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**The Early Experience of
the Carle Medicare
Coordinated Care
Demonstration Program**

Final Report

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EXECUTIVE SUMMARY

In January 2001, the Centers for Medicare & Medicaid Services (CMS) selected Carle Foundation (Carle) of Urbana, Illinois, to operate a demonstration program as part of its Medicare Coordinated Care Demonstration (MCCD). Mathematica Policy Research, Inc. is evaluating the 15 programs in the demonstration, as well as 1 program that is participating in CMS's Medicare Case Management Demonstration for Congestive Heart Failure and Diabetes Mellitus. The evaluation uses a randomized design to test the impact of care coordination on care quality, health service use, and health service costs. This case study, which is based on document review and telephone interviews with program staff conducted three months after the program began enrolling patients, documents Carle's early experiences in the demonstration. A report about preliminary program impacts, which also provides a more detailed description of program implementation, is planned for mid-2003.

Experience with Care Coordination. Carle consists of a 290 bed teaching hospital and a diverse, nonprofit integrated delivery system. Carle Clinic Association is the large multispecialty physician group closely affiliated with the system. Most of the enrollees in the demonstration program will be patients of Carle physicians, so that the primary physician practices, the demonstration program, and the host organization are all part of a single, larger system. Carle has a long history of developing and demonstrating innovative approaches to geriatric care, including participation in two previous CMS Medicare demonstrations and, in a project for the Hartford Foundation, the design of a program for Carle's Medicare+Choice plan, called Geriatric Team Care. The Geriatric Team Care program was the prototype for the Carle MCCD intervention.

Carle modified the Geriatric Team Care model to create the MCCD intervention. The current program differs from the Geriatric Team Care model in that it requires specific diagnoses for eligibility, targets a somewhat higher-risk population, and features greater physician involvement. A Medical Director Group consisting of senior physicians meets regularly to develop and update clinical practice guidelines, and to discuss recruitment and operational issues. In addition, the Carle MCCD has improved its data systems to monitor patients more closely, and to report process and outcome measures for nurse case managers (whom the program calls "nurse partners") and physicians. New education programs have been developed for patients, families, and providers, and new services offered to facilitate transitions in care and referrals to Carle and community services.

Goals and Eligibility Criteria. The program's broad goals are to improve (1) the practice of health care providers, and (2) the behavior and clinical outcomes of beneficiaries. Major strategies to reach the first goal include educating providers about evidence-based practice guidelines and giving regular feedback to providers about their performance in recommended elements of care, and on their patients' outcomes, such as laboratory values. Major strategies to achieve the second goal include teaching patients and their families how to perform self-care and motivating them to become actively involved in the patients' care, both at home and within the context of the health care system. To be eligible to participate in the program, beneficiaries must reside in specified counties in Illinois and Indiana, have a primary physician in one of a number

of designated specialties, have at least one of the following diagnoses—atrial fibrillation, congestive heart failure (CHF), coronary artery disease, diabetes, chronic obstructive pulmonary disease, or asthma—and have had at least one hospitalization or three office visits during the past 12 months. Permanent nursing home residents and current recipients of hospice care are excluded. As in all of the MCCD demonstration sites, participants also must have both Medicare Part A and Medicare Part B, have Medicare as their primary payer, and must not be enrolled in a managed care plan.

Outreach and Enrollment. The program is identifying potential enrollees primarily from Carle administrative claims data. Staff generate lists of patients who have the specified diagnoses and live in the catchment area. After confirming with the identified patients' primary physicians that the patients are living, not in a nursing home, and appropriate for the program, program staff mail the beneficiaries a packet containing a letter signed by their physician, an informational brochure about the demonstration, and a brief application form with questions about demographic information and the diagnosis and health care utilization eligibility criteria. Beneficiaries determined from their initial application forms and from the Medicare Common Working File to be eligible are scheduled for a visit in the clinic or at home to complete an informed consent form and a short health questionnaire that covers self-reported health and satisfaction with care (to be used for the program's initial assessment, research, and quality assurance purposes). After providing informed consent, participants are randomly assigned to either the treatment or control group. The rate of enrollment has been close to what the program expected. As of August 4, 2002, there were 518 treatment group members, compared with a projected 600. In addition, as of that date, the mix of primary diagnoses, comorbidities, and prior hospitalizations has been close to the anticipated mix. (The program had wanted at least half to have had a hospitalization within the past year.)

Key Program Staff. The program is led by the project director, the director of operations, and the nurse partner supervisor, all of whom have worked together for many years on several care coordination research and demonstration projects. Nurse partners and case assistants, who are based in the various Carle primary care clinics, deliver the intervention. The nurse partners are registered nurses, all with several years of nursing experience (although not all in case management). The case assistants extend the nurse partners' capacity by handling clerical tasks and routine patient contacts. After being hired, both types of staff underwent at least three weeks of initial intensive training. The program also has a few advanced practice nurses who visit hospitalized participants.

Care Coordination Components. The Carle intervention includes the basic components of care coordination—assessment, care planning, monitoring, patient education, service arrangement, and facilitation of communication between providers and patients and across providers. The program does not discharge enrollees and will follow them until the end of the demonstration. Each new treatment group members undergoes an initial in-person assessment, either in the home or at the clinic. That assessment covers environmental, psychosocial, physiological, and health-related behavioral issues. Assessment is viewed by the program as an ongoing process.

The nurse partners base the initial care plans they formulate on the initial assessment, medical records, the enrollment health questionnaire, communications from primary physicians,

and suggestions from the families of the participating patients. There also are disease-specific care planning guidelines that call for interventions particular to a patient's chronic condition. Each participant receives a letter outlining his or her initial care plan. The nurse partners monitor the participants through a combination of telephone calls, meetings during physician office visits, office visits with nurse partners, and home visits that depends on the participants' and nurse partners' schedules, the weather, the nature of any active problems, and the participants' health and energy. Monitoring contacts are made at least monthly, and they may occur more often at the nurse partners' discretion. A nurse clinical specialist or nurse partner visits hospitalized patients and coordinates care with hospital discharge planners. The nurse partners perform home visits to recently hospitalized participants within 24 to 48 hours of hospital discharge.

Patient Education and Coordination Across Providers. The nurse partners are the main providers of patient education, although they also refer participants to community diabetes educators, smoking cessation classes, and nutrition groups. The content of each participant's educational program depends on individual needs, but general underlying objectives for all participants include improving participants' self-care skills, health behaviors, and clinical outcomes; , improving their ability to communicate with providers; and improving their ability to get physicians to communicate among themselves. Specific patient subgroups, such as cardiac patients, receive additional relevant instruction and educational materials.

The location of the nurse partners at the same clinics as the primary physicians facilitates communication. The nurse partners hold twice-yearly formal conferences with the primary physicians (called team conference or collaborative visits) to review and assess the progress of their patients. The medical group is paid for each of these meetings, and Carle physicians are given credit towards their productivity statistics. Nurse partners frequently contact the physicians informally (in person, by telephone, or by e-mail) as well. The frequency of contacts varies but is often higher for newly enrolled patients or for patients with complex care needs. The nurse partners and physicians may have agreements on when and how to communicate. Carle staff report having good access to the physicians.

Arranging Services. The nurse partners arrange or help participants to arrange for a wide variety of services, including community services (transportation, housing, and home-delivered meals), medical supplies and equipment, medication assistance programs, and medical and personal care services (skilled home health care, mental health care, dental care, adult day care, and personal care). The demonstration has limited funds to pay for a few supportive services, or to provide them through contracted providers. These services include transportation; personal care, homemaker, companion, and respite services; and basic medical equipment, such as peak flow meters and scales.

Physicians' Expected Role. The program's expectations were that the primary physicians would support the recruitment process, and that they would work with the nurse partners in the collaborative practice model. Indeed, by encouraging their patients to enroll, physicians have been helpful in recruitment. Most of them also have signed standing orders, recommended by the program, that allow the nurses to order routine tests, and they participate in the team conferences, as well as the physician education programs. Only two or three physicians who

historically do not participate in new initiatives have not signed standing orders and do not participate in collaborative practice meetings.

Physicians are expected to participate in the continuing medical education (CME) program. The program includes lunchtime presentations at the clinics, with CME credit; handouts and pocket cards providing recommended practice guidelines; and online CME courses for which physicians receive \$50 toward educational use upon completion.

Data Systems. Participant-level data are stored in a number of electronic databases. The nurse partners use a Case Management Information System (CMIS) for their daily care coordination activities. CMIS includes the assessments and care plans, and monthly laboratory data downloaded from Carle's main electronic medical records system. The main Carle electronic information systems automatically send e-mails to the nurse partners about participants' service use, such as emergency room visits, hospitalizations, tests, primary care and specialist appointments, and procedures.

Early Implementation Experience Carle's MCCD has encountered remarkably few of the operational problems that often plague health care delivery demonstrations during the start-up period. These problems include lower-than-expected enrollment, opposition from physicians, difficulty hiring qualified staff or obtaining space and equipment, and difficulty developing a data collection system that can monitor patients and program activities efficiently. The Carle MCCD has had a number of advantages that have enabled it to avoid major problems in these areas, including the long-standing support of top administrative staff for geriatric research, previous experience in running CMS demonstrations, patient and provider familiarity with random assignment, a well-functioning prototype intervention, well-functioning data systems, and a seasoned demonstration team whose members have worked together for many years. Except for minor adjustments, Carle is implementing its program largely as planned.

Problems Related to Evaluation Activities. Demonstration programs commonly encounter early problems that can affect their evaluation. The Carle program actually seems at very low risk for the most common problems—contamination of the control group, provider or beneficiary opposition to random assignment, and difficulty providing program data required for the evaluation. The Carle program does face the challenge of demonstration spillover effects on physicians' care, which would both alter the way that physicians treat their control group members and reduce program impacts. Spillover could arise both from physician contact with the nurse partners and the extensive physician education initiatives about the disease-specific clinical guidelines. A second important factor that might attenuate intervention impacts is the Carle environment itself. Carle already has hosted a number of care coordination demonstration projects, and it sponsors ongoing physician practice improvement efforts. Interviewed physicians noted that the baseline quality of care at Carle and physician adherence to practice guidelines are already quite high, especially for diabetes. The medical director did comment that Carle physicians' treatment of patients with CHF could be improved, and he speculated that there may be additional impacts for CHF. In general, the intervention may be testing primarily whether the addition of nursing care management services has marginal benefits beyond the already high quality of physician care. A final concern for the evaluation is how well demonstration findings will generalize to other settings, given Carle's high degree of integration,

its electronic medical records systems, and its providers' and patients' previous experiences with, and receptiveness to, care coordination interventions.

Early Successes. The Carle MCCD has achieved several milestones during the initial months of implementation, and it appears well under way toward achieving its goals. The data infrastructure, staff infrastructure, and network of provider relations necessary to mount a large health care delivery demonstration project were in place before the demonstration began, and recruitment of new participants is going well. The physician leadership's enthusiasm for the program and involvement in it has stimulated physician support, and primary care physicians have been encouraging their patients to participate. Primary care physicians are collaborating with the nurse partners and are willing to issue standing orders to them.

The main concerns for the evaluation are that the demonstration intervention may unintentionally result in improvements in the care received by control group members, and that the intervention may have difficulty further raising the already high baseline level of care quality of care within the Carle system. Both of these effects might serve to blunt any program impacts.

CARLE CASE STUDY

This case study briefly describes the features and early experiences of Carle Foundation Hospital's Medicare Coordinated Care Demonstration Project, which we abbreviate as the Carle MCCD. The Carle MCCD is 1 of 15 programs participating in the Centers for Medicare & Medicaid Services (CMS) nationwide Medicare Coordinated Care Demonstration, mandated by the Balanced Budget Act of 1997. The national demonstration is testing a wide range of models to improve the care of chronically ill beneficiaries who are in the Medicare fee-for-service (FFS) program. Mathematica Policy Research, Inc. (MPR) is evaluating the national demonstration, through both impact and implementation analyses.¹

This case study is part of the implementation analysis. Separate case studies will be prepared for each of the 16 demonstration programs. Each case study will be based on telephone interviews with key program staff, program documents, and program encounter data that the programs have been submitting electronically to MPR. The telephone interviews are based on semistructured protocols and are being conducted roughly three to four months after each program starts enrolling patients.

Subsequent reports from the implementation analysis will describe program implementation in greater detail, using information from site visits, a second round of telephone interviews, and data and documents submitted by the programs. Ultimately, to help us to interpret the overall results, and to tease out program features that correlate with program effectiveness or lack of effectiveness, we will synthesize the findings from the implementation analyses with those from

¹ MPR is incorporating a 16th program into the overall MCCD evaluation. That program, the CMS Medicare Case Management Demonstration for Congestive Heart Failure and Diabetes Mellitus, is operated by Lovelace Health Systems, in Albuquerque, New Mexico.

the impact analysis. We are unable to undertake such an assessment in this early descriptive report.

The Carle MCCD began enrolling patients in late April 2002. For this report, we interviewed the following Carle MCCD staff in August 2002: the program director, one of several medical directors, the care coordination supervisor, and a member of the financial staff. Other sources of data include Carle's original proposal, submitted to CMS October 2000, and the program documents listed in Appendix A.

Program Context

The demonstration host (the entity receiving Medicare payment for demonstration services) is the Carle Foundation, a large, diverse, nonprofit, integrated delivery system with headquarters in Urbana, Illinois. Carle Foundation owns and operates Carle Foundation Hospital (CFH), a 290-bed hospital that is the main teaching hospital for the University of Illinois College of Medicine at Urbana–Champaign. The Health Systems Research Center (HSRC), a health services research department within CFH, is responsible for the Carle MCCD. Other organizations owned by or affiliated with Carle Foundation are an ambulance service, a skilled nursing facility (SNF), a home health agency, a durable medical equipment company, a continuing care retirement community, and retail pharmacies.

The Carle Clinic Association (CCA) is the multispecialty physician group affiliated with the Carle Foundation. CCA has more than 300 physicians practicing out of a main clinic in Urbana and nine branch clinics throughout east central Illinois. CCA also owns and operates a commercial managed care plan and a Medicare+Choice managed care risk plan.

CFH and CCA are major providers of health care for a large rural area consisting of much of east central Illinois and parts of west central Indiana. The Carle clinics are sufficiently geographically dispersed such that any patient resides within about 20 miles of a clinic. Most of

the enrollees in the Carle MCCD are Carle patients, so the Carle MCCD, the majority of primary physician practices, and the host organization are all part of the larger Carle system.

Carle has been active in the development and demonstration of innovative models of geriatric care for more than 12 years, in large part due to the chief executive officer's long-standing interest in improving care for the elderly. Carle has participated in three large CMS demonstrations—the Medicare Alzheimer's Demonstration, from 1989 to 1994, the Medicare Community Nursing Organization Demonstration, from 1992 to 1999, and the Medicare +Choice Demonstration (Premier Choice). In addition, between 1992 and 1997, Carle received funding from the Hartford Foundation to develop a model of geriatric care based on a collaborative practice team of a primary care physician, a nurse case manager, and a case assistant working with the patients and families. That geriatric collaborative team model evolved into Carle's Geriatric Team Care in Managed Care case management program for members of Premier Choice, Carle's Medicare+Choice plan. The Hartford Foundation provided additional funding from 1998 through the end of 2003 to compare the costs and outcomes of the Geriatric Team Care in Managed Care model against usual medical care among Premier Choice enrollees.

Intervention History. The immediate precursor of the Carle MCCD intervention is the Geriatric Team Care in Managed Care program. A central feature of the program, reflected in its name, is the teaming up of case management nurses with primary physicians. The nurses are based in the offices of primary physicians and help to care for the physicians' patient panels. Geriatric Team Care targets high-risk Premier Choice members who use Carle's facilities. (There are also members who live outside of Carle's immediate service area, and who use non-Carle providers.) The nurses perform patient and family assessments in the home or office, formulate care plans, coordinate care, and procure supportive services. Program staff maintain telephone contact with patients for routine and post-illness followup, assessment of adherence to

treatment regimens, and provision of disease-specific and general health education. At the time of Carle's original proposal to CMS to operate an MCCD demonstration site (in October 2000), more than 800 Medicare risk enrollees were in Geriatric Team Care.

In its proposal, Carle presented data from a comparison-group study on the effectiveness of the Geriatric Team Care model. Patients enrolled in Geriatric Team Care in 1998 and 1999 were compared with a similar group of enrollees in Premier Choice but residing outside of Carle's main service area. The comparison group members did not use Carle's physicians and did not have access to the program. At the end of two years, the Team Care enrollees had total expenditures of \$6,406, versus \$7,569 in the comparison group—a difference of \$1,163, or \$87 per member per month. There was a larger effect for patients in a high-risk group, with total expenditures of \$9,896 versus \$11,731 at the end of two years.

Carle applied to the MCCD as part of its general mission to improve care for the elderly, and to take advantage of specific opportunities it saw to build on the Geriatric Team Care model, demonstrate it in FFS Medicare, and develop evidence for policymaking on care coordination in FFS Medicare. Carle wanted to more tightly integrate case management with primary physicians' practice, further standardize care planning, and better incorporate current medical and nursing practice guidelines into care plans. It also planned to improve its case management information system to make patient data more retrievable. As one respondent told us, "Carle likes to explore best practice with the help of government funding."

The Carle MCCD and Geriatric Team Care differ in several respects. Unlike Geriatric Team Care, the MCCD requires specific diagnoses for eligibility, and the eligibility criteria target a higher-risk population in general. The MCCD also features greater physician involvement; more emphasis on providing medical and nursing care that is consistent with clinical practice guidelines; and better data systems that enable nurse case managers (whom the program calls

“nurse partners”) to track and monitor patients more closely, and to produce various reports. Examples of enhancements to the data systems include an e-mail alert system that notifies nurse partners whenever an MCCD enrollee receives any health care service in the Carle system (including emergency room visits, hospitalizations, outpatient visits, and so on); a connection to the main Carle electronic medical record system (called EpicWeb), which enables the nurse partners to upload their case management notes for review by the larger Carle physician and provider community; and the ability to produce detailed reports about nurse partner activity (for example, the proportion of each nurse partner’s patients contacted within a specific time frame, understanding a particular aspect of self-care, or achieving a target blood test result). The MCCD added education programs for patients, families, and providers; strengthened relationships among the clinics, the hospital, and community agencies; and contracted with transportation and homemaking providers. Table 1 summarizes the Carle MCCD’s history.

Relationship Among Program, Host Organization, and Providers. There are strong organizational and physical linkages between the Carle MCCD and the participants’ primary care physicians that should provide a foundation for effective communication among the nurse partners, physicians, and participants. For example, both the host organization (the Carle HSRC) and the physicians’ group (CCA) belong to the larger Carle organization, and Carle’s physicians have a long history of participating in HSRC-operated care coordination projects.

Furthermore, the Carle physician leadership appears to be strongly committed to the project, reportedly much more so than in any of Carle’s previous care coordination efforts. The Carle MCCD has a Medical Director Group consisting of the chiefs of family medicine and adult medicine; representatives of these departments from each of the four large clinics; senior members from the departments of cardiology, pulmonology, and endocrinology; and a nurse

TABLE 1
PROGRAM HISTORY

Intervention Developers

Carle Foundation Hospital, Health Services Research Center

Where Original Intervention Was Used and Intervention's Target Population

- Geriatric Team Care in Managed Care model
 - Targets Medicare HMO enrollees at risk of high health care use and costs (targeting not diagnosis specific)
 - Had served more than 800 Medicare risk enrollees as of October 2000

Original Intervention and Adaptations for Demonstration

- Geriatric Team Care model
 - Collaborative team practice by primary physician and nurse care manager
 - Health risk screening
 - In-home assessment
 - Care planning
- Carle MCCD's differences from Geriatric Team Care model
 - Specific diagnoses for eligibility (targets a higher-risk population in general)
 - Greater physician involvement
 - Stronger emphasis on using clinical practice guidelines for medical and nursing care
 - Improved data systems
 - E-mail alert system to notify nurse partners of MCCD enrollee use of any Carle health care service (including ER visits, hospitalizations, and specialist visits)
 - Connection between case management information system and main Carle electronic medical record system—nurse partners can upload case management records for use by the larger Carle physician and provider community
 - Can produce detailed reports of nurse partner activity (for example, percentages of patients contacted within specific time frames for specific purposes)
 - Expanded education programs for patients, families, and providers
 - Strengthened relationships among clinics, the hospital, and community agencies
 - Contracted providers of transportation and homemaking services

TABLE 1 (continued)

Effectiveness of Intervention

	Total PMPM Expenditures After Two Years
Medicare+Choice members for whom Geriatric Team Care not available but otherwise similar to Geriatric Team Care group (n = 549)	\$623
Medicare+Choice members enrolled in Geriatric Team Care 1998 and 1999 (n = 2,134)	<u>\$536</u>
Difference	\$87
High-risk subset of non-Geriatric Team Care group (n = 124)	\$1,047
High-risk subset of Geriatric Team Care group (n = 501)	<u>\$805</u>
Difference	\$242

Source: Telephone interviews with Carle program staff conducted in August 2002 and review of program documents.

EM = emergency room; HMO = health maintenance organization; MCCD = Carle Foundation Hospital's Medicare Coordinated Care Demonstration Project; PMPM = per member per month.

cardiology department who has a doctorate degree. The group has been meeting bimonthly since the beginning of the project to discuss developing the clinical guidelines, increasing physicians' involvement, and educating participating physicians. Members of the medical group have been promoting the demonstration to their colleagues, so that they, in turn, will encourage their patients to enroll.

In addition to these organizational linkages, the Carle MCCD and the primary physicians are integrated physically. Although the project leaders are located at HSRC, which is in Mahomet, Illinois (about 15 miles northwest of the main Carle campus in Urbana), the nurse partners and case assistants (staff who help the nurse partners with some of the more strictly clerical and routine case management duties) are based in the local clinics throughout the Carle service area. Thus, the nurse partners have opportunities to schedule meetings with enrollees' physicians, run into physicians informally in the clinics' hallways or rooms, and meet with enrollees when they come in for physician visits. Nurse partners and case assistants also can collaborate easily with the physicians' office staff.

Service Environment. Carle's service area has experienced labor shortages of both nurses and primary care physicians that could affect the Carle MCCD indirectly through effects on hospitals, physicians' offices, and other providers. Neither area hospitals nor physician clinics have enough nurses. Thus far, however, the Carle MCCD has not had any problems recruiting nurses, as many nurses see the type of work that the demonstration offers as more challenging, interesting, and satisfying than standard hospital or outpatient work. In addition, a few nurses from previous Carle care coordination demonstrations knew and enjoyed nurse case management work, and they were willing and available to join the Carle MCCD.

High physician turnover at the clinics and a local shortage of primary care physicians have created access problems. At some clinics, patients must wait months for routine appointments,

and the clinics have been instructing patients with more urgent problems to go directly to hospital emergency rooms because they cannot be seen in a timely way. Respondents speculated that physicians may find the local practice environment unattractive because of recent local increases in managed care penetration. To resolve the physician shortage problem, CCA has been trying to hire physicians who have just completed their residency at the University of Illinois Urbana–Champaign Medical School.

No other external trends are likely to have any major effects on the operations of the Carle MCCD. No other care coordination programs are available in the area that could hinder the recruitment or affect the care of control group members. No major mergers of health care providers have taken place. The growth in managed care enrollment has meant the potential loss of some beneficiaries who might otherwise have been eligible for the demonstration, but it did not concern the demonstration staff, and, as discussed in more detail in the next section, Carle has not had any problems recruiting beneficiaries.²

The rural and dispersed nature of the region also necessarily shapes demonstration operations to some extent, but not in any detrimental way. For example, the nurse partners often must drive 50 to 100 miles daily to make home visits, and to travel to smaller outlying clinics. Care management information systems and e-mail are very important for accessing current patient information and maintaining communication between project staff and with physicians. The staff also make use of conference calls, voice-mails, and occasional in-person meetings.

² Unlike in the rest of the country, Medicare managed care is popular and has been growing in Carle's local service area.

Key Program Features

Program Goals and Expected Savings. The Carle MCCD's broad primary goals are to improve the practice of health care providers on the one hand, and the behavior and clinical outcomes of beneficiaries on the other. The program aims to improve and standardize the practice of physicians and nurses by helping them to consistently follow evidence-based practice guidelines, and by effectively disseminating updates and changes to guidelines. It also seeks to improve the adherence of enrollees to medication, exercise, and diet regimens. The program believes that enrollees who attain these primary goals will have better (or at least stabilized) health status or improved end-of-life care, depending on the goals of care. For the larger health care system, achieving the goals will result in better communication and coordination among and between beneficiaries, physicians, and community providers, and in the development of new community strategies to benefit chronically ill elderly patients (Table 2).

Specific program objectives include clinical and service utilization performance targets. Examples of clinical targets are percentages of patients receiving recommended drug therapies, achieving blood test values within a certain range, or having blood pressure controlled. An example of a service utilization target is a reduction in hospitalizations sufficient to offset the cost of the intervention.

The demonstration waiver package prepared by MPR estimated savings to Medicare over the life of the demonstration under various assumptions. In the scenario that assumes a 20 percent reduction in Medicare costs, savings to Medicare net of demonstration costs (other than those for startup and evaluation) are projected to be roughly \$33,500 over the 4-year demonstration (Brown et al. 2001). CMS is paying the program \$159 per patient per month.

TABLE 2
PROGRAM GOALS AND DESIRED OUTCOMES

Program Goals^a

- Improve participants' self-management practices
- Improve the practice of physicians and nurses (by making care more evidence-based and reducing unwarranted variation)

Outcomes for Patients

- Improved self-management practices, as measured by rates of specific behaviors (for example, smoking cessation, regular physical activity, healthy eating habits, medication compliance; regular self-monitoring of blood glucose or weights)
- Improved clinical status, as measured by specific tests (for example, blood levels of hemoglobin A1c or lipids, or blood pressure readings)
- Improved health status, as measured by scores on physical and mental health status instruments, limitations in activities of daily living, and all cause mortality

Outcomes for Health Service Delivery System

- Enhanced patient education and self-management support resources
- Improved communication and coordination among and between beneficiaries, physicians, community providers, and health systems
- Improved ability to meet transitional care needs of patients discharged from the hospital and other institutional care settings; overall improved appropriateness of service utilization (including for end of life care)
- Improved monitoring of participants' health and service utilization through computer based information systems
- Reductions in hospitalizations sufficient to offset the cost of the intervention, through earlier detection of problems, better preventive care, and more timely follow-up of lab results and acute incidents

Outcomes for Providers

- Increased use of medical and nursing guidelines to support decision making and provision of evidence-based care
- Improved care through improved access to information, such as patient health questionnaires and results of patient self-monitoring (for example, daily weights or blood sugar levels)
- Increased percentages of patients receiving recommended general and condition specific preventive and therapeutic care, as measured by rates of vaccinations, mammograms, and specific recommended laboratory tests (such as hemoglobin A1c or lipid tests), examinations (such as eye and foot examinations), and medications (such as blood thinning drugs, kidney protective drugs, or lipid lowering drugs)
- Increased experience and comfort with collaborative practice model

Program Payments and Net Savings for Medicare

- Payments to program of \$159 per patient per month
- Average savings to Medicare (net of demonstration costs) of \$0.75 per patient per month, or projected four-year net savings to Medicare of about \$33,500, assuming a 20 percent reduction in Medicare costs (Brown et al. 2001)

Source: Telephone interviews with Carle program staff conducted in August 2002 and review of program documents.

^aAfter our interviews program staff informed us that another program goal is to identify specific program components and interventions most closely associated with desired patient, provider, and health system outcomes.

Target Population and Outreach. In addition to standard criteria for all of the MCCD sites (such as Medicare coverage and no enrollment in a Medicare risk plan), the target population for Carle’s MCCD is defined by geographic and clinical criteria. Beneficiaries must reside in 1 of 11 specified counties in Illinois or in 1 of 2 specified counties in Indiana.³ They must be patients of a physician who provides primary care (family practice, internal medicine, cardiology, pulmonology, or endocrinology);⁴ must have had at least one hospitalization or three office visits during the preceding 12 months; and must have one or more of several diagnoses—atrial fibrillation, congestive heart failure (CHF), coronary artery disease (CAD), diabetes, chronic obstructive pulmonary disease (COPD), or asthma. Finally, exclusion criteria are permanent nursing home residence, current receipt of hospice care, and end-stage renal disease. Table 3 summarizes targeting and outreach.

The program had multiple related and equally important reasons for choosing this target population—the high frequency of the target conditions, the high potential for both cost savings and slowing of functional decline, the presence of evidence-based treatment guidelines, and the availability of data to identify potential enrollees. Respondents noted that, given the sparse numbers of patients and large geographic area, restricting the program to only one or a few diagnoses was unfeasible in their rural environment. Program staff estimated that, conservatively, there were 10,000 potential eligible enrollees in the Carle service area. They anticipated eventually enrolling about 1,100 treatment group members, or roughly 11 percent of the target population, requiring that they recruit about 22 percent of eligible enrollees to participate in the study.

³ In Illinois, Champaign, Coles, Dewitt, Douglas, Edgar, Ford, Iroquois, McLean, Moultrie, Piatt, or Vermilion counties. In Indiana, Fountain or Vermillion counties.

⁴ The demonstration recently reached agreements with some non-Carle physician groups to enroll their patients. In February 2003, project staff estimated that non-Carle patients represent fewer than five percent of the enrollment.

TABLE 3

TARGET POPULATION AND OUTREACH

<p>General Eligibility Criteria for All Medicare Coordinated Care Demonstrations</p>	<p>Has coverage under Medicare Parts A and B</p> <p>Does not have Medicare as secondary payer</p> <p>Is not enrolled in Medicare risk plan</p>
<p>Eligibility Inclusion Criteria for Carle MCCD</p>	<p>Reside in 1 of 11 specified counties in east central Illinois or in 1 of 2 specified counties in west central Indiana</p> <p>Has had at least one hospitalization or three office visits during the past 12 months</p> <p>Has one or more of the following diagnoses—atrial fibrillation, CHF, CAD, diabetes, COPD, or asthma</p>
<p>Eligibility Exclusion Criteria</p>	<p>Is a permanent nursing home resident</p> <p>Is currently receiving hospice care</p> <p>Has end-stage renal disease</p>
<p>Procedures for Outreach to Patients</p>	<p>Lists of potentially eligible beneficiaries generated from Carle’s administrative claims data</p> <p>Physicians confirm that listed patients still living, not in a nursing home, and appropriate for the demonstration</p> <p>Application packets mailed to beneficiaries: letter signed by primary care physician, background information, and application form</p> <p>Beneficiaries determined to be eligible from returned application forms and Medicare Common Working File contacted to schedule visit for informed consent and health questionnaire</p> <p>Enrollees randomly assigned to control or treatment groups</p>

TABLE 3 (continued)

Referral Procedures	Word of mouth (small numbers of direct physician referrals and self-referrals)
Enrollment	
Projected	500 at the end of September 2002 ^a
Number actually enrolled as of September 30, 2002	623
Problems with Eligibility Criteria or Enrollment Shortfalls	None

Source: Telephone interviews with Carle program staff conducted in August 2002 and review of program documents.

^aAssuming a steady rate of enrollment of 1,100 over 52 weeks

^c

CAD = coronary artery disease, CHF = congestive heart failure, COPD = chronic obstructive pulmonary disease; MCCD = Carle Foundation Hospital's Medicare Coordinated Care Demonstration Project.

The Carle MCCD is identifying potential enrollees from Carle administrative claims data. Using the Carle Claims and Utilization database, the program staff produce lists of patients whose primary physicians are in the designated service area and selects from the lists those with the specified diagnoses. The database also contains information on physician visits and hospital stays at Carle Hospital. The Carle MCCD staff confirm with the primary physicians that the listed patients are still alive, not in a nursing home, and appropriate for the program. The physicians then sign letters to the patients.⁵ Each potentially eligible patient is mailed a packet containing the letter, an informational brochure on the demonstration, and a brief application form with questions about basic demographic information, the chronic conditions needed for eligibility, and a few questions on self-reported health and health care utilization (see Appendix B). To achieve a staggered continuous enrollment, the staff have been mailing packets to several hundred potential enrollees per week.

Beneficiaries whose initial application forms show that they meet the diagnosis and health service utilization eligibility criteria are then checked against the Medicare Common Working File for the Medicare coverage eligibility criteria.⁶ Those who meet all criteria are then contacted to schedule an office or home visit to obtain informed consent and complete a brief health questionnaire. It was initially planned that the enrollment worker schedules would explain random assignment and obtain informed consent over the telephone, but following a small initial pilot, the project switched to face-to-face meetings because of the difficulty of explaining these topics to beneficiaries. At the same time that they obtain informed consent, the enrollment

⁵ Letters to patients who have no obvious primary physician are signed by the Carle MCCD project director and one of the Carle MCCD medical directors.

⁶ The self-reported diagnoses are also confirmed with clinical records, but the program has been finding so far that patients' self-reported diagnoses have been very accurate.

workers collect the health questionnaire, which asks about functional status, self-perceived health, medications, understanding of illness, self-care behaviors, and satisfaction with health care (Appendix C). The program will be using the baseline self-reported health information for its own quality assessment and research purposes. Finally, participants are randomized to either the treatment or the control group.

The rate of enrollment has actually been better than expected. As of the end of September 2002, there were 623 treatment group members, compared with a projected 500 (assuming a steady rate of enrollment of the target 1,100 people over 52 weeks). Also as of that time, the mix of primary diagnoses, comorbidities, and prior hospitalizations was close to what was anticipated. (The program had wanted at least half the enrollees to have had a hospitalization during the preceding year.) Program staff have been able to track the total numbers of application packets mailed, processed, outstanding, and missing, as well as the numbers of people eligible, ineligible, refusing, deceased, pending CMS verification, and randomized. They also are following the numbers of “false positives.” (False positives are beneficiaries who initially appeared to be eligible but who actually were ineligible.)

The Carle MCCD has not actively promoted itself to beneficiaries through traditional marketing approaches, as the current patient recruitment strategy is working well. However, to promote the demonstration, Carle MCCD staff have been attending Carle provider staff meetings. By the time of our interviews, a large enough number of beneficiaries had enrolled to result in some publicity by word of mouth. That is, physicians have been referring some patients directly, and a small number of patients (fewer than five percent) have self-referred.

The Carle MCCD staff believe that a number of reasons explain their success in recruitment, relative to the struggles that some of the other non-Carle MCCD sites have faced. Their administrative claims database has produced, with a reasonably low “false positive” rate, large

numbers of potential enrollees to approach. The physician leaders who make up the Carle MCCC Medical Directors Group have actively promoted the project to their colleagues. Physician support for the demonstration has been very helpful—program staff feel that the signed letters from the primary physicians have been key to beneficiary acceptance, as have been the physicians’ positive recommendations and reassurances when patients ask them about the program, or when they call because they are worried that assignment to the control group might mean loss of benefits or the requirement that they change physicians.

Another contributor to Carle MCCC’s recruiting success may be that its eligibility criteria are somewhat less restrictive than are those of the other demonstration sites. The Carle MCCC has included several diagnoses and has not restricted beneficiaries only to those who have had a recent hospital stay. Because the MCCC’s monthly payment rate is relatively low, the program does not need to produce large savings on high-cost enrollees in order to cover the intervention costs.

Random assignment seems to arouse less concern among beneficiaries and physicians in the Carle program than it has in some of the other MCCC sites. Carle program staff make follow-up telephone calls to people who do not answer the introductory letter, and nonrespondents’ main reason for not replying usually has been a lack of energy, or the need to “think about it” for another few months, rather than any issues specific to randomization or the Carle MCCC. Program staff speculated that this relative acceptance of random assignment might be due to Carle’s previous experiences in random assignment demonstrations, or perhaps because of a Midwestern ethic of helping out, as control group members see themselves as contributing to the research effort as well. Physicians, like enrollees, have had little issue with random assignment.

Key Program Staff Members and Their Responsibilities. The project is led by the project director, the director of operations, and the nurse partner supervisor. All three have

worked together at the HSRC for many years. The project director is an experienced researcher who has led all of Carle's previous coordinated care projects. She also is the head of the HSRC and an Associate Professor at the University of Illinois College of Nursing. She is responsible for the overall conduct of the project and for the project's clinical outcomes. The director of operations oversees enrollment, billing, personnel issues, contracts, marketing, and compliance with Carle's corporate policies, roles she has played on previous projects. The nurse partner supervisor is an experienced case manager who has participated in other demonstrations. In addition to supervising the nurse partners, she played a key role in the development of clinical guidelines, and she also develops and assembles all the educational and informational materials for the nurse partners.

Nurse partners and case assistants are based in the various Carle primary care clinics. The case assistants help the nurse partners by performing much of the office work of making routine patient follow-up calls, arranging and following up on services, and ordering laboratory tests. They must have an associate's degree or at least one year's work experience in a health care or service agency setting, and some familiarity with computers.

The nurse partners are responsible for all of the main components of care coordination—assessment, care planning, monitoring, patient education, and coordination. Some of the nurse partners cover two or three clinics, traveling to the smaller sites as needed.

Minimum qualifications for a nurse partner are a bachelor of science in nursing degree and 5 years' work experience in medical–surgical or home health nursing, or an associate's degree or diploma in nursing and 10 years' work experience in medical–surgical or home health nursing. Nurse partners must be licensed in Illinois as registered nurses (RNs). Their scope of practice in the demonstration does not include any hands-on home health care, such as giving injections or providing catheter or wound care. Valuable qualities in nurse partners include strong assessment

skills; geriatric experience; the ability to make decisions independently; the ability to communicate well with physicians and patients; and the ability to plan well, and to allocate time efficiently across multiple patients.

Newly hired nurse partners undergo at least three weeks of initial intensive training. Training topics include the history of geriatric case management models at Carle, essentials of case management, basic disease physiology, clinical guidelines, case studies, principles of patient education, information systems, and Carle MCCD processes and operations. An education specialist based at HSRC helped to organize the nurse partner curriculum, and various Carle MCCD clinical experts and management personnel teach the sessions. For a period of several weeks after the sessions, a supervisor accompanies the newly trained nurse partners on home visits. Nurse partners also continue to receive annual evaluations based on direct observation and reviews of their charts. For continuing education and to maintain their competencies in clinical skills, the nurse partners spend time with providers in specialty areas, such as cardiology and respiratory medicine. The nurse partners receive continuing education credit through the Illinois Nurses Association for these activities.

As of August 2002, the Carle MCCD had hired five experienced, well-trained nurse partners who had a range of backgrounds. Some came to the program with home health care experience, one is a certified diabetes educator, one has a master's degree in psychology, and two have a master's degree in nursing. One nurse had participated in several other Carle care coordination projects over the years and is well known and highly respected at her clinic.

The Carle MCCD also has advanced practice nurses, called clinical nurse partner specialists. In addition to a master's degree from a nursing or nurse practitioner program and licensure as an advanced practice RN, they also must have at least five years' experience as an RN, preferably in a community setting. At the time of our interviews, there was one clinical nurse partner

specialist on staff, and the program was hiring a second. The clinical nurse partner specialists are located next to the hospital, and their job is to visit hospitalized patients, and to provide clinical consultation to the nurse partners. Their role may be evolving toward providing mainly post-hospital follow-up care.

The Carle MCCC is aiming for a ratio of nurse partners to participants of roughly 1 to 100. This figure was in part derived from the anticipated numbers and lengths of contacts and from the project budget, but it is mainly a desired ratio based on Carle's many years of case management experience. Other Carle demonstrations have had ratios as high as 1 to 120, but the nurse partners found it difficult to "stay connected" to the participants at that ratio, at least early on. However, the higher ratios become easier to manage as the nurse partners develop relationships with their patients, because patients will take the initiative to call the nurse partners when they have problems or need advice. At the time of the interviews, the number of patients assigned to a nurse partner ranged from 57 to 105. (Five nurse partners and four case assistants were responsible for the 10 clinics, and two more nurse partners were expected to start shortly.) At full enrollment, there are projected to be 10 nurse partners (and four or five case assistants) for 1,000 to 1,200 treatment group members, or ratios of nurse partners to participants ranging from 1 to 100 to 1 to 120.⁷ Because the geographic region is so large, and it makes the most sense for nurse partners to cover defined areas, Carle is hiring nurse partners gradually, as enrollment grows, so that each new nurse partner will have enough patients to keep busy.

⁷ At our later site visit, we were told that the goal had changed to two nurse partners and one case assistant for every 300 participants.

Care Coordination Components

Like many other care coordination programs, Carle's MCCD includes the following care coordination components: assessment, care planning, monitoring, patient education, provider education, service arrangement, and facilitating communication with and between providers and patients. The program does not plan to discharge enrollees and will follow them until the end of the demonstration. Table 4 summarizes Carle's approaches to the components of care coordination.

Assessment. Each new treatment group member participates in an initial assessment conducted by his or her assigned nurse partner. The purpose of the assessment is to develop a baseline understanding of the patient's current problems and needs, previous experiences with the health care system, and strategies that have been successful in the past. This information is important in the formulation of a realistic care plan and establishing mutual goals and targets. The program had hoped to perform the initial assessment within two weeks of a beneficiary's enrollment, but it has fallen behind somewhat during the first few months of high enrollment, and is taking as many as three to four weeks to complete the assessment.

The first contact with a new treatment group member usually is a telephone call to learn about any immediate needs, and to schedule an appointment for the in-person assessment, either in the participant's home or at the clinic. The nurse partner uses the Omaha System to perform a wide-ranging initial assessment covering environmental, psychosocial, physiological, and health related behavior issues. The initial assessment often takes more than one visit to complete, as the patients typically have very complex problems. Assessment is viewed as an ongoing process.

The Omaha System is a standardized documentation tool for nursing practice developed more than 30 years ago with research funding from the National Institutes of Health (Martin and Scheet 1992; and The Omaha System 2003). It consists of three components, the first of which,

TABLE 4
MAJOR PROGRAM COMPONENTS

Component	Provided?	Description
Initial Assessment and Reassessments	Yes	<p>Patients assigned to nurse partners on geographic basis</p> <p>Initial telephone call to learn about any immediate needs, and to schedule appointment for in-person initial assessment</p> <p>In-person initial assessment at home or in clinic includes environmental, psychosocial, physiological, and health related behavior domains, according to the Omaha System Problem Classification^a</p> <p>Additional information available from self-administered health questionnaire completed at informed consent visit and clinical medical records</p> <p>Reassessments using full Omaha instrument conducted on an ongoing basis</p> <p>Ad hoc reassessments after trigger events (hospitalization, ER visit, physician visit for new problem, or nurse partner judgment).</p>
Care Planning	Yes	<p>Based on initial and ongoing assessment; review of patient's medical records; communication with primary physician; and possibly, communication with community service providers, and home health care staff</p> <p>Uses Nursing Intervention Classification Scheme augmented with disease-specific care planning guidelines</p>
Ongoing Monitoring and Evaluation	Yes	<p>Contacts at least monthly, more frequently per nurse partner judgment. Contacts generally by telephone, but also at office visits, the patient's home, or other convenient locations in the community</p> <p>Clinical nurse partner specialist visits hospitalized patients at least once, communicates with hospital discharge planner</p> <p>No telemedicine or interactive telephone technologies used</p> <p>Participants discharged only if dies, enrolls in HMO, moves away from the area, or voluntarily disenrolls</p>

TABLE 4 (continued)

Component	Provided?	Description
Patient Education	Yes	<p>Primarily by nurse partners. Can also refer participants to community diabetes educators, smoking cessation classes, nutrition classes</p> <p>Content depends on needs identified in individual assessments and care plans. General underlying objectives for all participants—improving participants’ self-care skills, health behaviors, and ability to communicate with providers</p> <p>Packets of printed educational materials for each major diagnosis and materials tied to problems listed in the Omaha System, put together by the HSRC education specialist. Additional self-care and monitoring information for specific patient subgroups, such as cardiac patients</p>
Provider Education	Yes	<p>For physicians, small, group meetings every six months at clinics. In-depth case studies on treatment of heart disease, diabetes, and COPD and asthma. Led by respected specialist physicians. Covers Carle MCCC disease-specific clinical guidelines, concepts of nurse partnering, and use of standing orders for nurse partners</p> <p>Online CME web site with questions written by medical directors. Completion tracked electronically. \$50 toward physician’s CME fund for completion of each unit</p>
Service and Resource Arrangement or Provision	Yes	<p>Arrange or help participants to apply for a wide variety of services—medication assistance programs, public programs, transportation, meals, medical supplies, skilled home health care, personal care, mental health care, dental care, adult day care, housing, spiritual support, and Medicare-covered durable medical equipment</p> <p>Modest coverage by Carle MCCC for limited services—transportation; personal care, homemaker, companion, respite services; and basic medical equipment, such as peak flow meters and scales. Contracted transportation and homemaking providers</p>

TABLE 4 (continued)

Component	Provided?	Description
Facilitating Communication	Yes	<p>Twice-yearly team conferences with nurse partner and primary physician to review and assess progress of patients. Physicians reimbursed/credited for these conferences. Nurse partners remind physicians to provide or order necessary tests and services.</p> <p>Frequent informal contact between physicians and nurse partners: in person (nurse partners at the same clinics as primary physicians), by telephone, or by e-mail. Typical patient—once a month; patients with complex care needs or new patients—as needed</p> <p>Nurse partners coordinate with skilled and nonskilled home care and hospice.</p> <p>Increased communication around time of a hospitalization. Visits to hospitalized patients, if possible; contact hospital discharge planner. Call patient within 48 hours of discharge to home, and home visit as soon as possible. Analyze reasons for hospitalization and make plans to avoid future admissions</p>

Source: Telephone interviews with Carle program staff conducted in August 2002 and review of program documents.

^a A standardized documentation tool for nursing practice developed more than 30 years ago with research funding from the National Institutes of Health (Martin and Scheet 1992; and The Omaha System Main Page 2003).

CME = continuing medical education; COPD = chronic obstructive pulmonary disease; ER = emergency room; HMO = health maintenance organization; HSRC = Health Systems Research Center; MCCD = Carle Foundation Hospital's Medicare Coordinated Care Demonstration Project.

the Problem Classification Scheme, guides patient assessment. The Problem Classification Scheme covers 44 potential client problems that are grouped into four broad domains—environmental, psychosocial, physiological, and health-related behavior. Carle has used the Omaha System in previous care coordination projects for many years, as it has found it to be well suited for community residents, and it has developed a customized online version to meet its particular needs. The nurse partners first document the initial assessment on paper forms, which later are entered into the Case Management Information System (CMIS), a special HSRC data system developed for Carle’s MCCD and future care coordination projects.

The program initially had planned to have the initial assessment process for each patient include a meeting that would have been attended by the patient, his or her physician, and his or her assigned nurse partner, but it decided to drop this component because of scheduling difficulties. The nurse partners already are hard pressed to complete the initial visit within four weeks of the participant’s enrollment. Thus, instead of meetings during the initial assessment, they will conduct meetings with patients’ physicians (described below, under Monitoring) within the first two months of patients’ enrollment.

The nurse partners perform full reassessments, using the full Omaha instrument, only once per year. However, they supplement that annual assessment with ad hoc reassessments after trigger events, such as a hospitalization, emergency room visit, or physician visit for a new problem, as well as whenever they feel one is warranted. Reassessments are conducted on average every six months. All patients (both treatment group and control group members) also are resurveyed annually using the health questionnaire about their level of satisfaction and self-perceived health status.

Care Planning. During the initial assessment contact, the nurse partner and patient develop a care plan. In addition to using the information gathered during the initial assessment, the nurse

partner also reviews the patient's medical records and the health questionnaire that had been completed at the time of informed consent, communicates with the primary physician, and may speak with community service providers, home health care staff, or others involved in the patients' care. The CMIS can download patient laboratory and radiology data from the main Carle clinical system.

The second component of the Omaha System, The Nursing Intervention Classification Scheme (NIC), helps the nurse partner to specify the interventions to be included in the care plan. If pain is an active problem, for example, the CMIS generates a list of signs and symptoms from which to choose, followed by a list of possible NIC interventions. For the MCCD, Carle also developed disease-specific care planning guidelines that call for interventions particular to patients' chronic conditions. The nurse partner may identify other goals and interventions directly from the initial assessment, from suggestions provided by patients and their families, or from input from the primary physician. Each participant receives a letter outlining his or her own care plan.

The care plans are stored in the CMIS. Like the initial assessments, they are first recorded on paper forms, and then entered into the CMIS, along with the initial assessments. The CMIS data are accessible to the MCCD staff at all the clinics through the Carle intranet, and the data can be uploaded to the separate main Carle computer records system, which is used by the regular Carle clinical staff; thus, primary physicians can view the information as well.

Monitoring. The nurse partners monitor participants' progress by contacting them at least monthly, and more frequently according to the nurse partners' discretion. These contacts generally are by telephone, but they may take place during physician office visits or in the patients' homes. The nurse partner might make a home visit, for example, to review and sort out all the medications in the home. Because Carle's region is rural, nurse partners also may see

their patients “all over town: in church, the mall, at parties.” The nurse partners hold team conferences with the primary physicians to review and assess the progress of their patients, and they frequently discuss their patients informally between meetings.

The MCCD maintains contact with participants across the spectrum of health care settings. The nurse partner clinical specialists will visit hospitalized patients at least once and will contact the hospital discharge planner. For post-acute SNF stays, nurse partners will not have much direct contact with patients so as to avoid interference with the rehabilitation plan, but they will keep in touch with patients’ families and help to coordinate discharge plans. The nurse partners coordinate with providers of skilled and nonskilled home care. Enrollees entering hospice remain in the program, and nurse partners coordinate with the hospice staff. Participants in assisted-living facilities, group homes, intermediate-care facilities, or nursing homes also stay in the program.

The main Carle electronic information systems are separate from the CMIS. An electronic interface with the main Carle systems helps the MCCD to monitor patients by automatically generating e-mails to nurse partners about participants who have emergency room visits, hospitalizations, outpatient hospital services, tests, primary care and specialist appointments, and procedures. The CMIS system prints out periodic “to do” lists for the nurse partners for each patient based on the plan of care. The MCCD itself does not use any telemedicine or interactive telephone technologies to monitor patients; the Carle home health agency has funding through a grant to offer these technologies, and the MCCD refers patients there, if necessary.⁸ Even though the CMIS is capable of generating them, the program has not been using individual

⁸ By the time of our site visit in February 2003, the grant had ended, and the home health agency no longer offered these services.

patient reports much to monitor patients' progress. Most of the reports that the program has been producing have been at the nurse partner or program level.

There is also ongoing monitoring of program operations. The project director monitors the frequency of face-to-face and telephone contacts between nurse partners and patients and periodically reviews clinical data.

Participants generally stay in the program indefinitely. The program will discharge a participant only if he or she becomes a permanent nursing home resident, moves away from the area, or voluntarily disenrolls.

Patient Education. The nurse providers are the main providers of patient education. As described earlier, patient education is an important part of the initial training that nurse partners undergo. Carle offered group education for patients in the past but found it too hard to implement in its rural service area, due to low volume. However, the nurse partners refer participants to diabetes educators, smoking cessation classes, and nutrition groups that are ongoing in the community.

The content of participants' education depends on the needs identified in the individual assessments and care plans, but the program does have general underlying objectives for all participants. The two most important objectives are improving participants' self-care skills and health behaviors that affect their chronic conditions, and improving participants' ability to communicate with providers. (Carle called the latter objective "a cornerstone of collaborative practice".) A third goal (developed primarily for patients with cardiac problems, such as coronary disease and heart failure) is instruction in disease etiology, signs and symptoms, and the relationship between signs and symptoms and participants' behaviors. Finally, the nurse partners will provide education about the availability of community and financial resources, although few such resources are available in parts of Carle's service area.

The program has developed packets of printed educational materials for each major diagnosis, as well as materials that are tied to the problems identified in the Omaha System Problem Scheme. The HSRC education specialist helped to organize the education materials into packets. To teach participants how to communicate better with providers, nurse partners will give the participants written lists of questions to ask during their appointments with their providers. Carle also has many other health education resources available for all Carle patients—videotapes, audio tapes, a web site, and a 24-hour health information telephone line.

Provider Education and Practice. The MCCD has developed a program of provider education designed for both primary physicians and nurse partners. Physician education initially featured sessions on the seven Carle MCCD disease-specific clinical guidelines. These guidelines were created by the group of 12 clinic medical directors, all of whom are senior physicians and respected opinion leaders, who adapted national guidelines to fit the Carle context (see Appendix D for examples).

The medical directors also helped to develop and write questions for a web site about the guidelines. Physicians are asked to access the web site, read the guidelines, review short case studies, and answer questions. Completion of the web-based guideline review, for which physicians receive continuing medical education (CME) credit, is tracked electronically.

Currently, specialist physicians are planning to lead small, group meetings at the clinics every six months. These sessions are in-depth, case study presentations about the medical management of heart disease, diabetes, COPD, and asthma. Materials are sent out first, and, because the physicians are on a production schedule, meals, CME credit, and a modest financial incentive (\$50 deposited into the physician's education account that can be used to attend a conference or purchase a textbook) are provided. At the time of our interviews, for example, an endocrinologist was giving presentations at all the clinics that had demonstration participants.

Next year, the MCCD plans additional presentations about pain management, end-of-life care, polypharmacy, and changes in the Illinois prescription benefit.

The program also uses other strategies to improve physician practice. The nurse partners are responsible for reminding physicians to provide or order necessary tests and services (such as eye and foot examinations for participants with diabetes), usually in the team conferences. In addition, they encourage participants to follow up with the appropriate providers to schedule necessary services. The physician education sessions promote the concept of nurse partnering and the signing of standing orders for the nurse partners. These standing orders allow the nurse partners to order recommended laboratory tests and services without having to obtain a physician's approval each time. Aggregated laboratory results on demonstration patients are provided to the physicians and nurses as feedback.⁹ Finally, the program tracks physician profiles of guideline adherence. Each clinic's medical director is notified about physicians who are persistent outliers.

Arranging Services. The nurse partners arrange or help participants to apply for a wide variety of services. They will help participants to apply for medication assistance programs, public programs, or other benefits, as well as to obtain Medicare-covered durable medical equipment, such as glucometers. They also will arrange for nearly all other types of available services and resources that might be required—transportation, meals, medical supplies, skilled home health care, personal care, mental health care, dental care, adult day care, housing, spiritual support, and so on. To prepare for the demonstration, the program staff worked hard to strengthen relationships among the clinics, the hospital, and community agencies.

⁹ The program currently is planning to provide programwide and clinic-level results. It is considering whether to report individual physician-level results.

The Carle MCCD also pays a limited amount for a few supportive services, including transportation; personal care, homemaker, adult day care, and respite services; and basic medical equipment, such as peak flow meters and scales. It establishes contracts with transportation, adult day care, and homemaking providers for some of these services.

Facilitating Communication. Carle staff stressed the importance of nurse partners having good communication skills. Nurse partners are expected to elicit patients' values and preferences for care, act as a link between physicians, and develop trusting relationships with the primary physicians. The location of the nurse partners at the same clinics as the primary physicians facilitates communication. In addition to the required twice-yearly, in-person team conferences of the nurse partners and the physicians, a great deal of informal contact occurs in person, by telephone, and by e-mail. (E-mail is considered very important in rural areas.) The less-formal contacts with the primary physicians typically occur once a week, but they may occur more frequently on an as-needed basis, for patients with complex care needs, and the nurse partners and physicians may have established agreements on when and how to communicate. Program staff noted that the physicians have been accessible and responsive. The nurse partners also teach patients how to advocate for themselves. In cases in which multiple physicians were providing confusing or conflicting advice, for example, a nurse partner's initial approach probably would be to encourage the patient to convince his or her physicians to talk to each other. The clinics' medical directors also serve as a back-up resource for the nurse partners in situations in which there are disagreements with or among physicians.

A hospitalization will prompt increased communication. The nurse partner clinical specialist or the nurse partner visits the patient in the hospital, notifies the primary physician, and contacts the hospital discharge planner. In addition, either the nurse partner or the nurse partner clinical specialist will try to visit the patient in the home within 24 to 48 hours of discharge to

ensure understanding of discharge indications, presence and understanding of follow-up plans, and absence of any safety concerns. Nurse partners also make an effort to find out why the hospitalization occurred and how to prevent future admissions (for example, with better patient education or better adherence to a diet).

Early Implementation Data

Table 5 displays data up to the end of September 2002 that the Carle MCCD has been collecting for the evaluation. By that date, the majority of enrolled patients (535 of 623) had had at least one nurse partner contact. Of these, it appears that slightly fewer than half (248) had had multiple contacts; in their reports, however, the program has been including contacts by the nurse partners' case assistants in this category, as well as contacts by other nurse partners covering or acting as backups for the primary nurse partners. Nurse partners are given one month to complete their initial patient assessment contacts. However, staff had assessed 64 percent of the enrollees and, of those assessed, roughly 18 percent were assessed within the first two weeks after random assignment. As mentioned, the program has built up a backlog of initial assessment contacts.¹⁰

A significant proportion of contacts have been for the purpose of identifying service needs (37 percent for non-Medicare services and 45 percent for Medicare services). Most other contacts have been for medical issues, such as providing disease-specific education, explaining tests or procedures, and explaining medications.

¹⁰ This slight delay in initial assessment contacts is unlikely to have a large effect on either program costs or enrollee outcomes. A few weeks will likely not represent a large amount in the program's bills for care coordination, nor will a few weeks at the very beginning of the intervention likely have great impact on patients' health and health care utilization outcomes.

TABLE 5

CONTACTS BY DEMONSTRATION STAFF WITH PATIENTS BETWEEN
JULY 1, 2002, AND SEPTEMBER 30, 2002

Number of Patients Enrolled ^a	623
Number of Staff Contacting Patients ^b	15
Number of Patients with One or More Staff Contacts	535
Number of patients with more than one staff contact	248
Total Number of Contacts for All Patients	2,035
Among Patients with at Least One Contact:	
Percentage of contacts staff initiated	86.5
Percentage of contacts	
By telephone	76.4
At patient's residence	7.0
In person, elsewhere	16.6
Of All Patients Enrolled, Percentage with an Assessment Contact	63.9
Among Patients with an Assessment, Percentage Whose First Assessment Contact Was:	
Within one week after random assignment	13.3
Between one and two weeks after random assignment	17.6
More than two weeks after random assignment	69.1
Of All Patients Enrolled, Percentage with Contacts to:	
Identify need for non-Medicare service	53.0
Identify need for Medicare service	46.2
Provide disease-specific or self-care education	60.8
Explain tests or procedures	45.6
Explain medications	46.2
Perform routine patient monitoring	56.0
Monitor services	12.8
Monitor abnormal results	14.8
Provide emotional support	24.7
Average Number of Patients Contacted per Staff Member	35.7
Average Number of Patient Contacts per Staff Member	135.7

Source: Carle Foundation program data submitted in November 2002.

^aNumber enrolled in the treatment group as of September 30, 2002.

^bIncludes nurse partners, case assistants, and clinical nurse specialists.

Involvement of Physicians

The program's expectations were that the primary physicians would support the recruitment process, and that they would work with the nurse partners in the collaborative practice model (Table 6). Physicians have indeed been helpful in recruitment, as potentially eligible patients who receive the letters and application packets for the MCCD will ask their physicians about the program, and the physicians have been encouraging patients to enroll. The program has been trying to encourage physicians to actively refer their patients, or to alert the enrollment workers about the most appropriate patients to approach.

Most physicians have been participating in the twice-yearly team conferences with the nurse partners, signing standing orders allowing the nurse partners to order routine tests, and attending the physician education programs. The enthusiasm of the clinics' medical directors seems to have made a difference in the level of physician support for the program. For example, the medical director whom we interviewed has seniority and is well respected, and he personally asked the physicians in his clinic—a close-knit group—to participate in the physician education program. The other medical directors are likewise considered “opinion leaders.” Two or three physicians who historically never participate in new initiatives have not signed standing orders and do not participate in team meetings.

Data Systems

Participant-level data are stored in a number of electronic databases (Table 7). The CMIS is housed at HSRC and contains data only on treatment group members. Information from the initial assessments and care plans are entered, and laboratory data from Carle's main EpicWeb data system are downloaded to CMIS. CMIS and Carle's main information systems are used to develop hospital use patterns, and to monitor how long it takes for nurse partners to contact a patient after a hospitalization. The HSRC database, a research tracking system originally

TABLE 6

PLANNED PHYSICIAN INVOLVEMENT

	Brief Description
Promotion of Program to Physicians	Program staff and medical directors promoted Carle MCCD enthusiastically to primary physicians in clinics.
Physicians as Referral Sources	Physicians not expected to be a major source of patients, main source has been administrative claims data
Physicians' Role in Encouraging and Maintaining Patient Participation	Anticipated to play an important role in program success, and have been important in addressing concerns of eligible beneficiaries and in encouraging their participation
Physicians' Role in Care Coordination	Anticipated to play an important role in program success (important for collaborative care model). Reportedly, physicians have been easy to approach and easy to discuss patients with, twice-yearly team conferences going well, standing orders working well

Source: Telephone interviews with Carle program staff conducted in August 2002 and review of program documents.

TABLE 7
PLANNED DATA SYSTEMS

Type of Data	Program Maintains?	Brief Description
Participant Level		
Enrollment/disenrollment	Yes	HSRC ^a
Assessment	Yes	CMIS ^b
Care planning	Yes	CMIS
Monitoring/evaluation	Yes	CMIS
Non-Medicare services	Yes	CMIS
Adverse events	Yes	E-mail alerts ^d
Grievances	Yes	CMIS
Self-reported health risks (for example, smoking, receipt of preventive care)	Yes	HSRC data from health questionnaire
Laboratory data	Yes	CMIS, downloaded from Carle's main electronic information systems
Dictated reports of test results and dictated physician notes	Yes	Accessed through EPICWeb
Whether standing orders signed by primary physician	Yes	HSRC
Nurse Partner Level		
Time log/productivity	Yes	Nurse partners record data similar to time sheets, either on paper forms or directly into computer. Nurse partner and case assistant time recorded for all time spent on and with patients. Program produces regular time/activity reports for each nurse partner. These data also provided to MPR for evaluation purposes ^c
Participant data	Yes	CMIS, all participant-level data listed above aggregated to nurse-partner level
Clinic Level		
Participant data	Yes	CMIS, all participant-level data listed above aggregated to clinic level
Program Level		
Costs, by type (labor, by type of staff; supplies; rent; other)	Yes	Separate accounting data system
Participant data	Yes	CMIS, all participant-level data listed above aggregated to program level

^aHSRC = Health Systems Research Center tracking database. A special research database that was originally created for Carle's Hartford Foundation-funded development of the Geriatric Team Care Model. HSRC contains data on both treatment group and control group members.

TABLE 7 (continued)

^bCMIS = Case Management Information System. It contains data only on treatment group members. Nurse case managers first complete initial assessments and care plans on paper, and these are then entered into CMIS.

^cEpicWeb = Carle's general electronic medical records system, used by the hospital and the medical group for hospital and outpatient service use, laboratory data, and transcribed notes. The program uploads care plans and nurse partner notes from CMIS into EpicWeb.

^dAn alert system from Carle's main electronic information systems notifies the demonstration nurse case managers whenever a treatment group member has an emergency room visit, is hospitalized, or otherwise uses health care services.

^eSee Table 5.

developed for the Geriatric Team Care Model program in Carle's Premier Choice Medicare risk plan, and also housed at HSRC, is used to track both treatment group and control group members. Information about patient satisfaction is entered into the HSRC database, as are the results of the initial health questionnaire that participants complete prior to random assignment.

The Carle M CCD data systems can and do generate a wide variety of reports for monitoring nurse partners' and program performance. For example, the systems generate reports on the time that the nurse partners spend on or with a particular patient, and on patients' self-rated understanding of and adherence to treatments (from the initial health questionnaire). Laboratory values will be downloaded into CMIS to track patients' clinical progress, such as control of blood sugar or cholesterol levels.

Early Implementation Experience

Operations. Carle's M CCD has encountered remarkably few of the operational problems that often plague health care delivery demonstrations during the start-up period. These problems include lower-than-expected enrollment, opposition from physicians, difficulty hiring qualified staff or obtaining space and equipment, and difficulty developing a data collection system that can monitor patients and program activities efficiently. As detailed in this case study, the Carle M CCD has avoided major problems in all of these areas and, except for minor adjustments, is implementing the program largely as originally planned.

Potential Problems Related to Evaluation Activities. Health care delivery demonstration programs also commonly encounter early problems that can affect their evaluation. These problems include contamination of the control group, provider or beneficiary opposition to random assignment, and difficulty providing program data required for the evaluation.

Control group contamination can occur in several ways. Control group members might participate in other case management programs. Their contact with demonstration staff before or

after random assignment might lead them to receive treatment they might not have received otherwise. Demonstration influences on physicians' practice patterns could lead to treatment changes for all patients, control and treatment group alike, in the so-called "spillover" effect on physicians' care.

In the Carle MCCD, the potential for control group contamination from other case management programs or from demonstration distortions of the treatment control group patients normally would have received, seems low. No other programs similar to the Carle MCCD are available to control group members in the local service environment. Participants have minimal contact with demonstration staff prior to random assignment. Although the Carle MCCD conducts an annual health questionnaire to survey the control group, the instrument, which asks primarily about level of function, self-perceived health, self-care behaviors, and satisfaction, seems unlikely to trigger any additional care-seeking behaviors among the control group members.

Demonstration spillover effects on physicians' care may be a major factor, making any Carle MCCD intervention impacts more difficult to detect. The extensive MCCD physician education programs about the seven disease-specific clinical guidelines could certainly affect how physicians treat control group members. However, any effects on physician behavior due to program feedback to physicians about their patients' progress will occur only for treatment group members, as this feedback is provided only for this group.

A second important factor that might blunt intervention impacts is the Carle environment itself. Carle already has hosted a number of care coordination demonstration projects, and it sponsors ongoing physician practice improvement efforts. In fact, physician respondents noted that the baseline quality of care at Carle and physician adherence to practice guidelines already are quite high, especially for the care of patients with diabetes. However, the medical director

commented that the physicians' treatment of CHF could be improved, and he speculated that there may be more impacts for CHF. In general, the intervention may be testing primarily whether the addition of a nurse partner has marginal benefits beyond the already high quality of physician care.

Opposition to random assignment has not been a major problem for the Carle MCCD. Carle's previous experiences with operating demonstrations may have familiarized physicians and beneficiaries with the idea of random assignment, and some of the respondents noted that some patients feel they are helping to advance knowledge by participating in the study.

The data collection for the evaluation has been going smoothly. The nurse partners have been entering the evaluation data daily, and the data are cleaned before transmission to MPR. The Carle MCCD had planned to collect these data anyway, although it would have used the nurse contact categories that it has been using for many years rather than the ones developed for the evaluation.

A final concern relates to the generalizability of the results from the Carle MCCD. Compared to most private, community-based health care in the U.S., the Carle system is unusually integrated, with an extensive electronic medical records system. Also, as noted, Carle providers and patients have probably had more experience and are likely more receptive to care coordination interventions than providers and patients in other parts of the country. These differences may make it difficult to extend the findings from Carle to other communities around the U.S.

Summary and Discussion

The recent rapid growth in care coordination and disease management initiatives has yielded a confusing array of programs. Some do little more than utilization review, others focus on improving physicians' practice patterns, and others attempt to intervene at multiple levels—

physicians' practice, patients' behavior, and coordination of providers and services. In addition, the programs' interventions consist of various combinations and permutations of basic care coordination elements.

One of the eventual aims of the implementation analysis for the evaluation of the MCCD is to develop a useful method of classifying the wide variety of care coordination/disease management programs by using readily observed program features, and to relate this classification scheme to program impacts. We start with a simple, provisional framework that will evolve as we learn more from the MCCD. In the current framework, we classify programs by (1) the organization or organizations implementing the program, and the extent of the program's integration with other key providers; (2) the program's target population, and whether the program is condition-specific or not; and (3) the program's major strategies and interventions. By major strategies and interventions, we mean, for example, improving patient education and adherence, improving provider practice, providing or arranging for services, and improving communication and coordination. In addition to placing the Carle MCCD intervention in this framework, we provide some early observations on the implementation experiences of the program to date, and on potential challenges facing its evaluation.

Organizations Implementing the Program and Integration with Providers. The implementers of the demonstration and the providers (including physicians, clinic staff, hospital staff, and home health staff) are part of the larger Carle integrated delivery system. In addition to integration resulting from the fact that the program staff and providers are employed by the same organization, however, there is real integration in data systems (the program has access to administrative data on physician visits and hospital use), geography (the nurse partners are located in the same clinics as are the physicians), and physician practice (there is strong involvement by physician leaders, who seem genuinely supportive of the program and its goals).

In particular, most physicians actively encourage patients to participate in the program, and nearly all of them have provided the nurse partners with standing orders for routine tests and procedures.

Target Population. The Carle MCCD targets beneficiaries residing in Carle's mainly rural service area, who have any of a number of common, chronic conditions, and who are, by virtue of recent health care use, at risk of future high utilization of health care. The conditions are atrial fibrillation, CHF, CAD, diabetes, COPD, and asthma, and potential participants must have had at least one hospitalization or three office visits during the past 12 months (for any reason).

Although targeting persons at risk primarily by specific medical diagnoses is a hallmark of disease management programs, the Carle MCCD views itself as more of a combined case- and disease-management program. As the staff pointed out, it is difficult in rural areas to find enrollees with a single diagnosis to easily implement pure disease-management models. The MCCD has thus enhanced Carle's previous case management models, which featured comprehensive assessments of participants, identification of a broad range of needs, and service arranging, with disease-specific guidelines and provider education.

Major Strategies and Interventions. The Carle MCCD is pursuing the two major strategies of improving participants' behaviors and knowledge, and improving provider practice. The program makes patient health education an important part of its training for nurse partners, and it has assigned an education specialist to prepare and organize educational packets for specific diagnoses, and for problems identified in the Omaha System. The nurse partners are the main providers of education, which they offer through one-on-one instruction. The program also has developed a physician education program that features clinical guidelines customized by local clinician opinion leaders for Carle; small, group educational seminars in the clinics led by

respected clinicians; an online CME program; and periodic physician profiling to clinic medical directors.

Early Successes of the Demonstration. The Carle MCCD has achieved several milestones in its early implementation, and it appears well under way to achieving its goals. The support by Carle's CEO for projects to improve geriatric care and Carle's extensive experience with demonstrations of geriatric care coordination undoubtedly have contributed to the early successes of Carle's MCCD. The data and staff infrastructure and the network of provider relations that are necessary to mount a large health care delivery demonstration project were already in place. The program has completely filled its nurse partner positions with well-qualified, experienced nurses, and, at the time of the interviews, it was seeking to hire only one more nurse partner clinical specialist. The program also has extended the nurse partners' capacity by using case assistants to handle clerical tasks and routine patient contacts. The assessment and care planning instruments and the electronic medical records systems are all well established and functioning. The strategy of using administrative data to identify lists of patients for review by physicians has worked well. The mailings of introductory letters signed by primary physicians combined with having physicians actively encourage patients to participate has been very successful. Both beneficiaries and providers have had little objection to random assignment. The physician education program is reported to be working well, with good attendance. The collaboration between nurse partners and primary physicians is progressing smoothly, and physicians are willing to issue standing orders so that nurse partners can ensure that recommended care is delivered.

Potential Challenges for the Demonstration and Evaluation. There appear to be no major challenges ahead to the implementation of the demonstration, but its evaluation faces the challenge of potentially understated or undetectable impacts. The MCCD intervention may spill

over and affect how physicians treat their control patients. In addition, the baseline quality of medical care at Carle is reportedly already very high, so that the addition of nurse partners in this instance may provide few marginal benefits. It is obviously hard to foretell what the impact analysis will show at this point, however. A final concern for the evaluation is the generalizability of findings from Carle, given the Carle system's high degree of integration, its electronic medical records system, and its providers' and patients' previous experiences with, and receptiveness to, care coordination interventions.

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- Martin, Karen S., and Nancy J. Scheet. *The Omaha System: Applications for Community Health Nursing*. Philadelphia: Saunders, 1992.
- The Omaha System. Available online at [<http://www.omahasystem.org/index.htm>]. Accessed February 6, 2003.

APPENDIX A

**MATERIALS PROVIDED BY CARLE AND
REVIEWED FOR THIS REPORT**

**LIST OF MATERIALS PROVIDED BY CARLE AND REVIEWED
FOR THIS REPORT**

Carle Medicare Care Coordination Demonstration (MCCD) proposal to the Centers for Medicare & Medicaid Services dated October 6, 2000

Invitation letter and informational brochure sent to potentially eligible beneficiaries

Beneficiary application form and questionnaire

Beneficiary informed consent form

Informational materials and presentation by demonstration project staff to Carle's physicians

Carle's MCCD revised protocol February 2002

Carle's MCCD clinical practice guidelines

Carle's patient education materials

Sample Case Management Information System reports

Health Systems Research Center (HSRC) organization chart

HSRC job descriptions

APPENDIX B

**CARLE MCCD RECRUITMENT MATERIALS—LETTER
FROM PHYSICIAN, BROCHURE, AND
BENEFICIARY APPLICATION**

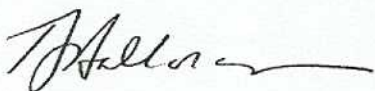
Dear «FName» «LName»;

I am excited to tell you about a new and valuable program for seniors called Carle Medicare Coordinated Care Demonstration, also known as the MCCD. Carle is working with Medicare to develop better ways of providing care for our Medicare patients who have certain health conditions such as diabetes, heart, or lung problems. I would like for you to apply for this program. **There is no cost to you to join and participation does not affect your health insurance coverage!**

Please read the enclosed brochure that describes the program. Please complete the *Application for Participation*. Return the completed application in the postage-paid envelope. After we receive your application and determine you are eligible for the program, you will be contacted to complete a *Health Questionnaire* and an *Informed Consent for Participation*.

I encourage you to call the MCCD office at (217) 586-5913 or toll-free at (888) 874-4477 with any questions. I am pleased to offer you the opportunity to participate in this nationwide Medicare study that is committed to finding better ways for seniors to manage their health.

Sincerely,



Thomas Halloran, MD
Danville Clinic

Eligibility Requirements

To be eligible for MCCD, you must:

- ⊗ Maintain your Medicare Part A & B coverage;
- ⊗ Have a participating physician;
- ⊗ Have been hospitalized (includes one day surgery or overnight) **OR** had 3 or more medical office visits (visits with all types of doctors or nurses are counted) during the past 12 months;
- ⊗ Have one of the following health conditions: atrial fibrillation, heart failure, coronary artery disease, diabetes, COPD (chronic obstructive pulmonary disease), emphysema, or chronic asthma;
- ⊗ Live in one of the following counties in Illinois: Champaign, Coles, Dewitt, Douglas, Edgar, Ford, Piatt, Iroquois, McLean, Moultrie, Vermilion; or in Indiana: Vermillion or Fountain;
- ⊗ **Not** be a member of a Medicare Risk Plan (such as Premier Choice);
- ⊗ **Not** be a permanent resident in a nursing home;
- ⊗ **Not** be diagnosed with end stage kidney disease;
- ⊗ **Not** be receiving hospice services.

How to Enroll into MCCD

- ⊗ Contact the MCCD central office at (217) 586-5913 or (888) 874-4477 to request an application packet.
- ⊗ After we receive your application and confirm your Medicare eligibility, we will contact you to obtain an Informed Consent for Participation and a Health Questionnaire.
- ⊗ After we receive your signed Informed Consent and Health Questionnaire, you will be randomly assigned to the Coordinated Care or the Usual Care group.
- ⊗ You will be informed of your assignment by letter within two weeks.



Medicare Coordinated Care Demonstration

Carle MCCD, P.O. Box 718
Mahomet, IL 61853
(217) 586-5913

Call Toll-Free at (888) 874-4477

The MCCD is a 4-year study funded by Centers for Medicare & Medicaid Services (CMS) and administered by Carle Foundation Hospital.

CARLE MCCD

Medicare Coordinated Care Demonstration



Medicare Coordinated Care Demonstration (MCCD), a National Demonstration

MCCD Program

Carle has been selected as one of 16 national sites to offer a new program designed to improve health care to seniors. MCCD is intended to offer coordinated, cost-effective health care. These coordinated care services are provided at **no cost to you** and you **retain your complete Medicare benefits**.

The program will study the impact of a team approach to healthcare for patients with chronic health conditions. It will address the following issues important to the future of Medicare:

- ⊙ Improvement in health outcomes.
- ⊙ Improvement in the quality of care.
- ⊙ Lowering of Medicare costs.

MCCD Participants

Eligible participants who enroll into MCCD are randomly assigned into one of two groups, a **coordinated care group** or a **usual care group**. Participants of both groups retain all of their current Medicare services.

The Usual Care Group

If you are selected to participate in the Usual Care group, you will continue to receive care as you currently do now.

The Coordinated Care Group

If you are selected to participate in the Coordinated Care group, you will be assigned a Nurse Partner and may receive the additional benefits described below as MCCD Supportive Community Services and Team Care Services.

MCCD Supportive Community Services

To assist you with access to medical care, the following services may be provided on a limited basis (up to \$300 per year). These services are authorized under a plan of care developed with your Nurse Partner and your physician.

- ⊙ Homemaker & personal care
- ⊙ Transportation
- ⊙ Adult Day Care
- ⊙ Respite services

MCCD Team Care Services

You will become an active member of a team with your Physician(s) and Nurse Partner(s) who will provide:

- ⊙ Health care visits with you and your nurse partner and your physician.
- ⊙ In-person and phone consultations.
- ⊙ Medical and nursing care.
- ⊙ Disease monitoring.
- ⊙ An individualized care plan.
- ⊙ Education on specific self-management techniques associated with your health conditions.
- ⊙ Assistance in making progress toward your health goals.
- ⊙ Coordination of care with your family members, your physician, and other healthcare providers.
- ⊙ Assistance with arrangement of needed health services.
- ⊙ Medication review by a pharmacist if needed.



Medicare Coordinated Care Demonstration

Carle MCCD, P.O. Box 718
Mahomet, IL 61853
(217) 586-5913
(888) 874-4477

Individual Information (please print):

Last Name: _____ First Name: _____ Middle Initial: _____

Mailing Address: _____ County: _____

City: _____ State: _____ Zip Code: _____

Female Male Social Security: _____ - _____ - _____ Birthdate: ____ / ____ / ____

Phone: (____) _____ Medicare #: _____ Carle Clinic #: _____

What is your ethnicity?

- American Indian or Alaskan Native (1)
- Asian or Pacific Islander (2)
- African American (3)
- Caucasian/White (4)
- Other (5)
- Unknown (6)
- Hispanic or Latino (7)

Contact Person Information:

Name, address, and phone for a proxy decision-maker or someone who will know how to reach the participant

Name: _____ Phone Number: (____) _____

Address: _____

Relationship to Applicant: _____

Individual Demographics:

1. What was the last grade of schooling that you completed?

- 8th Grade or less (1)
- 8th Grade (2)
- High School/GED (3)
- Some college/2 year degree (4)
- 4 year college graduate (5)
- More than 4 year college degree (6)

2. What is your marital status?

- Married (1)
- Separated (2)
- Divorced (3)
- Widowed (4)
- Never Married (5)

3. What are your current living arrangements? Please mark all that apply:

- Alone
- With a spouse
- With a relative
- With a non-relative
- In some form of group housing

Is there another person in your household that is planning to join the MCCD demonstration, or would be interested in joining?

Yes

No

Name: _____

(OVER)

Physician Information:

5. Personal Physician's Name: _____ Phone Number: (____) _____
Personal Physician's City: _____

Please list any specialist physicians (i.e. cardiologist, endocrinologist) that you are currently seeing:

6. Physician's Name: _____ Phone Number: (____) _____
Physician's City: _____

7. Physician's Name: _____ Phone Number: (____) _____
Physician's City: _____

8. Physician's Name: _____ Phone Number: (____) _____
Physician's City: _____

9. If I am hospitalized, I usually go to these hospitals: _____

10. If I have lab work or x-rays, I usually go to these facilities: _____

Please CHECK ALL That Apply To You:

- | | |
|---|---|
| <input checked="" type="checkbox"/> I have both Medicare Parts A & B | <input type="checkbox"/> I currently live in a nursing home |
| <input type="checkbox"/> I have had 3 or more medical office visits in the last 12 months (visits with all types of doctors and nurses are counted) | <input type="checkbox"/> I have end stage renal disease |
| <input type="checkbox"/> I have been in the hospital in the last 12 months (this includes 1 day surgery or overnight care) | <input type="checkbox"/> I am using hospice services |
| | <input type="checkbox"/> I am enrolled in Premier Choice (or another Medicare Risk Program) |

Has Your Doctor Ever Told You That You Have ANY of the Following Health Conditions?

Please CHECK ALL That Apply To You:

- | | |
|--|---|
| <input type="checkbox"/> Asthma | <input type="checkbox"/> Congestive Heart Failure |
| <input type="checkbox"/> Atrial Fibrillation or Atrial Flutter (irregular heartbeat) | <input type="checkbox"/> Coronary Artery Disease (Chronic Angina, chest pain, Heart Attack, or Heart Surgery) |
| <input type="checkbox"/> Chronic Lung Disease (COPD or emphysema) | <input type="checkbox"/> Diabetes |
| <input type="checkbox"/> I Do Not Have Any of the Health Conditions | |

Signature _____ Date _____

Thank you for completing this application. If you have any questions or concerns, or need help completing the application, please feel free to contact our office Monday thru Friday, 9:00 – 5:00.

APPENDIX C

CARLE MCCD ANNUAL HEALTH QUESTIONNAIRE

Carle MCCD

Medicare Coordinated Care Demonstration
 PO Box 718
 Momet, IL 61821

Name: _____

Address: _____

Carle Clinic Number: _____

HEALTH CONDITIONS

1. Please mark the appropriate boxes if your doctor has ever told you that you have any of the following health conditions	Yes
Asthma	(1)
Atrial Fibrillation or Atrial Flutter (irregular heartbeat)	(1)
Chronic Lung Disease (COPD or emphysema)	(1)
Conjunctive Heart Failure	(1)
Coronary Artery Disease (angina/chest pain, heart attack, or heart surgery)	(1)
Diabetes	(1)
Alzheimer's Disease or Dementia	(1)
Arthritis	(1)
Blindness or Trouble Seeing (even when wearing glasses)	(1)
Cancer	(1)
Chronic Back Pain	(1)
Depression	(1)
High Blood Pressure	(1)
High Cholesterol	(1)
Hip Fracture	(1)
Kidney Disease	(1)
Osteoporosis	(1)
Parkinson's Disease	(1)
Stomach/Bowel Problems	(1)
Stroke	(1)
Trouble Hearing	(1)
Urinary Incontinence	(1)

2. In the past year have you had a major illness or injury?
 (1) Yes (2) No
 If yes, what was the type of illness or injury?

Marking Instructions

USE BLACK INK OR NO. 2 PENCIL
 MAKE HEAVY DARK MARKS ERASE CLEANLY TO CHANGE

EXAMPLE: (1) (2) (3) (4)

HEALTH STATUS

These questions ask for your view about your health. Please answer every question by marking one box. If you are unsure about how to answer, please give the best answer that you can.

3. What is your current height?

4. What is your current weight?

5. In general would you say your health is:

- (1) Excellent (4) Fair
 (2) Very good (5) Poor
 (3) Good

The following items are activities you might do during a typical day. Does your health now limit you in these activities? If so, how much?

6. Moderate activities, such as moving a table, pushing a vacuum, or bowling?

- (1) Limited a lot (2) Limited a little (3) Not limited at all

7. Climbing several flights of stairs?

- (1) Limited a lot (2) Limited a little (3) Not limited at all

During the past week, have you had any of the following problems with your work or other regular daily activities as a result of your physical health?

8. Have you accomplished less than you would like?

- (1) Yes (2) No

9. Were you limited in the kind of work or other activities?

- (1) Yes (2) No

During the past week, have you had any of the following problems with your work or other regular daily activities as a result of any emotional problems?

such as feeling depressed or anxious)

10. Have you accomplished less than you would like?

- ① Yes ② No

11. Didn't do work or other activities as carefully as usual?

- ① Yes ② No

12. During the past week, how much did pain interfere with your normal work (including both work outside the home and housework)?

- ① None at all ④ Quite a bit
 ② Slightly ⑤ Extremely
 ③ Moderately

These questions are about how you feel and how things have been with you during the past week. For each question, please give one answer that comes closest to the way you have been feeling.

How much of the time during the past week...

13. Have you felt calm and peaceful?

- ① All of the time ④ Some of the time
 ② Most of the time ⑤ A little of the time
 ③ A good bit of the time ⑥ None of the time

14. Did you have a lot of energy?

- ① All of the time ④ Some of the time
 ② Most of the time ⑤ A little of the time
 ③ A good bit of the time ⑥ None of the time

15. Have you felt downhearted and blue?

- ① All of the time ④ Some of the time
 ② Most of the time ⑤ A little of the time
 ③ A good bit of the time ⑥ None of the time

16. During the past week, how much of the time has your physical health or emotional problems interfered with your social activities (like visiting with friends, relatives, etc.)?

- ① None at all ④ Quite a bit
 ② Slightly ⑤ Extremely
 ③ Moderately

17. The following is a list of daily activities

Please rate your ability . . .	No Difficulty	Some Difficulty	Unable To Do By Self
Taking a bath?	①	②	③
Dressing yourself?	①	②	③
Using the toilet?	①	②	③
Getting in and out of bed or chairs?	①	②	③
Eating?	①	②	③
Walking?	①	②	③

PREVENTIVE HEALTH

18. Do you currently smoke?

- ① Yes ② No

19. If you used to smoke, how long has it been since you quit?

- ① 6 months or less ③ Don't know
 ② More than 6 months

20. If you smoked in the past 12 months, has your doctor or nurse suggested that you quit?

- ① Yes ② No

21. Have you had a flu shot in the past year?

- ① Yes ② No

22. Did you have a shot to prevent pneumonia after you turned 65 years of age?

- ① Yes ② No

23. In the past 12 months, did your doctor or nurse talk to you about preventive health test options?

- ① Yes ② No

FEMALES ONLY

24. Did you receive a mammogram in the past two years?

- ① Yes ② No

HEALTH MANAGEMENT

25. In the past 12 months, did a doctor or nurse talk to you about how to eat right for your health condition(s)?

- ① Yes ② No

26. Thinking about your health condition(s), how well do you understand how to eat right?

- ① Understand Completely ③ A Little Unsure
② Understand Pretty Well ④ Do Not Understand

27. During the past month, about how often have you followed a healthful eating plan?

- ① Little or None of the Time ③ Most or All of the Time
② Some of the Time ④ Do Not Know

28. During the past 12 months, did your doctor or nurse talk to you about how to exercise the right way for your health condition(s)?

- ① Yes ② No

29. Do you exercise regularly?

- ① Yes ② No

30. Thinking about your health condition, how well do you understand how to exercise the right way?

- ① Understand Completely ③ A Little Unsure
② Understand Pretty Well ④ Do Not Understand

HEALTH UTILIZATION

31. Have you ever signed an advance directive (a living will and power of attorney for healthcare that says what kind of medical care you would want if you were so sick you couldn't tell your doctors what you wanted)?

- ① Yes ② No

32. How many times in the past 12 months have you been hospitalized?

- ① Not at all ③ Three times
② One or two times ④ More than three times

If you have, at which hospital(s) did you stay?

33. How many times in the last 12 months have you had to go to the emergency room or urgent care center?

- ① Not at all ③ Three times
② One or two times ④ More than three times

If you have been to an urgent care center, at which healthcare facility did you receive care?

34. Do you have any major surgery planned in the next 12 months?

- ① Yes ② No

If yes, where is your surgery planned?

35. At what facilities do you typically receive your lab tests or X-Rays, if needed?

HEALTH SATISFACTION

The following questions ask you about your personal satisfaction with health care services you have received.

36. We want to know how you rate all of your health care in the last 12 months from all doctors and other health professionals. Use any number on a scale from 0 to 10, where 0 is the worst health care possible, and 10 is the best health care possible.

How would you rate all of your health care?

- Worst Best
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

37. We want to know how you rate your personal doctor. Use any number on a scale from 0 to 10, where 0 is the worst personal doctor possible, and 10 is the best personal doctor possible.

How would you rate your personal doctor?

- Worst Best
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

38. We want to know how you rate your personal nurse(s). Use any number on a scale from 0 to 10, where 0 is the worst personal nurse(s) possible, and 10 is the best personal nurse(s) possible.

How would you rate your personal nurse?

- Worst Best
① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩

MEDICATIONS

39. What is the total number of medications, prescribed by your doctor, that you take?

- ① ② ③ ④ ⑤ ⑥ ⑦ ⑧ ⑨ ⑩
⑪ More than ten

40. During the past 12 months, has your doctor or nurse asked about how and when you take your medications?

- ① Yes ② No

41. During the past 4 weeks, have you taken your medications as ordered by your physician?

- ① All of the Time ③ Some of the Time
② Most of the Time ④ None of the Time

42. If you have CONGESTIVE HEART FAILURE Do you take any of the following medications?

MEDICATIONS	Yes
Atenolol (Tenormin)	①
Benzazepril (Lotensin)	①
benazepril/hydrochlorothiazide (Lotensin-HCT)	①
Captopril (Capoten)	①
Carvedilol (Coreg)	①
Enalapril (Vasotec)	①
Enalapril/hydrochlorothiazide (Vaseretic)	①
Fosinopril (Monopril)	①
Lisinopril (Prinivil, Zestril)	①
Lisinopril/hydrochlorothiazide (Zestoretic)	①
Losartan (Cozaar)	①
Losartan/hydrochlorothiazide/potassium (Hyzaar)	①
Metoprolol (Lopressor)	①
Metoprolol (Toprol XL)	①
Propranolol (Inderal)	①
Quinapril (Accupril)	①
Ramipril (Altace)	①
Sotalol (Betapace)	①
Valsartan (Diovan)	①

43. If you have ATRIAL FIBRILLATION, Do you take any of the following medications?

MEDICATIONS	Yes
Aspirin	①
Clopidogrel (Plavix)	①
Warfarin (Coumadin)	①

44. If you do not take one of the Atrial Fib medications, has your doctor told you why?

- ① Yes ② No

45. If you have CORONARY ARTERY DISEASE Do you take any of the following medications?

MEDICATIONS	Yes
Atorvastatin (Lipitor)	①
Flavastatin (Lescol)	①
Lovastatin (Mevacor)	①
Pravastatin (Pravachol)	①
Simvastatin (Zocor)	①

46. If you have COPD or ASTHMA, Do you take any of the following medications?

MEDICATIONS	Yes
Albuterol (Proventil, Ventolin)	①
Albuterol/ipratropium (Combivent, Duoneb)	①
Beclomethasone (Becloforte, Beclovent, Beconase, Vancenase, Vanceril, QVART)	①
Bitolterol (Tornalate)	①
Budesonide (Pulmicort)	①
Cromolyn (Crolom, Nasalcrom, Intal)	①
Flunisolide (Aerobid)	①
Fluticasone (Flovent)	①
Formoterol (Foradil)	①
Ipratropium (Atrovent)	①
Levalbuterol (Xopenix)	①
Metaproterenol (Alupent)	①
Montelukast (Singulair)	①
Pirbuterol (Maxair)	①
Prednisolone	①
Prednisone (Deltasone)	①
Salmeterol (Serevent)	①
Salmeterol + Fluticasone (Advair)	①
Terbutaline (Brethaire, Brethine, Bricanyl)	①
Theophylline (Slophylline, Theodur, Theolair, Theo Uniphyll 24)	①
Triamcinolone (Azmacort)	①
Zafirlukast (Accolate)	①
Zileuton (Zyflo)	①

47. What other prescription medications, besides the ones listed, are you taking?

SPECIFIC HEALTH CONDITIONS

If you have one or more of the following health condition(s), please answer the questions following the condition(s) you have. Please answer the questions for all of the conditions that you have.

CONGESTIVE HEART FAILURE

Questions 48 through 50

Only answer the following questions if you have been diagnosed with congestive heart failure.

48. In the past year, did your doctor or nurse discuss with you your eating and drinking to control salt and fluid build-up?
- ① Yes ② No
49. During the past 2 weeks, how often have you weighed yourself?
- ① Daily ④ 5 or 6 Days a Week
② 1 or 2 Days a Week ⑤ Never
③ 3 or 4 Days a Week
50. During the past 4 weeks, how often have you had swelling in your feet, ankles, or legs when you woke up in the morning.
- ① Most of the Time ③ Rarely
② Some of the Time ④ Never

CHRONIC LUNG DISEASE (COPD OR EMPHYSEMA)

Questions 51 through 55

Only answer the following questions if you have been diagnosed with COPD. Thank you.

51. In the past 4 weeks, on average, how many times have you had shortness of breath or wheezing from mild exertion?
- ① Once or twice a month ④ Daily or almost daily
② Once or twice a week ⑤ Never
③ Several times a week
52. Have you ever been taught how to measure your lungs with a peak-flow meter?
- ① Yes ② No

53. In the past 12 months, have you participated in a pulmonary rehabilitation program?

- ① Yes ② No

54. Do you check your lungs on a regular basis with a peak-flow meter?

- ① Daily ③ Only When Necessary
② Weekly ④ Never

55. If you use oxygen, please check the box with the closest number of hours a day you use it?

- ① 0 - 6 Hours ③ 13 - 18 Hours
② 7 - 12 Hours ④ 19 - 24 Hours

CORONARY ARTERY DISEASE (Angina/ Chest Pain, Heart Attack, Heart Surgery)

Questions 56 through 59

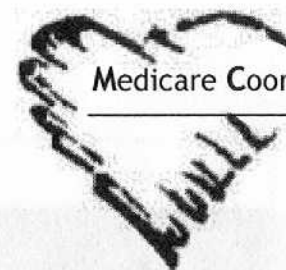
Only answer the following questions if you have been diagnosed with coronary artery disease.

56. In the past year did your doctor or nurse give you a list of heart attack warning signs and instructions on what to do?
- ① Yes ② No
57. How well do you understand which heart symptoms to look for and when to seek urgent medical attention?
- ① Understand Completely ③ A Little Unsure
② Understand Pretty Well ④ Do Not Know
58. In the past 4 weeks, on average, how many times have you had chest pain, chest tightness, or shortness of breath?
- ① Once or twice a month ④ Daily or almost daily
② Once or twice a week ⑤ Never
③ Several times a week
59. How many times have you used nitroglycerin, tabs or spray, for chest pain, chest tightness, or shortness of breath?
- ① Once or twice a month ④ Daily or almost daily
② Once or twice a week ⑤ Never
③ Several times a week

APPENDIX D

**EXAMPLES OF CARLE MCCD CLINICAL
GUIDELINES (FOR DIABETES AND
CONGESTIVE HEART FAILURE)**

At Diagnosis	Therapy Start	Therapy Adjust			
		< 80	140-250	> 250	
FBG > 300 mg/dL CBG > 350 mg/dL HbA1c > 11% Stage Insulin Stage 2 (Not being recommended for elderly)	RA/N - 0 - RA/N - 0 R/N - 0 - R/N - 0 AM - MIDDAY - PM - BEDTIME Distribution 2/3 0 1/3 0 R/N or LP/N ratio 1:2 - 1:1 - Premixed insulin, 10/30 AM and 50/50 PM, may be used for patients unable to draw insulin correctly Increased risk of nocturnal hypoglycemia, check BG 2-3 AM once a week	AM or 3 AM	↓ PM N 1-2 U	↑ PM N 1-2 U	↑ PM N 2-4 U
		MIDDAY	↓ AM RA or R 1-2 U	↑ AM RA or R 1-2 U	↑ AM RA or R 2-4 U
		PM	↓ AM N 1-2 U	↑ AM N 1-2 U	↑ AM N 2-4 U
			< 100	160-250	> 250
		BEDTIME	↓ AM RA or R 1-2 U	↑ AM RA or R 1-2 U	↑ AM RA or R 2-4 U
			< 80	140-250	> 250
FBG > 300 mg/dL CBG > 350 mg/dL HbA1c > 11% Stage Insulin Stage 3	RA - 0 - RA - N R/N - 0 - R - N AM - MIDDAY - PM - BEDTIME Insulin sensitizers may be added when total daily insulin dose ≥ 0.7 U/kg	AM or 3 AM	↓ BT N 1-2 U	↑ BT N 1-2 U	↑ PM N 2-4 U
		MIDDAY	↓ AM RA or R 1-2 U	↑ AM RA or R 1-2 U	↑ AM RA or R 2-4 U
		PM	↓ AM N 1-2 U	↑ AM N 1-2 U	↑ AM N 2-4 U
			< 100	160-250	> 250
		BEDTIME	↓ AM RA or R 1-2 U	↑ AM RA or R 1-2 U	↑ AM RA or R 2-4 U
			< 80	140-250	> 250
FBG > 300 mg/dL CBG > 350 mg/dL HbA1c > 11% Stage Insulin Stage 4	RA - RA - RA - N or G R/N - 0 - R - N AM - MIDDAY - PM - BEDTIME Insulin sensitizers may be added when total daily insulin dose ≥ 0.7 U/kg	AM or 3 AM	↓ BT N or G 1-2 U	↑ BT N or G 1-2 U	↑ PM N or G 2-4 U
		MIDDAY	↓ AM RA or R 1-2 U	↑ AM RA or R 1-2 U	↑ AM RA or R 2-4 U
		PM	↓ MID RA or R 1-2 U	↑ AM N RA or R 1-2 U	↑ AM RA or R 2-4 U
			< 100	160-250	> 250
		BEDTIME	↓ AM RA or R 1-2 U	↑ AM RA or R 1-2 U	↑ AM RA or R 2-4 U
			< 80	140-250	> 250



Medicare Coordinated Care Demonstration

Diabetes Treatment
Research Guideline

Medicare Coordinated Care Demonstration

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<http://cweb.carle.com/MCCD/guidelines/guidelines.htm>

FBG=Fasting Blood Glucose, CBG=Casual Blood Glucose, RA = Rapid acting (Lispro or Aspart), N = NPH, or G = Glargine

At Diagnosis	Therapy Start		Therapy Adjust	
FBG < 200 mg/dL CBG > 250 mg/dL HbA1c > 7% Stage Medical Nutrition Therapy	<ul style="list-style-type: none"> Total fat = 30% total calories, less if obese and elevated LDL Saturated fat < 10% total calories, <7% with elevated LDL Cholesterol <300 mg/day Sodium < 2400 mg/day Protein reduced to 0.8 gm/kg/day (~10% total calories) if macroalbuminuria Calories decreased by 10-20% if BMI ≥25 kg/m² Set meals and snack times Set consistent carbohydrate intake at meals and snacks to meet BG targets (see sample food plan) Establish regular exercise regimen based on fitness level Exercise – 20 minutes 3 times a week 		Continue Medical Nutrition Therapy throughout all stages	
FBG 200-300 mg/dL CBG 250-350 mg/dL HbA1c > 9% Stage Oral Agent	Indications for Use of Oral Agents			
	Metformin	<u>Positive</u> Obesity Dyslipidemia Insulin resistance	<u>Negative</u> Lactic acidosis Hypoxia > 80 years of age CHF	
	Sulfonylurea	<u>Positive</u> Insulin deficiency FPG > 250 CPG > 300	<u>Negative</u> Hypoglycemia Weight gain Sulfa allergy (rarely)	
	α-Glucosidase Inhibitor	<u>Positive</u> Post-meal hyperglycemia	<u>Negative</u> GI disturbances	
	Thiazolidinedione	<u>Positive</u> Obesity Insulin resistance	<u>Negative</u> CV disease Liver disease	
Repaglinide of Nateglinide	<u>Positive</u> Insulin deficiency Flexible meal schedule Renal insufficiency	<u>Negative</u> Hypoglycemia Weight gain	<ul style="list-style-type: none"> If SMBG and/or HbA1c is in target range continue current therapy Assess monthly improvement if SMBG improved by 15-30 mg/dL and/or HbA1c by 0.5-1.0 percentage points in 3 months continue current therapy If not making progress increase oral agent up until reaches maximum dosage After maximum dose reached for 4-8 weeks and not controlled change to Combination Therapy or Insulin Therapy Essential to recognize that hypoglycemia secondary to glyburide can persist 72 hrs If single patient-unsupervised use with caution If AM blood glucose is high, check 2-3 AM to see if it is too low and patient rebounding 	
Stage Combination Oral Agent	<ul style="list-style-type: none"> Maintain current oral agent dose Add starting dose of second oral agent with first meal unless otherwise noted 			<ul style="list-style-type: none"> If not making progress increase second oral agent up until reaches maximum dosage
Stage Oral Agent and Insulin	Oral Agent (OA) - Insulin OA – 0 – 0 – NPH (N) or Glargine (G)			
	<ul style="list-style-type: none"> Decrease oral agent dose to ≤ 50% maximum; give as single dose in am Calculate insulin dose at 0.1 U/Kg based on current body weight; give at bedtime 			
	Time	BG mg/dL		Action
	AM or 3 AM	< 80	↓ BT N or G 1-2	
		> 140	↑ BT N or G 1-2	
	If dose > 0.3 U/hg, move to insulin stage 2, 3, or 4			
PM or BT	< 80	↓ OA		
PM	> 140	Move to insulin		
BT	> 160	Move to insulin		

FBG=Fasting Blood Glucose, CBG=Casual Blood Glucose, RA = Rapid acting (Lispro or Aspart), N = NPH, or G = Glargine

DIAGNOSTIC TESTS FOR PATIENTS WITH HEART FAILURE

(Test, Frequency, and Purpose)

1. **Electrocardiography** – Yearly
 - Determine if ischemic heart disease is present
 - Gather information regarding rhythm abnormalities
 - Rule out heart failure symptoms related to other conditions
2. **Stress echocardiogram** (Naughtl) – Initially
 - Evaluation of functional capabilities
 - Determine ejection fraction
 - Ventricular function
 - Chamber size and shape
 - Wall thickness and valvular function
 - Rule out heart failure symptoms related to other conditions
3. **Chest x-ray** – Initially and prn
 - Pulmonary congestion
 - Cardiomegaly
4. **B-type Natriuretic Peptide (BNP)** - Q 3 mo & prn
 - Confirm diagnosis
 - Marker of severity of heart failure
5. **Basic Metabolic Profile (BMP)** – As needed
 - Determine renal function
 - Monitor electrolytes
6. **Comprehensive Metabolic Profile (CMP)** – Yearly
 - Evaluation of nutritional status and multisystems
 - Serum albumin to monitor extracellular volume
7. **CBC** – Initially and prn
 - Rule out heart failure symptoms related to other conditions
 - Anemia
8. **Lipid panel** - X 2 until LDL < 100 then annually
 - Medication management
 - Decrease LDL to prevent further cardiac compromise
9. **Urinalysis** - Initially and prn
 - Nephrotic syndrome
 - Proteinuria
 - Glomerulonephritis
 - Red blood cells
 - Cellular casts
10. **TSH** – initially and prn
 - Hypo/hyperthyroidism
 - Monitor effects of medication

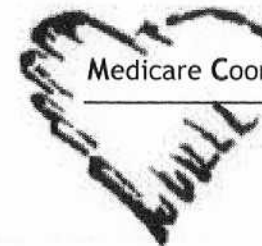
B-TYPE NATRIURETIC PEPTIDE (BNP)

Every 3 month BNP levels

- Confirm that the patient is on optimal treatment
- LV function deteriorates over time without acute events, checking levels on regular basis can pick up deterioration
- If the BNP is going up you can get an echo to see if LVH has changed
- Trigger medication change/addition to improve the situation
- Trying to establish a baseline along with dry weight
- Heart failure is a chronic illness and this is an easy test to monitor heart failure
- Gives added value to the clinical assessment; Blood test – not a lot of added cost
- BNP in atrial fibrillation – early detection of heart failure permits early intervention that might prevent the disease from progressing

What to do with an elevation

- If 100 point change
 - Are they optimized on their medications?
 - Is their fluid increasing?
- IF 500 point change
 - Obtain an echocardiogram
- If continues to creep up
 - Evaluate medication optimization
 - May want to get an echocardiogram if one has not been obtained recently



Medicare Coordinated Care Demonstration

Heart Failure Research Guideline

Medicare Coordinated Care Demonstration
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(217) 586-5913
(888) 874-4477

<http://cweb.carle.com/MCCD/guidelines/guidelines.htm>

HEART FAILURE MCCD RESEARCH GUIDELINE FOR THE OLDER ADULT

MEDICATION STEPS	MEDICATION DOSE AND FOLLOW UP RECOMMENDATIONS	CLINICAL COMMENTS
1. Start initial dose of ANGIOTENSION CONVERTING ENZYME INHIBITOR (ACE I)	<p><u>Initial dose:</u></p> <ul style="list-style-type: none"> • Quinapril (Accupril) 2.5-5 mg QD • Ramipril (Altace) 1.25-2.5 mg BID • Lisinopril (Zestril or Prinivil) 2.5-5 mg QD • Or other approved ACE <p>---Titrate dosage up every two weeks till reach target dosage and with each increase in medication check blood pressure, renal function, and serum potassium</p> <p><u>Target dose:</u></p> <ul style="list-style-type: none"> • Quinapril (Accupril) 20 mg QD • Ramipril (Altace) 5 mg BID • Lisinopril (Zestril or Prinivil) 20-40 mg QD 	<ul style="list-style-type: none"> • Patients who can not tolerate ACE Inhibitors should be place on Angiotension II receptor blocker • Patients with contraindications to an ACE I and an AngiotensionII receptor blocker should be given a trial of Hydralazine/Isosorbide Dinitrate (Hyd/Isdn) • If serum creatinine is > 3.0 mg/dL or an estimated creatinine clearance of < 30 mL/min., ACE inhibitors should be used with caution and titrated upward slowly, as tolerated, to a maximum of half the usual maintenance dose. <p>Once target dose of ACE I reached AND patient is stable add beta blocker</p>
2. Start initial dose of HMG-CoA REDUCTASE INHIBITOR	<p><u>Initial dose:</u></p> <ul style="list-style-type: none"> • Simvastatin (Zocor) 20 mg QD <p><u>Target dose:</u></p> <ul style="list-style-type: none"> • as needed to reach target LDL of < 100 	<p>If patient is already on a lipid-lowering agent, no need to change.</p> <p>Lipid panel X 2 until LDL < 100 then annually, also monitor ALT or AST</p>
DIURETICS	<p>– for fluid volume issues - may be added as needed at any time based upon patient symptoms of fluid overload</p> <ul style="list-style-type: none"> • Furosemide (Lasix) • Bumetanide (Bumex) • Torsemide (Demadex) <p>If refractory add Thiazide</p> <ul style="list-style-type: none"> • HCTZ • Metolazone (Zaroxolyn - for intermittent use) 	<p>Weight</p> <p>As soon as able document patients ideal dry weight</p> <ul style="list-style-type: none"> • Must be stable • No fluid overload • Not symptomatic
DIGOXIN	<p>May be added at any time based upon patient symptoms and need.</p> <p>For atrial fibrillation and will therapeutically improve fatigue</p>	<p>Check therapeutic level annually and as needed.</p> <p>If suspect level toxic also check a CMP</p>
3. Add initial dose of BETA-BLOCKER	<p><u>Initial dose:</u></p> <ul style="list-style-type: none"> • Metoprolol (Toprol XL) 25 mg QD • Carvedilol (Coreg) 3.125 mg BID <p>Titrate dosage up every two weeks till reach target dosage and with each increase in medication check blood pressure, renal function, and serum potassium</p> <p><u>Target dose:</u></p> <ul style="list-style-type: none"> • Metoprolol (Toprol XL) 150 mg QD • Carvedilol (Coreg) 25 mg BID 	<p>Beta blockers</p> <ul style="list-style-type: none"> • Should only be started when patients condition is stable • Significant bradycardia (<60-65/minute with symptoms) may require lowering the beta-blocker dose <p>Diuretic dose may need to be increased or decreased depending upon symptoms</p>
4. Add ALDOSTERONE ANTAGONIST	<p><u>Initial and Target dose:</u></p> <ul style="list-style-type: none"> • Spironolactone (Aldactone) 25 mg QD <p>• if renal function and serum potassium are normal</p> <p>Check serum potassium level in 1 week and with any change in medication</p>	<p>Spironolactone</p> <ul style="list-style-type: none"> • If on potassium supplement discontinue • Monitor serum potassium especially in combination with an ACE
5. Add initial dose of ANGIOTENSION II RECEPTOR BLOCKER IF NEEDED	<p><u>Initial dose:</u></p> <ul style="list-style-type: none"> • Losartan (Cozaar) 25 mg QD <p>Titrate dosage up in two weeks to target dosage and check blood pressure, renal function, and serum potassium</p> <p><u>Target dose:</u></p> <ul style="list-style-type: none"> • Losartan (Cozaar) 100 mg QD 	<p>Can be added to therapy in Stage IV patients to help relieve symptoms. Combining an ARB with an ACE inhibitor can improve physical function. Combination of ARB with an ACE inhibitor may be warranted in the presence of severe hypertension.</p>
CALCIUM CHANNEL BLOCKER	<p><u>Initial dose:</u></p> <ul style="list-style-type: none"> • Diltiazem (Cardizem CD) 120 mg QD • Verapamil (Covera HS) 180 mg QD <p><u>Target dose:</u></p> <ul style="list-style-type: none"> • Diltiazem (Cardizem CD) as needed to get to target heart rate • Verapamil (Covera HS) as needed to get to target heart rate 	<p>May be added in diastolic dysfunction for increased heart rate of blood pressure</p>
HYDRALAZINE ISOSORBIDE DINITRATE	<p><u>Initial Dose:</u></p> <ul style="list-style-type: none"> • Hydralazine 25 mg TID • Isosorbide Dinitrate 10 mg TID <p><u>Target dose:</u></p> <ul style="list-style-type: none"> • Hydralazine 75 mg TID • Isosorbide Dinitrate 40 mg TID 	<p>Patients with persistent dyspnea after <u>optimal maximum doses</u> of diuretics, ACE inhibitors, and digoxin should be given a trial of hydralazine and/or nitrates.</p> <p>Hydralazine may be particularly useful in patients with <u>persistent hypertension</u> and in patients with evidence of severe mitral regurgitation.</p> <p>Alternately, if a patient primarily has symptoms of pulmonary congestion or has a low systolic blood pressure, nitrates are preferred, such as isosorbide dinitrate, 40 mg TID.</p>