

The Value of Nursing Care Coordination

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The Value of Nursing Care Coordination: Executive Summary

Why “care coordination” and why now? Care coordination has been proposed as a solution to many of the seemingly intractable problems of American health care: high costs, uneven quality, and too frequent disappointing patient outcomes. More resources are devoted to health care per capita in the United States than in any other nation, yet our fragmented system is often characterized by communication failures and non-beneficial or redundant healthcare tests and services. This results in an unacceptable risk of error and an increase in cost, in terms of both resources and human suffering.

Many independent elements of U.S. health care are high quality, but these need to be better aligned to serve patients and the people and institutions that care for them. Current financial and structural incentives restrict potential for better patient care outcomes and effective resource allocation. Rather, they intensify the weaknesses inherent in the non-coordinated, independently functioning pieces of our health care system. The development and implementation of effective systems and processes to cure this current misalignment can benefit tremendously from the experience, professional competencies, and long-standing ethos of registered nursing.

Coordination of care is not a new idea, and it is certainly not new to registered nurses. In the context of a partnership guided by patients’ and families’ needs and preferences, the registered nurse is integral to patient satisfaction and care quality, as well as the efficient use of health care resources. Patient-centered care coordination is a core professional standard and competency for all nursing practice. Registered nurses understand that they are an essential component of the care coordination process to improve patients’ care outcomes, facilitate effective inter-professional collaboration, and decrease costs across patient populations and health care settings. What is well known to registered nurses, however, has not often been recognized outside of nursing. This white paper was initiated to highlight both the qualitative and quantitative accomplishments of registered nurses in care coordination.

RNs and APRNs have been performing care coordination as a core part of the nursing discipline since the turn of the last century.

Care coordination has been defined by numerous groups, many of which have focused on specific patient populations in specific settings. ANA has adopted the approaches of the National Quality Foundation and the Agency for Healthcare Research and Quality. Care coordination is (a) a function that helps ensure that the patient’s needs and preferences are met over time with respect to health services and information sharing across people, functions, and sites; and (b) the deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient’s care to facilitate the appropriate delivery of health care services. Additionally, the best coordination model is one in which a patient experiences primary care as

delivered by an integrated, multidisciplinary team that explicitly includes at least one staff care coordinator.

The value of registered nurses in care coordination roles has been demonstrated in numerous health care reform initiatives focused on integrative service delivery. Nurses design, implement, and participate in care coordination projects and practices that seek to improve patient outcomes and decrease costs, frequently demonstrating the effectiveness of nurse-led and patient-centered care coordination. The focus of this white paper is on recent reports and studies that have documented results involving registered nurses in care coordination.

While the results derive from a wide variety of settings and diverse patient populations, the conclusions reached are strikingly similar. Authors observed the following:

- Reductions in emergency department visits
- Noticeable decreases in medication costs
- Reduced inpatient charges
- Reduced overall charges
- Average savings per patient
- Significant increases in survival with fewer readmissions
- Lower total annual Medicare costs for those beneficiaries participating in pilot projects compared to control groups
- Increased patient confidence in self-managing care
- Improved quality of care
- Increased safety of older adults during transition from an acute care setting to the home
- Improved clinical outcomes and reduced costs
- Improved patient satisfaction overall

There is much more to be learned. But the pattern of results to date is very suggestive and demands expanded research. RNs and advanced practice registered nurses (APRNs) can play substantial roles in care coordination to improve the delivery of health care. Nurses are central to coordinating the patient experience, targeting both cost efficiencies and improved care outcomes for diverse patient groups. Different care settings, patients' needs, and availability of resources may influence the selection of a care coordinator. For many patients, the registered nurse is the most appropriate care coordinator.

In order to fully achieve this potential, clear models and outcome measures are needed to specify the context for care coordination, identify nursing competencies, and value the nurse's role

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within the health care team. To this end, ANA recommends that (a) more research be conducted to improve quality measures and the understanding of best practices of effective care coordination; (b)

registered nurses' education should be enhanced throughout their didactic and clinical learning experiences by incorporating care coordination, including an emphasis on inter-professional, team-based care; and (c) nursing organizations and nurse leaders should identify and implement care coordination opportunities and nurse-led care coordination models. Further, care coordination must be explained to patients (and families) so they will know how it may affect both their treatment and their participation in their treatment.

ANA is deeply committed to improving the quality of outcomes for patients and providing greater health care efficiencies through care coordination that is centered on the needs and preferences of patients and their families. ANA recognizes and promotes the integral role of registered nurses in the care coordination process to improve patient care quality and outcomes, and to decrease costs across patient populations and health care settings.

Introduction

Care coordination is foundational to the health care reform goals of improving the quality of care for individuals and populations via the efficient and effective use of resources. The increased complexity of care, growing numbers of patients with chronic disease, and exploding health care costs heighten the need for better integration of care without increased expenditures (Robinson, 2010). Very convincing evidence indicates that uncoordinated care greatly increases health care costs, but there is still a need to identify “best practices” and describe models and interventions that achieve patient-centered, high-quality care.

Despite the challenges of measuring the cost effectiveness of care coordination, addressing care gaps, and avoiding service duplication, there is consensus around the need for a designated health professional to provide patient/family-centered care coordination (National Coalition on Care Coordination, 2010). Care coordination is a professional competency of all registered nurses (American Nurses Association, 2012). In numerous studies and analyses, registered nurses, in partnership with other providers, have integral roles that improve patient care quality through care coordination across health care settings and populations.

The American Nurses Association (ANA) position statement, *The Nurse’s Essential Role in Care Coordination* (2012), affirms that registered nurses are integral to the achievement of care coordination excellence. This white paper describes the roles and benefits of nursing in the care coordination process and provides evidence of the centrality of registered nurses to health care that is patient centered, high quality, and cost effective.

Background

Health care in the United States is characterized by overuse, underuse, and misuse (Orszag, 2008) with unsustainable costs, sub-optimal outcomes, and increasing numbers of uninsured citizens. Care coordination has been identified as an essential strategy to control costs while achieving value in health care. The Patient Protection and Affordable Care Act invokes *care coordination* throughout its provisions to improve quality and control costs to transform the health care delivery system (2010). Care coordination is also a key feature of evolving Accountable Care Organizations (ACOs), which seek to integrate effective care coordination with accountability, incentives, and quality measurement. The goal of the ACO is to improve patient-centered care quality and control costs within and across settings. Ideally, patient- and family-centered care coordination integrates shared plans of care among all relevant providers and through episodes of care in multiple settings.

Care coordination models vary, but

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typically they utilize case managers, care transition programs, disease management, health information technology, and other strategies to manage service delivery and support patients and providers. Care coordination has the potential to reduce cost and improve outcomes for all populations in all health care settings; the most impressive outcomes occur in high-risk populations whose complex health issues involve costly treatments and repeated hospitalizations (National Quality Forum, 2010).

The stakes are very high for health care reform to institute effective care coordination. A study commissioned by the Institute of Medicine reported on the analysis of over nine million Medicaid and dual Medicare/Medicaid patient claims records for five large states to determine patterns and costs associated with uncoordinated care (Owens, 2010). About 10% of patients demonstrated extreme patterns of uncoordinated care and accounted for 30% of program costs. Specifically, uncoordinated care patients accounted for 46% of drug costs, 32% of medical costs, and 36% of the total costs for this population segment. On average, patient costs of those with uncoordinated care were 75% higher than matched patients whose care was coordinated. Owens suggested that enhanced care coordination could reduce 35% of costs. Extrapolating those findings for national public plans resulted in projected annual savings of \$133.5 billion. If care coordination were implemented for both public and private plans nationally, projected savings would be \$240.1 billion per year, according to Owens' model.

According to the National Quality Forum (NQF), care coordination is foundational to quality health services (2010). In fact, care coordination could be the key to accomplishing the "Triple Aim" of Center for Medicare and Medicaid Services (CMS): (a) improving the individual experience of care, (b) improving the health of populations, and (c) reducing the per capita costs of care for populations.

Various care delivery models, including nursing-led models, have been evaluated in relation to improved clinical and financial outcomes. In general, care coordination results in better care at lower cost, particularly for populations with multiple health and social needs (Craig, Eby, & Whittington, 2011). Team-based care coordination and outreach efforts supported through the Primary Care Medical Home (PCMH) model suggest a significant return on investment with care coordination of both Medicaid and Medicare populations (Grumbach, Bodenheimer, & Grundy, 2009).

Defining Care Coordination

Many health policy groups, professional organizations, regulatory agencies, and consumer advocacy groups have been challenged to define care coordination. Examples of such groups include the Agency for Healthcare Research and Quality (AHRQ), the Center for Health Systems Change, NQF, National Committee for Quality Assurance, the Institute for Healthcare Improvement (IHI), ANA, the American Medical Association, and the American Association for Retired Persons. Care coordination is conceptually intertwined with organizational analysis,

quality improvement, and prevention science (McDonald et al., 2010). Writing for the IHI, Craig, Eby, and Whittington, (2011) state, “the best coordination model is one in which a patient experiences primary care as delivered by an integrated, multidisciplinary team that includes at least one care coordinator staff person” (p. 8).

Two respected organizations have devised complementary definitions that together succinctly capture care coordination. The NQF defines care coordination as “a function that helps ensure that the patient’s needs and preferences for health services and information sharing across people, functions, and sites are met over time” (NQF, 2006). The AHRQ defines care coordination as “the deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient’s care to facilitate the appropriate delivery of health care services” (McDonald, et al., 2010).

The Nurse’s Role

In a recent statement to CMS, ANA advocated for the vital role of nurses in the design and implementation of care coordination systems within institutions and organizations (ANA, 2011). The care coordination process is one aspect of professional practice through which registered nurses at every level regularly influence patient care. Within PCMH models, nurses are central to coordinating the patient experience, targeting both cost efficiencies and improved care outcomes for diverse patient groups. Many practice innovations in the nursing community are showcased by the American Academy of Nursing’s (AAN) Edge Runners program as part of its Raise the Voice campaign for transformational health leadership (AAN, 2012). The Edge Runners program highlights pioneering care models and interventions that improve clinical and financial outcomes for large numbers of patients in a variety of care settings. To date, over 50 nurse-driven programs in a variety of settings among various populations have been recognized for reflecting new thinking in an ailing health care system (AAN, 2012).

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Review of Literature

Measuring and achieving health care value is complex but essential (McDonald, et al., 2007). The value of registered nurses in care coordination roles is demonstrated in numerous health care reform initiatives focused on integrative service delivery. Nurses have designed, implemented, and participated in care coordination projects and practices that seek to improve patient outcomes and decrease costs, frequently demonstrating the effectiveness of nurse-led and patient-centered care coordination (Boyd, et al., 2009; Coleman, 2006; Naylor, Aiken, Kurtzman, & Olds, 2010; Naylor, Aiken, Kurtzman, Olds, & Hirschman, 2011; Naylor, et al., 1999).

Acute Care Coordination Models

A retrospective study of 826 patient records demonstrated that the addition of a nurse practitioner (NP) improved patient outcomes and reduced emergency room visits (Robles, et al., 2011). The staff at the Department of Surgery at Loyola University had noticed more disrupted care coordination and patient concerns, because of resident hour restrictions. The department hired an NP for discharge planning and outpatient visits for patients in the colorectal and surgical oncology clinics. The primary responsibility of the NP was to collaborate with resident and attending physicians to coordinate discharge plans and communicate with patients after discharge through post-operative visits and phone calls. The number and substance of telephone contacts were measured and components of discharge plans were assessed. The study authors found a 64% increase in the amount of telephone contact initiated and received by the NP. There was a substantial increase in the use of home health RNs and rehabilitation therapies. There was a 52% reduction in emergency department (ED) visits that did not result in admission. The number of unnecessary ED visits was defined as the number of trips to the ED that did not result in admission to the hospital. Each ED visit was estimated to cost at least \$800. The number of patients admitted to the hospital was not considerably different prior to and following hiring of the APRN. This may indicate that patients who were seen in the ED and admitted were appropriate. Overall, this pilot study supports the role of the APRN in care coordination.

In some studies, care coordination is being combined with other types of modalities such as relaxation therapies to decrease costs of care. Kligler, et al., (2011) conducted a study of “patient navigators” to facilitate coordination of care, working in tandem with specially educated nurses who introduced a variety of complementary therapies to address symptoms of pain, anxiety, insomnia, and nausea in their oncology patients. This innovation in practice, combined with coordination of care, demonstrated a noticeable decrease in medication costs in the order of \$469 per patient. When these costs were extrapolated to patient days per year, the projected savings to the hospital were \$977,184.

Gundersen Lutheran Health System’s Care Coordination model is based on an effort to reduce re-hospitalizations by identifying the sickest 1-2% of the system’s patient population and providing care coordination services in an integrated model. Gundersen Lutheran employs 24 registered nurses and 4 social workers in the program who coordinate care for approximately 1,250 participants. The case load is 40-60 patients for each RN and 70-100 patients for each social worker. The RN maintains contact with the patient and other members of the health care team; the participant’s care is managed in the ambulatory setting as much as possible. The social worker partners with the RN to assess financial, social, and emotional needs and assist patients in obtaining the resources they need to manage their care at home.

This model demonstrated significant results. The total charges were reduced by \$6.5 million during the first year; an additional \$3 million was saved in the second year. Prior to

implementation of the program, approximately 80% of health care charges were inpatient related. After the program was initiated, inpatient charges were reduced by 55%, and overall charges were reduced by 40% (\$10 million). The average cost of care coordination during the 2005-2009 time period was \$2,000 per patient per year. Ultimately, for every \$1 invested in care coordination, the hospital realized an \$8 reduction in health care charges. When managed appropriately, inpatient visits were less frequent, less critical, and were, on average, 30% shorter.

The health care savings associated with a successful care coordination program in the sickest of the health system's population implies that better care coordination of the moderately sick, composing 2-5% of the system's population, could also result in more effective health care utilization. Although Gundersen has contributed significant quantitative data to support the RN care coordination role, they recommend more research, especially on the moderately ill patient.

Care Coordination involving Transitions

Care coordination has demonstrated improved outcomes and cost savings for patients transitioning from acute care hospitals to the home, especially for the frail, elderly population. The work of Naylor, et al., (2004) with older adults during acute episodes of heart failure described the challenges faced by patients with multiple comorbidities. Naylor, et al. built on previous studies that suggested that older adults were at increased risk for errors during and after the transition from hospital discharge to home. Naylor, et al. designed a randomized control trial involving three advanced practice registered nurses (APRNs) who followed hospitalized patients admitted with heart failure throughout their hospitalization and for three months post discharge. The intervention group had at least eight APRN visits during the three-month transition period. The intervention simultaneously collaborated with patients' other providers to prevent medication and other errors, and identified exacerbation of comorbidities for prompt intervention, to focus on developing strategies for patients and families to motivate the older adults and encourage their adherence to the plan of care. The study measured the effectiveness of the APRN-directed intervention strategies based on the time to first readmission or death, re-

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hospitalizations due to heart failure or other comorbid conditions, quality of life, functional status, costs, and satisfaction. Study participants had to be English speaking, alert and oriented, reachable by phone, and live within a 60-mile radius of the admitting hospital. The three APRNs were educated in the unique needs of older adults by a multidisciplinary team of

providers. The program provided intense APRN involvement in the acute setting with coordinated discharge planning and post-discharge interventions. Phone interviews were conducted by research assistants regarding unscheduled MD visits or hospitalizations and other measures, including satisfaction and quality of life.

The results were an estimated average savings of \$4,845 per patient over three months, with a significant increase in survival and fewer readmissions. Additionally, intervention patients had fewer hospital days than in the control group (Naylor, 2004). When the program ended after three months, the intervention effect was lessened as the one-year mark approached, suggesting that continued APRN involvement was needed to maintain health outcomes in this population. The APRNs had flexibility to individualize care plans and interventions according to the needs of the patients and their families while utilizing evidence based protocols. It is important to note that this program excluded very frail individuals whose needs for this type of intervention might be even greater than the study participants.

Community-based Care Coordination

Atherly and Thorpe (2011) demonstrated significant cost reductions among high-cost, chronically ill Medicare patients by using an inter-professional clinical team and nurse care coordination to educate and empower patients. The goal of this program was to enable patients to increase their ability to engage in self-care management activities. The RN care coordinators worked with patients and their caregivers to promote adherence to clinical care plans. Findings from this study revealed that total annual Medicare costs for the participating sample were 15.7% lower in 2007 (\$3240) than for the control group. In the descriptive analysis, the mean spending for the intervention group was \$3567 lower than for the control group.

Nurse care coordination of patients 65 years of age and older living in the community also resulted in improved quality of care and cost savings (Coleman, Perry, Chalmers, & Min, 2006). This research examined the effects of care transition interventions on re-hospitalizations within 30 days for 750 community-dwelling older adults (65 years of age and older). The Care Transitions intervention utilized transition coaches (APRNs or RNs) who worked within an integrated delivery system. The four-week intervention focused on enhancing the self-management skills and knowledge of older adults after being discharged home from a hospital. The main components of the intervention included medication self-management, a patient-centered record, primary-care and specialist follow up, and patient knowledge of “red flags”—warning signs and symptoms indicative of a worsening condition. Home visits were conducted 48-72 hours post hospitalization, with three phone follow-ups during the 28 days after hospitalization. The total cost of the transitional care interventions was \$70,980, resulting in annual cost savings of more than \$295,000 for the entire group. Participants reported increased confidence in the ability to self-manage their care. The findings from this study demonstrated that care coordination improved the quality of care and reduced costs, while ensuring the safety of older adults during a transition from an acute care setting to the home, when they are most vulnerable to poor health outcomes.

Laughlin and Biesel (2010) describe several pilot projects to increase the functionality of nurses employed in ambulatory care practices. For RNs caring for ambulatory patients with chronic

health problems, the authors describe strategies to expand and improve the role of RNs beyond activities such as telephone triage, patient education, technical care such as infusion and medication administration, and visits with patients incident to physicians' plans of care. The authors noted that prior to piloting new RN roles, the Chronic Care Model (Wagner, 1998) guided the care system in the practice. A six-month trial was accomplished with two groups; one group received enhanced diabetic care with their visits, and the other group received telephone cold calls. Although the group comparisons were limited by the small sample size, descriptive data demonstrated improved outcomes in statin use, number of foot exams, blood pressure control, and inclusion of eye exams. An additional pilot study was described by Laughlin and Beisel in this article: Telephone outreach was used to reconnect patients to their medical home post hospital discharge, improve care coordination, and assess gaps in knowledge, skills, and

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resources to manage at home. RN care coordination activities were documented on an electronic health record. The most frequent activities were medication management (89%), self-management goal setting (63%),

referral to a primary care provider (51%), and care coordination among providers or services (20%). These findings suggest that patients were frequently discharged from hospitals without adequate medication knowledge or financial access to medications. Inadequate caregiver support and lack of follow-up appointments at the time of discharge are indicative of uncoordinated care for some patients. The effects of these new models suggest potential for cost savings (no cost data were presented in the article).

Marek, Adams, Stetzer, Popejoy, and Rantz (2010) demonstrated that nurse coordination helped decrease overall costs for a geriatric Medicare-Medicaid dual eligible population in a community-based long-term care program. Total Medicare costs savings were \$686 per patient in a 12-month period. Medicaid costs increased \$203 per patient in a 12-month period. The nurse care coordinators in this study followed older adults across all care settings.

As people age, they may experience physical and/or cognitive decline that requires nursing home placement—something most would prefer to avoid. In the current health care system, there is a need for care systems that support better health outcomes while reducing costs in this growing population. RN care coordination may be a way to achieve these goals. Rantz and colleagues (2011) at the University of Missouri's Sinclair School of Nursing (MUSSON) developed an Aging in Place (AIP) model of care aimed at allowing older adults to remain at home while receiving supportive health care. A state-sponsored AIP incorporated two sites where there was RN care coordination. One site was designed to provide care through end of life (AIP 1 TP). The other was an independent living apartment within a continuing care retirement community (AIP

2 MW). The aim of AIP is to help older adults to remain independent and stay in their homes as long as possible before having to move to a higher level of care.

The MUSSON-owned and operated Sinclair Home Care Agency provided care to residents of AIP 1 TP and AIP 2 MW. An RN coordinated the care of all residents in collaboration with health care providers, families, and other health care professionals. Care coordination included health assessment, ongoing monitoring of residents' health status, recognizing and intervening when there was an acute change in health status, medication management, and facilitating other health care services. Care delivery encouraged independence and self-care, providing only services that were needed; after acute situations when health status improved, additional services were withdrawn. An evaluation of the first four years of the state-sponsored AIP settings indicated RN coordination improved clinical outcomes and reduced costs, compared to a similar case-mix in traditional nursing homes.

At AIP 2 MW—during all four years of this pilot project—the average combined housing and annualized care cost remained lower than the national average cost for both nursing home and assisted living by several thousand dollars per year (\$1137 to \$2591 per month). AIP 1 TP also showed similar annualized savings. In both settings, home health services with RN coordination improved or stabilized clinical assessment measures, reduced nursing home use, and were cost effective. Fall-risk scores showed a continual decline throughout the study, indicating a reduction in need for costly rehabilitation services. Cross-sectional analysis revealed that although mental health (depression and quality of life) improved at both sites, cognitive abilities declined, measured using the Mini Mental State Examination (MMSE) to evaluate cognitive function. This may be due to the MMSE's insensitivity to early cognitive impairment and the RN coordinator's timing of the resident's cognitive evaluation. This supports the need for conducting cognitive assessment as a part of a regular geriatric assessment. Socialization at both sites increased, which is most likely due to social work interventions as recommended through RN annual and semiannual assessments.

The AIP also served as a cutting-edge health care delivery site for students requiring research or clinical experiences in nursing, health care informatics, social work, and electrical and computer engineering. While pursuing their education, some nursing students sought work as home health aides, further enhancing their knowledge and skills to care for older adults. These skills are particularly important in light of the Institutes of Medicine Report (2008) indicating the shortage of health care workers for an aging U.S. population.

Although the findings from this study are promising, the scope of the research did not include the frail older adult. Many scholars suggest that care coordination is most fruitful in frail older adult populations, especially those who are experiencing transitions from one level of care to another, such as discharge from hospital to home. This population should be considered in future work.

Care Coordination for Children with Special Health Care Needs

As with various other patient populations, children also receive demonstrated value from care coordination. Care coordination is especially important and challenging for children who have complex chronic conditions that may be lifelong and require special services. These children are often called *children and youth with special health care needs* or *children with special health care*

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needs. In fact, the initial concept of *medical home* was first developed by the American Academy of Pediatrics and the federal Maternal and Child Health Care Bureau with just these children and families in mind (Sia, Tonniges, Osterhus, & Taba, 2007). Three studies examining the benefit of care coordination for children with special health care needs are worth mentioning.

Nurse care coordination for children and youth with chronic conditions has resulted in improved quality and reduced costs. Antonelli, Stille, and Antonelli (2008) conducted a study to quantify the activities, personnel costs, and outcomes associated with care coordination for children and youth with special health care needs. Care coordination activities were measured in six pediatric clinics varying in size, population, and practice models. Data were collected over 220 days with a total of 3,855 encounters representing 3,172 patients. There were 92 data collectors including physicians, nurse practitioners, RNs, licensed practical nurses, licensed clinical social workers, and clerical staff, who documented 6,507 interventions. Of those interventions, 32% prevented resource use outside of the primary care setting. The RNs intervened to eliminate the majority of potential unnecessary resource use (62%), resulting in an 81% reduction in emergency room visits and a 63% reduction in unnecessary medical office visits. It was postulated that further savings would be realized through secondary benefits, such as a reduction in lost work days due to illness or time off for medical office visits.

Farmer, Clark, Drewel, Swenson, and Ge (2011) randomly assigned 100 children and their families to either an intervention group receiving care coordination or to a usual care group for six months, and then switched the groups to provide the control group with the intervention for the second six months of the project. All children were part of a Medicaid-managed care plan and had at least one health condition lasting at least one year. A care team was put in place which included a physician, a staff member (usually a nurse), and a family support specialist. One nurse

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practitioner, two nurses, and a social worker provided families with support, care coordination, written care plans, and

resources. The written care plan and support from the care coordinator were valued by the parents, and physicians valued the assistance for solving problems of these children and families with complex conditions. Using a variety of analytical techniques, an analyses of the data includes overall child health ratings and identifies a trend of improved child functional status.

Even more challenging is coordinating care across systems for children with special health care needs, from primary care to specialty care (often called *tertiary care*). Gordon, et al. (2007) used three years of longitudinal data to examine the care of 230 children with complex illnesses who were enrolled in a dedicated program for children with special health care needs. Pediatric nurse case managers served as single points of contact for the families and providers. These nurses created care plans, communicated with families and providers, and advocated for children and their families inside and outside the health care and school systems. The study measured resource utilization, charges, and payments. The authors found a decrease in hospitalizations and hospital days and an increase in clinic visits, which are much less costly than hospitalization. The total costs of care for the children in the study were reduced.

Technology such as telehealth capability, coupled with advanced knowledge and skills, may prove to be beneficial in this population. Looman and colleagues (2012) describe a Value Model of nurse “dose” to patient complexity in an urban pediatric clinic with a dedicated advanced practice nurse care coordinator for children with complex special health care needs. The Value Model proposes that improved outcomes require a match between the complexity of the patient and family needs and the education and scope of practice of the nurse care coordinator.

The Value Model project is a federally funded, four-year, three-armed randomized controlled trial within an existing large urban pediatric clinic affiliated with a nonprofit children’s hospital. Approximately 600 children were enrolled in the special needs program. From that group, 97 families were identified and randomized into the APRN intervention group. The aim of this study is to qualitatively evaluate the effectiveness of telehealth technology and care coordination provided by an advanced practice nurse.

The advance practice nurse in this study was a certified pediatric nurse practitioner (CPNP) with specific competencies in chronic care needs of the pediatric patient and family and family-centered care of children with complex health care needs. The CPNP role was clearly defined as a care coordination role with direct patient contact via clinic visits, telephone, and/or webcam. The role was also facilitated by an electronic health record, with a modified template for care coordination activities and outcomes and the availability of telehealth technology which was provided to the study participants.

The initial qualitative analysis demonstrated improved patient satisfaction with reduced navigation barriers to care, reduced completion times for forms and prescriptions, and improved responsiveness to patient issues due to the CPNP’s autonomy as an advanced practice nurse. This approach facilitated trust and relationship-building through continuity of care, which allowed the

CPNP to recognize “layers of meaning” during conversations with patients and families to distinguish between action and listening. The authors report anecdotal evidence of reduced office and ED visits due to enhanced communication between the family and the CPNP and subsequent interventions.

The Value Model serves to conceptually distinguish between those health care needs which may be coordinated by a nurse with basic nursing education and those which are better served by an advanced practice nurse. The authors specifically advocate for improved methods of tracking APRN care coordination activities for complex patients to provide evidence for role competency delineation as well as reimbursement reform. The study’s quantitative analysis is pending further data collection.

Care Coordination in Mental Health Care

Care coordination has demonstrated value in removing barriers to effective management of mental health conditions. Oxman, et al. (2001) and Dietrich, et al. (2004) make recommendations for the Three Component Model for reengineering systems for the treatment of depression in primary care. This includes the provision of a series of routines (processes for structured diagnostic and follow-up care with a timeline) and division of responsibility, including a role for a telephone care manager. Clinician and office education create a prepared practice that is predisposed to providing evidence-based depression management. Enabling elements include the telephone care managers who are trained to promote adherence to a management plan, and a supervising psychiatrist. The key reinforcing element is care manager reports about patient response to treatment. The Three Component Model is bound together by a common depression diagnostic and severity measure that facilitates communication and treatment decisions. Deitrich, et al. (2004) tested the effectiveness of this model in a cluster randomized control trial which resulted in patients’ greater response to treatment of (60%, or 106 of 177) compared to 47% in usual care.

Case management was one of the specific interventions found to be helpful in improving depression outcomes.

Christensen, et al. (2008) reviewed 55 randomized control trials in databases that focused on adults and which also included depression outcome measures. Case management was one of the specific interventions found to be helpful in improving depression outcomes. This includes care management with tracking and monitoring by registered nurses, procedures to encourage medication adherence, and linking of patients to community-based health professionals other than physicians, including pharmacists. Significant improvement with key depression measures was associated with the provision of a case manager who provided direct feedback to the primary care provider and delivered psychological therapy.

Primary Care Medical Home Models

A review of multiple studies focused on the Primary Care Medical Home Model suggests that this model shows great promise as the ideal framework for the care coordination process, particularly among patients with complex chronic conditions (Grumbach, Bodenheimer, & Grundy, 2009). Medicaid, Medicare, and State Children's Health Insurance Program (SCHIP) populations can benefit from team-based care that includes nurse coordination and/or nurse/primary care provider coordination and outreach efforts. This model has demonstrated improved quality of care and overall cost reductions. The primary benefits of care coordination were realized in reductions in ED visits and hospitalizations. Those reductions accounted for significant cost savings, especially in patients with complex chronic conditions. However, specific coordination functions and cost measures for the team-based models were not defined in the multiple-study review.

Another study, focused on enhancing the Chronic Care Model, used nurse interventions to enhance patient decision-making, self-care management, and access to resources (Boyd, et al., 2009). This randomized clinical trial used evidenced-based processes and patient communications to improve outcomes for patients with chronic illnesses and complex care needs. Specifically, RNs provided the guided care and worked with primary care physicians and other health care providers to coordinate the care for a panel of 50-60 high-risk older adults. The provider teams met regularly to discuss performance reports and address patient problems. Interviews with participants were conducted at baseline and at 18 months. Patient perceptions of the quality of their care were assessed with the Patient Assessment of Chronic Illness Care instrument, a well-validated measurement tool. Although no cost data were determined, after 18 months, the guided care intervention group rated their quality of care higher than the control group, and these differences were statistically significant. This study provides more evidence of the value of care coordination and related modalities to patients with chronic conditions.

Uncertainties in Understanding and Assessing Nurse Care Coordination

The value of care coordination activities and contributions of RNs in all settings are not well articulated or understood. For example, current reimbursement mechanisms of capitation and fee-for-service do not provide reimbursement for care coordination services. Capitation rewards minimizing services, and fee-for-service rewards only face-to-face encounters with providers. Consequently, the costs of RN care coordination are important to measure against potential or actual benefits of this role. This situation was addressed by Antonelli, et al. (2008). The RN encounters in their study led to an 81% reduction in ED visits and a 63% reduction in unnecessary office visits. Although the authors reported many limitations in this study, such as the potential underestimation of the coordination time in the busy clinic setting, it was clear that the RN coordination saved money for the patients and system. Laughlin and Beisel (2010) also

suggested the need for care coordination RNs to be separated from the distractions in the office and allowed to focus on proactive care functions with the high-risk patients.

In some studies, the roles of RN care coordinators are buried within the study descriptions. For example, Wennberg, Marr, Lang, O'Malley, and Bennett (2010) used a telephone care-management strategy in their large randomized study (N=174,120) to assess the effects of telephone-based care management on cost and resource utilization. Buried in the text is the fact that the health coaches were RNs, LPNs, dietitians, respiratory therapists, and pharmacists. The coaches used person-centric software, developed jointly with the Foundation for Informed Medical Decision-making, designed to provide consistent information and guidelines. The coaches also provided web links, videos, and print materials to the subjects. Outcome measures derived from insurance claims data demonstrate that after one year, the health care costs for the enhanced-support group were \$8.48 lower per person than for the usual support group. This number translates into a cost reduction of 4.4% in overall health care expenditures for the year. The savings in the enhanced-support group were primarily due to reduced inpatient and outpatient services. This article provides evidence for care coordination in medical home models. It also adds some support for the telephone outreach methodology as a potential useful strategy.

Discussion

Before the turn of the 21st century, the situation in this country of substantial overuse, underuse, and misuse of health care services had become well known. This reputation involves neither price issues nor workforce issues specifically. However, care can be rendered in a more efficient and better organized fashion to enhance quality and improve outcomes, providing an easy justification for exploring better care coordination. RNs and APRNs have been performing care coordination as a core part of the nursing discipline since the turn of the last century.

The formal study of care coordination is a much younger affair, with the preponderance of studies released during the last six years. There is much more to be learned. But the pattern of results is very suggestive, even if tentative. RNs and APRNs in care coordination can play substantial roles in improving the delivery of health care. There are positive findings with respect to nursing care coordination in terms of utilization and cost reductions, higher quality of care, and improved clinical outcomes.

Those results derive from a wide variety of settings and diverse patient populations. They include children with special needs and geriatric patients who suffered heart failure.

The formal study of care coordination is relatively new, with the preponderance of studies released during the last six years. There is much more to be learned.

The models studied covered patients in emergency departments and those admitted to inpatient care. Much of the early research on nurses in care coordination involved patient transitions. The studies reviewed here include patients in transition from hospital to homes in addition to elderly

patients in their communities. Emerging models work with patients with acute care problems, those using home health, inpatient use of medications, and ambulatory patients with multiple chronic care conditions. They cover mental health, pediatric care, geriatric care, and rehabilitation. RNs and APRNs in care coordination work as patient navigators, educators, communicators, and case managers. Care coordination is executed in person, over the telephone, and through electronic health records. The recognition of the skills of nurses in care coordination will only expand upon these early demonstrations of their capabilities.

Summary

The studies described herein demonstrate the integral role of the registered nurse in care coordination activities at various practice levels and settings and with various populations. This review of literature was not intended to reflect an exhaustive systematic review. The review does demonstrate the versatility of nurses in recognizing care coordination gaps and designing, implementing, and evaluating efficient interventions focused on improving patient outcomes and satisfaction. Although the overarching conclusion of the literature review confirms nurses as significant contributors in care coordination practice and research, the ability to overcome barriers such as reimbursement and scope of practice issues remains a focus of current and future work.

Conclusion

As McDonald et al. observe, care coordination is a complex concept which encompasses many aspects of care delivery, organization, and quality (2010). The role of the professional nurse incorporates both the function of ensuring that patients' needs are met across settings and providers and facilitating the delivery of quality care (ANA, 2011).

As recent studies suggest, professional nurses have the potential for significant contributions to patient-centered, cost-effective care through the care coordination role. In order to fully achieve this potential, clear models and outcome measures are needed which specify the context for care coordination, identify nursing competencies, and value the nurse's role within the health care team. To this end, ANA makes the following recommendations:

RESEARCH

- Studies are needed to refine the definition, characteristics, and structure of effective care coordination processes.
- Expand existing quality improvement measures across health care settings, with care coordination as a central element of the patient-centered experience.
- Nursing must increase its current evidence base for professional role competencies in care coordination.

- Collaborative, inter-professional research is needed to evaluate provider contributions to cost-efficient care, through care coordination or other methods.

EDUCATION

- ANA's Scope and Standards of Professional Practice and ANA's position statement, The Nurses' Essential Role in Care Coordination, should be foundational documents for nursing education related to care coordination.
- The Quality and Safety Education for Nurses (QSEN) competencies should be incorporated across pre-licensure and graduate nursing programs, with specific curriculum components to promote RN and APRN competencies related to care coordination.
- Inter-professional clinical and didactic learning experiences should be promoted to facilitate team-based primary care in clinical settings.
- Students should be engaged in clinical improvement projects to measure outcomes of care coordination.

PRACTICE

- Professional nursing organizations and practice leaders must assume a leadership role in identifying and implementing care coordination opportunities.
- Care coordination models and strategies must be patient centered, with inclusion of family and patients in process and outcome measures as well as educational initiatives.
- Inter-professional care teams must be established to promote care coordination for each population and each health care setting, accompanied by process and outcome measures as well as educational initiatives.
- Professional practices should explore options for nurse-led care coordination models.
- Patients who are beginning their care and their families should be educated with respect to care coordination and how it may affect both their treatment and their participation in their treatment.

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