s short- and long-term outcomes. Mr. B. was returning to a boarding-house setting where there were supportive residents who could informally monitor major changes in his health status but no one who could be considered a family caregiver.

The self-management skills and behavioral changes required of Mr. B. are typical in the treatment of diabetes, hypertension, high cholesterol, and GERD. In practice, these adaptations were a huge undertaking for Mr. B. Thankfully, his basic needs were met, allowing the APN to focus on higher-priority needs specific to his health and well-being.

Before the index hospitalization, Mr. B. did not regularly take medication, have a set activity pattern, follow any dietary guidelines, or eat on a regular schedule. It was crucial that the APN form a connection with Mr. B. to ensure his understanding of and successful adaptation to this life-altering diagnosis. Fortunately, Mr. B. was

motivated to make necessary changes to adapt to his new health status and to monitor important symptoms such as hypoglycemia. The APN provided general diet education in concert with the diabetes educator to stress the need for balanced, regular meals to determine appropriate insulin doses.

In total, Mr. B. received eight home visits focusing on incorporating the education he received in the hospital regarding the new diagnosis of diabetes into his daily behaviors. These home visits were augmented with 10 unscripted telephone calls in which the APN monitored Mr. B.'s reported self-management behaviors to help him meet his goals. The APN worked with Mr. B. to develop a written emergency and urgent care plan and a patient health record. Mr. B.'s ability to manage his complex medication regimen and SMBG was verified through teach-back methods, as was his ability to reorder and monitor his medications. Mr. B. scheduled and completed a PCP visit within 10 days of discharge from his index hospitalization and scheduled needed specialty follow-up appointments. His health screening needs were identified and triaged by his PCP and the APN.

After 2 months, Mr. B. was determined to be stable and ready to transition out of the TCM program. The APN developed a plan for tran-

sitioning Mr. B. from the intensive TCM program to his own self-management in collaboration with his PCP. This plan included continued education about meals and nutrition, which was realistically grounded in what Mr. B. would be able to prepare in his boarding house, could obtain easily in his neighborhood, and was interested in eating.

During the intervention, Mr. B. had no rehospitalizations but was seen once in the ED for a rapidly developing abscess on his cheek. He was not rehospitalized during the 6 months after his participation in the TCM program ended. After 6 months of active treatment and self-management, Mr. B.'s A1C was < 7%. He was able to find employment and incorporate a healthy lifestyle into his new daily routine.

Lessons Learned

Mr. B.'s case illustrates three key features of the TCM. First, early intervention during hospitalization is crucial. By connecting with Mr. B. within the first 24–48 hours of hospitalization, the APN was able to establish a relationship with him, complete a comprehensive assessment of his physical and social needs, talk with him about his condition and personal goals (e.g., return to work), and begin to collaboratively develop a plan

of care that would take him from the hospital to home. Second, the same APN worked with Mr. B. and was available to him and his health care team throughout the intervention. This level of continuity of care from the acute setting to the community with a provider who can monitor and assess the patient's ability to self-manage provided a holistic approach to managing his multiple chronic conditions. Finally, the patient-centered care plan developed for Mr. B. focused not only on his clinical needs, but also on what was important to him personally. Education about his medications and interactions with the APN and other team members about his eating and exercise habits and other chronic conditions helped this motivated patient with newly diagnosed diabetes take control of his self-care.

Mr. B. received this service during a pilot-test period of a TCM service line provided by a home care agency affiliated with the health system where Mr. B. was admitted. Primary care costs were initially underwritten by the treating health system to ensure a quality care outcome while public insurance options were addressed by the patient and social work department. Although Mr. B. did not pay for these services, the program has been rolled out by the home care agency

and is paid for by local insurers for their members.

References

- ¹Centers for Disease Control and Prevention: National diabetes fact sheet: national estimates and general information on diabetes and prediabetes in the United States, 2011. Atlanta, Ga., U.S. Department of Health and Human Services, Centers for Disease Control and Prevention, 2011
- ²Go AS, Mozaffarian D, Roger VL, Benjamin EJ, Berry JD, Borden WB, Bravata DM, Dai S, Ford ES, Fox CS, Franco S, Fullerton HJ, Gillespie C, Hailpern SM, Heit JA, Howard VJ, Huffman MD, Kissela BM, Kittner SJ, Lackland DT, Lichtman JH, Lisabeth LD, Magid D, Marcus GM, Marelli A, Matchar DB, McGuire DK, Mohler ER, Moy CS, Mussolino ME, Nichol G, Paynter NP, Schreiner PJ, Sorlie PD, Stein J, Turan TN, Virani SS, Wong ND, Woo D, Turner MB; on behalf of the American Heart Association Statistics Committee and Stroke Statistics Subcommittee: Heart disease and stroke statistics—2013 update: a report from the American Heart Association. *Circulation* 127:e6–e245, 2013
- ³American Diabetes Association: Economic costs of diabetes in the U.S. in 2007. *Diabetes Care* 31:596–615, 2008
- ⁴Naylor MD, Sochalski JA: Scaling up: bringing the transitional care model into the mainstream. *Issue Brief (Commonw Fund)* 103:1–12, 2010
- ⁵National Quality Forum: Preferred practices and performance measures for measuring and reporting care coordination: a consensus report. Washington, D.C., National Quality Forum, 2010
- ⁶Coalition for Evidence-Based Policy: Top tier evidence initiative: evidence summary for the transitional care model. Available from <http://toptierevidence.org/wp-content/uploads/2013/12/TransitionalCareModelTT.pdf>. Accessed 30 May 2014
- ⁷Naylor M, Brooten D, Jones R, Lavizzo-Mourey R, Mezey M, Pauly M: Comprehensive discharge planning for the hospitalized elderly: a randomized clinical trial. *Ann Intern Med* 120:999–1006, 1994
- ⁸Naylor MD, Brooten D, Campbell R, Jacobsen BS, Mezey MD, Pauly MV, Schwartz JS: Comprehensive discharge planning and home follow-up of hospitalized elders: a randomized clinical trial. *JAMA* 281:613–620, 1999
- ⁹Naylor MD, Brooten DA, Campbell RL, Maislin G, McCauley KM, Schwartz JS: Transitional care of older adults hospitalized with heart failure: a randomized, controlled trial. *J Am Geriatr Soc* 52:675–684, 2004
- ¹⁰Naylor MD, Hirschman KB, Hanlon AL, Bowles KH, Bradway C, McCauley K, Pauly M: Comparison of evidence-based interventions on outcomes of hospitalized, cognitively impaired older adults. *J Comp Eff Res*. In press
- ¹¹Fisher MA, Ma ZQ: Multiple chronic conditions: diabetes associated with comorbidity and shared risk factors using CDC WEAT and SAS analytic tools. *J Prim Care Commun Health* 5:112–121, 2014
- ¹²Naylor MD, Bowles KH, McCauley KM, Maccoby MC, Maislin G, Pauly MV, Krakauer R: High-value transitional care: translation of research into practice. *J Eval Clin Pract* 19:727–733, 2013

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