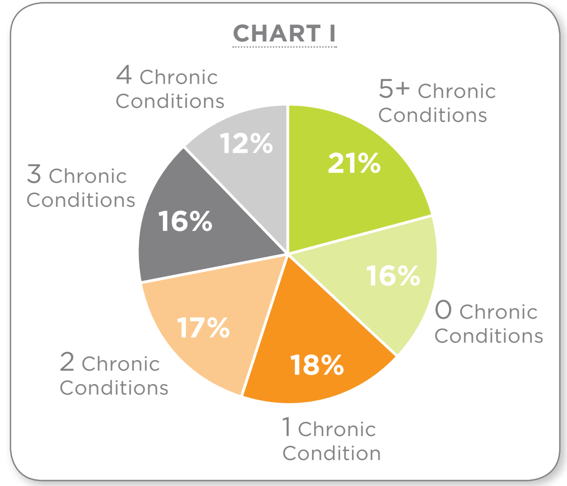
Issue Brief VI:

The Value Of Care Management Programs

In a previous Issue Brief, *The Value of Prevention and Wellness*, Vita Advisors discussed the evidence for value in prevention and wellness programs. Those programs are primarily oriented toward healthy individuals or those in very early stages of disease. For patients with chronic disease or complex health care needs, efforts aimed at more intensive management of health care service delivery, referred to as care management, are utilized.[1]

We have divided care management efforts into two primary categories: disease management and care coordination. Disease management, as we use that term in this Issue Brief, means programs focusing on patients with a specific chronic disease and having as a principal objective getting and keeping that disease in an optimal state of control. Care coordination, for purposes of this Issue Brief, refers to interventions for patients who have complex health care needs and are usually high cost. Care coordination focuses first on care processes, particularly the interaction among providers, facilities, patient and family caregivers. There can be overlap in the patients who might be targeted by each category of program. As explained further in the endnotes, other sources may use slightly different category names or categorization schemes.

The underlying rationale for care management programs is the well-recognized opportunity to improve health outcomes and the potential to reduce spending within this chronic disease population. Health outcomes and care processes for these patients, particularly those with multiple co-morbidities, are widely acknowledged to be deficient.[2] Health care spending is concentrated among a relatively few patients, typically with one or more of these chronic diseases. According to data from the Medical Expenditure Survey ("MEPS") 2006, people with chronic conditions account for 84% of all health care spending. As shown in Chart I below, 66% is spent on those with multiple conditions.



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In addition, the cost of people with multiple chronic conditions escalates dramatically, ranging from $2,844 per capita for individuals with one chronic condition, to $14,768 per capita for individuals with 5 or more chronic conditions.

GRAPH I

Per Capita Spending With Chronic Conditions

Number Of Chronic Conditions	0	1	2	3	4	5+
Per capita spending	$1,081	$2,844	$5,074	$7,761	$10,411	$14,768

The expectation that a programmatic approach to managing a defined population of high cost individuals could result in significant value spurred the creation of the care management programs described herein. The question on many purchasers' and policymakers' minds is: do these care management efforts work--do they improve health and will they lower spending?

While cost control is usually the primary driver for uptake of these programs, most also aim to improve clinical results for affected patients. This Issue Brief examines the evidence regarding the value of care management programs, in terms of both health and cost outcomes. As described in the Wellness Issue Brief, health outcomes usually measure items such as

The table below lists some common components of both disease management and care coordination interventions.[3]

CARE MANAGEMENT FRAMEWORK		
Components	**Definition**	**Tools / Strategies**
IDENTIFICATION STRATIFICATION PRIORITIZATION	Identify consumers at the highest risk who offer the greatest potential for improvements in health outcomes. Programs should incorporate clinical and non-clinical sources of information to identify consumers who will most benefit from care management.	• Health risk assessments • Predictive models (algorithm-driven models) • Surveys (e.g., Patient Health Questionnaire 9, Short Form 12) • Case finding (e.g., chart reviews, surveys) • Referrals (from member, provider, community)
INTERVENTION	Interventions should be tailored to meet individual consumer need, respecting the role of the consumer to be a decision maker in the care planning process. Interventions should be designed to best serve the consumer, be multi-faceted, improve quality and cost effectiveness, and ensure coordination of care.	• Evidence-based practices • Interactive care plan, developed with consumer-set priorities • Multidisciplinary care teams with "Go to" person • Medical home • Physical/behavioral health integration • Specialized patient engagement (e.g., self-mgmt training)
EVALUATION	Systematic measurement, testing, and analysis to ensure that tailored interventions improve quality, efficiency, and effectiveness. Careful and consistent evaluation will build the evidence base in terms of what works.	• Program evaluations • Rapid-cycle micro experiments (e.g., CQI) • Representative measures of quality (e.g., HEDIS) • Representative measures of cost (e.g., ROI)
PAYMENT / FINANCING	Aligned to support improvements in care management by rewarding consumers and providers for participating in interventions/ evaluations and establishing accountability for quality and cost.	• Pay for performance at multiple levels • Share in program savings (gainsharing) • Representative measures of quality (e.g., HEDIS) • Case management/medical home payments

mortality, morbidity, processes of care, biometrics, functional status, quality of life or satisfaction with care. Cost outcomes are measured by looking at health care expenses with and without an intervention, taking into consideration the cost of the intervention itself. Interventions that create reduced spending, assuming health outcomes are at least as good, are generally non-controversial. Once an intervention adds to cost, the question becomes whether it improves health outcomes enough to justify that additional cost.

The evidence for value generally comes from research and studies employing a variety of methods, although value may also be suggested by the willingness of purchasers to initiate and maintain care management programs. Randomized clinical trials are viewed as the most accurate and reliable source of evidence, but are expensive and often encounter practical limitations. Other types of research may have various methodological and analytic issues, but can produce very credible data. Thoughtful consideration has gone into evaluation of disease management program results.[4] In examining the evidence base, while it is necessary to be cautious not to over-interpret positive results, it is also important not to take ambiguous outcomes as proof that a care management program does not work. The body of research should be viewed as an evolving entity that provides guidance for improving the design and implementation of care management programs and no single trial or study should be taken as definite evidence of value or its absence.

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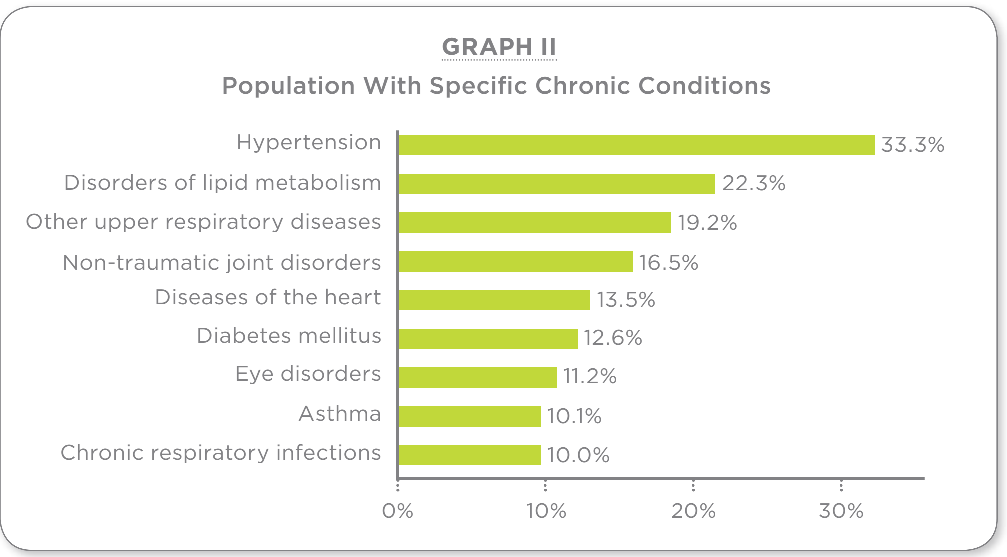
Our process for presenting the evidence on value is to extract conclusions from several reviews of the published research on care management, as well as from recent individual studies. We also describe evaluations in specific populations such as Medicaid or Medicare. Our intent is to give the reader a good sense of the research to date, a resource for further study, and our own conclusions on the state of the evidence.

I. DISEASE MANAGEMENT PROGRAMS

The Rand Corporation defines disease management as "an organized, proactive approach to health care for members of a population with a specific disease or combination of diseases."[5] For a number of years, general case and utilization management were widely used care management techniques. Following patient, provider and regulatory pushback against these practices in the 1980s and early 1990s, the notion of disease management became the focus for care management efforts. Support for and prevalence of disease management is also partially linked to the enthusiasm currently surrounding wellness and prevention; the two pieces are seen as part of a larger puzzle: how to maintain or improve health before crisis occurs and how to effectively and efficiently manage chronic disease from its earliest stages forward. The commercial disease management industry has begun to recharacterize its programs as "population health management" or "chronic disease care".[6] This shift is largely due to negative perceptions accruing to the term "disease management" as a result of customer disappointment with actual versus promised or expected cost savings, and from research results, most prominently



Source: Medical Expenditure Panel Survey, 2006

from Medicare's disease management demonstrations, which have been portrayed as indicating that these interventions did not work.

The chronic diseases that account for the bulk of disease management programs are characterized by their incidence, high cost and population concentration. The graph above details the percentage of people with each of the top chronic conditions.

When a health plan or employer initiates a disease management program, the intervention typically begins with the managing entity looking through claims data or health risk assessments to locate covered individuals who are eligible for the specific aims of the program. These individuals will be contacted and asked if they would like to participate; most disease management programs are opt-in, which is one of the barriers to higher enrollment and one of the limitations to rigorous research. Once the patient is enrolled, the interaction begins. Many of the first disease management programs consisted of telephonic interventions conducted by a nurse or other clinical professional, focused on educating the patient to engage in better self-care or to recognize certain warning signs. Interventions might also be undertaken with providers, to ensure that they understand and follow best practice guidelines for management of the patient's disease. The nurse would also typically assist with coordination and transition across multiple providers and care sites. While telephonic interventions have remained the most common offering, especially in third-party payer sponsored (as opposed to provider-based) programs, other possible elements include face-to-face contact with a clinician or other trained staff, and provision of literature through the mail or online. Frequent diagnostic monitoring and biometric data collection will be used to ensure that the patient is stable, if not improving.

Disease management programs have been examined for value in several contexts over the past two decades. Some research looks at particular components of a program and other studies attempt to ascertain the effect as a whole. Analyses are done of effects on clinical processes, health behaviors, intermediate outcomes, clinical outcomes, utilization, costs and patient satisfaction. Results have varied according to the intervention, disease, and patient group being studied.

DISEASE MANAGEMENT STUDY SUMMARIES

A summary of studies or reviews on the value of disease management programs discussed below.

		STUDY TYPE		POPULATION			DISEASES		OUTCOME (+, +/-, -)	
STUDY #	YEAR	SPECIFIC	META	COMMERCIAL	MEDICARE	MEDICAID	ONE	MULTIPLE	CLINICAL	COST
I	2007		X	X				X	+	+/-
II	2002, 2004		X	X	X	X		X	+	-
III	2009		X					X	+/-	+/-
IV	2008		X	X	X	X		X	+	+/-
V	2008		X	X	X	X		X		+/-
VI	2009	X		X	X		X		+	+
VII	2009	X		X	X		X		+	+
VIII	2009	X		X	X			X	+	+
IX	2009	X	X	n/a			X		+	+
X	2008, 2009	X				X		X	+	+
XI	2009	X			X			X	+/-	+/-

I. »

Casting questions of cost savings aside, the authors of a recent review of DM literature asserted that "Any intervention that improves the sorry state of chronic care at a reasonable price should be supported."

A relatively recent review of a large number of disease management studies published in the American Journal of Managed Care stratified interventions by intensity of the techniques applied and by severity of the population adressed.[7] Across these interventions the authors concluded that there was consistent evidence that disease management improved processes of care, intermediate outcomes and disease control. The findings on long-term outcomes, utilization and cost savings were more mixed, but as the researchers noted "this may be a consequence of the limited follow-up, which was commonly limited to 1 year, because changes in the long-term outcomes of patients may take longer to materialize." For larger scale population-based programs, they identified three studies, all of which improved quality of care and two reported cost savings. The review's take-away points were that although disease management seems to improve quality of care, its effect on cost was uncertain. Despite those uncertain cost savings, in a letter responding to a commentary on their article the authors stated "any intervention that improves the sorry state of chronic care at a reasonable price should be supported, even if it does not save money".[8] The authors' summary of evidence in regard to small-scale interventions is provided in the table below.

SUMMARY OF EVIDENCE OF DISEASE MANAGEMENT PROGRAM OUTCOMES BY CONDITION

Disease	Adherence to Evidence-based Guidelines	Changes in Health Related Behaviors	Changes in Intermediate Disease Control Measures	Clinical Outcomes	Changes in Utilization of Services	Financial Outcomes	Satisfaction, Quality of Life, Etc.
CONGESTIVE HEART FAILURE	IMPROVED	Inconclusive Evidence	IMPROVED	Inconclusive Evidence	REDUCED HOSPITAL ADMISSION RATES	Inconclusive Evidence	IMPROVED
CORONARY ARTERY DISEASE	IMPROVED	Evidence for No Effect	IMPROVED	Evidence for No Effect	Inconclusive Evidence	Inconclusive Evidence	Insufficient evidence
DIABETES	IMPROVED	Evidence for No Effect	IMPROVED	Insufficient evidence	Inconclusive Evidence	Inconclusive Evidence	Insufficient evidence
ASTHMA	Inconclusive evidence	Inconclusive evidence	Inconclusive evidence	Evidence for No Effect	Inconclusive Evidence	Evidence for No Effect	Insufficient evidence
CHRONIC OBSTRUCTIVE PULMONARY DISEASE	Inconclusive evidence	Insufficient evidence	Inconclusive evidence	Insufficient evidence	Insufficient evidence	Insufficient evidence	Insufficient evidence
DEPRESSION	IMPROVED	n/a	IMPROVED	Inconclusive Evidence	INCREASED UTILIZATION	INCREASED COST	IMPROVED

Source: S. Mattke et al, Evidence for the Effect of Disease Management

II. » **Early meta-studies concluded that DM interventions had a positive effect on clinical outcomes, but an unknown effect on cost.**

An early meta-study of 118 disease management programs, published in the British Medical Journal in 2002, concluded that all the interventions studied (including patient education, education of healthcare providers, provider feedback, reminders, and financial incentives) were "associated with improvements in provider adherence to practice guidelines and disease control."[9] The CBO's own review in 2004 relied to a large extent on earlier meta-studies like the BMJ one and concluded that there was insufficient evidence at that time to find that disease management programs could generally reduce the overall cost of health services, stating that "the prevailing evidence appears to be that while disease management programs improve adherence to practice care guidelines and lead to better control of the disease, their net effects on health costs are not clear."[10]

III. » **Targeted patient selection is essential for DM program success—RAND estimated that for Massachusetts it could mean a $12bn difference in cost/savings.**

The Rand Corporation in August 2009 outlined a number of options for the State of Massachusetts to control health spending, including more use of disease management.[11] The report suggests that only under very optimistic conditions could the state expect to save money by implementing these programs. The authors, however, generally assume limited targeting of the effort, appear to assume a higher cost of the intervention than is currently seen in many, if not most disease management programs, and do not calculate any savings other than from emergency room use and hospitalizations. Under their best case scenario, disease management would reduce spending in the state by $308 million and in the worst case, increase it by $6.7 billion! When they calculate a more-likely scenario in which patients are carefully selected, a savings of over $6 billion could result.

IV. » **A 2008 AHRQ literature review found significant value in several DM programs.**

The Agency for Healthcare Research & Quality in 2008 put together a guidebook on disease management for state Medicaid programs, which included a comprehensive review of the evidence base on what does and does not work, compiled from published research.[12] The studies included in the review had as subjects all populations; in fact very few involved Medicaid enrollees. The Table below summarizes AHRQ's findings. In general, the Agency concluded that there was significant evidence of value in terms of improving clinical outcomes, clinical processes and reducing utilization and cost. Its support for use of disease management programs by Medicaid programs suggests that the Agency believes disease management works, and the evidence base assembled in the report indicates it will work for populations other than Medicaid.

AHRQ EVIDENCE BASE REVIEW, BY DISEASE STUDIED

	Diabetes	Asthma	CHF	COPD	CAD
NUMBER OF STUDIES	61	34	18	6	5
TYPE OF INTERVENTION WITH STRONGEST EFFECT	In-person case management Provider Education	In-person case management Patient Education	In-person case management Telephonic case management Self-management and monitoring	In-person case management	In-person case management Self-management
EVIDENCE FOR POSITIVE EFFECT ON:					
CLINICAL OUTCOME	STRONG	STRONG	Mixed to Slight Positive	Mixed to None	STRONG
CLINICAL PROCESS	STRONG	STRONG	Slight	MODERATE	MODERATE
UTILIZATION	Mixed	MODERATE	GOOD	Mixed to None	No Evidence
COST	Mixed	MODERATE	Mixed	Slight	No Evidence

Source: AHRQ, Designing and Implementing Medicaid Disease and Care Management Programs

V. » An evidence base characterized by heterogeneity leading to mixed results is not the same thing as no evidence.

HEALTH MANAGEMENT ASSOCIATES DID AN ANALYSIS of the evidence for savings from disease management in 2008.[13] The authors conducted a comprehensive review, focused specifically on the issue of cost savings, of the published literature, including other meta-analyses or reviews. They acknowledged that this research gives discordant answers to the savings question, but note that "an evidence base characterized by heterogeneity leading to mixed results is not the same thing as 'no evidence'", and conclude that "well-designed care management programs can generate a positive rate of return of investment." They also found that the level of care management before the intervention and the characteristics of the patients selected for a program, as well as the type of intervention, could have a substantial impact on the amount of savings possible to achieve. The results of their review by disease are summarized below.

EFFECTS OF SELECTED DISEASE MANAGEMENT STRATEGIES

Disease/ condition	Intervention	Utilization changes or savings
CHF, MULTIPLE CHRONIC CONDITIONS, COPD	Multi-disciplinary pre-discharge planning and intensive patient counseling followed by post-discharge support that includes home visits	36% - 45% drop in readmissions; 35% - 45% drop in total hospital costs; ROIs from 1.4 to 32.7; savings of $535 pmpm and Medicare savings from reduced CHF readmissions of $424 million per year
ASTHMA	Home environmental assessments and amelioration for patients with frequent ED use or hospitalization	49% reduction in combined urgent care utilization (ER, hospital, unscheduled clinic visit)
HIGH-RISK PREGNANCY	Intensive pre- and post-natal care including dietary counseling and multiple home visits throughout pregnancy and post-partum	62%-31% drop in NICU admissions; 65%-39% drop in hospital costs; 16% drop in later pregnancies; 9 month drop in time that mother is on Medicaid
DIABETES	Multi-disciplinary teams applying treatment algorithms, meal planning, exercise reinforcement, extensive individualized and group follow-up education	$685 - $950 drop in per patient per year costs; 9% drop in all-cause hospitalizations; 71% drop in ER/hospital utilization; 21% fewer total claims
MENTAL ILLNESS	Intensive individualized chronic care model for severely and persistently mentally ill	In New York City, $3000 investment in services per patient yields savings of $24.6 million per year

Source: Meyer & Markham Smith, Chronic Disease Management

VI. » Long-term disease management studies showing longitudinal results may reveal new evidence of value and savings for well-designed interventions.

VERY RECENT RESEARCH SUPPORTS THE NOTION that interventions are becoming more targeted and sophisticated, leading to better results. In the last year, Aetna published outcomes from the first two and a half years of a program called Diabetes America, including a comparison of costs.[14] It is interesting to note that for the first two years of the study, the Diabetes America participants showed no statistically significant difference in their all-condition medical costs, inpatient hospitalizations, and emergency room visits when compared to the control group. However, in both those years the rate of poorly controlled diabetics (>7% HBA1c) decreased, and in year 2 that rate within study participants was significantly lower than the control group (44.4%, compared to 58.3% for the control group and a 61% baseline). In the third year of operation overall costs (medical and pharmacy) were $186 lower on a per-member per-month basis. The reduction in costs, attributed to fewer inpatient days and fewer emergency room visits, was accompanied by increased health in the form of better compliance with diabetic maintenance services and fewer poorly managed diabetics. Better control of participants' diabetes led to a decrease in costs for co-morbid conditions. This study is significant, not just for the health improvement and cost control outcomes, but as a reflection of a critical aspect of disease management research–the program must be evaluated over a number of years to ascertain value; looking at just at one or two years is not appropriate to accurately measure the longer-term outcomes these programs are intended to affect.

VII. »

A diabetes program generating savings of 5x cost found that these savings were concentrated in patients whose disease was not well-managed prior to the intervention.

Another recent study looking at Fallon Health Plan members, with a design aimed at minimizing confounding factors frequently mentioned in regard to disease management research, also examined diabetes management, with a population that was about 60% Medicare.[15] The patients were stratified into those considered in and out of control, meaning they were in more or less compliance with clinical practice guidelines. The intervention consisted of patient education, supplies for self-testing of blood sugar, and collection of information, which was shared with physicians when a health problem seemed to be developing. The program demonstrated better compliance with those care guidelines, better blood sugar control, fewer hospitalizations and lower onset of complications than for patients in the control group. The program generated significant savings of about five times the cost of the intervention. These savings were concentrated in the out-of-control group, which may be a useful lesson for patient selection in future disease management programs.

VIII. »

A VA DM program using telemonitoring showed dramatic decrease in service utilization for patients using the technology.

Utilizing telemedicine and eHealth technologies has gained popularity in disease management programs in recent years and appears to have aided these programs in creating value. More intensive home monitoring, sometimes referred to as remote patient or physiologic monitoring, may be one of the rising trends in disease management, based on very successful tests within the Veterans Affairs system. Studies conducted at the VA showed a 60% decrease in hospital admissions, 81% decrease in nursing home admissions, and a 66% decrease in emergency department visits for congestive heart failure patients with a remote monitoring intervention, compared to those who did not use the technology.[16] Remote monitoring also facilitates self-management of care and provides real-time information to providers about potential health issues, allowing more rational planning for a health care provider or facility visit. A study conducted in London found that compared to usual care, heart failure patients with monitoring equipment in the home which transmitted information to a nurse on a daily basis had fewer specialty and emergency room visits and fewer unplanned hospital admissions, although overall hospital days were similar.[17] Patients were comfortable with the device and used it appropriately. Although the study did not find an overall decrease in cost, it had a short follow-up period. The authors said that improvements in quality of care justified the small incremental cost.

IX. »

Increasing use of technology will likely improve both health and cost outcomes in care management programs.

Similarly, in another trial using remote monitoring for heart failure, emergency visits, hospitalizations and rehospitalizations were down for the intervention group compared to controls, and average per patient per month costs were down by almost $375, although intervention costs do not appear to have been included. Part of the goal of this study was to train patients to better self-manage care. The monitoring was stopped after a patient “graduated” from the program, and costs continued to decline after monitoring ended.[18] A recent review of heart failure telemonitoring studies concluded that most research demonstrated improvements in outcome measures and quality of life and showed decreased hospitalizations.[19] Increasing use of technology will likely improve both health and cost outcomes in care management programs.

X. » State Medicaid DM programs have had mixed results in cost reduction efforts.

The states have implemented a number of disease management efforts for Medicaid recipients. Research published in Health Affairs regarding Indiana's Medicaid disease management effort reports a mixed effect on costs.[20] The study evaluated spending 21 months before and 21 months after implementation for participants with CHF and diabetes. The patients were stratified by risk and lower risk members received a less intensive intervention. Costs were about $283 per month less for CHF patients and around $4 a month higher for diabetes patients. The savings were higher for low-risk members, which seemed counter-intuitive to the authors but may be consistent with the notion that the sickest patients with a disease have relatively unavoidable recurring health care needs. Different characteristics of the two diseases may be responsible for the different cost impact. CHF tends to have higher costs and more acute episodes, particularly of hospitalization, so there may be a greater opportunity for short-term cost savings. Diabetes, as the Aetna study discussed above suggests, is a lower-intensity chronic disease; one in which many elements of best practice care are often missing. Costs for these patients may temporarily increase as there is a "catch-up" on required health services. A longer follow-up would likely have demonstrated savings in future years for the Indiana Medicaid program. A recent paper utilizing a rigorous methodology and examining Georgia's Medicaid disease management program found strong evidence for reduction of health costs and utilization.[21] The analysis indicates that for high and moderate risk enrollees, savings were around $600 per month and for all eligible patients, about $140, compared to program costs of $30 per month.

XI. » CMS' Medicare DM programs have been widely commented on but perhaps imperfectly understood.

Medicare has conducted disease management demonstrations, which have resulted, somewhat misleadingly, in much of the negative commentary on the value of these programs. CMS' interest in disease management comes from its focus on the role of chronic illness as a significant driver of its spending. Health Affairs published an article reviewing Medicare's disease management and care coordination projects.[22] The table below summarizes the primary Medicare disease management demonstrations.Several commentators have explored reasons why these demonstrations, and the Medicare care coordination pilots described later, may not fully reflect the potential cost savings from care management, including patient selection and engagement problems, small sample sizes, inconsistent implementation of the intervention, failure to receive needed data quickly from CMS and too short study periods.[23]

MEDICARE DISEASE MANAGEMENT INTERVENTIONS

Demonstration	Intervention Group Population	Type of Intervention	Financial Provisions	Evaluation results / selected impacts
Medicare Disease Management for Severely Chronically Ill	Cumulative total of 18,165 beneficiaries with HF, diabetes, or CAD	Telephonic disease management and prescription drug benefit, with remote monitoring of HF patients	Organizations paid PBPM fee, at risk for program fees plus any increase in Medicare claims spending (budget-neutral)	One program improved quality of care in a few claims-based process measures; programs were unable to generate savings to offset program fees, were far from being cost-neutral. CMS recouped costs from two programs, pursuing recoupment from the third
Disease Management for Dual Eligible Beneficiaries	Dual eligibles with HF or any two of HF, CAD, and diabetes (number enrolled changed with redesigns)	Predominantly telephonic disease management by RNs, supplemented with in-home care management, wound care and end-of-life program	Organization paid PBPM fee, at risk for program fees (budget-neutral)	Redesigned after two years to reflect claims cost reductions in subpopulation, including fee reduction, scaled-back population and geography; now covering fees with reduced claims costs; evaluation of impact on outcomes in progress
Medicare Health Support	Initial enrollment 160,000 (in eight programs), now a total of 206,000 with HF, diabetes	Care and disease management, telephonic health coaching, some additional variation within programs	Organization paid PBPM fee for beneficiaries who agree to participate; up to full fee at risk if not budget-neutral	Fees increase Medicare costs 5-11% with little savings to date to offset those costs; impact on quality and satisfaction has been small and inconsistent

Source: Bott et al. Disease Management for Chronically Ill Beneficiaries in Traditional Medicare

II. CARE COORDINATION PROGRAMS

One of the frustrations with disease management programs has been that they often focused only on a specific disease, when many high-cost patients have multiple chronic and acute conditions. This recognition has prompted a shift towards whole person management, which is often addressed by care coordination programs. This evolving care management approach, which has gained momentum in recent years, hones in on the overall medical needs of the patient and better coordination of the complete set of medical services needed for that patient, with special attention paid to care at transitions, such as after a hospital discharge, and to social needs. The National Coalition on Care Coordination has defined care coordination as a:

> *client-centered, assessment-based interdisciplinary approach to integrating health care and social support services in which an individual's needs and preferences are assessed, a comprehensive care plan is developed, and services are managed and monitored by an identified care coordinator following evidence-based standards of care* [24]

The AHRQ definition is "deliberate organization of patient care activities between two or more participants (including the patient) involved in a patient's care to facilitate the appropriate delivery of health care."[25] And the Robert Wood Johnson Foundation defined it as "a set of activities designed to assist patients and their support systems in managing medical conditions and related psychosocial problems more effectively with the aim of improving patients' health status and reducing the need for medical services."[26] Regardless of the definition chosen, care coordination clearly does not have a specific disease orientation, in contrast to disease management, although care coordination would include attention to appropriate care for each of the conditions a patient might have.

Care coordination focuses on medical care processes and improving the interaction among health professionals, facilities, the patient and family caregivers.

While there are multiple approaches to care coordination, they tend to share core features, such as use of care teams, good communication and close working relationships among members of that care team, attention to transitions, teaching self-care and/or support of family caregivers, frequent or constant monitoring of the patient's condition to provide early awareness of danger signals, and keeping the patient in the least expensive setting, preferably his or her home. Many of the same patients who might be selected for a disease management program would also likely be chosen for care coordination efforts, since high cost patients almost always have one or more chronic diseases, but a care coordination program would select patients on the basis of the complexity and cost of their care needs, not primarily on the presence of a particular disease.

CARE COORDINATION STUDY SUMMARIES

A summary table of the studies on the value of care coordination programs discussed below.

		STUDY TYPE		POPULATION			DISEASES		OUTCOME (+, +/-, -)	
STUDY #	YEAR	SPECIFIC	META	COMMERCIAL	MEDICARE	MEDICAID	ONE	MULTIPLE	CLINICAL	COST
XII	2007		X	X	X	X		X	+	+/-
XIII	2009		X	X	X	X		X	+	+/-
XIV	2009		X	X	X			X	+	+/-
XV	2009	X	X	X	X			n/a	+	+
XVI	2006	X		X	X				+	+
XVII	2009	X		X			X	X	+	+
XVIII	2008	X			X		X	X	+	+/-
XIX	2009	X			X			X	+	+/-

XII. »

AHRQ's review of care coordination programs found a positive impact on health outcomes but insufficient evidence for cost savings.

In 2007 AHRQ published a lengthy review of care coordination programs as part of its Closing the Quality Gap series.[27] That review includes an analysis of the health and cost outcomes of existing care coordination efforts, as well as a description and categorization of those efforts and recommendations regarding future research directions. The AHRQ review concluded that there was "a positive effect of the care coordination strategies on the (health) outcomes studied," but that the "evidence was insufficient to allow for any definitive conclusions regarding the costs and benefits of the care coordination interventions evaluated."

XIII. »

RWJ's survey showed "convincing evidence of improving quality" but ambiguous results on utilization and cost.

The Robert Wood Johnson Synthesis Report itemized a variety of care coordination interventions in different settings and utilizing different techniques.[28] This Report also considered the evidence for health and cost outcomes, with results summarized in the table below. Their conclusion was that the studies showed "convincing evidence of improving quality" but reductions in hospital use and cost were more ambiguous.

SUMMARY OF FINDINGS OF CARE MANAGEMENT STUDIES

Site of study	Quality of care	Quality of care
Primary care	7 out of 9 studies found improved quality	3 out of 8 studies found reduced hospital use for subpopulations
Primary care	Some evidence of improved quality	Inconclusive evidence
Integrated multispecialty group	2 out of 3 studies found improved quality	1 out of 3 studies found reduced costs
Hospital-to-home	Many studies found improved quality	Many studies found reduced hospital use and costs
Hospital-to-home	No clear evidence of improved quality	No evidence of reduced costs

Source: RWJ Foundation, Care Management of Patients with Complex Health Care Needs

XIV. » Components linked to program success include appropriate targeting, in-person contact, timely access to data, close interaction between care coordinators and clinicians, and comprehensive services.

The NCCC Promise of Care Coordination report referenced above also examined a number of care coordination models, identifying factors that appeared to create good outcomes, finding that transitional care and self-management interventions, as well as those targeted at patients with a high risk of hospitalization in the coming year had the greatest likelihood of success.[29] Program components associated with that success included appropriate targeting, in-person contact, access to timely information on hospital and ER admissions, close interaction between care coordinators and primary care physicians and comprehensive services, including medication management. Their list of interventions with the strongest evidence of cost savings is presented in the table below.

	PROGRAMS					
	Naylor (2004)	Coleman	Lorig	Wheeler	Mercy	Mercy
STRUCTURAL CHARACTERISTICS						
TARGET POPULATION	CHF inpatients	Inpatients w/ chronic illness	Chronic illness	Women with cardiac problems	Heart Problems	Chronic illness
SETTING	Hospital/home	Hospital/home	Community	Community	Outpatient hospital	PCP's office / patient's home
INTERVENTION TYPE	Transitional Care Intervention	Transitional Care Intervention	Self-Management Intervention	Self-Management Intervention	Coordinated Care Intervention	Coordinated Care Intervention
LENGTH OF INTERVENTION	Inconclusive evidence	Insufficient evidence	Inconclusive evidence	Insufficient evidence	Insufficient evidence	Insufficient evidence
STAFFING	3 months	1 month	7 weeks	1 month	Open-ended	Open-ended
FOCUS OF INTERVENTION						
ADHERENCE	X	X	X	X	X	X
MONITORING	X	X	X	X	X	X
WORKING WITH PCP	X	X			X	X
IMPROVING COMMUNICATION	X	X	X	X	X	X
GETTING PHYSICIANS TO CHANGE TREATMENT	X	X			X	X
ARRANGING SUPPORT SERVICES	Limited	Limited	Limited	Limited	Limited, except for high severity patients	Limited, except for high severity patients
EVALUATION FEATURES						
FOLLOWUP LENGTH	1 year	180 days	6 months	21 months	30 months on average	30 months on average
SAMPLE SIZE (N+/NC)	118/121	379/371	664/476	233/219	463/467	739/725
METHODOLOGY	RCT	RCT	RCT	RCT	RCT	RCT
IMPACTS	-10.5% rehosps at 1yr -$4,845 in mean total costs at 1yr	-3.6% rehosps at 30d -5.8% rehosps at 90d -4.5% rehosps for same condition at 90d -5.3% rehosps for same condition at 180d -$488 mean hosp costs at 180d	-0.8 fewer nights in hospital -$820 in 6-month costs	-46% in-patient days -49% in-patient costs	-17.0% #hosps -$113 pmpm	-13.6% #hosps -$100 pmpm
COSTS	Total cost of intervention: $115,856 ($982 pm)	Annual cost of intervention: $74,310 ($196 pm)	$70 pm	$374 pm	$248 pmpm	$102 pmpm

Source: R. Brown, The Promise of Care Coordination

XV. »

Guided Care "appears to reduce multimorbid older patients' use of [health services]… the avoided cost of the services appear more than sufficient to offset the costs of providing GC."

An early care coordination model for chronic disease is the "Chronic Care Model" developed by Dr. Edward Wagner and colleagues. A Health Affairs article summarizes the evidence that this model has improved quality and created cost savings.[30] Another prominent care coordination approach was developed at Johns Hopkins Medical School under the leadership of Gerard Anderson, and is referred to as "Guided Care". It is primarily aimed at older persons with multiple chronic conditions and care is provided by a practice-based team that includes a registered nurse, 2-5 physicians, and other members of the office staff. The Guided Care Nurse (GCN) is responsible for assessment, monitoring and coaching, coordination of care, smoothing transitions, promoting self-management, helping to educate and support family caregivers, and facilitating access to appropriate community resources.[31] Based on preliminary reports from a pilot program, Guided Care "appears to reduce multimorbid older patients' use of hospital care, skilled nursing facility rehabilitation, home healthcare, and emergency care… the avoided costs of the services appear more than sufficient to offset the costs of providing GC." The Guided Care patients used less hospital, skilled nursing facility, emergency and home health care, but more specialist care, durable medical equipment, tests and treatments, compared to patients under usual care. The net cost savings after the cost of the program was about $75,000 for 55 patients in a year, or around $1500 per patient. The trial is ongoing, but the authors anticipate that future results will show even more cost savings. An earlier report on the study demonstrated that patients had a higher level of satisfaction with their care under the Guided Care model.[32]

XVI. »

A California care coordination program for dementia created improved quality and cost savings.

Another recent study examined care coordination for dementia.[33] Dementia has become one of the highest cost chronic diseases and because of its nature, almost always involves family or other non-professional caregivers. Patient-caregiver pairs in 18 primary care clinics in California were assigned to usual care or an intervention utilizing care managers and care management software. The study lasted for 18 months, which is probably too short a follow-up and may account for the mixed findings on cost savings. The researchers looked at cost outcomes from a payer perspective and an overall social perspective. Over three-quarters of the participants were in Medicare managed care programs, which also may limit cost savings, because most of those programs already have some degree of care management in place. The ongoing cost of the intervention was about $100 per month per patient. From a payer perspective, cost savings amounted to about $260 per month for patients who were in the study for the entire 18 months, but this was not statistically significant. From the social perspective the savings were about $365 per month, again not statistically significant. An earlier article had reported that the same intervention improved quality and health outcomes, primarily measured as compliance with care guidelines.[34] Although this research looked at one disease, it was a care coordination focused intervention.

XVII. »

Boeing's innovative care coordination approach led to costs that were 20% lower, and patients missed far fewer days at work.

The Health Affairs blog gives a preliminary report on a pilot project sponsored by Boeing to test a primary care-based care coordination approach called the "ambulatory intensive caring unit." The program evaluation matched the 276 high-cost, chronic disease patients enrolled in the project for at least twelve months with a control group and found that medical costs, taking into account the cost of the intervention, were 20% lower, physical functioning was higher and patients missed far fewer days at work, which is obviously important to employers.[35]

XVIII. »

Medicare patients have been the focus of many care coordination interventions with mixed results.

Care coordination trials or pilots have often involved Medicare beneficiaries, as this population tends to have the highest costs and the most hospitalizations. As with disease management, Medicare has engaged in coordinated care demonstration programs. The conclusions of the review by Bott and his co-authors in regard to those pilots is summarized in the table below, and are subject to the same methodological issues as noted in regard to the Medicare disease management projects.[36]

MEDICARE CARE COORDINATION INTERVENTIONS				
Demonstration	Intervention Group Population	Type of Intervention	Financial Provisions	Evaluation results / selected impacts
Medicare Coordinated Care	13,379 beneficiaries (in fifteen programs) with HF, CAD, diabetes cancer, COPD and others	Case management, telephonic management, telemonitoring	Organizations paid PBPM fee, not at risk for budget-neutrality or savings	Improved various aspects of quality of care, but extent of improvement varied among programs; increased Medicare costs overall by 11%
Care Management for High Cost Beneficiaries	Initial total enrollment 47,000 (in six programs). Current total 7,510 (in four programs)	Each program unique, including clinician home visits, in-home monitoring, caregiver support and education, preventive care tracking and reminders, 24-hr nurse lines	Organization paid PBPM fee; fees at risk for guaranteed savings of 5%, net of fees	Three programs show financial savings; only two are sufficient to cover fees and required 5% savings

Source: Bott et al. Disease Management for Chronically Ill Beneficiaries in Traditional Medicare

XIX. »

The weight of the evidence indicates that care coordination improves health outcomes, and can produce cost savings.

In addition to the projects reviewed by Bott and co-authors, another recent Medicare test in care coordination is the Physician Group Practice Demonstration. The demonstration began in April 2005 to test a hybrid payment methodology for physician groups–10 practice groups, with over 200 physicians each, participated. The new payment approach combines Medicare fee-for-service payments with incentive payments. All of the participating groups initiated care coordination programs with the goal of improving quality and generating cost savings. Only two of the ten groups were paid incentives in the first year for meeting quality of care targets; the others improved on most quality metrics but failed to generate sufficient cost savings to earn bonus payments. Performance improved in the second year and four of the groups received incentive payments. The GAO's report on this project concluded that the care coordination programs show promise, but that the study design could be improved.[37] HHS' own report to Congress on the demonstration found that it was generally reaching quality of care and savings targets.[38]

Although the Medicare disease management and care coordination projects to date have had mixed results, Congress directed the Medicare Payment Advisory Commission to study the feasibility of establishing a Medicare Chronic Care Practice Research Network to further evaluate models which might provide superior outcomes for Medicare and Medicare beneficiaries. Medpac completed a comprehensive review of the Medicare disease management and care coordination demonstrations and pilots in response, noting the methodological issues, and made recommendations regarding the proposed network.[39] This effort is deemed appropriate in part because Congress believes other research indicates that care management can deliver value if the programs are well-designed and have good execution. As with disease management, the weight of the evidence indicates that care coordination improves health outcomes, and can produce cost savings.

III. OBSERVATIONS ON OUTCOMES AND CONCLUSION.

In reviewing both disease management and care coordination programs, it is striking that the programs and the research on what features allow a program to create positive outcomes are in their early stages, yet many commentators opine that such efforts haven't worked, particularly in terms of saving money. That is not a fair characterization of the entire body of research and many of the studies, such as the Medicare demonstrations, cited in support of this conclusion have a variety of design, implementation and methodological issues. Given the widespread perception that the care of patients with chronic diseases and complex health care needs has been deficient, providing more rational management of that care should be expected to not only necessitate significant administrative time and expense but also potentially higher health costs in the short run as patients "catch up" on needed services. The research does strongly indicate that care management results in higher patient satisfaction, better care processes, better clinical outcomes and better health outcomes. The evidence may appear to be more mixed on cost savings, but many studies have had relatively brief follow-up periods which may not have allowed cost savings to be fully revealed and more recent studies tend to demonstrate that significant cost reductions are possible.

Even if care management does not universally create cost savings, the same criteria applied to preventive and wellness services should be applied to care management; that even interventions which improve health at some added expense can be deemed cost-effective and worth that extra expense. In the case of care management programs, the cost is small compared to that of many preventive interventions. As noted in one critique of the disease management industry "when measured on a cost per quality-adjusted life-year saved (QALY), some disease management interventions may, in fact, provide a good value."[40] It is not good public policy to know that a program improves clinical processes and health but refuse to fund the intervention because it doesn't reduce overall costs.

> "The primary standard for evaluation of any care management program should be first whether it improves health outcomes, and then whether it does so at a reasonable price."

The primary standard for evaluation of any care management program should be first whether it improves health outcomes, and then whether it does so at a reasonable price.

A critical issue for future interventions and research is the expanding role of new technologies, which can both reduce the cost of the intervention and increase health cost savings. Most care management programs are fairly labor intensive. Newer technologies and processes, such as text messaging or email reminders and interactions, remote patient monitoring and better patient risk stratification algorithms, can significantly lower the cost of the program. These technologies allow more real-time collection of data and therefore faster intervention to avoid expensive health care events. For example, remote monitoring of patient status in the home can help prevent trips to the emergency room. As these technologies spread, studies will likely reflect

both the lower cost of intervention and health spending reductions, which should cause more care management programs to be cost-saving. Some of the technology-oriented interventions we have described in this Issue Brief have demonstrated good outcomes and additional research is underway. For example, the Mayo Clinic has recently announced a 200 patient study that will examine whether home monitoring can reduce ER visits and hospitalizations for chronic disease patients.[41] In the United Kingdom, several tests are underway utilizing remote patient monitoring for chronically ill patients to determine if quality can be maintained while reducing costs.[42] And the Cleveland Clinic has an ongoing study involving patients with diabetes, heart failure and hypertension that uses various home monitoring devices to upload data to both a personal health record and the Clinic's electronic medical record. Early results suggest that this allows more appropriate scheduling of patient visits–less frequently in some cases, more often for heart failure patients, which improves overall patient care.[43]

Commercial care management companies to some extent created the dilemma of value being defined by spending reductions by focusing almost exclusively on cost savings as the rationale for utilizing their programs and probably overpromising the savings that could be delivered.[44] But the experience of the last few years and the growing body of research suggests that these programs do have value and that proven designs and good execution can produce both better health outcomes and lowered costs. It is certainly far too early to conclude that care management programs don't work; on the contrary, particularly with extensive use of new technologies, these programs provide the best opportunity for improving how health care is delivered to the system's most complex and costly patients and ultimately reducing health spending on these patients. ▪

The current state of care management program value is summarized on the bottom.

KEY POINTS IN CREATING AND ASSESSING INTERVENTION VALUE
Value should be primarily understood to be moving a patient to a well-controlled state, as reflected primarily in clinical process and clinical measure outcomes, at a reasonable cost
Patients should be selected for intervention not just on likelihood for high future health care costs, but for poor performance on clinical process and clinical measures
The intervention should be tailored by disease, by the state of disease and the level of disease control in a specific patient and by patient idiosyncrasies – i.e. what components a particular patient may best respond to
Value analysis may vary depending on nature of disease, the state of disease, and the level of disease control in a particular patient
The cost of the intervention should be kept as low as possible consistent with creating good health outcomes, and technology should be deployed to that end
If cost-saving is an objective, it should be viewed as secondary to improving health care processes and outcomes and should be measured over long enough periods to observe all effects of the intervention and should consider all health-related and non-health costs, such as less lost time at work
Real time information collection and transmission to providers should be used and a process to act quickly on warning signals should be in place
Where there are multiple caregivers, interaction and coordination should be maximized, preferably in an in-person manner
Medication therapy should be intensely managed

End Notes

[1] There is definitional confusion, with different sources using slightly divergent terms to refer to the same kind of program. We have chosen "disease management" for programs focused on a particular disease and "care coordination" for programs focused on the overall health services received by a patient.
We use care management as an overarching term to refer to any effort of any type to affect the care received by an individual.

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[3] Center for Health Care Strategies. Care Management Definition and Framework. (2007). http://www.chcs.org/usr_doc/Care_Management_Framework.pdf

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[10] CBO. An Analysis of the Literature on Disease Management Programs. (October 2004) http://www.cbo.gov/doc.cfm?index=5909&zzz=27534. The CBO has continued to be reluctant to assume that disease management will save money, see Key Issues in Analyzing Major Health Insurance Proposals. (December 2008). http://www.cbo.gov/ftpdocs/99xx/doc9924/12-18-KeyIssues.pdf

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[19] B. Maric et al. A Systematic Review of Telemonitoring Technologies in Heart Failure. European Journal of Heart Failure. v. 11, p. 506 (2009).

[20] A. Holmes et al. The Net Fiscal Impact of a Chronic Disease Management Program: Indiana Medicaid. Health Affairs v. 27 no. 3, p. 855 (2008).

[21] K. Kranker. The Impact of Disease Management Programs on High-Cost Chronically Ill Medicaid Enrollees. (November 2008). http://econweb.umd.edu/~kranker/research/Keith-Kranker-Job-Market-Paper.pdf

[22] D. Bott et al. Disease Management for Chronically Ill Beneficiaries in Traditional Medicare. Health Affairs v. 28 no. 1, p. 86 (2009).

[23] See Meyer above, for example.

[24] R. Brown. The Promise of Care Coordination. (March 2009). http://www.socialworkleadership.org/nsw/Brown_Full_Report.pdf

[25] Agency for Healthcare Research & Quality. Technical Review No. 9 Closing the Quality Gap, v. 7–Care Coordination (2007) http://www.ahrq.gov/downloads/pub/evidence/pdf/caregap/caregap.pdf

[26] RWJ Foundation. Care Management of Patients With Complex Health Care Needs (2009). http://www.rwjf.org/files/research/121609.policysynthsis.caremgt.report.pdf. In another instance of definitional confusion, what RWJ calls care management is what we refer to as care coordination.

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(continued)

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[42] http://business.timesonline.co.uk/tol/business/industry_sectors/health/article6974684.ece

[43] http://www.fiercehealthcare.com/press-releases/cleveland-clinic-microsoft-pilot-promising-home-health-services-may-benefit-chronic-d

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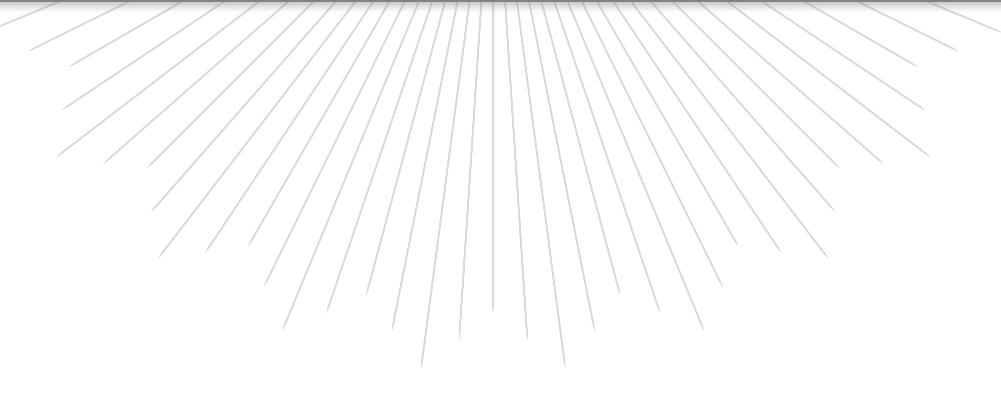

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