Working With Socially and Medically Complex Patients: When Care Transitions Are Circular, Overlapping, and Continual Rather Than Linear and Finite

Shauna R. Roberts, Jane Crigler, Cristina Ramirez, Deborah Sisco, Gerald L. Early

Introduction
With the goal of improving health, reducing hospital admissions and cost, and improving safety and quality, modern healthcare has given considerable attention to identifying the steps needed to successfully transition patients from one healthcare setting to another. Efforts tend to concentrate on promoting patient/caregiver understanding of the providers’ instructions as to how to manage their medical conditions, and addressing impediments that inhibit their ability to take such actions. The primary focus has been on the transition from hospital to home (or other care facility). Models have described what should take place at the time of hospital discharge and the short time thereafter (Coleman et al., 2004; Naylor and Sochalski, 2010; Parry et al., 2003) and Registered Nurses tasked with follow-up on care steps have been able to demonstrate success in reducing hospitalization and cost. (Coleman et al., 2004; Naylor et al., 2004).

We found that we needed more for the medically complex patient whose life situations and added social barriers had to be addressed before they could give attention to their health. For these patients, a more intensive care coordination intervention was necessary if we were to succeed.

Review of the Literature
Randomized controlled trials have shown some care transition models to be successful in reducing rehospitalizations and cost for the patients studied (Coleman et al., 2006; Jack et al., 2009; Naylor et al., 1999, 2004). Other care transition approaches have also shown positive results (Dedhia et al., 2009; Hansen et al., 2013). The transition of interest in these interventions has been hospital to home or other care facility, and the models describe what should take place at the time of hospital discharge and in the immediate time thereafter (Coleman et al., 2006; Naylor and Sochalski, 2010; Parry et al., 2003). The care transition interventions have focused on clinical issues, and advanced practice nurses often take the lead in carrying them out. Tasks have included educating patients and their caregivers to assure that they understand their medication regimen, can take their...
medications correctly, perform recommended self-care steps, and are able to make and keep medical appointments (Bodenheimer and Berry-Millett, 2009; Coleman et al., 2004; Penn Nursing Service, 2013).

Although the care transition models differ in duration and intensity, they extend 12 weeks or less (Bodenheimer and Berry-Millett, 2009). For example, one follows patients/families at home post-hospital discharge with 1 home visit and 3 phone calls over 2 to 4 weeks, and another requires 2 home visits with more as needed plus at least a weekly phone call for 4 to 12 weeks (Coleman et al., 2006; Naylor et al., 1999; Volland et al., 2012–2013). Since staff are continuously adding newly discharged patients and completing their time-limited involvement with others, it is not surprising that program descriptions do not discuss caseloads or intent to establish longer-term relationships with discharged patients and their families or caregivers.

Some models have aimed at serving the high-utilizing medically complex patients. These interventions have been referred to as “comprehensive care coordination,” “coordinated care,” or “care management” (Schraeder et al., 2011), and the Patient Protection and Affordable Care Act, signed into law in 2009, mentions the concept of “coordinated care” in more than 20 places (U.S. DHHS). Despite this new attention, interventions continue to focus almost entirely on medical and clinical issues. Care transition models almost never engage staff such as social workers and community outreach personnel whose job is to address social barriers, nor do most comprehensive care coordination approaches (Boult et al., 2009; Dorr et al., 2006; Peikes et al., 2009). Among the few that do include social workers on their interdisciplinary care coordination teams, most serve the elderly and are affiliated with health plans (Bodenheimer and Berry-Millett, 2009). Most care transition models have been developed for, and tested with, relatively high functioning patient populations, who are generally insured through Medicare and often have strong social support systems (Bodenheimer and Berry-Millett, 2009; Coleman et al., 2004; Dedhia et al., 2009; Parry et al., 2009; Naylor et al., 1999; Rich et al., 1995).

An understanding of the profound effect of social workers or community outreach staff to address nonmedical issues in patients’ lives that impede their ability to take full advantage of medical care is only now being articulated. For example, just this year a debate was initiated regarding the value of adding socioeconomic status or other sociodemographic factors into predictive risk models used to assess provider performance and for public reporting. In March 2014, the National Quality Forum (NQF) issued a draft technical report exploring this topic and asked for comments on the merit of pursuing the idea of adjusting such measures in this way (National Quality Forum, 2014a, 2014b). Simultaneously, two articles were published exploring aspects of the same question (Herrin et al., 2014; Nagasako et al., 2014) In addition, a bipartisan bill was introduced in Congress aimed at requiring the Secretary of the Department of Health and Human Services to adjust Medicare and Medicaid’s hospital readmission penalty so as not to penalize hospitals that treat poorest and most vulnerable citizens (Renacci, 2014).

Complex patients with five or more diagnoses are responsible for >70% of Medicare healthcare spending and most of Medicare spending growth since 1987 can be attributed to these patients (Bodenheimer and Berry-Millett, 2009). Although it is recognized that at the time of discharge from the hospital different patients can benefit from different levels of interventions (Bodenheimer and Berry-Millett, 2009; Volland et al., 2012–2013), more has been needed to work with patients whose lives are socially, as well as medically, complex. Safety-Net providers often see patients who have unstable health insurance status, insecure housing, fractured social supports, a history of substance use and mental illness, and those who face difficult daily barriers that must be addressed before they can give attention to maintaining their health. Patients such as these need a more intensive intervention.
Program Description

Our care coordination intervention represents the evolution of a program begun in 2009 and, in its current iteration, serves high-cost high-utilizing chronically ill patients. It is an adaptation of an acclaimed high-utilization team model (Gawande, 2011), and we are one of the four sites in a learning network, for which primary technical assistance is provided through a school of health policy. (Please see acknowledgements and disclaimer).

We are a Midwestern, urban core Safety-Net health system, and in 2013, we provided more uncompensated care than any other hospital in our state. Our system includes two acute care hospitals, inpatient and outpatient behavioral health services, acute inpatient rehabilitation, primary and specialty care practices and clinics, a county health department, and a long-term care facility. We are an academic medical center and serve as the primary teaching site for schools of medicine, nursing, and pharmacy affiliated with the University and colocated on our main campus. In 2013, we served 110,429 unduplicated patients of whom 73,229 were chronically ill. About half of the organization’s patients are of minority racial or ethnic origin, 37% are uninsured, 30% are covered by Medicaid, 13% by Medicare, with the remaining 20% covered by other payers. We are among the 2% of U.S. hospitals to receive a Stage 7 Award from the Healthcare Information and Management Systems Society (both inpatient and ambulatory), representing attainment of the highest level on the Electronic Medical Records Adoption Model. The workflow and patient records of this program are contained within our integrated inpatient and ambulatory care electronic health record.

Described herein is an ongoing quality improvement program, categorized as not human subjects’ research by the Adult Health Sciences Institutional Review Board. In this program, we are testing concepts around interventions of intensive care coordination, with a primary focus on training chronic disease patients in both self-management and how to use the health system more wisely. To be eligible for our care coordination services, patients must be 18 years of age or older, have two hospital admissions within the previous 6 months or three within the previous year, one or more chronic diseases, and have baseline data for 1 year or more available before enrollment. Excluded are those patients whose admissions are primarily driven by diagnoses and treatments for acute oncologic or surgical care. Patients are identified through daily electronic health record census and readmissions reports, as well as large retrospective health system data sets. When at all possible, the patient is introduced to the program and offered enrollment while an inpatient.

Each care team is composed of a Health Coach Registered Nurse (HC RN) and community-based staff members, whose titles are Client-Community Liaison (CCL) and Community Health Advocate (CHA). The CCL position was developed for our high-utilizer care coordination program to provide supportive services and advocate for individuals as they acquire self-management skills. Qualifications for the CCL include an associates’ degree or organized healthcare training of at least a year, plus 7 years of healthcare experience. The CCLs live in the communities we serve, have a high school diploma or General Educational Development (GED) certificate, and have completed Community Health Worker training through an institution of higher education. The CCLs and CHAs, known in other programs as Community Health Workers, make regular visits, single or together, to work with patients’ and their caregivers/families in the home. They observe and report back to the program’s nurses and social workers the patients’ real-life situations that need attention. The CCLs and CHAs receive Medication Aid Training offered through the state’s mental health department plus our internal training on safety in the community.

A Licensed Clinical Social Worker (LCSW) serves as Team Leader for the
community portion of the program, and another LCSW provides intensive case management to a smaller number of patients (<20) who need brief concentrated support. In addition, a Psychologist and an Advanced Practice RN (APRN) have regular points of involvement with our patients. The Psychologist meets new enrollees and counsels about half of them on issues such as depression or anxiety related to living and coping with a chronic illness, past adverse experiences, and coexisting issues. The APRN sees patients being discharged from the hospital who do not have a primary care provider (PCP) and is available for quick access to patients in the program who are unable to see their PCP in a timely fashion. The APRN has a collaborative practice agreement with an Internal Medicine physician.

Staying in contact with our patients is critically important, but does wax and wane. Our electronic record helps us stay engaged with them by notifying us when one of our patients registers anywhere in our healthcare system.

Our care coordination intervention includes the following distinct processes: (1) Case Discovery/Triage, (2) Pre-enrollment assessment, (3) Enrollment and First Home Visit, (4) Care Coordination (addressing both medical and social issues), (6) Care Planning (Care Plan developed within 30 days of enrollment; updated thereafter), (6) Graduation, and (7) Check back to assess maintenance of desired behaviors.

We have developed two assessment and education tools for our program that are critical to our care coordination work. The Guided Chronic Care Social Intake Navigation Guide (SING) (Figure 1) helps determine patient attributes and stimulates initiation of the Care Plan (Figure 2), which lists the milestones the patient needs to meet to be able to self-manage their medical condition(s). The Care Plan is used to introduce the patient to the navigation measures needed for self-management and contains medical and social criteria for graduation as well as a planning section to address behavioral and substance abuse issues. Care steps that meet best practice guidelines for management of the individual’s major chronic disease diagnoses are identified and addressed within the plan, as are the personal goals outlined by the patient. The individualized Care Plan is developed within 30 days of enrollment and refined during the teams’ interventions going forward; the navigation skills are reviewed and discussed until the patient can “teach back” what is required for self-management. The SING uses the patient’s housing situation as a point of departure for learning each patient’s unique circumstances and identifying areas for initial attention by the team. Demonstration of these behaviors is used to determine readiness for phased steps toward graduation.

In addition to these instruments, the electronic Medication Record form, although not unique to our program, is important. The Medication Record is used to record the number of refills remaining and the need for prescription renewal. Several members of the team are involved in understanding medications, including the CCLs and CHAs. On the first home visit, they observe the medications the patient has in the home and record what the patient reports they are taking. They pass this information back to the HC RN for review and reconciliation with what is prescribed. The HC RN can then counsel and educate the patient about the medications and communicate with the patient’s PCP if clarification, refills, or new prescriptions are needed.

**Study Design and Methods**

In this program, we are exploring and testing the use of intensive resources to change behavior in the way a small group of high-cost patients with chronic disease(s) use the health system. The outcomes of interest include improved use of resources by reducing charges and cost for hospital admissions and emergency department (ED) visits. The goal of our high-utilizer intervention is to teach patients to self-manage their medical conditions and then “graduate” them into a primary care setting with an understanding of how to effectively navigate the healthcare system.

Project effectiveness for resource utilization is assessed by measuring the
number of ED visits, number of inpatient admissions, and those total charges during the previous year and for the variable period after enrollment. Patient charges are used as an indicator of "costs," even if imperfect (and even though our charges tend to be the lowest in the community), because charges reflect the standard hospital pricing of services before adjustments that occur at varying rates according to the payer. Cost to charge ratio is monitored in the absence of cost accounting.

Patients are continually enrolled at different times, resulting in different lengths in the post-enrollment time frame. Patient diagnoses that are driving admissions, and their burden of coexisting chronic diseases, are heterogeneous. The natural history of these common chronic diseases is such that the patients have ever-evolving health conditions intermixed with periods of disease decompensation.

Length of time in the intensive intervention period is variable and determined by demonstrated need and functionality: socially, medically, and behaviorally. Our intervention is not administered by number of days exposed but instead is administered until the patient demonstrates the behavior criteria we have defined ("graduates"), the patient expires, or transitions. Because the patients are graduated according to demonstration of objective self-management behaviors (Figure 2), the resultant post-graduation time frames are also variable. A small number of patients are transitioned to

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**Figure 1.** The Guided Chronic Care Social Intake Navigation Guide is used as an assessment of the patient’s housing and social circumstances at enrollment. Care coordination efforts are considerably less successful if barriers in these areas are not effectively addressed.

<table>
<thead>
<tr>
<th>Guided Chronic Care: Social Intake Navigation Guide</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Check when Complete</strong></td>
</tr>
<tr>
<td>ID; Social security card, birth certificate, DDS-14, insurance card, driver’s license</td>
</tr>
<tr>
<td>Medication Review/planning/costs</td>
</tr>
<tr>
<td>Housing /conversation regarding housing history</td>
</tr>
<tr>
<td>Contact Information / plan</td>
</tr>
<tr>
<td>Enrollment at bedside if no phone</td>
</tr>
<tr>
<td>Encourage Pt to keep appointment with PCP, Specialty doctor or Nurse Practitioner</td>
</tr>
<tr>
<td>Assess and work on plan to establish formal/informal supports</td>
</tr>
<tr>
<td>CCL completes follow up phone calls and file checks post –graduation</td>
</tr>
</tbody>
</table>
other care settings for a variety of reasons, for example, residential care or absence of readiness to engage in self-management. Variable intensity of follow-up occurs post-graduation, according to need, and some patients have periods where partial team support is resumed. Criteria are in development for when the team should resume support and for what period of time. All enrolled patients continue to be tracked over time.

To make like comparisons and monitor resource use and cost data in short intervals, our major metrics are calculated as per 30-day averages per patient, across the year before and the time since enrollment for each patient. With this method, the significance of the intervention can be

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**Figure 2. The Guided Chronic Care Plan is used to assess and teach self-navigation skills needed for graduation and contains best practice disease management care steps for the patient’s chronic conditions.**

**Guided Chronic Care Plan**

Demographic/Background information:

Identified Strengths:

Social Supports:

<table>
<thead>
<tr>
<th>Health Criteria For Graduation</th>
<th>Yes</th>
<th>No</th>
<th>Date Mastered</th>
<th>Barriers / Comments</th>
<th>Action Step</th>
<th>Date Completed</th>
</tr>
</thead>
<tbody>
<tr>
<td>Keeps 75% of appointments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knows/demonstrates how to schedule appointments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knows/demonstrates names and reasons of all their prescribed medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Keeps logs (blood pressure, blood sugar, etc.)</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brings a list of questions for the doctor to appointments / asks questions</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Brings medications or updated medication list to appointments</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knows/demonstrates how to refill medications, and maintains adequate supply of all prescribed medication</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Knows/demonstrates primary medical diagnosis, and basic treatment/maintenance, knowledge thereof</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Patient Goal(s) and Action/Step(s) to achieve:**

**Disease Specific Care Steps inserted here (chronic disease management measurable care steps matching patient diagnoses):**
assessed at intervals for each individual patient and for the overall program. Each patient serves as their own control by using a 1-year baseline of utilization pre-enrollment to compare with utilization after enrollment. Interval assessment of results allows us to be responsive to findings and make process refinements toward better quality of care or best use of resource investment in the care management strategies. Patients with a year or more since enrollment are analyzed as a segment of particular interest, because their utilization may be more reflective of the longer-term program outcomes. Annualized data are also tracked, but with caution, because this heterogeneous population has ongoing changes in their medical and social condition. Statistical Analysis System (SAS) paired t-test is used for these before–after comparisons.

Results

We have enrolled 198 patients: 86 have graduated and 43 are now 1 year or more...
after enrollment. The mean number of chronic disease diagnoses per patient is 4.98, SD 2.18, and a median of 5. More than one third of the patients enrolled have six or more chronic disease diagnoses.

Patient complexity is reflected by the characteristics in Table 1. A total of 17 patients have died, which is not unexpected considering the natural history of their chronic diseases and their underlying social complexities.

Table 2 displays descriptive statistics of the 30-day averages of hospital utilization for inpatient admissions, ED visits, and those patient charges before and after program enrollment. In this interval analysis of the 198 patients enrolled for different time periods, the results demonstrate statistically significant reduction in post-enrollment resource use. A corresponding rise in clinic visits is a positive outcome because the goal was to shift the care of these patients into continuity through connection to the PCP and away from episodic interactions with ED and hospital inpatient providers (Table 3).

Persistent reduction in resource utilization is demonstrated in the subgroup of 43 patients for whom >1-year post-enrollment data are available to compare to the baseline year of pre-enrollment data. Statistically significant improvements for these 43 patients include a reduction in hospital admissions from a mean of 0.56 per 30 days or 6.7 admissions per person per year to 0.3 per 30 days or 3.6 admissions per person per year. The reduction in ED visits for these patients decreased from a mean of 1.55 per 30 days or 18.6 ED visits per person per year to 0.7 per 30 days or 8.4 ED visits per person per year. The reduction in charges decreased from a mean of $110,601 to $57,038 per person per year. Total charge reduction was $2,303,209 when comparing the year before to the year after enrollment.

The actual cost reduction for this group of patients when comparing the year before and after enrollment was $1,451,021.67 or $33,745 per person per year, when cost to charge ratio was applied (63%) to the difference of $53,563. Table 4 demonstrates this analysis in the same format of per 30-day averages as the tables showing the total number of patients enrolled and Table 5 shows their clinic visits.

Annualized improvements demonstrated so far for the 198 patients enrolled include reduction of 283 hospital admissions and 845 ED visits. The mean charges of $78,740.91 per person or an annualized total of $15,590,700.18 pre-enrollment to mean charges of $54,198.64 per person or an annualized total of $10,731,330.72 is significant ($p < .001, Table 6). Note that

Table 1. Guided Chronic Care: Patient Characteristics

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>N (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Gender</td>
<td></td>
</tr>
<tr>
<td>Female</td>
<td>101 (51%)</td>
</tr>
<tr>
<td>Male</td>
<td>97 (49%)</td>
</tr>
<tr>
<td>Age</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>55.83 years (SD 11.54)</td>
</tr>
<tr>
<td>Range</td>
<td>24–84 years</td>
</tr>
<tr>
<td>Stated race</td>
<td></td>
</tr>
<tr>
<td>Black</td>
<td>146 (74%)</td>
</tr>
<tr>
<td>White</td>
<td>48 (24%)</td>
</tr>
<tr>
<td>American Indian</td>
<td>1 (0.005%)</td>
</tr>
<tr>
<td>Other</td>
<td>1 (0.005%)</td>
</tr>
<tr>
<td>Prefer not to say</td>
<td>1 (0.005%)</td>
</tr>
<tr>
<td>Chronic conditions</td>
<td></td>
</tr>
<tr>
<td>Mean</td>
<td>4.98 (SD 2.18)</td>
</tr>
<tr>
<td>Range</td>
<td>1–13</td>
</tr>
<tr>
<td>Housing</td>
<td></td>
</tr>
<tr>
<td>House/apartment/room</td>
<td>148 (75%)</td>
</tr>
<tr>
<td>Shelter</td>
<td>19 (10%)</td>
</tr>
<tr>
<td>With friend or relative</td>
<td>19 (10%)</td>
</tr>
<tr>
<td>Street/abandoned home</td>
<td>3 (2%)</td>
</tr>
<tr>
<td>Other</td>
<td>8 (4%)</td>
</tr>
<tr>
<td>Insurance</td>
<td></td>
</tr>
<tr>
<td>Medicaid</td>
<td>102 (52%)</td>
</tr>
<tr>
<td>Medicare</td>
<td>82 (41%)</td>
</tr>
<tr>
<td>Uninsured</td>
<td>13 (7%)</td>
</tr>
<tr>
<td>Commercial</td>
<td>1 (&lt;1%)</td>
</tr>
<tr>
<td>Education</td>
<td></td>
</tr>
<tr>
<td>Completed grades 6–8</td>
<td>13 (7%)</td>
</tr>
<tr>
<td>Completed grades 9–12</td>
<td>63 (32%)</td>
</tr>
<tr>
<td>High school diploma/GED</td>
<td>55 (28%)</td>
</tr>
<tr>
<td>Some College/Associates degree</td>
<td>32 (16%)</td>
</tr>
<tr>
<td>Bachelor’s or other degree</td>
<td>12 (6%)</td>
</tr>
<tr>
<td>Unsure or prefer not to say</td>
<td>16 (8%)</td>
</tr>
</tbody>
</table>

Abbreviation: GED, General Educational Development.
annualized clinic charges did not increase significantly during this time period for these patients (Table 7).

The annualized savings in charges for admissions and ED visits is $4,859,369.46 and with an applied 63% cost to charge ratio would be stated as annualized cost reduction of $3,061,402.76. However, cost reduction would need to be restated by the payer. For example, in cases where the patient had no healthcare coverage and whose cost of care was a burden for the healthcare system, these calculations would be restated as cost avoidance for the health system. If this program were not funded by an award, the cost of the program would then need to be subtracted from the annualized cost reduction as well. For cases with an allowable or contract payment, the cost to the payer would be expressed as the allowable amount and the cost and margin for the health system recalculated accordingly. These are important considerations because this program is staff-time intensive.

Length of stay for the 198 patients was 4,525 admitted days before enrollment with a mean of 0.87 (SD 3.12) and median of 0. After enrollment, there were 3,245 admitted days with a mean of 0.84 (SD 3.84), a median and interquartile range of 0, and a p of .0107.

### Table 2. Descriptive Pre- to Post-Enrollment Hospital Utilization Statistics

<table>
<thead>
<tr>
<th></th>
<th>Before Enrollment</th>
<th>After Enrollment</th>
<th>% Improvement</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>Inpatient admissions</td>
<td>198</td>
<td>0.37 (0.32)</td>
<td>0.25 (0.34)</td>
<td>32% &lt;.0001</td>
</tr>
<tr>
<td>ED visits</td>
<td>198</td>
<td>0.89 (1.37)</td>
<td>0.53 (0.98)</td>
<td>40% &lt;.0001</td>
</tr>
<tr>
<td>Charges: admissions</td>
<td>198</td>
<td>$6,561.74 ($5,287.61)</td>
<td>$4,516.55 ($6,506.66)</td>
<td>31% .002</td>
</tr>
<tr>
<td>and ED</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

"Since patients were enrolled at different times, they had differing lengths of post-enrollment time frames, ranging from 30 to 512 days; median 245 days. For comparison, pre- to post-enrollment resource use outcomes were adjusted to reflect the 30-day averages per patient.

\*N = patients enrolled through March 31, 2014.

\^Before enrollment—1 year before enrollment date of each patient, ending the day before enrollment.

\%After enrollment—starting with enrollment date and ending April 30, 2014.

\‖Cost to charge ratio 63%: does not represent total healthcare spend.

### Table 3. Descriptive Pre- to Post-Enrollment Clinic Utilization Statistics

<table>
<thead>
<tr>
<th></th>
<th>Before Enrollment</th>
<th>After Enrollment</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
</tr>
<tr>
<td>Clinic visits</td>
<td>198</td>
<td>1.24 (1.12)</td>
<td>1.62 (2.01)</td>
</tr>
<tr>
<td>Charges(</td>
<td>)</td>
<td>198</td>
<td>$848.05 ($1333.27)</td>
</tr>
</tbody>
</table>

"Since patients were enrolled at different times, they had differing lengths of post-enrollment time frames, ranging from 30 to 512 days; median 245 days. For comparison, pre- to post-enrollment resource use outcomes were adjusted to reflect the 30-day averages per patient.

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\%After enrollment—starting with enrollment date and ending April 30, 2014.

\‖Cost to charge ratio 63%: does not represent total healthcare spend.

Abbreviation: ED, emergency department.
Data from the Guided Chronic Care Plan are not yet refined to differentiate responses by discreet fields versus free text comment and thus not yet available for results reporting. Data from the actions taken by care managers on disease management best practice care steps within the Guided Chronic Care Plan are also not yet available. The disease management module data will be measured both by care manager actions taken and chronic disease registry metrics, which are in the early stages of deployment within our electronic health record.

Despite the statistically significant reductions after intervention, some of the results impact is best relayed by a patient story:

Jim is a 63-year-old Africa American with diagnoses of hypertension, asthma, anti-social personality disorder, bipolar disorder, and anxiety. He has a history of substance abuse and trauma from a gunshot wound. He was estranged from his family and lived in a shelter. The team, including the psychologist, quickly established rapport with him.

### Table 4. Descriptive Pre- to Post-Hospital Utilization Statistics for Patients 1 Year or More Post-Enrollment

<table>
<thead>
<tr>
<th></th>
<th>Before Enrollment</th>
<th>After Enrollment</th>
<th>% Improvement</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N†</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>Inpatient admissions</td>
<td>43</td>
<td>0.56 (0.50)</td>
<td>0.30 (0.36)</td>
<td>46%</td>
</tr>
<tr>
<td>ED visits</td>
<td>43</td>
<td>1.55 (2.33)</td>
<td>0.70 (1.07)</td>
<td>55%</td>
</tr>
<tr>
<td>Charges: admissions and ED</td>
<td>43</td>
<td>$9,216.76 ($7,755.93)</td>
<td>$4,753.19 ($4,788.87)</td>
<td>48%</td>
</tr>
</tbody>
</table>

*Since patients were enrolled at different times, they had differing lengths of post-enrollment time frames, ranging from 399 to 512 days; median 447 days. For comparison, pre- to post-enrollment resource use outcomes were adjusted to reflect the 30-day averages per patient. Only patients with at least 1 year of time post-enrollment were included in this segment of the resource analysis.
†N = patients enrolled between December 1, 2012, and March 31, 2013.
‡Before enrollment—1 year before enrollment date of each patient, ending the day before enrollment.
§After enrollment—starting with enrollment date and ending April 30, 2014.
¶Cost to charge ratio 63%: does not represent total healthcare spend.

### Table 5. Descriptive Pre- to Post-Clinic Utilization Statistics for Patients 1 Year or More Post-Enrollment

<table>
<thead>
<tr>
<th></th>
<th>Before Enrollment</th>
<th>After Enrollment</th>
<th>% Improvement</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N†</td>
<td>Mean (SD)</td>
<td>Mean (SD)</td>
<td></td>
</tr>
<tr>
<td>Clinic visits</td>
<td>43</td>
<td>1.15 (1.37)</td>
<td>0.96 (0.93)</td>
<td>16.52%</td>
</tr>
<tr>
<td>Charges</td>
<td>43</td>
<td>967.55 ($1,721.30)</td>
<td>503.73 ($542.84)</td>
<td>47.94%</td>
</tr>
</tbody>
</table>

*Since patients were enrolled at different times, they had differing lengths of post-enrollment time frames, ranging from 399 to 512 days; median 447 days. For comparison, pre- to post-resource use outcomes were adjusted to reflect 30-day averages per patient. Only patients with at least 1 year of time post-enrollment were included in this segment of the resource analysis.
†N = patients enrolled between December 1, 2012, and March 31, 2013.
‡Before enrollment—1 year before enrollment date of each patient, ending the day before enrollment.
§After enrollment—starting with enrollment date and ending April 30, 2014.
||Cost to charge ratio: does not represent total healthcare spend.
and while the Health Coach worked with Jim on medical issues, the social worker assisted him in securing housing and re-establishing a relationship with his daughter. The Community Client Liaison and Community Health Advocate provided social support. All members of the team were available to Jim by phone and in person to listen and to offer support and encouragement when he expressed frustration and discouragement. He was open to change and worked productively with the team. Jim now takes initiative for his own care and continues to work with the psychologist. He is drug and tobacco free, and he and his daughter live together in an apartment. They recently attended a ceremony celebrating his graduation from the program the same week his daughter graduated from high school. He remains in contact with the team and recently signed up for a nutrition class at the hospital. His mean 30-day inpatient admissions, ED visits, and charges also showed marked improvement. Annualized admissions decreased from 3.12 to 0, ED visits decreased from 8.28 to 0, and aggregated charges decreased from $37,884 to 0 to date. Not only was Jim’s personal response gratifying, but after 241 days of being engaged in the program, his high utilization of healthcare resources was markedly reduced.

Table 6. Descriptive Pre- to Post-Annualized Hospital Utilization Statistics

<table>
<thead>
<tr>
<th>Annualized</th>
<th>N†</th>
<th>Before Enrollment Mean (SD)</th>
<th>After Enrollment Mean (SD)</th>
<th>% Improvement</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Inpatient admissions</td>
<td>198</td>
<td>4.46 (3.78)</td>
<td>3.02 (4.03)</td>
<td>32%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>ED visits</td>
<td>198</td>
<td>10.66 (16.43)</td>
<td>6.39 (11.72)</td>
<td>40%</td>
<td>&lt;.001</td>
</tr>
<tr>
<td>Charges: admissions</td>
<td>198</td>
<td>$78,740.91 (63,451.27)</td>
<td>$54,198.64 ($78,079.93)</td>
<td>31%</td>
<td>.0002</td>
</tr>
<tr>
<td>and ED visits</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*Since patients were enrolled at different times, they had differing lengths of post-enrollment time frames, ranging from 30 to 512 days; median 246 days. For comparison, resource use outcomes were adjusted to reflect 30-day averages per patient then annualized (multiplied by 12).

†N = patients enrolled between December 1, 2012, and March 31, 2013.
‡Before enrollment—1 year prior to enrollment date of each patient, ending the day before enrollment.
§After enrollment—starting with enrollment date and ending April 30, 2015.
||Cost to charge ratio: does not represent total healthcare spend.

Abbreviation: ED, emergency department.

Table 7. Descriptive Pre- to Post-Annualized Clinic Utilization Statistics

<table>
<thead>
<tr>
<th>N†</th>
<th>Before Enrollment Mean (SD)</th>
<th>After Enrollment Mean (SD)</th>
<th>% Improvement</th>
<th>p</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinic visits</td>
<td>198</td>
<td>14.94 (13.40)</td>
<td>19.41 (24.12)</td>
<td>29%</td>
</tr>
<tr>
<td>Charges†</td>
<td>198</td>
<td>$10,176.61 (15,999.29)</td>
<td>$10,161.20 (19,189.76)</td>
<td>0.15%</td>
</tr>
</tbody>
</table>

*Since patients were enrolled at different times, they had differing post-enrollment time frames, ranging from 30 to 512 days; median 246 days. For comparison, pre- to post-resource use outcomes were adjusted to reflect 30-day averages per patient then annualized (multiplied by 12).

†N = patients enrolled between December 1, 2012, and March 31, 2013.
‡Before enrollment—1 year before enrollment date of each patient, ending the day before enrollment.
§After enrollment—starting with enrollment date and ending April 30, 2015.
||Cost to charge ratio: does not represent total healthcare spend.
Discussion

The complexity and combination of medical conditions and life situations in this patient group is the major reason why they ultimately benefit from this intensive care coordination approach. As we demonstrated in a previous article, although they are very sick, these patients remain surprisingly functional despite their illness(s) (Roberts et al., 2012). Additional important general observations include the following: these individuals are very resilient, highly resourceful, and are extraordinarily patient with the healthcare system. At enrollment, many are overwhelmed; disengaged; non-trusting; and lacking in a feeling of self-worth or deserving of services (making it critical to have psychology expertise integrated into the team structure). Furthermore, this patient group wants to be perceived as agreeable (e.g., may know they will be unable to keep their next appointment for some reason but would not offer that unless asked).

Care transitions are normally linear and finite (e.g., from Provider A to Provider B), but in our care coordination programs, the number and nature of care transitions are circular, overlapping, and continual. They involve cross-sectoral caregivers including social services, government workers, and church and community members—in addition to medical, social work, and behavioral health providers in one or more health systems—and they take place at multiple locations. Because the interventions need to be tailored to each patient individually, based on their medical and life situations, they are not predictable at the outset, and “model fidelity,” as required by most care transition models, is not feasible.

Patients in this quality improvement program tend to be younger than those targeted by previously described care transition models and many have unstable health insurance, a history of substance use, and significant mental illness. Nearly all are from socially disadvantaged communities plagued by poor health status, and low literacy is common. Many are struggling with difficult life circumstances such as an alarming number have been emotionally or physically traumatized; some have no income while others have income that it is insufficient to meet basic survival needs making it challenging to pay even minimal co-pays for prescriptions; many live in unstable housing or in dangerous neighborhoods; and many have inadequate, or no, family and social support systems. At enrollment, the concept of self-management is not familiar to most of them.

Systems, like the Housing Authority, Medicaid, and health systems, often add to their burden. Examples include applications for benefits are frequently difficult to figure out and time consuming to file, applicants often feel disrespected or treated as if they were helpless, and agency staff are often not adequately sensitive to client issues regarding low/no literacy. In addition, for non-English speaking, translation services can be inadequate, cultural competency is a problem, and mailed annual reapplication notices (such as for Medicaid) are difficult to recognize as something official and may be disregarded.

Despite all this, with our team approach, many program participants have been successful in learning and applying the skills needed to self-manage their condition(s). Some of the principles underpinning our care coordination intervention include (1) our work with patients is strength based, meaning we look for the strengths each patient bring to the encounters and build on these when partnering with them in setting goals and tracking progress. Although the strength perspective is a classic tenet of social work thought (Cohen, 1999; Saleebey, 1996) and is regularly used in social work practice, we have found this orientation to be uncommon among other practitioners, who often look for deficits when engaging with patients. Also, most assessment tools focus on identifying patient/client deficits, prompting us to modify these tools to strength-based for use in our programs. (2) Establishing trust relationships between team members and the patients with whom they are working is
essential in empowering patients to self-manage their medical conditions. (3) Any step patients take toward self-management is important, and we recognize that competing priorities in patients’ lives must often be addressed alongside the work they do with us. (4) Every member of this multidisciplinary team is challenged to be highly adaptable as traditional roles oftentimes need to be supplemented by other responsibilities not normally asked of their discipline. Intense care management requires critical thinking and skills that exceed what is taught in traditional health professional programs (Bodenheimer and Berry-Millett, 2009).

There are similarities between our care coordination intervention and others’ care transition interventions, including (1) typically serve adult populations, (2) engagement generally starts with patients during a hospital stay and focuses on the transition at hospital discharge, (3) an emphasis on patient involvement in goal setting, (4) the necessity of care plans (but ours are developed over a period of time as the patient engages in the program, whereas other programs develop these at the time of hospital discharge), (5) follow-up home visits, (6) a follow-up appointment with a PCP at hospital discharge, (7) Information Technology support, and (8) recognition that telephonic follow-up alone is not enough.

There are also differences: care transition approaches usually offer “models” and require adherence to the models (Coleman, 2007), whereas our care coordination intervention is more accurately described as a framework or set of processes focused on changing behavior, rather than a model.

The usual care transition interventions involve fewer interactions between the team and the patients, whereas our care coordination process involves a large number of team/patient interactions over more than 8 weeks, with that time extended until patients are able to demonstrate behaviors required to “graduate.” We see building of trust and assuring that patients are taking medications as prescribed, among our greatest impact steps, and achieving these outcomes cannot be accomplished in a shorter intervention window. Patient self-management is a goal of both the care transition and care coordination interventions, but it is the centerpiece of every interaction our care coordination team has with patients, and we have spent considerable time articulating what is required to achieve this. This difference seems related to the characteristics of the patient populations served. Many of the patients served through usual care transition programs seem to need limited support to acquire self-management skills. However, self-management is a new concept to most of our patients, and it needs to be modeled to be understood while simultaneously addressing the significant socioeconomic and other challenges to achieving it. Our emphasis on trust and relationship building between the teams and participants does not seem reflected in literature describing the care transition models. Here, too, the populations served may be a factor.

Our teams focus on both medical and social issues and understanding and building the capabilities needed to self-manage in both arenas, and our teams require social workers and community-based staff because of the frequent dominating effect of social issues. Our focus on serving the patient while they are attending an appointment and working in the space between provider encounters minimizes requests for patients to make extra trips to the healthcare system. This is particularly important for our patient group as they frequently have limited access to transportation, complicated by limited phone minutes or changing phone numbers and addresses.

Our teams are larger, more diverse, and carry smaller caseloads than those used by medical care transition interventions. Our program builds on quality improvement programs we have had underway since 2009 to better serve our chronic care patients as described in the Journal for Healthcare Quality (Roberts et al., 2012). We also participate in the state’s Medicaid Health Home program, established under Section 2703 of the Affordable Care Act.
allowing states to provide care coordination services for chronically ill Medicaid beneficiaries. These programs coupled with our long history of disease management efforts have provided us with valuable understanding regarding the spectrum of care coordination needs and the indications for intensive care management.

The uniqueness of the complexity for each individual patient in this program creates many confounding variables, and because only the very high-cost patients are eligible, the samples sizes are small. This care coordination intervention is very labor intensive and thus costly itself, making assessment of ongoing effectiveness essential. Our method for analyzing care coordination outcomes allows interval comparison of pre/post-enrollment results in an individual chronic disease patient or aggregate patient population, with variable times of program entrance and lengths of time to graduation. Ongoing assessment and quarterly data monitoring is used to guide course correction and program refinements. Subgroup analyses such as those patients enrolled 1 year or more as well as annualized data for the entire group provide additional perspective that is helpful.

Limitations, Challenges, and Lessons Learned

Limitations of this program are the short duration, lack of access to total healthcare spend data from other institutions, lack of randomization, and small sample size of the patients enrolled, although high-intensity care management is only applicable to a small percentage of our patient population.

Challenges include the complexity of the patient group we focus on, which forces us to evolve in response to lessons learned. The workforce development portion of this program is particularly challenging and a few key learnings are outlined here. We underestimated the challenges faced by this multidisciplinary team. In our earlier care coordination initiatives, we observed that the RNs and LCSWs were needed for a number of roles and responsibilities that are nontraditional for their professions. Although issues of a medical nature were chiefly addressed by the RN and issues of a social nature were primarily the responsibility of the LCSW, considerable coordination between the team members was needed to assure an effective approach in working with these medically and socially complex patients. More recently, we realized that beyond role definition, the RN and LCSW positions lacked the usual structure that is characteristic of most nursing and social work positions in health systems and (while in the development stage) were constantly evolving. The commitment to working as a part of a team was also different because staff are asked to rely on expertise and support from team members of other disciplines.

Early on, we determined that certain tasks the HC RNs and LCSWs were performing could be offloaded as these did not require their level of licensure, training, and skill. By doing so, we could free up the HC RNs and LCSWs to serve more patients and increase their job satisfaction. To address this, we worked with the teams to identify tasks that could be done by high functioning Administrative Assistants (AAs) and we now use AAs for tasks such as maintaining telephone contact with patients to remind them of appointments, check up on them when they have not been heard from, and assist the team members in entering and retrieving data related to the patients they serve. This is effective as long as there are intermittent face to face opportunities for the patients with the HC RNs, LCSWs, and CCLs.

From the outset, we were convinced that we wanted to incorporate members of the community on our care coordination teams believing in the value peer support has been shown to bring to this type of work. To this end, we worked with a community coalition and the local community college to develop a Community Health Worker training program. We have recruited individuals from the training program and call this role in our program CHA’s. They often serve as a bridge between the patients, their
supports such as family and friends, and the hospital personnel. The CHA’s advocate for and assist patients with navigating both the healthcare system and the systems of care within the community. A patient, who cannot read, for instance, may have a CHA go with them to fill out paperwork at the Social Security office. A CHA may know the best place in the local community to find a used couch for someone or which food pantry is closest to a patient’s home. However, we have found that expecting CHA’s to be able to complete many hospital environment tasks is probably not reasonable. For example, the CHA’s have consistently had difficulty with computer skills (including scheduling, calendar maintenance, and documentation). Extensive and ongoing training regarding basic office and organizational skills has been necessary along with reconfiguration of job expectations. The strength of the CHA is in establishing relationships through face to face interactions and assisting in addressing the social barriers for our patients. Our CHA’s provide perspectives in huddles that often enlighten licensed staff and offer a better understanding for the team regarding the unique needs of the patients we serve.

We also developed a position which is unique to our program called Client Community Liaisons; these individuals are extenders of the LCSW in the community and are crucial to success. They spend their time meeting patients where they live: in their homes, in shelters, at restaurants, libraries, and any number of other places in the community. They are the frontline contact between the health system and the patient, working to assist patients with both the physical and social barriers to health. The CCLs may assist patients in filling out paperwork to apply for disability, take patients shopping to model appropriate food choices at the grocery, and help a homeless patient find housing or any number of tasks that hinder the patient’s ability to manage their health. Working in collaboration with the Health Coach, they may deliver blood pressure cuffs or logs and check medication lists against what the HC RN reports should be in the home.

Key to the success of the work of the CCL is the ability to establish trusting relationships with patients, their families, and other caregivers. Many of the high utilizers of Safety-Net hospitals live not only with the challenges surrounding multiple chronic diseases but also with poverty, mental illness, and chaotic life circumstances. The CCLs must understand the context of the lives of their patients and accept those individuals where they are. It is crucial to the CCL’s success that we hire those with an aptitude for ongoing professional development regarding effective interactions with patients and dealing with their barriers to self-management.

With CCLs and CHAs, their supervisors must be mentors and a means of support. The CCLs and CHAs often find themselves face to face with the graphically difficult living conditions of many of our patients and each interaction and patient experience is unique. The staff need to feel safe enough with their supervisors and team colleagues to discuss and process the experience, to prevent burnout.

A final observation about our diverse multidisciplinary team is that, to be successful, we need to pay considerable attention to supporting the team’s development. Team members come from different work cultures where distinctive terminology and concepts are used and shorthand and acronyms are common. Professionals working within the walls of the hospital may at times be untrusting or not quite understand the role of the community staff in actually doing their work “on the streets,” and there may be mistrust of other team member’s frame of reference. The “lens” through which each sees this work results in different priorities, requiring consistency and transparency in communication to mitigate conflict.

There are pragmatic aspects to the team development needs as well. For example, we found that many of our patients have substance abuse issues and that addictions were often a barrier to care. The staff needed training in substance
abuse counseling, and this is being incorporated in our ongoing work and training plan.

**Implications for Practice**

Population management approaches are being implemented nationally, and care coordination has a valuable place in them. As we previously described, it is important to recognize that not everyone needs care coordination. We approach this by profiling patients in quadrants by burden of chronic medical conditions. There is a spectrum of disease and social complexity that benefit from different levels of care coordination intensity. Through evolving understanding, we can learn how much cost investment for intensive care coordination is warranted to yield clinical and financial effectiveness (Roberts et al., 2012; Figure. 2). Although it can be augmented by Information Technology, care coordination is resource intensive and must be carefully applied to both improve quality and reduce cost. We describe a successful approach of intensive individualized care management for a small group of high-cost chronic disease patients. Carefully applied, the cost of the intervention is worthwhile and yields significant savings.

The high cost of healthcare and its continuing increase is a major social and economic force and increasingly a life effector for all of us. If we can learn how to provide useful quality care for those with extremely high medical and social needs and more effectively manage their cost challenges, we can help to impact the upward cost spiral. Furthermore as Medicaid is transformed, adding newly insured beneficiaries with social complexity and value-based purchasing seeks providers who can address issues that impede patients’ abilities to take full use of the health system, payers will look to those who have developed successful approaches for serving these challenging populations. If we can improve our efficiency of care for those with greater needs, we can also expect to transition some of the best practices and lessons learned to other less-intensive segments of the patient population.

**Directions for Future Research**

It will be important to continue to streamline our program methodology, further improve its efficiency, and evolve in our understanding of the essential intervention components that are of highest impact. Defining which interventions are most critical to obtaining our results would have considerable value. Delineation of the most impactful resource investment for each level of care management complexity is needed (e.g., at what complexity is there cost and quality benefit of care coordination and for what profile of high complexity patients is it impactful to have smaller case loads that lead to more effective care management as return on investment). Learning these things will in turn help us understand how to further decrease the cost of the interventions and/or to apply them more selectively. These are important considerations because this program is staff-time intensive and the indication for this level of intervention is applicable to only a small group of patients. Ultimately, we need to learn to identify those at risk for becoming high-cost high-utilization chronic disease patients and design earlier interventions that prevent cost escalation.

Additional studies should include qualitative evaluation of the life improvement and reduction in burden of treatment associated with the interventions. Continued evolution in understanding the measurable quality of clinical outcomes that result in this type of care intervention is essential, because there are both clinical and cost benefits to systematic incorporation of disease management into intensive care coordination programs. Analyzing the measurable disease management impact and using standard finance methods for tracking return on investment in care coordination will be needed if this type of work is to be sustainable.

Our future analyses should also include comparison of patients enrolled who stay engaged with those who do not.
Additional understanding is needed of the postgraduation period, and results change over time. It would be valuable to more clearly define the monitoring needed, indications to reintervene with support, and the effectiveness of reintervention, for those whose cost and utilization are trending back up after graduation. Additionally, we need to continue to separately analyze and learn from that small but growing group of patients who have at least 1 year of post-enrollment data.

Further evaluation is also needed to answer overarching cost-effectiveness questions “How many dollars does it cost to save the dollars identified?” But, perhaps the most difficult questions will turn out to be societal or even political and include: “What’s it worth to address the healthcare needs of the high utilizers?”

Summary
Transitioning from inpatient to outpatient care is a difficult and blurred step for the high utilizer. We are evolving a replicable program that can help, when selectively applied. It has at its core a growing awareness of the patient and their strengths, the individual’s needs and their barriers to care and self-management, and a transition of care that entails a programmatic intervention of an unusually designed and coordinated multidisciplinary team. The early results show significant reductions: 32% decrease in admissions, a 40% reduction in ED visits, and a 31% reduction in aggregate charges and costs. We believe that we have only begun to understand what is needed and the extent of what can be accomplished.

Acknowledgments
The Truman Medical Centers (TMC) high-utilization team model described in this article reflects our experience and builds on consultative guidance provided by the Camden Coalition of Healthcare Providers. Funding is provided through a Centers for Medicare and Medicaid (CMS) Health Care Innovation Award. Project management and the primary technical assistance are through the Rutgers Center for State Health Policy.

The four clinical site partners of this Learning Network include TMC, a non-profit health system consisting of 2 acute-care hospitals, serving more than 100,000 patients with primary care and specialty practices, including extensive behavioral health services; Neighborhood Health Centers of the Lehigh Valley of Allentown, PA, a non-profit organization operating two Federally Qualified Health Center (FQHC) look-alikes; Metro Community Provider Network, Aurora, CO, an FQHC; and MultiCultural Primary Care Medical Group, San Diego, CA, an IPA with 300 physicians including >120 primary care physicians and >14,000 members. The authors would also like to acknowledge the late William E. Lafferty, MD, Merl and Muriel Hicklin Missouri Endowed Chair in Medicine at the University of Missouri-Kansas City School of Medicine, for his contribution in designing the methodology used to evaluate Truman Medical Center’s care coordination interventions.

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Core CPHQ Examination Content Area
IV. Performance Measurement and Improvements

Learning Objectives
After reading this article, the reader will be able to:

- Describe an intensive care coordination intervention that empowers high-cost, high-utilizing, medically and socially complex, chronically ill patients to self-manage their medical conditions while achieving the triple aim of better health, better care, and lower costs;
- Identify similarities and differences between this approach and care transition models which have proven effective in reducing rehospitalizations among patients whose life situations do not present the challenges faced by the population served by the program discussed in this article; and
- Explain the principles undergirding the work of the care coordination team.

Posttest Questions

1. Community-based members of the care coordination team:
   a. Establish relationships through face-to-face interactions and assist in addressing patients’ social barriers.
   b. May go into the home to meet with patients but primarily use the telephone to check in with patients after they are discharged from the hospital.
   c. Focus on a discrete set of topics related to assuring patients understand the clinical directives they were given, such as what medications to take when.
   d. Follow a model when patients are transitioning from one care site to another or to home, where fidelity to the activities required by the model is paramount.

2. Care coordination team activities are led by:
   a. A registered nurse whose focus is clinical.
   b. A registered nurse whose focus is clinical–medical and a co-equal master’s level social worker whose focus is on patients’ clinical–social issues.
   c. A primary care physician and a pharmacist who focus on critical aspects of medication management.
   d. A registered nurse whose focus is on medical issues and a psychologist whose focus is on patients’ behavioral health issues.

3. Intensive, individualized care coordination as described in the article is best used with:
a. Any population of very sick, high-cost, chronically ill patients.
b. Any patient discharged from the hospital who has low health literacy and may not understand self-care recommendations for what they are to do when they get home, and have no one to explain these to them.
c. A small group of high-cost “super-utilizers” who are both medically and socially complex.
d. Any group of low income, inner city patients with chronic conditions.

4. An individualized Care Plan used to assess each patient’s readiness to “graduate” from the care coordination intervention contains criteria in these domains:
   a. Lists milestones the patient needs to meet to self manage in these domains: Health (e.g., keeps appointments, brings questions for the doctor, knows names of meds and reasons taking them), Social (e.g., knows how to use transportation to get to/from appointments, demonstrates skills to maintain adequate housing), Behavioral/Substance Abuse (has resources/referrals to appropriate programs).
   b. Has completed the intensive hospital readiness for discharge through counseling in Medication Self-Management; has had the support of a Dynamic Patient-Centered Record; and has been given Follow-up and Red Flags for when to call the clink.
   c. “Increases in Healthy Days” as reported by a patient at 30 and 60 days, as recorded on their tracking log that their hospital discharge registered nurse reviewed with them.
   d. Patient self-reporting on satisfaction with the program and feeling she/he has received all the information they need and is ready to graduate.

5. We have established that patients with combined medical and social complexity can and in most cases do learn and demonstrate self-management of their conditions. Which of the following are the principles underpinning the care coordination intervention:
   a. It uses the strengths each patient brings when goal setting and tracking progress; it believes trust relationships between team members and patients are essential to empower patients to self-manage; it acknowledges any step a patient takes to self manage as important, given competing priorities that require the patients’ attention; it challenges every member of the team to be highly adaptable and able to step outside the roles/responsibilities normally required of their discipline.
   b. It believes it is most effective to identify and address deficits (such as “can’t afford copays” or “lacks transportation to get to appointments”) that impede a patient’s progress toward reaching self-management goals.
   c. It thinks there is value in offering time-limited services introduced at hospital discharge, as patients should be able to “stand on their own two feet” if given some basic tools.
   d. It is not sure that patients with chaotic life circumstances (e.g., addiction) can ever really self-manage their conditions; so it uses a short list of interventions and looks for ways to hand off patients to others in the community who can continue to work with them.

6. The primary reasons for the care coordination program are:
   a. To save money for the health system and for payers.
   b. To lessen the “cognitive overload” many physicians face in serving a high-utilizing patient population.
   c. To train chronic disease patients in both self-management and how to use the health system more wisely.
   d. To treat all patients alike in a Patient Centered Medical Home ambulatory setting.

7. Utilization outcomes are considered a success if:
   a. Outpatient visits go down, as do emergency department visits and hospitalizations.
   b. Outpatient visits stay the same, as emergency department visits and hospitalizations decrease.
   c. Outpatient visits go up, as emergency department visits and hospitalizations decrease.
d. It doesn’t matter what outpatient visits do as long as emergency department visits and hospitalizations decrease.

8. Assuring that patients are taking the “right medication at the right time” is regularly recognized as a major challenge for care management programs, but for ours:
   a. “Taking medications as prescribed” is, along with “building trust” among our greatest impact steps, and we have found that it takes time to accomplish both of these.
   b. We have tried many things to accomplish issues of access, cost, etc., to achieve medication adherence and believe we have exhausted the things we can try.
   c. We believe medication reconciliation at the time of hospital discharge and soon thereafter should be sufficient if coupled with patient education and teach back to make sure patients/caregivers know what they are to do.
   d. We think patient compliance is really up to the patient and family in the end, and we can’t really help.

9. Many patients do not need care coordination, but the level of intensive care management this program offers has consistently produced improved outcomes for those who:
   a. Have one chronic illness.
   b. Have a working relationship with a Primary provider that allows them to avoid visits to the Emergency Department.
   c. Have both medical and behavioral health diagnoses (and may have a history of psychologically or physical trauma).
   d. Have a history of successful self-management, but need a little extra help at the time.

10. Carefully applied, the intervention is scalable and yields significant savings in the following settings:
   a. It is replicable for most high-cost patients
   b. It is replicable for chronic illnesses whether or not disease management principles have been established.
   c. It works in the space between the encounters, leveraging the existing care givers and natural support that exist or potentially exist for the patient.
   d. Is easily applied with little expenditure of resources.