THE PROMISE OF CARE COORDINATION

Models that Decrease Hospitalizations and Improve Outcomes for Medicare Beneficiaries with Chronic Illnesses

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EXECUTIVE SUMMARY

Numerous studies have documented that the relatively small percent of Medicare beneficiaries with multiple chronic conditions account for the vast majority of Medicare spending, all too often due to inadequate care, poor communications, and weak adherence by patients. A decade of research and demonstrations has developed evidence regarding "care coordination" interventions that are effective in achieving both improved beneficiary outcomes and reduced Medicare expenditures. This experience has demonstrated that "the devil is in the details," that many apparently promising approaches have not proven to be effective, and that careful attention to implementation and targeting is essential if "care coordination" is to fulfill its potential for both Medicare beneficiaries and the Medicare program.

To promote better coordinated health and social services for older adults with multiple chronic conditions, the National Coalition on Care Coordination (N3C) was formed in 2008 by leading social, health care, family caregiver, and professional organizations. This paper was commissioned by N3C to synthesize the evidence on cost-effective interventions and their essential components, identify key issues that still must be resolved for ongoing research, and present recommendations for care coordination policies in health care reform that can be supported by the currently available evidence base. The paper draws heavily on Chad Boult's (2008) recent comprehensive survey of the literature, supplemented with findings from several recent Medicare demonstration evaluations, especially findings from the Medicare Coordinated Care Demonstration (Peikes et al. 2009).

"Effective Care Coordination": A Definition

"Care coordination" is not yet consistently defined by the various organizations and researchers that have addressed the topic. To provide a common framework, this paper has been based on the definition proposed by N3C:

> "Care coordination" is a client-centered, assessment-based interdisciplinary approach to integrating health care and social support services in which an individual's needs and preferences are assessed, a comprehensive care plan is developed, and services are managed and monitored by an identified care coordinator following evidence-based standards of care.

"Care coordination" encompasses both health care and social support interventions across the range of settings from the home to ambulatory care to the hospital and post-acute care. The specific interventions required by an older adult with chronic conditions depend upon that individual's health status and social environment, at a particular time and over time. Serving the

whole population of Medicare beneficiaries with multiple chronic conditions requires the availability of an array of capabilities along both medical care and social service dimensions that historically have divided into "acute care" and "long-term care" domains. Serving the frail elderly and beneficiaries with cognitive impairment is particularly challenging as their needs tend to fall into gaps that currently exist between these two domains. The emphasis of this paper is primarily on care coordination interventions within the acute care domain. Interventions that focus on meeting individuals' long-term care needs with the principal goal of enhancing their ability to remain in the community, rather than being placed in a nursing home, are beyond the scope of this paper.

"Effective" care coordination brings the essential dimension of cost into the definition. In this time of unsustainable increases in the costs of the Medicare program, an effective intervention must reduce total Medicare expenditures for the participating beneficiaries at least enough to cover intervention costs, while maintaining or improving beneficiary outcomes. Because the major contributor to expenditures is hospitalization, an "effective" intervention has been further defined for this synthesis to be one that reduces participants' hospitalizations (including re-hospitalizations).

Effective Interventions

Three types of interventions have been demonstrated to be effective in reducing hospitalizations for Medicare beneficiaries with multiple chronic conditions who in general are not cognitively impaired:

- **Transitional care interventions** in which patients are first engaged while in the hospital and then followed intensively over the 4 - 6 weeks after discharge to ensure they understand how to adhere to post-discharge instructions for medication and self-care, recognize symptoms that signify potential complications requiring immediate attention, and make and keep follow-up appointments with their primary care physicians. Naylor and colleagues (2004), using advanced practice nurses (APNs), and Coleman et al. (2006), using a Care Transitions Intervention (CTI) guided by an APN "transition coach," have demonstrated the effectiveness of this intervention using randomized control trials in a number of different hospitals.

- **Self-management education interventions** that engage patients for 4 -7 weeks in community-based programs designed to "activate" them in the management of their chronic conditions. Randomized controlled trials by Lorig and colleagues (1999, 2001) and by Wheeler (2003) have demonstrated that such interventions significantly reduced hospitalizations and costs over a period of 6 – 21 months. The interventions enable patients to self-manage symptoms/problems, engage in activities that maintain function and reduce health declines, participate in diagnostic and treatment choices, and collaborate with their providers. The necessary education is provided by a mix of medical and non-medical professionals.

- **Coordinated care interventions** that identify patients with chronic conditions at high risk of hospitalization in the coming year, conduct initial assessments and care planning, and provide ongoing monitoring of patients' symptoms and self-care working with the patient, primary care physician, and caregivers to improve the exchange of information. The Medicare Coordinated Care Demonstration (MCCD) initiated in 2002 and, for selected programs, continuing today, is the major source of insights into the details of effective interventions and what distinguishes them from other interventions (Peikes et al. 2009).

Only 3 of the 15 programs in the MCCD were effective in reducing hospitalizations and costs over the first four years of operations. In-depth analysis of program details has revealed that six key components distinguished the successful MCCD programs from the ineffective ones:

- ***Targeting*:** patients at substantial risk of hospitalization in the coming year, but not necessarily those with great risk for repeated hospitalizations, are those most likely to be impacted by the intervention. The two most successful programs were those serving patients with average costs about twice the national average and who averaged about 1 hospitalization per year per participant. While individuals at high risk of multiple hospitalizations and extreme costs might be thought to provide the greatest opportunity for savings through care coordination, in some cases these individuals have diseases that have progressed so far that improving patient adherence or communications among providers will not reduce the likelihood of a hospitalization.

- ***In-person contact*:** successful interventions had substantial amounts of in-person contacts with their patients. While many of the contacts were by telephone, the successful MCCD programs averaged nearly one in-person contact per month during patients' first year in the program, far higher than most of the unsuccessful MCCD programs.

- ***Access to timely information on hospital and emergency room admissions*:** Learning about acute episodes very shortly after they occur is a critical factor. Patients are particularly vulnerable for readmissions after a hospitalization or emergency room visit, and the incident provides a heightened opportunity to explain how better adherence and self-care may prevent such occurrences.

- ***Close interaction between care coordinators and primary care physicians*:** two primary factors affect the strength of the relationship—the opportunity to interact face-to-face on occasion and having the same care coordinator working with all the program patients for a given primary care physician.

- ***Services provided*:** All of the successful programs focus their interventions on assessing, care planning, educating, monitoring, and coaching patients on self-management. Teaching patients how to take their medications properly was a particularly distinguishing factor of successful programs. In addition, some patients require social supports, such as assistance with daily living activities, transportation, or overcoming isolation. The successful MCCD programs emphasized the importance of having staff who could arrange such services for patients, when needed.

- ***Staffing*:** the MCCD care coordination interventions rely on registered nurses to deliver the bulk of their intervention, with each patient assigned to a particular nurse coordinator to create rapport and preserve continuity with both the patient and the primary care physician. For some patients, social workers provide valuable assistance with assessing eligibility for and arranging services such as home delivered meals, transportation, emergency response systems, advanced care planning, and coordination with home health agencies.

Potentially Promising Models

No single program has yet combined all three types of interventions, but doing so should further reduce hospitalizations and costs. The reductions in hospitalizations and cost savings achieved by the successful MCCD programs were accomplished without the benefit of a structured transitional intervention; thus, the combination of these two interventions could be expected to generate larger savings than either alone. Adding the intensive self-management intervention when a patient is first enrolled in a coordinated care program would provide training in self-care similar to that in the transitional intervention and could potentially further reduce both hospitalizations and ongoing monitoring costs. While the self-management programs can achieve short-term cost savings, the MCCD evidence suggests that sustaining these savings over a longer period is likely to require ongoing coaching and support of patients as their health, environment, and goals change.

A number of other models with promising results from small pilot studies or with creative designs that incorporate many of the desirable features identified above are currently being tested. The Guided Care model developed by Chad Boult and colleagues (Sylvia, et al., 2008; Boyd et al., forthcoming) features a multi-disciplinary approach, including the primary care physician, the "Guided Care" nurse, social workers, nutritionists, therapists, and pharmacists, and offers support for family caregivers as well as patient-centered care management. The model has shown quite favorable results for hospitalizations and costs in a pilot test (though they are not statistically significant in the small samples available to date).

The model gaining the greatest momentum is the Patient-Centered Medical Home (PCMH), a concept developed under the joint auspices of the American College of Physicians, the American Academy of Family Practice, the American Academic of Pediatrics, and the American Osteopathic Association. Criteria have been developing by which primary care practices can qualify to be "medical homes," and a number of private insurers and Medicare are launching demonstrations to test the feasibility of the concept. The beneficiary eligibility criteria for the Medicare demonstration currently include 86 percent of all beneficiaries in fee-for-service Medicare. Evidence presented in this paper suggests that if "medical homes" participating in the Medicare demonstration are expected to generate savings that equal or exceed the monthly fees paid, they are unlikely to be successful because they will be serving too broad-based a population.

Large clinics, group practices, and academic medical centers may have the array of staff, services, and systems to meet the requirements to qualify as "medical homes" and "advanced

medical homes." Small practices of one or two physicians, who represent 83 percent of all practices and 45 percent of all physicians, will not (Pham 2007). Community Care of North Carolina (Thorpe 2008) has created a model that links small physician practices with community health teams comprised of care coordinators, nurse practitioners, social and mental health workers, and community health and outreach workers to support effective care coordination.

Costs of Effective Care Coordination Programs and Approaches to Financing

How and at what level care coordination services should be reimbursed under Medicare are key considerations. Evidence to date from the MCCD (Peikes et al. 2008; Peikes et al. 2009) suggests that effective, ongoing care coordination programs were able to generate savings in total Medicare costs, before program fees, of about $120 per member per month over the 2002-2007 period, if properly targeted. This finding suggests that program fees paid for care coordination should not exceed that amount, on average. The savings estimate is roughly consistent with the 15 percent reduction in hospitalizations observed in these programs.

Under Medicare's current Inpatient Prospective Payment System, hospitals have no incentive to provide and support effective transitional interventions because such interventions would reduce readmissions for targeted patients (by 25 to 34 percent, if the findings from published randomized trials can be replicated) and therefore reduce hospitals' total Medicare revenues. Incentives for hospitals to improve transitional care and reduce readmissions are needed to spur such efforts.

Issues for Ongoing Research

While much has been learned since the earliest care coordination efforts and the components of effective interventions can now be specified with a substantial probability of success, much remains to be learned. The key issues for which greater clarity is required are:

- **How to identify the optimal target population:** using only data readily available to most clinics or programs, is there a simple way of identifying a mix of individuals who are at high enough risk to benefit from the intervention, but not so high risk that little can be done to help reduce their need for a hospitalization? While one of the successful MCCD programs risk-stratified very successfully, the assessment form used requires a substantial amount of data that can be obtained only by interviewing the patient. What targeting criteria provide the optimal tradeoff between identifying a group for which the likelihood of generating savings is high, while not limiting the target population so severely that the impact on total Medicare costs is small?

- **Episodic vs. continuous enrollment/eligibility for care coordination:** while the transitional care and self-management interventions engage patients for a limited duration of about 1 to 3 months, the successful MCCD programs kept patients enrolled for the life of the program (up to 6 years). The advantage of continuous enrollment is that the relationship between care coordinator and patient remains intact, and the intervention can change as the patient's needs change. On the other hand, continuous enrollment is expensive. Most programs that maintain continuous enrollment classify patients into

specific risk tiers based on their assessed level of need for monitoring and coaching at any given time and move patients among tiers as their health and situation change. What is still undetermined is whether programs should be paid different rates for patients in different tiers or a single rate for all patients that on average will cover program costs.

- **How best to provide the transitional care intervention:** should all care coordinators be trained in the transitional care intervention or is this intervention more effective if it is provided by limited set of nurses who would specialize in transitional care? Do these nurses need to be advanced practice nurses, as in the most successful transitional care models? Could social workers be included in the pool of health professionals who can provide effective transitional care interventions, as is currently being tested in the Enhanced Discharge Planning Program at Rush University Medical Center (Golden 2009)?

- **How to provide care coordination as efficiently as possible**: given the difficulty of generating large savings, this is a very important area for further investigation. A key issue is determining the optimal frequency and nature of ongoing contacts with participating patients and how this would vary with patients' characteristics and length of time in the program.

- **What mix of nurse-oriented interventions and social service supports is most effective:** as the baby boom generation ages into Medicare and life spans continue to grow, programs may need to adjust their service mix and staffing to meet the social support needs of frail individuals with chronic illnesses. The extent to which patients should be moved from care coordination programs to long term care-oriented programs versus extending the continuum of care to meet these needs is a key issue to address.

The Medicare Chronic Care Practice Research Network (MCCPRN), a group of 12 clinical practices across the country (8 from the original MCCD), is seeking funding to provide an ongoing "learning laboratory" that can systematically, rigorously, and quickly explore such issues; enhance the understanding of which interventions work best for various subsets of the population; and develop detailed operational protocols to enable faithful replication of the successful interventions in a range of settings. The Medicare Payment Advisory Commission (MedPAC) is currently evaluating whether to recommend the MCCPRN approach and will report to Congress in June 2009.

Policy Recommendations

The current evidence regarding effective care coordination supports the following recommendations for Medicare policy:

- For the Patient-Centered Medical Home, be very prescriptive about what services are provided and how they are provided in specifying the requirements for the Patient-Centered Medical Home Demonstration

- Offer vehicles for physicians in small practices to participate in an effective care coordination intervention

- Target both medical homes and care coordination interventions on beneficiaries who are at substantial risk of hospitalization in the coming year

- Create incentives for hospitals to participate in a transitional care intervention.

A practice that meets the qualifications to be a "patient-centered medical home" currently specified for the Medicare Demonstration would have several characteristics associated with effective care coordination: co-location of care coordinators with primary care physicians, having the same care coordinator for all of a physician's patients, access to timely information on hospitalizations, and opportunity for substantial in-person contact between the care coordinator and the patient. Based on the evidence summarized here, other criteria should also be required: inclusion of a patient self-management component, inclusion of a transitional care intervention, and access to staff who can address isolation and community care needs. Without these prescriptive requirements, the medical home model could result in higher payments to participating practices and perhaps some improved patient outcomes, but may not generate sufficient reductions in hospitalizations to achieve cost savings that would offset additional payments.

It is also clear that *small* practices of one or two physicians will not be able to meet even the current requirements to be a medical home, let alone the additional ones recommended. Small practices should be encouraged to meet the criteria for a medical home by linking with a community health organization, an integrated delivery system, a local clinic, or a medical center that has assembled the staff and resources to provide effective care coordination.

In defining the Medicare beneficiaries eligible for inclusion in the medical home or in a care coordination program, the conditions and severity level shown to be responsive to care coordination interventions should be targeted. Recent unpublished work conducted by the author and colleagues suggests that this target population should include those who have high risk conditions (congestive heart failure, coronary artery disease, or chronic obstructive pulmonary disease) and have a hospitalization in the past year, plus beneficiaries with any chronic conditions who have multiple hospitalizations in the past 2 years.

Regarding hospital incentives, under Medicare's current Inpatient Prospective Payment System, hospitals have no incentive to provide effective transitional interventions because such interventions would reduce readmissions for targeted patients and therefore reduce hospitals' total Medicare revenues. Incentives for hospitals to improve transitional care could be created by paying a higher base rate for all Medicare admissions to hospitals that have below average 30-day readmission rates and lower base rates to hospitals that have higher readmission rates, with the rates appropriately risk-adjusted and set so that total Medicare payments to hospitals are equivalent to those that would have been achieved with a declining national readmission rate. Hospitals could either implement their own program that closely follows the tightly specified protocols developed by Naylor or Coleman, or could contract with an external provider that implements such models.

The policy implications for Medicare are likely to apply to Medicaid, private payors, and the Veterans' Administration as well. The chronic illnesses plaguing these populations differ somewhat from those for Medicare beneficiaries, but it remains true that the majority of costs are associated with those who have such illnesses. Better coordination of the care that these patients receive will continue to be one of the best opportunities for reducing costs and improving patient well being, through reduced need for hospital and institutional care.

Succeeding in these efforts to improve care coordination is critical to the health of Medicare beneficiaries and to the cost of health care in the United States. While better care coordination is not the sole solution to the entire health care problem, it is achievable now and can improve the quality of life for millions of Americans. It is important to move forward with what the best evidence suggests has the most promise, while continuing to improve and refine these interventions.

INTRODUCTION

It is well documented that Medicare beneficiaries with chronic illnesses have substantially poorer outcomes and higher costs than should be achievable if they consistently received evidence-based, coordinated care and adhered to prescribed medications, exercise, diet, and self-care regimens. Evidence abounds to support this premise. For example, a recent paper (Schoen et al, 2008) showed that Americans with chronic illnesses are more likely than residents of 7 other industrialized countries to report not having test results at the time of scheduled appointments, saw specialists who were not aware of their medical history, had primary doctors who did not seem to be informed about care the patient had received recently from a specialist, and did not have someone discuss their other medications when they were hospitalized. Overall, 41 percent of these patients reported that a physician or pharmacist only "sometimes, rarely or never" reviewed and discussed all the medications they were receiving. Between 20 and 25 percent reported their doctor only sometimes, rarely or never: 1) encouraged them to ask questions, 2) explained treatment options and involved the patient in decisions, or 3) gave clear instructions about symptoms to watch out for and when to seek further care. Jencks et al. (2003) has shown that, while care has been improving over time, over one-fourth of patients treated for chronic illnesses in 2000-2001 did not receive the appropriate care on the *median* indicator in the *median* state—a clear indication that many chronically ill beneficiaries receive substandard care. Many of these patients also are socially isolated and lack access to community support services, or have family caregivers who are overburdened and untrained for the care they provide.

The consequences of this poor clinical and self-care are disastrous for both the patients and the health care system. Data show that patients with claims for 2 or more of 7 chronic conditions comprised about 24 percent of Medicare beneficiaries in 2004, but accounted for 45 percent of all Medicare expenditures in the next year.[1] These patients experience high rates of hospitalizations, many of which are classified as "potentially preventable" (Sanderson and Dixon 2000; Burr et al. 2003; Brown et al. 2001), and live lives often severely compromised by their illnesses.

To promote better coordinated health and social services for older adults with multiple chronic conditions, the National Coalition on Care Coordination (N3C) was formed in 2008 by leading social, health care, family caregiver, and professional organizations. This paper was commissioned by N3C to synthesize the evidence on cost-effective interventions and their essential components, identify key issues that still must be resolved for ongoing research, and present recommendations for care coordination policies in health care reform that can be supported by the currently available evidence base.

The basic message of this paper is that solid evidence-based lessons from recent literature and demonstrations provide a clear prescription for significantly improving the

[1] One often sees studies reporting facts such as the most costly 5 percent of patients account for 50 percent of costs, but those statistics are less relevant, because they involve people who cannot be identified in advance. The statistics given here were calculated from the Medicare 5 percent sample.

current situation. In assessing "what works," this paper takes the view that simply improving patients' satisfaction with the care they get, or improving intermediate outcomes like preventive testing, is not sufficient to warrant paying for this type of intervention. Many of the hospitalizations and costs incurred are preventable, and reducing them would greatly benefit patients as well as payors. We should settle for nothing less than interventions that improve patients' well-being *and* reduce costs, at the very least by enough to cover the cost of the intervention. Such effects will almost always involve reducing hospitalizations, simply because that is where the bulk of costs (and misery) are generated. Thus, an "effective" intervention for the purposes of this paper is one that reduces hospitalizations, while maintaining or improving other patient outcomes.

The objective of this paper is to focus on the very few studies that meet the criteria of having rigorous evidence of reductions in hospitalization and costs. The paper draws heavily on Chad Boult's (2008) recent comprehensive survey of the literature, supplemented with findings from several recent Medicare demonstration evaluations, especially findings from the Medicare Coordinated Care Demonstration (Peikes et al. 2009). Interventions that require implementing expensive and comprehensive electronic health records or health information technology are beyond the scope of this paper. The paper also does not review Wagner's excellent, but already well-documented, chronic care model (e.g., see Wagner et al. 2001; Coleman et al. 2009), which lays out a range of recommended principles for transforming physician practices (many of which are consistent with the suggestions made here), but which is not a specific, well-defined intervention that has been tested in randomized trials nor subjected to benefit-cost calculations. Boult's paper, which reviews the literature and assesses the replicability of interventions, applies rigorous criteria to the quality of the evidence to ferret out weaker studies. He finds many models yielding evidence of improvements in quality indicators and patient well-being, but very few with solid evidence of reductions in hospital use or cost savings. This paper draws lessons only from the care coordination interventions for which there is strong, credible evidence that they are effective in reducing hospital use and costs

THE SPECTRUM OF PATIENTS WITH CHRONIC ILLNESSES AND CARE COORDINATION INTERVENTIONS

Before discussing the literature, we must first characterize the population with chronic illnesses, the range of needs they face for medical and social support services, and the types of programs that attempt to address their needs. Figure 1 depicts the very heterogeneous population of Medicare beneficiaries with chronic illnesses and the range of their needs for different types of services. The x-axis shows the continuum of need for support in improving adherence and coordination of medical care services. The more chronic conditions patients have and the higher their risk for hospitalization due to the severity and complexity of their conditions, the further they will be along the x-axis. The y-axis measures patients' level of need for social supports, such as help with

transportation, meals, addressing isolation and depression, caregiver supports, and coordination of paid and unpaid support services.

As the upper left-hand side of the graph shows, some beneficiaries, such as those with Alzheimer's but no major medical problems that would put them at high risk for a hospitalization, may need a significant amount of social supports, but not much coordination of care from multiple physicians. Other patients, such as those in the lower right hand side of the figure, are at high risk of a hospitalization, and therefore need a substantial amount of coordination of the care provided by numerous physicians and therapists. However, they need little help with social supports. For example, this group would include a patient with congestive heart failure (CHF) or chronic obstructive pulmonary disease (COPD) who is in the hospital about once per year on average, but who lives independently with a spouse, and who requires no outside assistance with activities of daily living or transportation, has adequate nutrition and financial resources, and arranges for the help he or she needs. Finally, patients who would fall in the interior of the diagram require varying degrees of both types of services.

Because there are a substantial number of patients along the x-axis and the y-axis, and because the types of care they require are typically best delivered by different types of health care and social service professionals, our health care and social service systems have built "silos" of care. Physicians and hospitals provide the acute medical care services, while home care agencies, Area Agency on Aging programs, senior centers, and family members provide many of the social supports needed. Many disease management or care coordination interventions have been developed to help patients adhere to treatment and diet regimens, obtain care consistent with evidence-based guidelines, and coordinate the care they need to stay out of the hospital. Others, such as the Program of All-Inclusive Care for the Elderly (PACE) (Foster et al., 2007) or the Community Medical Alliance Model (CMA) (Masters and Eng, 2001) were designed to provide and coordinate the support required to live independently and stay out of nursing homes. Few interventions address the joint needs of patients falling in the middle of Figure 1.

Even if a program initially targets only patients with acute care needs, it is typically only a matter of time until some will need help with social supports. Beneficiaries with chronic illnesses may break a hip or have a stroke, resulting in a need for social and personal care assistance. Beneficiaries with diabetes or heart problems may become depressed, or have to give up their driver's license as they become frailer. Programs that are not equipped to meet these needs are likely to fail the patient, resulting in preventable hospitalizations or nursing home use. However, programs that focus primarily on meeting individuals' long-term care needs with the principal goal of enhancing their ability to remain in the community, rather than being placed in a nursing home, are beyond the scope of this paper.

EVIDENCE FOR CARE COORDINATION INTERVENTIONS THAT REDUCE HOSPITALIZATION AND COSTS

The effective care coordination models fall into one of three categories: (1) short term care transition intervention models designed to reduce hospital readmissions, (2) short-term interventions providing patient "activation" and self-management education, and (3) a subset of the models from the Medicare Coordinated Care Demonstration (Peikes et al. 2008, 2009). Table 1 summarizes these models and their key attributes, which are described more fully below.

Not included among the effective care coordination models are large-scale "disease management" telephonic programs because they have shown little or no success in credible randomized trials (see Bott et al. 2009 for a concise summary of several CMS demonstration findings). Both the Medicare Health Support programs (which were financially at risk for all eligible Medicare beneficiaries in their target populations) and the Medicare Disease Management demonstration programs (which were at risk only for beneficiaries who enrolled) have failed to generate savings (Bott et al. 2009; Chen et al. 2008). Another large program, the LifeMasters program for dually eligible (Medicare and Medicaid) beneficiaries in Florida, has shown some promise, with savings of about 9 percent for a subset of program participants (those living in certain counties who had CHF or had both diabetes and coronary artery disease [CAD]) (Esposito, Stuart, and Brown 2008). However, even for these subgroups with the most favorable treatment-control cost differences, LifeMasters had no impacts on hospitalizations. Thus, this model does not meet the criteria for effectiveness established for this paper. Wagner (2004) notes other reasons to doubt the effectiveness of large-scale, commercial disease management programs.

Transitional Care Models

Some of the strongest evidence of care coordination interventions that reduce hospitalizations and costs are two well-tested models designed to reduce readmissions to hospitals. Readmissions within a short interval (30, 60, or 90 days, say) after a hospital discharge are a major problem for patients with chronic illness. Among all hospitalized Medicare patients, 18 percent are readmitted to the hospital within 30 days; readmission rates are even higher for patients with certain chronic illnesses such as CHF (unpublished data from the MCCD programs serving these patients showed 30-day readmission rates of 19 to 29 percent and 90-day readmission rates of 33 to 50 percent). These readmissions tend to occur because patients and their families often do not fully understand how to take their medications or perform other post-discharge self-care and the importance of doing so exactly as specified, nor do they understand the difference between normal post-hospital discomfort and symptoms signifying a potentially serious exacerbation or complication that requires immediate medical attention. Patients receive too little counseling while in the hospital and little or no at-home follow-up after leaving the hospital. Interventions devoted to rectifying these problems are often referred to as "transitional care" models because they focus on preparing patients and their caregivers for the transition from the hospital setting to the home.

The transitional care intervention developed by Naylor et al. (2004) targeted patients who were hospitalized for CHF and used highly trained advanced practice nurses (APNs) to administer the intervention.[2] Naylor's intervention was highly structured and effective. The APNs met with patients in the hospital and in their home shortly after discharge to provide intense coaching and education on medications, self-care, and symptom identification. The intervention lasted a total of 12 weeks, and patients were followed for one year. The intervention was evaluated with a randomized design and intent-to-treat approach with samples of 118 treatment group and 121 control group patients. During the year following the hospital discharge, the number of rehospitalizations per patient year was 34 percent lower in the treatment group than the control group (1.18 versus 1.79). In addition, rehospitalization rates in the treatment group were 44.9 percent compared to 55.4 percent in the control group, a decrease of 10.5 percentage points. This decrease in rehospitalizations occurring several months after discharge suggests that some patients may have reaped some benefits lasting well beyond the intervention period regarding ways to minimize their risk of hospitalization. At one year, treatment group patients also had mean total costs 39 percent lower than control group patients ($7,636 versus $12,481). The total intervention cost was $115,856 ($982 per patient).

The other successful transitional care model, developed by Coleman et al. (2006), also used advanced practice nurses as the care coordinators (referred to as "transition coaches"), but targeted hospitalized patients with a range of chronic conditions. Under Coleman's model, the one-month intervention provided patients with (1) tools to promote cross-site communication, (2) encouragement to take a more active role in their care, and (3) continuity of care and guidance from their transition coach. The intervention was evaluated with a random design, in which 750 subjects were randomized to receive the intervention or usual care (379 in treatment and 371 in control). Intervention patients had lower rehospitalization rates than control subjects at 30 days (8.3 percent versus 11.9 percent) and 90 days (16.7 percent versus 22.5 percent), as well as lower rehospitalization rates for the same condition that precipitated the initial hospitalization at 90 days (5.3 percent versus 9.8 percent) and 180 days (8.6 percent versus 13.9 percent). In addition, mean hospital costs were $488 lower for intervention patients than controls at 180 days ($2,058 versus $2,546). The annual cost of the intervention was $74,310 ($196 per patient), resulting in a net cost savings of approximately $147,797 over the 6-month follow-up.

While the impressive findings from these models are compelling, they raise the obvious question of whether some of these *initial* hospitalizations could have been prevented. A related problem is that including only patients who are in the hospital is that many patients will refuse to participate at that time (about half of the eligible patients approached by these studies declined to participate). Patients in the hospital are often

[2] Rich et al (1995) tested a similar intervention in a randomized trial and found the treatment group had statistically significant 56.2 percent fewer readmissions for heart failure at 90 days. Naylor et al. (1999) presents an earlier analysis of her intervention over a 24-week followup period, with large effects on hospital readmissions and costs similar to those found in her 2001 study.

confused, in pain, and disinclined to add yet another medical professional to their rapidly growing list. These two concerns limit the reach of the transitional care interventions and number of people impacted.

Patient Self-Management Models

Another model that has been shown to generate reductions in hospitalizations is one that focuses on educating patients in how to self-manage their condition. Kate Lorig and John Wheeler both developed such models and produced studies with strong designs and favorable results. The programs focus on four factors: identifying patients' goals, improving their self-management skills, building their sense of self-efficacy, and assessing their mastery of these skills.

Lorig et al. (1999, 2001) offered a community-based self-management program to patients who were 40 years of age or older and had a physician-confirmed diagnosis of heart disease, lung disease, stroke or arthritis. In seven weekly group sessions, course leaders[3] provided program participants with instruction on exercise, cognitive symptom management techniques, nutrition, fatigue and sleep management, use of medications, dealing with emotions, communication, problem-solving and other topics. The program was evaluated with a six-month randomized, controlled trial with an intent-to-treat approach that compared treatment subjects with wait-list control subjects (664 patients in treatment and 476 in control). Compared to control subjects, treatment subjects demonstrated improvements at six months in weekly minutes of exercise, cognitive symptom management, communication with physicians, and other healthy practices. Treatment subjects also had one-third fewer hospital stays (0.17 versus 0.25) and spent, on average, half as many nights in the hospital as control subjects (0.8 versus 1.6); these differences were statistically significant. Treatment subjects also generated $820 less in average 6-month health care costs than control subjects. The cost of the intervention was only $70 per participant, which produced health expenditure savings of approximately $750 per participant over the 6-month follow up.

Wheeler's (2003) model is in the same spirit as Lorig's work. Drawing from six hospital sites, Wheeler administered the "Women take PRIDE" program to women who were 60 years or older and had a diagnosis of cardiac disease. The four-week program featured four group meetings in which health educators taught program participants to manage cardiac problems such as diet, exercise and taking medicine. The program was assessed with a randomized study of 568 women (308 women in the intervention group and 260 women in the control group). Wheeler presents results from an intent-to-treat analysis, but focuses his discussion on findings for only the study participants (24 percent of the treatment group and 16 percent of controls withdrew or died). Using the more appropriate estimates from the intent-to-treat analysis, his results show that over a 21-month period following the intervention's conclusion, the treatment group experienced 39 percent fewer in-patient days and 43 percent lower in-patient costs than women in the

[3] Course leaders were a mix of medical professionals, non-medical professionals, and students, all of whom were trained to implement the intervention according to the program's protocol.

control group. The program cost about $374 per patient, resulting in a ratio of medical expenditure savings to program costs of approximately 5-to-1.

These studies and others reviewed by Hibbard et al. (2004) show that patients who are able to: "(1) self-manage symptoms/problems; (2) engage in activities that maintain functioning and reduce health declines; (3) be involved in treatment and diagnostic choices; (4) collaborate with providers; (5) select providers and provider organizations based on performance or quality; and (6) navigate the health care system, are likely to have better health outcomes." (Glasgow et al., 2002) suggests that this engagement can result in cost savings. Hibbard cites four stages that patients pass through in achieving activation: (1) believing the patient role is important, (2) having the confidence and knowledge necessary to take action, (3) actually taking action to maintain and improve one's health, and (4) staying the course even under stress.

These models are promising and their focus on patient empowerment is consistent with theories of behavior change. However, while some patients find group activities to be extremely supportive and helpful, many others are resistant, especially older patients and male patients. The generalizability of the findings to Medicare patients is also unclear, since Lorig's program served younger people and Stewart's served only female patients and included some under age sixty-five.

Models from the Medicare Coordinated Care Demonstration

A third group of models with evidence of success are those that focus on identifying patients with chronic illnesses at high risk of needing a hospitalization in the coming year and assigning a nurse care coordinator to work with them and their physicians to reduce this risk. These programs typically involve improving patients' knowledge of and adherence to treatment and self-care regimens, monitoring the patient's symptoms, well-being and adherence between office visits, advising the patient on when to see their physician, and apprising the patients' primary care physician themselves of important symptoms or changes observed. The programs couple this patient-centered intervention with efforts to improve communications and coordination between the patient's primary care physician and specialists and between these physicians and the patient. Finally, some of these models include a component involving working with the physicians to identify and rectify areas in which care for that patient may not be consistent with evidence-based guidelines.

Mathematica's Report to Congress (Peikes, Brown, Chen, and Schore, 2008) on the Medicare Coordinated Care demonstration (MCCD) and a recent followup article in the Journal of the American Medical Association (Peikes, Chen, Schore, and Brown, 2009) showed that a limited group of models that couple self-management education with ongoing monitoring and efforts to improve communication between patients and primary care physicians and among physicians can lead to reduced hospitalizations and costs. The evidence from this randomized trial of 15 independent programs, over a followup period averaging about 30 months per patient, was mixed. Each of the programs defined its intervention and the chronic illnesses and severity levels it would target. The

interventions were roughly similar on the surface, in that each used nurses as care coordinators, much of the contact was telephonic, and they devoted little attention to changes in physicians' general practices, but rather focused on monitoring patients and bringing to physicians' attention specific aspects of the care provided to individual patients in the demonstration that appeared to deviate from guidelines.

Only three of the programs had favorable effects on hospitalizations and costs—Mercy Medical Center, a hospital-based system in rural Iowa; Health Quality Partners, a non-profit community-based quality improvement organization (effects found only for their highest severity subgroup); and Georgetown University, a large academic medical center. For these three programs, hospitalizations were reduced by 17 to 24 percent and total Medicare costs by 10 to 20 percent. The savings were not enough to cover the cost of the intervention for Mercy, but were for the other two programs. However, the Georgetown program was never able to enroll many patients and terminated early, so discussion of successful MCCD programs is limited to Mercy and HQP.

The challenge in trying to identify "what works" in the MCCD was to identify the combination of structural and operational features of successful interventions that are not shared by ineffective interventions. This distinction is often difficult because (1) many unsuccessful programs look quite similar to successful ones on the surface, (2) dozens of program features and environmental factors can influence effectiveness (either by themselves or only in combination with other factors), and (3) it is *how well* program components are implemented, rather than simply their presence that determines whether an intervention succeeds or fails. For example, two programs may both offer patient education, but one may use a highly structured approach with reinforcement and built-in checks on patient learning, whereas the other may rely more on care coordinators' judgment about the important messages a given patient needs to absorb. Furthermore, certain "buzzwords" such as "patient-centered education" suggest a particular approach with obvious appeal, but it is frequently unclear precisely how such patient-centeredness should be implemented in order to be effective.

Detailed analyses of the 15 MCCD programs revealed six components that appear to influence the effectiveness of care coordination, considered below in detail (Peikes et al. 2009), We also note a few features that may be less critical although they may contribute to effectiveness.

Targeting. Examination of successful interventions suggests that care coordination programs are likely to have their greatest success with *patients at substantial risk* of needing a hospitalization in the coming year, but not necessarily those with the highest cost. The two most successful MCCD programs were those serving patients with average costs about twice the national average, and who averaged about 1 hospitalization per year per participant during the followup period.[4] About 80 percent of Mercy's control group had at least one hospitalization over the followup period, which averaged 30 months.

[4] HQP served patients with relatively low expenditures on average; however, its favorable impacts were concentrated entirely among their high severity group, which had average costs of approximately $900 per person per month.

Only one of the unsuccessful programs had average costs in this same range; the others either enrolled a substantially healthier mix of patients or a substantially higher severity mix. The evidence suggests that care coordination programs will have difficulty impacting costs for individuals at lower short-term risk within a 2- or 3-year period. Individuals at very high risk of hospitalizations would seem to present the most opportunity for savings, but in some cases these individuals have diseases that have progressed so far that little can be done to ward off hospitalizations. Wagner (2004), citing Riegel (2002), expresses a similar opinion.

Which diseases to target is another consideration. Mercy targeted heart disease. HQP enrolled patients with a range of diseases, but program impacts were much larger for those who had CHF, CAD, or COPD and at least one hospitalization in the year preceding enrollment.

In-person contact: The successful care coordination interventions had substantial amounts of in-person contacts with their patients.[5] While many of the contacts were by telephone, the successful care coordination programs averaged nearly one in-person contact per month during patients' first year in the program, far higher than most of the unsuccessful MCCD programs. Some of the programs saw the patient at the physician's office, at the time of a scheduled appointment. In other cases, care coordinators saw patients in their homes.

Access to timely information on hospital and emergency room admissions: Learning about the occurrence of acute episodes very shortly after they occur is a critical factor for care coordinators in ongoing programs such as the MCCD programs. Patients are particularly vulnerable for readmissions after a hospitalization or emergency room visit, and the incident may provide a heightened opportunity to explain how better adherence and self-care may prevent such occurrences. Both HQP and Mercy had access to such information, by virtue of being a hospital-based system (Mercy) or through arrangements made with area hospitals (HQP). Neither program, however, took full advantage of this information by implementing a structured transition intervention, such as those developed by Naylor and Coleman, to reduce readmissions.[6]

Close interaction between care coordinators and primary care physicians. Care coordination program directors consistently agree that a strong working relationship between the nurse coordinators and patients' primary care physicians is critical to the program's effectiveness. Two primary factors affected the strength of the relationship—nurse coordinators and physicians having the opportunity to interact face-to-face on occasion, and ensuring that all program patients of a given primary care physician are assigned to the same care coordinator. The Mercy program engaged patients' physicians

[5] Wagner (2004) makes a similar argument.

[6] Preliminary estimates suggest that none of the MCCD programs had statistically significant treatment-control differences in 30-day readmissions. HQP appeared to reduce 60-day readmissions, but the treatment-control difference was modest (3 percentage points), and smaller and not significant at 90 days after discharge. HQP implemented a modified version of Naylor's transitional care program late in the study period.

in the intervention in several key ways, including having them review the care plan and annual updates, and asking them to give the nurse care coordinators standing orders allowing the nurse to increase patients' dosage of diuretics. Mercy's nurses frequently met patients at their physicians' offices, whether the offices were part of the Mercy system or were in rural areas. Whenever possible, the program assigned the same care coordinator to all program patients who saw the same primary physician. HQP's care coordinators were well-known to local physicians through their association with Doylestown Hospital and agreements with other local hospitals. HQP also assigned care coordinators to patients so that a physician would work with the same coordinator for all of the program patients, provided that this did not require extensive travel for coordinators to visit all such patients in their homes. Only 2 of the unsuccessful MCCD programs had both co-location of the care coordinator and primary physician and assignment of the same care coordinator to all of a physician's patients in the program.

Services provided. All of the MCCD programs focused their interventions on assessing, care planning, educating, and coaching patients on self-management. The two most successful programs in the MCCD program were, with one exception, the only ones to show significant improvement (relative to the control group) in the proportion of patients being taught how to take their medications properly. They were also the two highest rated programs in the MCCD on patient education. In addition, some patients require social supports, such as assistance with daily living activities, transportation, or overcoming isolation. The successful MCCD programs emphasized the importance of having staff who could arrange such services for patients, when needed.

One major care coordination program feature for which the jury is still out is whether patients should be *continuously enrolled in the program*. Whereas the transitional care models and the group coaching models developed by Lorig and Wheeler engage patients for a limited duration of about 1 to 3 months, the successful MCCD programs kept patients enrolled for the life of the program (up to 6 years). The advantage of perpetual enrollment is that the relationship between care coordinator and patient remains intact, and the intervention can change as the patients' needs change. Some programs view this as especially important because the targeted patients have chronic diseases—there is no cure, and the conditions will eventually worsen. On the other hand, perpetual enrollment is expensive. Most programs classify patients into tiers, determined by their assessed level of need for monitoring and coaching at any given time, and move patients among these tiers as their condition and needs change. An essential design question still unresolved is whether programs should be paid different rates for the different tiers or a single rate that, on average, will cover program costs. The latter approach can lead to programs over-selecting eligible patients from the low-need tier (or selecting patients who can be quickly moved to this tier by the program intervention) to keep program costs down. Paying different rates for different tiers is also subject to abuse, unless care coordinators are *required* to devote a given level of attention to patients classified in a given tier. Such constraints would limit care coordinators' ability to use their professional judgment to tailor resources to the needs of the individual patient at a given time. Use of strict criteria for eligibility that target those truly at high risk of hospitalization and

limiting the number and types of patients excluded would reduce the potential for favorable selection by programs.

Staffing. The MCCD programs relied on registered nurses to deliver the bulk of their intervention, with each patient assigned to a particular nurse coordinator to establish rapport and preserve continuity with both the patient and the primary care physician. Successful programs routinely cite the experience and dedication of their care coordinators as central to their success. However, many unsuccessful programs hired highly skilled care coordinators as well. Thus, having highly competent and experienced staff is necessary for a successful intervention, but is not sufficient without other key features. The staffing ratios at the more successful plans were 50:1 at Mercy and 106:1 at HQP, with Mercy's much lower ratio being for a caseload with a substantially higher average severity level than HQP's. The median staffing ratio for the other 13 MCCD programs was 70.

One staffing issue that has not received sufficient attention in studies to date is whether social workers can serve as effectively as nurses as patients' care coordinators, or whether their role should be more on an as-needed basis. While they were not the principal care coordinators, social workers played an important role in the two successful MCCD programs. The Mercy program had a full time social worker to whom care coordinators referred specific patients. The nurse coordinators completed a social worker checklist for each patient upon their admission to the program, resulting in about 10 to 15 percent of the caseload receiving such referrals. The social worker linked these patients to services provided by the Veteran's Administration, Medicaid waiver services, and to places where they could get congregate or home-delivered meals. She also educated them on Medicare Part D and managed a program of volunteers who work with people on medication assistance. The social worker also worked with patients who needed help with grief and loss, domestic issues, or spiritual care. In interviews, Mercy's case managers stated that having a social worker as part of the team was key to their success, in part because a high proportion of patients lived in remote rural areas and had low incomes. HQP employs no social workers as part of the team, but the project manager is a licensed social worker and provides input to the nurse coordinators as needed. Most of her assistance is required in helping to arrange in-home meals, transportation, or home health care.

The Enhanced Discharge Planning Program (EDPP) initiated at Rush University Medical Center in 2007 should provide further insights into the scope of the role that social workers can serve as care coordinators. In this model the social worker is the care coordinator for the transition from the hospital to home, providing post-discharge phone and short-term care coordination for at-risk older adults. Assessments are completed using a Bio/Psycho/Social Framework that places equal importance on the psychosocial factors that affect health outcomes. The model uses existing health professionals and community partnerships to connect patients to health care providers and community-based services. An evaluation is in progress to determine the impact of the intervention on hospital readmissions and ER visits within 30 days, preventable admissions (falls,

patients unable to adequately manage medical conditions, and social admissions), and patient safety and satisfaction (Golden 2009).

Factors that Are Not Essential. Finally, while a variety of other features have been posited to be "essential" or recommended" for care coordination programs, there is little or no hard evidence to show that they would increase program effectiveness. Perhaps the most common such suggestion is the need for electronic health records and sophisticated health information technology. Coordinated care programs could clearly benefit from electronic health records that would yield immediate access to medical record information from all of the providers serving the patient. However, none of the successful (or unsuccessful) MCCD programs had such a system. Both HQP and Mercy had patient tracking systems, but these contained only the information that care coordinators input to the system. Thus, despite its appeal and obvious potential, expensive and comprehensive information technology is not essential to having a successful care coordination program.

POTENTIALLY PROMISING MODELS

Based on the evidence presented here, the most effective care coordination model would be one that combines transitional care, and possibly intensive self-management education, with an ongoing care coordination program. A major challenge is that even the more successful MCCD programs have generated reductions in Medicare costs of no more than $100 to $120 per member per month (pmpm) over their full population served, and that amount is barely enough (or not enough) to cover the programs' fees, leaving no net savings. However, combining all three components in a single program should yield greater cost reductions and could generate net savings. The hospital reductions and cost savings achieved by the successful MCCD programs were accomplished without the benefit of a structured transitional program; thus, the combination of these two components is expected to generate larger savings than either component alone. This conclusion is especially warranted by new analyses of MCCD data showing that very little of the reduction in hospitalizations for the MCCD programs were from reduced readmissions within the 90 days following a hospital discharge. Adding the intensive self-management intervention when a patient is first enrolled (unless they are in the hospital at the time) could reduce ongoing monitoring costs. However, some patients may be unwilling to engage in this type of intensive effort, so this component would need to be optional to avoid adverse effects on program participation. For those who are willing to engage in it, intensive self-management education in the first month or two may make it possible to reduce the frequency of ongoing contacts for care coordination and monitoring to a rate below that observed in the MCCD. This lower frequency would translate into higher average case loads per care coordinator and lower intervention costs, while maintaining patients' access to their care coordinator (and contact with the patient's primary care physician) should their health or situation change. The frequency and nature of the contacts after the initial intensive period must be tailored to the needs and circumstances of the individual patient, to obtain the optimum balance of efficiency and effectiveness.

A number of other models with promising results from small pilot studies or with creative designs that incorporate many of the desirable features identified above are currently being tested. The Guided Care model developed by Chad Boult and colleagues (Sylvia, et al., 2008; Boyd et al., forthcoming) has shown quite favorable results for hospitalizations and costs in a pilot test (though they are not statistically significant in their small samples). The Guided Care model features a multi-disciplinary approach, including the primary care physician, the "Guided Care" nurse, social workers, nutritionists, therapists, and pharmacists, and offers support for family caregivers as well as patient-centered care management.

The model gaining the greatest momentum is the Patient-Centered Medical Home (PCMH), a concept developed over the last several years under the joint auspices of the American College of Physicians, the American Academy of Family Practice, the American Academic of Pediatrics, and the American Osteopathic Association and now being actively promoted by a broad coalition of major employers, consumer groups, health plans, health care providers, and many others (Patient-Centered Primary Care Collaborative 2009). The Medical Home has many objectives that transcend effective care coordination, the principal one being to rejuvenate primary care and enable it to provide the foundation for health system reform. PCMH is featured in Senator Baucus' *Call to Action: Health Reform 2009,* included in the Congressional Budget Office's estimates of potential health reform initiatives (CBO 2009), featured in the Commonwealth Fund's *Path to a High Performance U.S. Health System* (Commonwealth Fund 2009), and the subject of a much anticipated Medicare demonstration.

As a recent Health System Change-Mathematica Policy Research Policy Perspective (Peikes et al. December 2008) highlights, the principles underlying the PCMH originate from two distinct conceptual frameworks: the primary care model and Wagner's chronic care model (p.3). The former focuses on all patients in a practice, emphasizing "whole person" care over time, while the latter emphasizes systems requirements to assure effective management of patients with chronic disease. The chronic care model assumes a solid foundation of primary care, so these frameworks, in general, are reinforcing. Where they have the potential to conflict will be in expectations for demonstrating "cost effectiveness." Criteria have been developing by which primary care practices can qualify to be "medical homes," and a number of private insurers in addition to Medicare are launching demonstrations to test the feasibility of the concept. Medicare has specified two levels of qualification, a "basic medical home" and an "advanced medical home" and proposed fees of approximately $27 per participating beneficiary per month for "low risk" beneficiaries (defined by a Medicare HCC score of <1.6) and $80 for "high risk" beneficiaries (HCC greater than or equal to 1.6) for the basic ("tier 1") medical home and $35 and $100, respectively, for beneficiaries in advanced (tier 2) medical homes. At present, the criteria for beneficiary qualification will include 86 percent of all Medicare beneficiaries in fee-for-service Medicare, with the expectation that one-fourth of these patients will be in the high risk group. Evidence from the MCCD suggests that if "medical homes" participating in the Medicare demonstration are expected to improve "care coordination" sufficiently to generate savings that equal or exceed the monthly fees

paid, they are unlikely to be successful because the program is not limited to the beneficiary population for whom savings are likely to be achievable. That is, the medical home model, even if implemented well, is unlikely to generate any savings for the low risk cases. Savings for the high risk cases may be sufficient to cover the fees paid for that group, if the medical home model is as effective as the most effective programs in the MCCD program. Thus, we expect the medical home model to increase net costs to Medicare for the low risk cases, which comprise three-fourths of all expected eligibles, by approximately the full amount of the fees paid for them.

Large clinics, group practices, and academic medical centers will have the array of staff, services, and systems to meet the requirements to qualify as "medical homes" and "advanced medical homes." Small practices of one or two physicians, who represent 83 percent of all practices and 45 percent of all physicians, will not (Pham 2007). Thus, there is also a need for community-based organizations that can team with physicians in small practices and perhaps the hospitals to which they admit their patients to build a "neighborhood" to support effective care coordination (Meyers and Clancy 2009). Community Care of North Carolina has created such a model. As described by Thorpe (2008), the North Carolina model links small physician practices with community health teams (CHT) comprised of care coordinators, nurse practitioners, social and mental health workers, and community health and outreach workers. This model can help ensure that evidence-based clinical preventive services and care coordination services reach patients who need them. More research is required to assess the effectiveness and cost-saving potential of the North Carolina model (see Ricketts et al. 2009 and Mercer 2009 for some preliminary evidence).

COSTS OF EFFECTIVE CARE COORDINATION PROGRAMS AND APPROACHES TO FINANCING

Even if effective care coordination programs can be defined in a way that distinguishes them from ineffective ones, the issue of how and at what level such services would be reimbursed under Medicare remains.

Under the MCCD, Medicare paid participating programs negotiated monthly fees per participating beneficiary ranging from $80 to $444, with an average of $235. Evidence to date from the MCCD (Peikes et al. 2008; Peikes et al. 2009) and the LifeMasters study (Esposito et al. 2008) suggests that effective, ongoing care coordination programs are capable of generating savings in total Medicare costs, before program fees, of about $100 to $120 per member per month (over the 2002-2007 period) if properly targeted. This finding suggests that program fees paid for care coordination should not exceed that amount, on average. The savings estimate is roughly consistent with the finding that the maximum reduction in hospitalizations observed is about 15 percent. With an average cost of about $11,000 per hospitalization[7], this would generate savings of about $1650

[7] This estimate is based on the author's calculations, using Medicare claims for beneficiaries with chronic illnesses in the MCCD demonstration. The estimate includes Medicare payments to the hospital, plus

per person per year for a population averaging one hospitalization per year, or $138 per member per month, if no other costs were affected.

It may be possible to generate larger net savings for Medicare by targeting the intervention more tightly on those at high risk of a hospitalization in any given year. However, the more tightly defined the target population is, the fewer beneficiaries potentially affected by it and the lower the total gross savings that can be achieved. Some preliminary work we have recently conducted for the Medicare Chronic Care Practice Research Network (MCCPRN) suggests that this group would best be defined on criteria that include both which conditions a patient has, and the severity of their condition, rather than simply the oft-cited criteria of the number of chronic conditions the beneficiary has. Current evidence suggests the best target group may be beneficiaries with CHF, CAD, or COPD and one or more hospitalizations in the past year, or multiple hospitalizations in the past 2 years for beneficiaries with any chronic illness. The group comprises about 18 percent of the Medicare population in any given year and accounts for about 38 percent of all Medicare expenditures in the subsequent year. More analysis is required to validate these results before a firm recommendation can be made.

Under Medicare's current Inpatient Prospective Payment System, hospitals have no incentive to provide and support effective transitional interventions because such interventions would reduce readmissions for targeted patients (by 25 to 34 percent, if the findings from published randomized trials can be replicated) and therefore reduce hospitals' total Medicare revenues. Incentives for hospitals to improve transitional care could be created by paying a higher base rate for all Medicare admissions to hospitals that have below average 30-day readmission rates and lower base rates to hospitals that have higher readmission rates, with the rates set so that total expected Medicare payments to hospitals are equal to the amount that would be generated if readmission rates nationally were reduced by a targeted percentage.[8]

Two developments in payment policy that could encourage health care providers at various levels to improve care coordination for Medicare beneficiaries with chronic illnesses are (1) bundled payment approaches being tested by CMS and recommended by the Congressional Budget Office (2009) and included in the President's 2010 budget (p. 28), and (2) creation of new billing codes for selected professional services fundamental to care coordination. Bundling of payments for episodes of care, perhaps including home health and SNF care as well as hospital readmissions, would provide a powerful incentive for hospitals to improve their transitional care.. New billing codes recently created by Medicare that allow providers to bill for medical team conference calls (with or without inclusion of the patient) and for motivational counseling, including readiness-to-change assessments, would overcome a major barrier to improved care coordination—lack of payment to physicians and other health care professionals for time spent in such

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physician, lab, and imaging costs incurred during the hospital stay, as well as home health and skilled nursing facility care immediately following the hospitalization.

[8] The base rate would need to be risk adjusted for the diagnoses and severity of illness of the patients, similar to the methodology currently used to adjust Medicare Advantage payment rates.

activities. However, Medicare does not currently recognize those codes for separate payment. It is unclear whether and when such payments might be activated.[9]

Another potential motivator for increased care coordination activities is CMS's pilot Resource Use Reporting program, in which physicians in selected states will be given feedback regarding Medicare expenditures and resources used per episode of care for their fee-for-service Medicare patients with certain chronic illnesses. These costs will be shown in relation to the mean and median of costs for such episodes in the local area, the state, and nationally. While no financial incentive is currently proposed to encourage physicians to improve their relative performance, the information alone may prompt physicians to be more conscious of improving coordination of the care they and other physicians provide to patients, thereby reducing their Medicare expenditures. If the methodology gains sufficient acceptance, CMS could consider tying reimbursement to such measures.

ISSUES FOR ONGOING RESEARCH

While much has been learned since the earliest care coordination efforts and the components of effective care coordination interventions can now be specified with a high probability of success, much remains to be learned. Among the issues for which greater clarity is required are:

- **How to identify the optimal target population**: using only data readily available to most clinics or programs, is there a simple way of identifying a mix of individuals who are at high enough risk to benefit from the intervention, but not so high risk that little can be done to help them? While HQP risk-stratified very successfully, it used the extensive Sutter assessment form, requiring a substantial amount of data that can be obtained only by interviewing the patient. What targeting criteria provide the optimal tradeoff between identifying a group for which the likelihood of generating savings is high, while not limiting the target population so severely that the impact on total Medicare costs is small?

- **Episodic vs. continuous enrollment/eligibility for care coordination:** while the transitional care and self-management interventions engage patients for a limited duration of about 1 to 3 months, the successful MCCD programs kept patients enrolled for the life of the program (up to 6 years). The advantage of continuous enrollment is that the relationship between care coordinator and patient remains intact, and the intervention can change as the patient's needs change. On the other hand, continuous enrollment is expensive. Most programs that maintain continuous enrollment classify patients into specific risk tiers based upon their assessed level of need for monitoring and coaching at any given time and move patients among tiers as appropriate. What is still undetermined is whether programs should be paid different rates for the different tiers or a single rate that on average will cover program costs.

[9] Private communication with CMS officials in the Center for Medicare Management, November 2008.

- **How best to provide the transitional care intervention:** should all care coordinators be trained in the transitional care intervention or is this intervention more effective if it is provided by a limited set of nurses who would specialize in transitional care? If the Enhanced Discharge Planning Program at Rush University Medical Center proves effective, should social workers as well as nurses be included in the pool of health professionals who can be recruited to provide transitional care interventions?

- **How to provide care coordination as efficiently as possible**: Given the difficulty of generating large savings, this is a very important area for further investigation. A key issue is determining the optimal frequency and nature of ongoing contacts with participating patients, and how this would vary with patients' characteristics and length of time in the program.

- **What mix of medical care interventions and social service supports is most effective** As people in care coordination programs age and get more frail, it is likely that their needs will become more heterogeneous, with fewer whose primary concern is avoiding hospital admissions and more whose primary concern is the risk of having to move to a nursing home. Programs may need to change their service mix and staffing to include more social workers and other personnel focused on the social support needs of frail individuals with chronic illnesses. It is unclear whether the most effective way to place more emphasis on social support will be to shift patients from care coordination programs to long term care-oriented programs, such as the Community Medical Alliance (CMA) program or PACE , or if care coordination programs should develop a continuum of care to meet these needs.

The Medicare Coordinated Care Practice Research Network, a group of 12 organizations across the country (including 8 from the original MCCD), is seeking funding to provide an ongoing "learning laboratory" that can systematically, rigorously, and quickly explore issues such as those listed above; enhance the understanding of which interventions work best for various subsets of the population; and develop detailed operational protocols to enable faithful replication of the successful interventions in a range of settings. Foote (2009) has recently suggested that such a network would have considerable value, and MedPAC will address the MCCPRN approach in its June 2009 Report to Congress. Bella et al. (2009) have made a similar recommendation for a "rapid learning network" for Medicaid.

POLICY IMPLICATIONS

The current evidence regarding effective care coordination supports the following recommendations for Medicare policy and for other payors seeking to improve outcomes for patients with chronic illnesses:

- Regarding the Patient-Centered Medical Home Demonstration, be very prescriptive about the requirements for what services are offered and how they are provided in specifying the requirements for the Patient-Centered Medical Home Demonstration.

- Offer vehicles for physicians in small practices to participate in an effective care coordination intervention.

- Target both medical homes and care coordination interventions on beneficiaries who are at substantial risk of hospitalization in the coming year.

- Create incentives for hospitals to participate in a transitional care intervention.

A practice that meets the qualifications to be a "patient-centered medical home" currently specified for the Medicare Demonstration would have several characteristics associated with effective care coordination: co-location of care coordinators with primary care physicians, having the same care coordinator for all of a physician's patients, access to timely information on hospitalizations, attention to improving patients' understanding of how to take their medications properly, and opportunity for substantial in-person contact between the care coordinator and the patient. Based on the evidence summarized here, other criteria should also be considered: inclusion of a patient self-management component as an option, inclusion of a transitional care intervention, and access to social workers to address isolation and community care needs. Without these prescriptive requirements, the medical home model could result in higher payments to participating practices and perhaps some improved patient outcomes but may not yield sufficient reductions in hospitalizations to achieve cost savings that would offset the monthly fees paid to medical homes.

It is also clear that *small* practices of one or two physicians will not be able to meet even the current requirements to be a medical home, let alone the additional ones suggested above. Small practices should be encouraged to coordinate care and perhaps meet the criteria for a medical home by teaming with a community health or quality improvement organization, a local clinic, or a medical center engaged in effective care coordination. Meyers and Clancy (2009) have made a similar recommendation in response to new evidence on the large total number of physicians seen by the patients of a typical physician, with whom the physician should presumably be coordinating their care.

In defining the Medicare beneficiaries eligible for inclusion in the medical home or in a care coordination program, the conditions and severity level shown to be responsive to care coordination interventions should be targeted. Recent unpublished work conducted by the author and colleagues suggests that this target population should include those who have high risk conditions (congestive heart failure, coronary artery disease, or chronic obstructive pulmonary disease) and have a hospitalization in the past year, plus beneficiaries with any chronic conditions who have multiple hospitalizations in the past 2 years.

Regarding hospital incentives, under Medicare's current Inpatient Prospective Payment System, hospitals have no incentive to provide effective transitional interventions because such interventions would reduce readmissions for targeted patients and therefore reduce hospitals' total Medicare revenues. Incentives for hospitals to improve transitional care could be created by paying a higher base rate for all Medicare admissions to hospitals that have below average 30-day readmission rates and lower base rates to hospitals that have higher readmission rates, with the rates appropriately risk-adjusted and set so that the total Medicare expenditures for hospitalizations do not exceed the level that would exist if average readmission rates nationally were reduced by some targeted amount. Hospitals could either implement their own program that closely follows the tightly specified protocols developed by Naylor or Coleman, or could contract with an external provider that implements such models.

The policy implications for Medicare are likely to apply to Medicaid, private payors, and the Veterans' Administration as well. The chronic illnesses plaguing these populations differ somewhat from those for Medicare beneficiaries, but it remains true that the majority of costs are associated with those who have such illnesses. Better coordination of the care that these patients receive will continue to be one of the best opportunities for reducing costs and improving patient well being, through reduced need for hospital and institutional care.

Succeeding in these efforts to improve care coordination is critical to the health of American consumers, and to the cost of health care in the United States. While better care coordination is not the sole solution to the entire health care problem, it is achievable now, and can improve the quality of life for millions of Americans. It is important to move forward with what the best evidence suggests has the most promise, while continuing to improve and refine these interventions.

TABLE 1
CARE COORDINATION PROGRAMS WITH THE STRONGEST EVIDENCE OF REDUCTIONS IN HOSPITALIZATIONS AND COSTS FOR PATIENTS WITH CHRONIC ILLNESSES

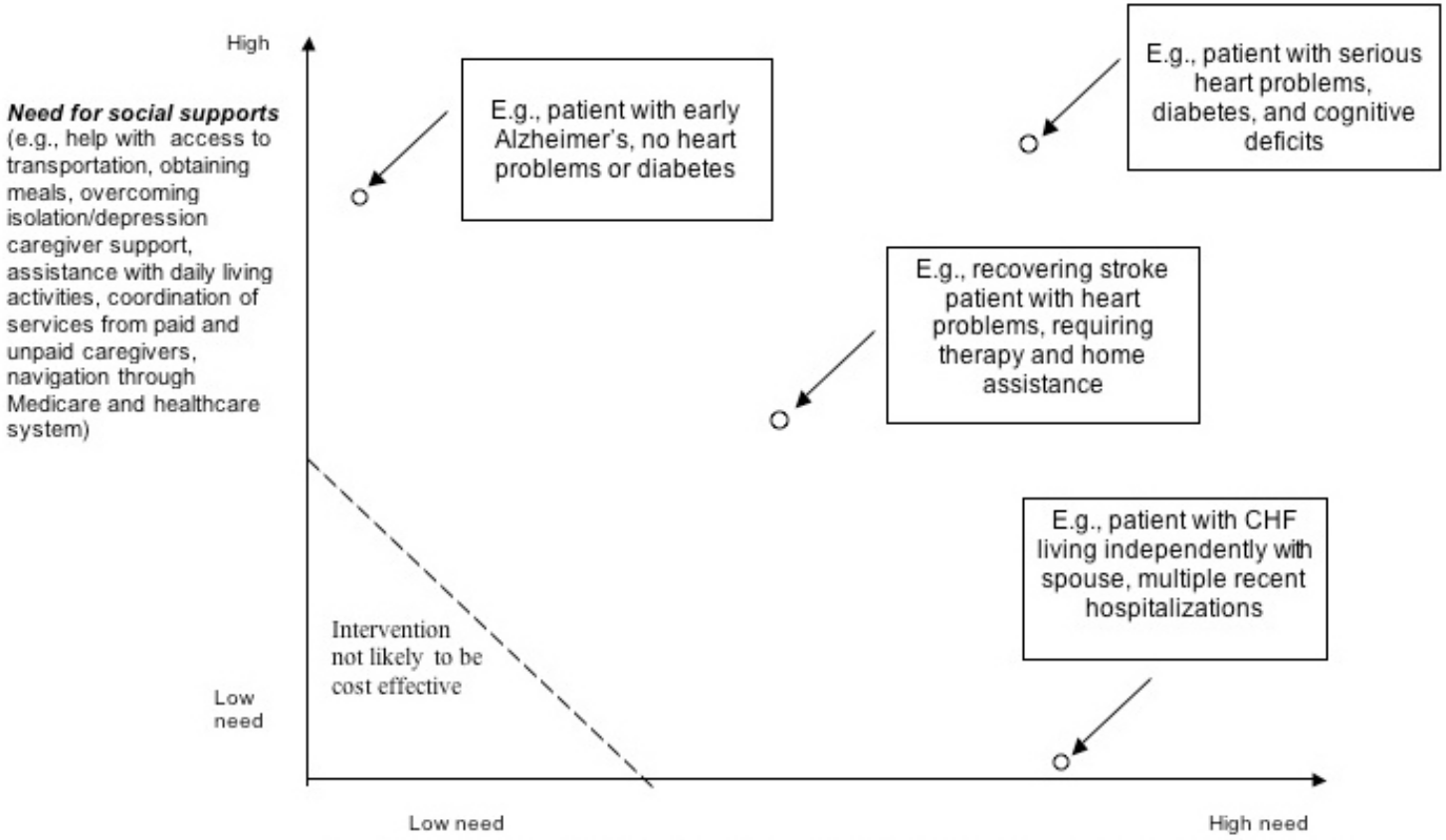
	Programs					
	Naylor (2004)	Coleman	Lorig	Wheeler	Mercy	HQP
Structural Characteristics						
Target population	CHF inpatients	Inpatients w/ chronic illness	Chronic illness	Women with cardiac problems	Heart Problems	Chronic illness
Setting	Hospital/home	Hospital/home	Community	Community	Outpatient hospital	PCP's office / patient's home
Intervention Type	TR	TR	SM	SM	CC	CC
Length of Intervention	3 months	1 month	7 weeks	1 month	Open-ended	Open-ended
Staffing	APN	APN	Medical and non-medical personnel	Medical and non-medical personnel	RN BSN	RN
Use of social worker	No	No	No	No	Yes	No
Use of volunteer/leader	No	No	Yes	Yes	No	No
Staffing ratio	5 APNs for 118 patients	Each APN managed 24-28 patients	87 leaders for 664 participants	Each leader taught 6-8 participant	Caseload at full enrollment: 1:40 to 1:60	Caseload at full enrollment: 1:94
Focus of Intervention						
Adherence	X	X	X	X	X	X
Monitoring	X	X	X	X	X	X
Working with PCP	X	X			X	X
Improving communication	X	X	X	X	X	X
Getting physicians to change treatment	X	X			X	X
Arranging support services	Limited	Limited	Limited	Limited	Limited, except for high severity patients	Limited, except for high severity patients

Evaluation Features						
Followup length	1 year	180 days	6 months	21 months	30 months on average	30 months on average
Sample size (nt/nc)	118/121	379/371	664/476	233/219	463/467	739/725
Methodology	RCT	RCT	RCT	RCT	RCT	RCT
Impacts	-10.5% rehosps at 1yr -$4,845 in mean total costs at 1yr	-3.6% rehosps at 30d -5.8% rehosps at 90d -4.5% rehosps for same condition at 90d -5.3% rehosps for same condition at 180d -$488 mean hosp costs at 180d	-0.8 fewer nights in hospital -$820 in 6-month costs	-46% in-patient days -49% in-patient costs	-17.0% #hosps -$113 pmpm	-13.6% #hosps -$100 pmpm
Costs	Total cost of intervention: $115,856 ($982 pm)	Annual cost of intervention: $74,310 ($196 pm)	$70 pm	$374 pm	$248 pmpm	$102 pmpm

TR = transitional care intervention
SM = self-management intervention
CC = coordinated care intervention
pm = per member
pmpm = per member per month

FIGURE 1

HEALTH-RELATED AND SOCIAL SUPPORT NEEDS OF BENEFICIARIES WITH CHRONIC ILLNESSES



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