



# The AD-LIFE Trial

Working to Integrate Medical  
and Psychosocial Care  
Management Models

Interdisciplinary care management that fully integrates medical and social care is advocated for optimal care of patients with many types of chronic illnesses, yet the effectiveness of this care model has been insufficiently tested using randomized controlled trials. This article presents the results of a pilot care management program and a description of a larger randomized controlled trial modeled after the pilot program (the After Discharge Care Management of Low-Income Frail Elderly [AD-LIFE] trial). It compares an integrated medical and social care management model (intervention group) with a purely social model (control group) involving low-income elderly patients with chronic conditions and functional impairment at high risk for rehospitalization or nursing home placement. A case study of a patient participant in the AD-LIFE study is presented. The case illustrates the positive effects of the intervention on biopsychosocial outcomes.

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## The Need for Improved Transitional Care and Chronic Illness Care Management

The healthcare system in the United States is structured to meet the needs of people with acute illnesses (Partnership for Solutions, 2002). As the population ages, however, the number of people with chronic diseases will substantially increase. Indeed, 75% of people older than 65 years have at least 1 chronic condition, and 50% have at least 2 chronic conditions (Agency for Healthcare Research and Quality, 2002). Chronic illnesses will place an increased burden on the healthcare system because people with chronic conditions account for 78% of all healthcare spending and 90% of all hospital costs (Partnership for Solutions, 2002).

Patients with chronic diseases often are hospitalized with exacerbations or complications of their illnesses and usually are discharged from the acute care facility into the care of their primary care physician (PCP) with little attention given to their transitional care needs (Naylor & McCauley, 1999; Naylor et al, 1994; Naylor, et al, 1999). Patients who must navigate the social and medical systems alone after discharge from the hospital often fail to receive many of the services they need and to which they are entitled (Mollica & Gillespie, 2003). This results in potentially avoidable rehospitalizations, decreased ability to live at home, and poorer quality of life. As currently organized, primary and acute care delivery systems are ill-prepared to meet the needs of elderly patients with chronic conditions, yet growing healthcare funding concerns necessitate a shift away from episodic acute treatment to illness prevention and optimal chronic illness management.

## Optimal Care for Patients With Chronic Illnesses

Interdisciplinary care management is advocated for the optimal care of patients with many types of chronic illnesses (Fonarow et al., 1997; Goldberg et al., 1997; Lorig et al., 1999; Philbin, 1999; Rich et al., 1995). Indeed, numerous care management programs exist for a variety of chronic illnesses throughout the country (Chen et al., 2000; Eng et al., 1997; Mollica & Gillespie, 2003). However, few of these programs have been tested using randomized controlled trials. In addition, most chronic care models are not fully integrated (i.e., the programs usually have a heavier social or medical component), although fully integrated programs are the gold standard (Mollica & Gillespie, 2003).

## Social Models of Care Management

Some case management services can be provided under state Medicaid and community-based long-term care waiver programs. However, most of these programs follow a social services model in which they often are “disintegrated” from the acute and primary care health sector. Social models typically use either social workers or nurses as case managers and place greater emphasis on resolving patients’ psychosocial issues than on closely following the patient’s medical condition. The case managers may or may not work within an interdisciplinary team and often do not have access to the patient’s PCP or the ability to collaborate with the PCP. As a result, care can remain fragmented, and although these models often show improvement in psychosocial issues, medical outcomes are less likely to be receiving the needed impact (Chen et al., 2000).

## Disease Management Models of Care Management

Traditional disease management programs have shown some promise for improving the quality of chronic illness care. However, they also have received criticism for being disease-centric, being impractical for patients with multiple comorbidities, and failing to address psychosocial factors that affect chronic illness outcomes.

Disease management programs tend to limit their attention to a few disease-related domains and to use care plans that are more standardized (Chen et al., 2000). A team approach is less useful in disease management because all goals tend to be disease specific and care plans usually are based on national guidelines, making them relatively inflexible. In fact, some disease management programs use care planning software to guide patient care. Disease management programs have been associated with decreased hospital use and lower costs. However, they do not address psychosocial issues such as caregiver support, geriatric syndromes (e.g., incontinence, depression, dementia), or financial and emotional problems. Furthermore, disease management programs are not well suited for patients with multiple chronic conditions.

## Integrated Models of Care Management

Few programs have fully integrated the social and medical models (i.e., models that bridge the health and functional dimensions) (Mollica & Gillespie, 2003). One example of a successful integrated care

management program is the Program of All-Inclusive Care of the Elderly (PACE). This care management program aims to prevent unnecessary hospitalizations and nursing home admissions (Eng et al., 1997). An interdisciplinary team approach is used by PACE to deliver care to nursing home-eligible patients within its centers. To provide for all patient care services, PACE uses capitated integrated (Medicare/Medicaid) financing. The emphasis of the program is on prevention, frequent follow-up evaluation, and comprehensive care. Although the effectiveness of the program has not been tested through a randomized controlled trial, PACE has received widespread acceptance and is believed to be cost effective.

The Wisconsin Partnership Program (WPP) currently is the most fully integrated care management program in the country (Mollica & Gillespie, 2003). In this capitated program, nursing home-eligible patients receive care in the setting of their choice by the provider of their choice. To coordinate all protocol-driven medical and social services, WPP uses an interdisciplinary team, which includes the member, the PCP, a registered nurse, a nurse practitioner, and a social services coordinator or social worker. The WPP care coordinator has the authority to order any primary, acute, or social service deemed necessary by the interdisciplinary team. A nurse practitioner shares the team care plan with the patient's PCP, but the entire team remains the patient's care manager. All providers must agree on how resources are to be spent. Therefore, medical needs do not automatically override psychosocial needs. The team uses shared documentation to decrease fragmentation of care (Mollica & Gillespie, 2003).

Although the aforementioned programs generally report improvement in patient outcomes associated with their interventions, they have not been tested using randomized trials. Thus, it is not known whether these models are ideal. The current study incorporated those elements of successful care management programs believed to be essential for success (i.e., integrated care management by an interdisciplinary team using evidence-based protocols and regular patient follow-up evaluation) and tested the effectiveness of the intervention using a randomized study design.

### Demonstration Pilot Study

The AD-LIFE trial was modeled after a pilot care management program conducted at our institution, a 963-bed nonprofit healthcare delivery net-

work with more than 30,000 admissions, 90,000 emergency visits, and 371,000 outpatient visits per year. In that pilot program, at-risk older adults were identified while hospitalized with an acute illness. At admission, an advanced practice nurse (APN) assessed eligible patients and assisted in discharge planning. The assessment findings were shared with a hospital-based interdisciplinary team that included the patient, a geriatrician, a registered nurse (RN) care manager, a pharmacist, a social worker, and other specialists as needed. This team was assembled by identifying geriatrics specialists throughout the hospital and transferring them to this health system initiative.

The team generated a care plan using evidence-based protocols for such problems as Alzheimer's disease, incontinence, health management, and depression. After discharge, the RN care manager implemented the plan in collaboration with the patient's PCP and provided ongoing follow-up evaluation. The PCPs were educated regarding the care management process, and each PCP practice was assigned its own RN care manager. A unique feature of this program permitted reimbursement for PCPs to meet face-to-face in their offices with care managers for about 15 minutes to review care plans and receive updates. This feature helped in achieving collaboration between the RN care manager, the interdisciplinary team, and the PCP. Then, RN care managers could call or visit patients as needed to ensure that the recommendations were implemented. They could even accompany the patient to any PCP visits if necessary.

One APN supervised 4 to 5 RN care managers, receiving regularly scheduled updates. The APN could reassess the patient at any time if necessary.

### Results From the Pilot Care Management Program

A subset of 118 patients from the pilot program who were Medicare/Medicaid dual-eligible patients similar to our target population in the larger randomized controlled AD-LIFE trial was selected to enable an estimate of the size of the care management program's effect on selected outcomes. As estimated, 92% of the patients enrolled in the pilot program had at least 1 medical or social issue requiring intervention, 78% had at least 1 medical problem, and 71% had at least 1 social problem requiring intervention.

Some of the problems identified at baseline among the 118 patients from the pilot program in-

cluded patients receiving 5 to 10 prescriptions (52%), patients receiving more than 10 prescriptions (37%), patients living alone (40%), patients with congestive heart failure (28%), patients with diabetes (28%), patients with chronic obstructive pulmonary disease (24%), and patients with cerebrovascular accident (10%). Most of the patients (97%) were 65 years of age or older. In addition, a large proportion of these patients had impairments in activities of daily living and instrumental activities of daily living as well as geriatric syndromes (Table 1). Table 2 shows the types of team-recommended nursing interventions that were implemented.

After 1 year in the care management program, all the patients were surveyed regarding their satisfaction with the program. Approximately 70% of those responding said that care management had improved their health, had made it easier to get healthcare services, and had provided them with a better understanding of their disease. They also reported that they had not experienced a subjective decline in health during the year. Furthermore, 92% said they would recommend the care management program to their friends, and 93% rated their experience as good or excellent. Surveys of PCPs showed extremely high levels of satisfaction with the program as well.

Decreased hospital admissions per 1,000 and decreased total costs were noted after implementation of the care management program. Costs com-

**Table 1. Proportion of Patients With Geriatric Syndromes**

Geriatric Syndrome	Patients With Syndrome (%)
Memory impairment	26
Positive depression screen	55
Falls	47
Incontinence	43
Sleep disturbance	41
Nutrition problems	25
Skin problems	13

**Table 2. Issues Addressed by the APN**

Intervention	Patients for Whom APN Interventions Were Implemented (%)
Teaching	91
Arranging social services	87
Performing medical screening	68
Addressing caregiver issues	24
Ensuring advanced directives are completed	57

paring 1-year prehospitalization with 1-year post care management implementation showed a savings of approximately \$1,000 per patient per month.

### The AD-LIFE Randomized Controlled Trial

On the basis of the findings from the pilot care management program, we are in the process of conducting a 3-year randomized trial comparing an integrated medical/social care management model (intervention group) with a purely social model (control group) involving elderly patients with chronic conditions and functional impairment at high risk for rehospitalization or nursing home placement. The study is called the After Discharge Care Management of Frail Elderly (AD-LIFE) study. The interventions for this randomized trial are essentially identical to those described earlier for the pilot program. Targeted patients include low-income elderly with functional impairment and chronic illnesses identified at the time of acute hospitalization. All patients enrolled are eligible for both Medicare and Medicaid, allowing future measures of healthcare utilization and costs.

Control conditions are characterized by usual medical care. Both groups are referred for evaluation by the local Area Agency on Aging (AAoA) for frail elderly. The AAoA, like many community-based care management programs, follows a social model of care that is not connected with the patient's healthcare providers. Our intervention fully uses the existing AAoA social services, but adds a hospital-based interdisciplinary team, comprehensive geriatric assessment, and care management by a team RN. The RN care manager



works collaboratively with the AAoA staff to ensure integration of medical and psychosocial care. We expect that our intervention will improve upon purely psychosocial interventions by integrating psychosocial and medical aspects of care, providing continuity of care across providers and care settings as well as individualized patient-centered care plans.

The experimental intervention involves assessment and intervention by an APN and an RN care manager in collaboration with a hospital-based interdisciplinary team that follows the patient from the hospital through the first year after discharge. The main elements of the intervention include

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comprehensive (hospital and home) assessment, patient goal setting, a focus on patient self-care skills and knowledge about chronic illness, evidence-based care planning for chronic illnesses and geriatric syndromes, an interdisciplinary team with access to medical subspecialties, collaboration with the PCP regarding implementation of the academically detailed and evidence-based care plan, frequent follow-up evaluation, and prompt revision of the care plan as needed.

Furthermore, this intervention helps to transition the patient from the hospital to home by assisting with discharge planning and following the patient up after discharge with an in-home assessment to ensure that the plan is implemented and that early revisions of the discharge care plan are made as problems are identified. In this way, patients can be ensured optimal preventive care and early identification of new problems, which should help in preventing not only acute illnesses requiring rehospitalizations, but also functional decline, which can lead to nursing home placement. The study RN care manager works collaboratively with community agency personnel to ensure that medical and social issues are addressed.

atively with community agency personnel to ensure that medical and social issues are addressed.

The following case from the current AD-LIFE trial illustrates how the intervention is implemented and how it can have an impact on patient outcomes.

### Case Study: Background

Mrs. F is a 70-year-old African American/Native American woman with a history of type 2 diabetes mellitus, hypertension, and congestive heart failure. She uses only formal social supports because her son has multiple medical problems that make him unable to provide care and she has no other friends or relatives in the area. She was admitted to the hospital for an emergency hemicolectomy.

After a 16-day hospital course, Mrs. F was discharged to a skilled nursing facility geriatrics rehabilitation unit (GRU) for 20 days. After returning home to her cluttered senior subsidized apartment, Mrs. F complained of feeling very tired and unable to perform activities of daily living. She also reported nausea and an overall feeling of malaise.

At a home visit by the APN and the RN care manager for the AD-LIFE trial, a medication review showed that the medications found in her home were not the same as those prescribed at discharge from the GRU. Mrs. F had been taking Ritalin, insulin, and oxycontin at the GRU, but did not have these medications at home, and thus was not taking them. As a result, her blood sugar was 349, and she showed signs of narcotics withdrawal. In addition, Mrs. F's spiritual health beliefs were hindering her adherence to traditional medical care. She is a devout Christian who has a deep faith in healing from God and personal sacrifice. In the past, she had stopped taking medications, believing that God would heal her of her diabetes. During hurricane Katrina, she stopped eating because others were suffering and she felt that her self-sacrifice would help them.

### Team Recommendations and Interventions

After the home visit, and in consultation with the patient's PCP, a team meeting was held to clarify

Mrs. F's correct medications. The care manager arranged for correct medications to be set up by the pharmacy, educated Mrs. F to throw out the old medications, and instructed her about how to take her new medications.

The AD-LIFE care manager worked with Mrs. F to identify her goals, which were "getting well" and "having energy." The care manager had to keep in mind Mrs. F's spiritual health beliefs of natural healing and her reluctance to take medications as interventions were developed. The interdisciplinary team developed the following recommendations to support her goals:

1. Fasting lipid panel, improved blood pressure control, and osteoporosis prevention
2. Education on self-management, taking medications, and monitoring blood sugar and daily weights
3. AD-LIFE pharmacist medication review to focus on changes in drug therapy
4. Consultation with AD-LIFE endocrinologist concerning medication suggestions to improve glycemic control and minimize medication side effects
5. Collaboration with AAoA care manager to provide community services and medical transportation
6. Consultation with AD-LIFE physical therapist after a fall to provide gait and home safety evaluation to reduce clutter
7. Coordination with the pharmacy to provide prepackaged home-delivered medications
8. AD-LIFE care manager to facilitate referral to ophthalmologist, podiatrist, and dentist, and to arrange mammogram for health maintenance
9. AD-LIFE care manager to facilitate and discuss advanced directives with Mrs. F.

During a subsequent home visit 4 months after discharge, the AD-LIFE care manager discovered that Mrs. F still was not taking her medications as prescribed. Her blood sugar was 332, and packages of unopened medications were found on her kitchen table. Again, the patient's spiritual health beliefs had negatively influenced her adherence to the prescribed medication therapy. The AD-LIFE care manager talked with Mrs. F about the consequences of not taking her medication, warning that she could end up in the hospital again. The care manager also reinforced that Mrs. F's reports of feeling sick and tired were directly related to her high blood sugar.

Next, the care manager tried to identify with the patient's faith beliefs, suggesting that the physician and other healthcare professionals may be tools God was using to treat her illnesses. This made the patient feel that her faith was being supported, which did not diminish Mrs. F's hope of healing. Through supporting her belief system, the care manager was able to encourage Mrs. F to adhere to medical treatment.

In addition, the AD-LIFE and AAoA care managers collaborated to discover that Mr. F was behind on Medicare D co-pays, with the result that the pharmacy would no longer deliver Mrs. F's medications. The AAoA care manager contacted the pharmacy to negotiate payment and to have the medications delivered. Approximately 2 months after discharge from the skilled nursing facility, the patient was discharged from home care when no further skilled needs were identified. Therefore, at this 4-month visit, the AD-LIFE care manager contacted Mrs. F's primary care physician, and home care was restarted to monitor medication therapy and adherence. The AAoA care manager also arranged for a phone call reminder service to contact Mrs. F 3 times a day to remind her to take her medications. The AD-LIFE care manager discovered that Mrs. F did not have a weight scale at home (an essential tool in daily monitoring of congestive heart failure) and contacted the AAoA care manager, who arranged for a scale to be delivered to the home.

### Outcomes of the Case

Within 6 months after implementation of the team recommendations, Mrs. F's blood pressure was at the target level, and her blood sugars had gone from the 300s down to between 90 and the 130s. Mrs. F is now recording her blood sugars using a daily log. She has even initiated obtaining glucometer strips (on her own) after running out. Mrs. F's blood sugars have improved since realizing how much better she feels when her blood sugar is under control.

By supporting Mrs. F's spirituality, the care manager was able to help Mrs. F understand the role of medical treatment and spirituality in keeping both her mind and body healthy. This was in line with her spiritual health beliefs and personal goals. Mrs. F still would prefer not to take her medications, but she dislikes being hospitalized more than she dislikes maintaining medication compliance. Mrs. F's PCP was pleased with her progress and was able to spend most of her recent follow-

up visit on health maintenance instead of crisis intervention related to poor glycemic control. The physician attributed Mrs. F's success to the care management of the AD-LIFE program, which skillfully integrated the medical and social model of care management to improve Mrs. F's health and functional status and promote independence.

## Discussion

Despite evidence of positive outcomes associated with the pilot care management program, as has shown by the other demonstration projects cited, the lack of randomization of subjects makes it difficult to determine the effectiveness of the intervention and the effect on costs. The current AD-LIFE study uses an organizational structure, evidence-based protocols, and communication protocols similar to those used in our demonstration pilot program. However, patients will be randomly assigned to our intervention or to control conditions. In this way, we will be able to draw clear conclusions about the effectiveness of this intervention in improving patient outcomes. ■

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**David Jarjoura, PhD**, is Co-investigator on the AD-LIFE trial. He provides statistical expertise for study design, implementation, and analysis and has developed a multiple end point global hypothesis testing strategy for the appropriate analysis of the wide array of outcomes impacted by care management interventions.

**Kyle Allen, DO**, is Principal Investigator on the AD-LIFE trial. He serves as the geriatrician on the interdisciplinary team.

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