

Improving Chronic Illness Care

An RWJF national program

SUMMARY

Some 133 million people—almost half of all Americans—live with a chronic condition such as diabetes, heart disease, depression or asthma. That number is expected to swell to 171 million by 2030 as the population ages.

Chronic conditions require ongoing management over years or decades, but most health care systems are not set up to provide this kind of care. Rushed practitioners often fail to follow well-tested practice guidelines and coordinate their care with other providers. Patients do not get the training they need to take more responsibility for their own health. And too often, there is no active follow-up to make sure patients comply with treatment plans.

Launched in April 1998, the Robert Wood Johnson Foundation (RWJF) national program *Improving Chronic Illness Care* (ICIC) aimed to improve the health of chronically ill patients by helping large numbers of organized health systems, especially those serving safety-net populations, redesign how they deliver care. At the heart of the program was the Chronic Care Model—an approach that replaces the traditional physician/office-based structure with one that encourages collaboration among patients, physicians, nurses, case managers, dieticians, patient educators, families and friends.

ICIC supported a clinical improvement program and its evaluation, targeted research projects and an intensive dissemination effort—together aimed at improving the way in which care for chronically ill people is delivered.

Key Program Results

• ICIC's clinical improvement program engaged dozens of practices and health systems in Breakthrough Series Collaboratives around the country. These Collaboratives

¹ The Breakthrough Series Collaborative was created by Donald Berwick, M.D., and his team at the Institute for Healthcare Improvement (IHI) in Cambridge, Mass. The collaborative is a short-term (six- to 15-month) learning system that brings together a large number of teams from hospitals or clinics to seek improvement in a focused topic area.

collectively involved over 1,500 different practice organizations—including a sizable percentage of the country's community health centers—37 academic health centers and large organizations such as the New York City Health and Hospitals Corporation (the largest municipal health care system in the country).

- The targeted research grants program funded 19 research projects that looked at major knowledge gaps and barriers in the Chronic Care Model and how it was being implemented.
- ICIC published 99 articles in academic publications and made some 350 presentations (in addition to those done as part of Breakthrough Series Collaboratives) to academic and practitioner audiences.
- The ICIC website grew into a vital hub for resources, information and communication
 for the chronic illness care field. Historical ICIC data show a six fold increase in
 traffic over the lifespan of the website.

Program Impact

A review published in *Health Affairs* in 2009 looked at journal articles that cited one of five key articles published between 1996 and 2002 that originally described the Chronic Care Model (CCM). The review focused on the experiences of practices and systems in implementing the CCM and concluded that:

- "... practices redesigned in accord with the CCM generally improve the quality of care and the outcomes for patients with various chronic illnesses. This finding appears to be consistent in both U.S. and international settings."
- "... high-performing practices make changes across multiple elements of the CCM."
- "The combination of the effort required by busy practices, unsupportive reimbursement, and an uncertain business case have limited widespread implementation of the CCM except by very large organizations."

According to ICIC and RWJF staff, a number of health system reform and improvement efforts embedded the Chronic Care Model, including:

- The Patient-Centered Medical Home—a model developed by the American Academy
 of Family Physicians and endorsed by 22 physician professional organizations—
 which integrates the Chronic Care Model with additional primary care expectations
 such as access, coordination of care and continuity
- National health care reform legislation (the Affordable Care Act), with its emphasis on evidence-based, patient-centered and population-based care systems
- The accreditation standards of the National Committee for Quality Assurance (NCQA) and performance indicators and the Joint Commission on Accreditation of

Healthcare Organizations' certification for chronic disease programs (The organization is now called the Joint Commission.)

Program Management

The MacColl Institute for Healthcare Innovation now part of the recently renamed Group Health Research Institute (formerly the GHC Center for Health Studies),in Seattle served as the national program office for *Improving Chronic Illness Care*. Edward H. Wagner, M.D., M.P.H. a senior investigator at Group Health Research Institute and the founder and director of the MacColl Institute for Healthcare Innovation, directed the program. Brian Austin was deputy director.

A multidisciplinary research team led by the RAND Corporation (RAND[®]) and the University of California at Berkeley oversaw a four-year evaluation of the clinical improvement component of the program.

The Lewin Group conducted a midcourse assessment of *Improving Chronic Illness Care*.

Funding

RWJF supported the program with grants totaling more than \$25 million from 1998 to 2010. Additional funding for specific projects came from the Agency for Healthcare Research and Quality (\$315,848) and the Commonwealth Fund (two grants of \$350,688 and \$701,839).

CONTEXT

Some 133 million people—almost half of all Americans—live with a chronic condition such as diabetes, heart disease, depression or asthma. That number is expected to swell to 171 million by 2030 as the population ages.

Chronic conditions require ongoing management over years or decades, but most health care systems are not set up to provide this kind of care. Rushed practitioners often fail to follow well-tested practice guidelines and coordinate their care with other providers. Patients do not get the training they need to take more responsibility for their own health. And too often, there is no active follow-up to make sure patients are complying with treatment plans.

RWJF's Early Interest in Chronic Illness Care: 1978–2000

Since early in its history, RWJF has been funding projects and programs to improve chronic illness care.

RWJF's First Effort to Improve Service Systems for Chronic Care

In December 1978, RWJF made a commitment to improving the quality of care for people with chronic illness when its Board of Trustees approved the development of a new national program called the *Chronic Disease Care Program* (1979–1984). It aspired to reduce the need for hospitalization or institutional care of chronically ill patients and to enhance functional effectiveness through the creation of a system of services offered by hospitals and their medical staffs.

The program represented an experimental approach; there was no model in place for RWJF to replicate. From the outset, there were difficulties. Grantees developed programs to meet their own individual institutional needs, which prevented standardization of procedures and made overall evaluation difficult. Other impediments included reluctance among the hospitals to assume full administrative responsibility, inadequate patient volume due to the lack of physician referrals and the failure of hospital officials to back up their nurses' decisions. The Board had authorized the program at up to \$6 million; actual grants totaled only \$3.4 million.

Chronic Care: A Community-Based Approach

Starting in 1979, RWJF engaged in two decades of grantmaking focused on helping communities improve their ability to offer services to people with chronic illness. This involved creating formal associations as well as informal networks provided by family and friends. The programs often targeted specific populations, including older people, children, people suffering from physical or mental handicaps and those afflicted by chronic diseases such as Alzheimer's and AIDS. Programs created included:

- *Program for the Health-Impaired Elderly* (1979–1986)
- *Health Care for the Homeless Program* (1983–1990)
- Interfaith Volunteer Caregivers Program, its Replications, including Faith in Action (1983–2008); see Program Results Report.
- Program on Chronic Mental Illness (1985–1992)
- Dementia Care and Respite Services Program (1986–1992), which focused on adult day centers and led to Partners in Caregiving: The Dementia Services Program (1991–2002); see Program Results Report.
- *Mental Health Services Program for Youth* and its replication (1988–1997); see the Anthology chapter and Program Results Report on the replication program.
- Independent Choices: Enhancing Consumer Direction for People with Disabilities (1995–1999); see Program Results Report.

 Self-Determination for Persons with Developmental Disabilities (1995–2001), based on the Monadnock project in New Hampshire; see Program Results Report on Monadnock and Program Results Report on Self-Determination.

Journalist Irene Wielawski in an *RWJF Anthology* chapter, "Health, Health Care and the Robert Wood Johnson Foundation," cogently summarized the Foundation's piecemeal efforts in providing chronic illness care from the 1980s–early 1990s when she commented, "What stands out from a review of these programs is how scattershot they were, addressing the isolated needs of people with particular handicaps but offering no systematic solution for patients, families, health care facilities and clinicians to collectively meet the challenges posed by chronic conditions." She added, "There also was little effort to utilize lessons across programs."

Chronic Care System Change

By the early 1990s, there were about 99 million Americans with some chronic physical or mental impairment. They were faced with a system of care fraught with administrative, institutional, professional and financial deficiencies, which resulted in care that was often fragmented, unresponsive, inappropriate, lacking in consumer choice and based in institutions, rather than occurring at home or in the community. Former RWJF Executive Vice President Lewis Sandy, M.D., recollected, "There had to be better integration and coordination of care, focusing on both medical and nonmedical needs."

RWJF's first effort to develop the needed integration and coordination was through two national programs: *Chronic Care Initiatives in HMOs* and *Building Health Systems for People with Chronic Illness*.

The purpose of *Chronic Care Initiatives in HMOs* (1992–1997) was to identify, demonstrate, evaluate and disseminate innovations in the health care of chronically ill people enrolled in prepaid managed care organizations. Operating under the leadership of a national program office at the American Association of Health Plans Foundation in Washington, the program encompassed 18 projects examining interventions for at-risk seniors, working-age adults, mothers and children. See Program Results Report.⁵

Building Health Systems for People with Chronic Illness (1992–2003) improved coordination between medical providers and supportive care providers such as home care agencies, nursing homes and social service organizations. See Anthology and Program Results Report.

² Chapter 1, p. 4, Anthology, Volume X.

³ Internal RWJF document

⁴ Chapter 8, p. 3, Anthology, 1998–1999.

⁵ Grant ID# 024739

CREATING THE CHRONIC CARE MODEL

Addressing Deficiencies in Chronic Illness Care

In 1994, under the aegis of *Chronic Care Initiatives in HMOs*, RWJF made a grant to the Group Health Cooperative of Puget Sound, a nonprofit health care system based in Seattle (the research arm of which is now called the Group Health Research Institute), to create a new model for chronic care (see Program Results Report). Under the leadership of Wagner, Group Health had spearheaded a number of systematic quality improvement efforts that had taught them something about what *wasn't* working in the care of chronically ill patients. As Wagner and his team observed:

- The typical primary care office is set up to respond to acute illness rather than to anticipate and respond proactively to patients' needs. Chronically ill patients, however, need the latter approach in order to avoid acute episodes of illness and debilitating complications.
- Chronically ill patients are not sufficiently informed about their conditions, nor are they supported in self-care beyond the doctor's office.
- Physicians are too busy to educate and support chronically ill patients to the degree necessary to keep them healthy.

Group Health's early efforts to address these deficiencies were wide-ranging, Wagner recalled. "We were coming up with ideas for improving diabetes care and then trying them out," Wagner said. "After a year or so, we came up with yet another idea, and the oversight committee rebelled. They said, 'It's one idea after another. What's the connection?' Someone went to the blackboard and started drawing boxes and circles—and someone else was wise enough to write it all down."

That was the genesis of the Chronic Care Model—a new approach that replaced the traditional physician/office-based structure with one that encouraged collaboration among patients, physicians, nurses, case managers, dieticians, patient educators, families and friends.

Testing and Refining the Chronic Care Model

Wagner and his colleagues tested this new approach to chronic illness care on 15,000 diabetic patients. Over a five-year span, the percentage of patients with up-to-to-date screenings for eye, foot and other complications rose, blood sugar levels improved and patients reported higher satisfaction with their care.

⁶ Grant ID# 024739.

⁷ Chapter 3, Anthology, Volume X, p. 5.

In June 1996, still as part of *Chronic Care Initiatives in HMOs*, Wagner convened a conference of experts who provided additional feedback on the Chronic Care Model (See Program Results Report). Following the conference, RWJF provided two planning grants to Group Health Cooperative in which the project team refined the model, conducted a literature review, published a database of interventions in chronic illness and surveyed 72 innovative chronic disease management programs by phone and/or through site visits. Dissemination activities under these grants included one book, more than a dozen articles published in journals and 15 presentations (For more information, see Program Results Report).

One of the innovative programs that Wagner and his team studied was the Special Diabetes Program for Indians,

established by Congress in 1997 to combat an alarming epidemic of diabetes in the American Indian population. ¹⁰ Though in its infancy, the program was showing promise in improving key clinical outcome measures—such as blood sugar control, cholesterol levels and kidney function—among American Indian populations.

"The diabetes work was one of the models of care that served as evidence for the Chronic Care Model," said Bruce Finke, M.D., a key leader in the Indian Health Service's Chronic Care Initiative, a program that is now using the model to address all chronic illness care in tribal

It Takes a Village to Combat Chronic Illness

An inside look at how the Indian Health Council in the Pauma Valley of California is implementing the Chronic Care Model in its clinics. Read the Sidebar.

communities in the Pauma Valley of California. Read Sidebar at the end of this report.

A strength of the Special Diabetes Program for Indians was its connection to the larger tribal community. Observing this work and the work of other key innovators led the Group Health team to make an important refinement in the Chronic Care Model. They incorporated the relationship of the health system to the community and added the concept of a "Prepared, Proactive Practice Team"—primary care providers, specialists

⁸ Grant ID# 028681.

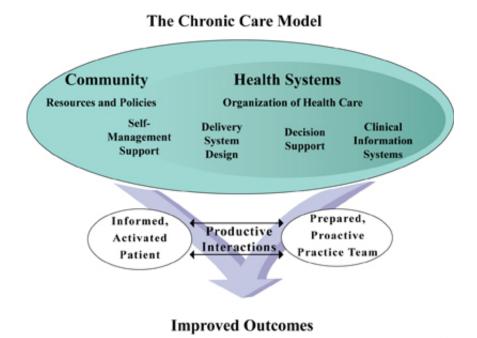
⁹ Grant ID#s 030104 and 033712.

¹⁰ Congress made an initial investment of \$30 million per year for five years for the Special Diabetes Program. The program is currently funded at \$150 million per year through 2011 and supports over 450 Indian Health Service, Tribal and Urban programs in 35 states.

and clinical educators working together to produce informed, activated patients who are ready to participate in collaborative care.

"The whole notion of productive interactions changed our view of how the model should go," said Judith Schaefer, M.P.H., 11 who was a key participant in those early discussions. "It became the heart of how we started thinking about this, that patients needed to be prepared as well as health care systems. That introduced the notions that communities were involved and that there was a contextual relationship—the health care system in the community."

The refined Chronic Care Model had six elements, which, working together, ensure high-quality disease management.¹² The model is pictured below.¹³



• Community resources. Doctors' offices and clinics should identify helpful resources, such as behavioral and social services or information on mandates about benefit coverage, and encourage patients to participate.

releped by The MacColl Ins ACP-ASIM Journals and Bo

¹¹ Schaefer is senior research associate at *Improving Chronic Illness Care* at the MacColl Institute for Healthcare Innovation at Group Health Research Institute.

¹² Chapter 3, Anthology, Volume X, page 6.

¹³ Figure 1: Edward H. Wagner, MD, MPH, Chronic Disease Management: What Will It Take To Improve Care for Chronic Illness? *Effective Clinical Practice*, Aug/Sept 1998, Vol 1. Published with permission of *Effective Clinical Practice*.

- *Health system*. Health care organizations must make excellence a priority. Essential to achieving this is top management support and open communication on errors and failings as well as strategies for improvement.
- *Self-management support*. Clinicians and health systems should employ strategies—including assessment, goal-setting, action-planning, problem-solving and follow-up—to empower and prepare patients to manage their health and health care.
- *Delivery system design*. To move from a one-on-one doctor/patient relationship to teamwork, the clinical staff needs defined roles and tasks.
- *Decision support*. To link treatment to research evidence, clinicians must have explicit guidelines, whether the question is scientific (e.g., drug dose) or psychosocial.
- Clinical information systems. Computers can efficiently deliver disease management information, including care guidelines, test results and even pop-up reminders about individual patients.

Implementing the Chronic Care Model became the basis for a new national program called *Improving Chronic Illness Care* (ICIC).

THE PROGRAM

Building the Field of Chronic Care

Launched in April 1998, ICIC aimed to improve the health of chronically ill patients by helping large numbers of organized health systems, including those that serve low-income populations, improve their care of older people and people with chronic illness.

ICIC approached the goal of helping people with chronic illness and building the field through a coordinated program of:

- Clinical quality improvement and its evaluation
- Targeted research
- Dissemination of effective innovations and key research results

Program Management

Wagner, served as program director for ICIC. Austin served as deputy director. The national program office became a unit within the MacColl Institute.

Sixteen leaders in the health care field served on the national advisory committee for Improving Chronic Illness Care. See Appendix 1 for a list of members.

CLINICAL QUALITY IMPROVEMENT: HELPING HEALTH SYSTEMS MAKE "BREAKTHROUGH" CHANGES

The Chronic Care Model had shown its utility in improving care systems for diabetic patients at Group Health, a fully integrated delivery system. The question was: Would other kinds of health systems and physician practices be able to make the changes the model called for?

"We heard from people from day one that our environment was so specialized that we didn't understand what it was like when things were not as aligned," Austin said. "We had to ask, 'Are we just playing in our own little pond? How generalizable are the things we are thinking of?' That pushed us, one, to collaborate and two, to test."

ICIC's first collaboration—with Donald Berwick, M.D., and the Institute for Healthcare Improvement (IHI)—was a pivotal one. A Harvard-trained pediatrician, Berwick founded the Cambridge, Mass.-based nonprofit in 1991 after years laboring in the health quality improvement arena and finding that making change often was painfully slow. ¹⁴ In an attempt to accelerate the process, Berwick and his team at IHI created the "Breakthrough Series Collaborative," a short-term (six- to 15-month) learning system that brings together a large number of teams from hospitals or clinics to seek improvement in a focused topic area.

RWJF Distinguished Fellow/Senior Scientist C. Tracy Orleans, Ph.D., who oversaw the ICIC program, recalls being "converted" at a session in Florida where Berwick described his vision for quality improvement. "We never had in the U.S. the quality improvement methods used by the auto industry and other industries to improve the quality of care in settings where it was delivered," Orleans said. "That's what Don Berwick brought to the initiative. It was a very exciting marriage of two hot-off-the-press innovations: a model of health care quality improvement for chronic disease and prevention—the Chronic Care Model—and a technology for health care quality improvement—the Collaboratives."

To apply the Breakthrough Series Collaborative improvement process to chronic illness care, staff at ICIC and IHI created a "change package" based on the Chronic Care Model. A change package is a set of concrete changes with measurable outcomes so teams can know if they are progressing in the larger areas of the model.

The First Collaboratives

Beginning in 1998, ICIC and IHI co-sponsored three national Collaboratives; 104 health care organizations participated. In recruiting organizations to participate, ICIC worked

¹⁴ Berwick was appointed administrator of the Centers for Medicare & Medicaid Services (CMS) on July 7, 2010. He resigned in November 23, effective December 2, 2011, after it was clear he would not be confirmed by the Senate.

closely with a group of network organizations, including the American Association of Health Plans, the Association of American Medical Colleges, the National Association of Community Health Centers, the U.S. Department of Veterans Affairs and others.

The organizations that applied were asked to form interdisciplinary teams and review a "pre-work package," which introduced the condition-specific aims and measures. They also completed the *Assessment of Chronic Illness Care (ACIC)*, an ICIC tool to help practices measure how closely they follow the Chronic Care Model.¹⁵

The participants made a significant commitment in both time and resources. Organizations had to pay, on average, \$12,500 to participate, though several received scholarships. And they were required to participate in three "learning sessions" and a final meeting. The need to arrange coverage for busy practices while attending meetings discouraged some groups and slowed both the recruitment process and initial data collection for an evaluation of the Collaboratives, according to ICIC staff.

The organizations chosen to participate varied widely in size; most were predominantly reimbursed by the fee-for-service method. Nearly half were community health systems supported by the federal Health Resources and Services Administration (HRSA) Bureau of Primary Health Care through its Health Disparities Collaborative. The remainder included 12 managed care organizations, 14 academic health center practice organizations, 20 hospital systems and 13 others.

Each organization was to use the Chronic Care Model to design and test system changes to improve the care of a single chronic condition.

- The first chronic illness Collaborative included 26 organizations working on diabetes and six on preventing frailty in elderly people.
- In the second collaborative, 16 organizations worked on congestive heart failure and 10 on diabetes care.
- In the third, 23 organizations worked on asthma and another 23 on depression.

How the Collaboratives Worked

The goal of the Collaboratives was to enable participant organizations to make dramatic improvements in patient-care processes and patient outcomes for all of their patients with the target condition. To do so, each team was required to develop a locally tailored set of process changes, creating a new system of chronic care based on the principles of the Chronic Care Model.

¹⁵ The ACIC tool was later validated; see Bonomi AE, Wagner EH, Glasgow RE and VonKorff M.

[&]quot;Assessment of Chronic Illness Care (ACIC): A practical Tool to Measure Quality Improvement." *Health Services Research*, 37(3): 791–820, 2002.

Then, over the course of months, the quality improvement team at each organization worked on the improvement plan with a pilot population of approximately 100–500 patients with the particular condition and their caregivers.

Learning Sessions

At the three two-day learning sessions, faculty experts offered lectures and workshops in the improvement method, the Chronic Care Model and the target condition being addressed. Faculty also consulted on specific questions throughout the Collaborative. Participating teams made presentations at later learning sessions.

Action Periods

Teams developed their interventions during the "action periods" between learning sessions by conducting small-scale tests of changes with pilot patients and providers. They shared results through monthly reports to senior leaders, teleconferences and a listsery.

From the outset, faculty urged organizations to engage in comprehensive system change by implementing changes in all six areas of the Chronic Care Model. Teams regularly collected data from the pilot population on predefined indicators of success (in effect, creating a small patient registry).

Faculty used the Chronic Care Model and clinical evidence to develop condition-specific goals. For diabetics, for example, a goal might be to achieve glycemic (blood glucose) control and reduce heart disease risk. Changes in the patient care process that might help reach those goals might be using the registry to track eye and foot exams, blood pressure, lipids and blood glucose levels or offering group visits.

Through the collaborative network, teams shared with each other the interventions that worked and the strategies they used to overcome barriers. ¹⁶

What Are You Going to Do By Next Tuesday?

A key part of the Collaboratives process is the use of a rapid cycle quality improvement tool called Plan-Do-Study-Act (PDSA), shorthand for testing a change by planning it, trying it, observing the results and acting on what is learned.

"Part of the mantra of IHI when they release people back to their practices after a meeting," said Austin, "is 'What are you going to do by next Tuesday?' It needs to be a small enough thing so that you can finish it quickly and move to the next test"

¹⁶ Read more about the Collaborative process at the IHI website.

A PDSA cycle for instituting planned visits for blood sugar management might look like this (from an example on the IHI website):

Plan: Ask one patient if he or she would like more information on how to manage his or her blood sugar.

Do: Dr. J. asked his first patient with diabetes on Tuesday.

Study: Patient was interested; Dr. J. was pleased at the positive response.

Act: Dr. J. will continue with the next five patients and set up a planned visit for those who say yes.

Michael Hindmarsh, at the time Group Health's associate director of clinical improvement, served as faculty for many of the early Collaboratives. He recalls that some participants were skeptical about doing small experiments on the fly and needed encouragement. "Call the person you are worrying about when you go into the parking lot at 6 o'clock at night," he counseled them. "Do one planned care visit, see what works and what doesn't work and build from there."

Doing the "small experiments" often helped change important attitudes and create new, more effective systems, a study of the first Collaborative found. At one large primary care system, for example, a physician called one patient who had not had a recent appointment to invite him or her to return. The patient's positive response helped persuade the involved physician of the potential of more proactive strategies.

How Practices Incorporated the Chronic Care Model

ICIC produced two videos that give examples of how practices in the early Collaboratives incorporated the Model:

The Path to Better Care—Three Stories gives first-hand accounts of implementing the Chronic Care Model and the changes that patients experienced dealing with diabetes and asthma.

Empowering Patients and
Caregivers tells the story of a
clinic in Olympia, Washington,
that implemented the Chronic Care
Model and achieved significant
improvements in patient health and
staff morale.

Small experiments also reveal that even a simple change is embedded in and dependent on a system—"Who's going to make the phone call, who's going to pull the chart," asked Austin.

Promising Results from Early Studies

But did the changes that practices instituted lead to improved outcomes? Initial results from the first national Collaborative were promising, according to ICIC staff. The organizations that focused on diabetes care achieved substantial increases in evidence-based practice and improvements in glycemic control.

The changes appeared to stick. Contacted months later, two-thirds of the organizations reported that changes spread both to other parts of the organization and to other clinical conditions. Many of the organizations with the largest improvements were community health centers, which had the fewest resources and the most challenged patient populations. The 19 organizations participating as part of the Bureau of Primary Health Care's Health Disparities Collaborative¹⁷ achieved significant improvements in diabetes care in one year, as shown by a study by Marshall Chin and colleagues at the University of Chicago.

The early Collaboratives also confirmed that implementing the Chronic Care Model in its entirety yielded the best results. As Wagner and colleagues reported in an article in *Health Affairs* in 2001:

...effective chronic illness management requires comprehensive system changes that entail more than simply adding new features to an unchanged system focused on acute care. Many organizations initially hoped that relatively noninvasive system enhancements such as the introduction of guidelines or disease registries would produce changes in their goal attainment measures. It became apparent to them that changes in process and outcomes would not occur unless preceded by fundamental changes to the design of practice and the provision of self-management support.¹⁸

The RAND/University of California at Berkeley Evaluation

Because the Collaborative process had not been studied in chronic illness care, ICIC and RWJF staff wanted to know to what degree Collaboratives enabled health systems make changes and achieve better outcomes for patients. ICIC leaders selected a multidisciplinary research team from the RAND Corporation and the University of California at Berkeley to evaluate the Collaboratives. They hoped the evaluation would shed light on organizational barriers to and facilitators of success as well as potential strategies for improving the Collaborative process.

¹⁷ Over the next decade, the health disparities Collaboratives would expand across the country and across chronic diseases. ICIC and IHI staff continued to collaborate with the bureau as the program unfolded.

¹⁸ Wagner EH, Austin BT, Davis C et al. "Improving Chronic Illness Care: Translating evidence into action." Health Affairs, 20(6): 64–78, 2001. Available online.

In 1999, the research team from RAND/Berkeley began a series of in-depth assessments of some 51 sites participating in four Collaboratives. Their four-year study involved almost 4,000 patients with diabetes, congestive heart failure, asthma and depression.

See Program Impact for findings from the national Collaboratives. 19

From National to Regional: The Collaborative Sponsorship Grants Program

While the national Collaboratives were proving effective, they were expensive—both for the national program office and for the participating health systems. "This was not a viable model for large-scale quality improvement," Wagner said. "It was national. It involved major travel. It was only the best and the brightest—only a larger organization could engage in it."

So the ICIC staff began to think smaller. Beginning in 2002, ICIC funded seven organizations to sponsor Collaboratives for health care groups in their region. With grants ranging from \$50,000 to \$100,000, each Collaborative sponsor committed to conducting two improvement efforts in their region, with the goal of both spreading expertise in the Chronic Care Model and in Collaborative methods and doing localized practice improvement.

The Collaboratives spanned the United States—Arizona, Chicago, Maine, North Carolina, Oregon, Rhode Island and Vermont—involving more than 140 practice groups from small doctor's offices to larger health systems and safety-net providers. Most of the teams achieved significant improvements, both in the redesign of office systems and processes and in clinical outcomes.

There was no shortage of challenges, however. The teams almost uniformly expressed dismay at how much time, resources and stamina were required to participate in the Collaboratives and to implement the changes needed to achieve their goals for their systems. For some teams, resistance in their parent organizations prevented them from achieving any improvements.

See Appendix 2 for descriptions and results of the Collaboratives.

A Regional Framework for Quality Improvement

The regional Collaboratives produced enough "glimmers of success," Wagner said, to suggest that regional quality improvement might work.

¹⁹ Tackling the Chronic Care Crisis, available by request from the ICIC program office. Includes evaluation findings and other evidence of delivery system improvements from implementation of the Chronic Care Model.

Small practices, experience showed, faced special difficulties that larger health groups did not, or at least not to the same degree. The Collaboratives were instructive here, as ICIC staff began to explore regional responses to some of the special difficulties that smaller practices faced when attempting to improve chronic illness care, such as:

- Lack of support for participation in organized quality improvement
- Many guidelines and performance measures from various health plans, leading to fragmented feedback and confusion
- Limited clinical staff support—exacerbated by low reimbursement rates
- The lack of reimbursement for activities that contribute to more effective, patientcentered care, such as longer planned visits, nurse counseling or telephone follow-up
- Lack of financial or technical assistance in the selection and implementation of information technology and care management software
- Absence of community nursing and other clinical assistance to provide selfmanagement support and more intensive care for high-risk patients
- Professional isolation among outpatient practitioners who spend less time in collegial settings such as the hospital

Practices that were part of larger organizations committed to quality improvement often received help with these challenges, but smaller practices rarely did.

In 2005, ICIC began to explore what the literature and their own experience suggested might be the benefit of local/regional efforts designed to address these problems. With funding from the California Healthcare Foundation, ICIC produced two reports setting forth a proposed *Framework for Creating a Regional Healthcare System* that would afford the advantages of a large system to even small community practices.

The reports describe the framework as a set of interdependent strategies that regional quality improvement coalitions are using for performance measurement, health care delivery improvement, consumer engagement and incentive and payment structure alignment. Highlighted is the importance of strong leadership and broad stakeholder participation in successful coalitions.

With RWJF and California Healthcare Foundation funds, ICIC held a meeting of nearly 80 leaders of quality improvement initiatives from 17 regions across the United States. Representatives from RWJF and the federal Agency for Healthcare Research and Quality (AHRQ) also attended. The "Networking Conference on Regional Healthcare Improvement," held in San Francisco on November 30, 2006, was the first time that the leaders of these vanguard efforts had the chance to interact and learn from each other.

Feedback from the participants indicated the need for further interaction and concerted action.

Over the next five years, ICIC continued to be involved in regional improvement efforts, including collaborations with *RWJF's program*, *Aligning Forces for Quality: The Regional Market Project*, where ICIC provided technical assistance and ongoing leadership, the Indiana State Medicaid Program, the state health departments in Vermont, Washington and others, as well as several efforts in different parts of California. These efforts often had an explicit focus on vulnerable and low-income populations.

ICIC also had close communication with the National Governors Association, the Association of State and Territorial Health Officers, the National Council of State Legislators and related organizations—all in an effort to promote a regional approach to quality improvement.

ICIC has been involved either as funder or collaborator with dozens of Collaboratives in many parts of the country. These Collaboratives collectively involved over 1,500 different practice organizations including a sizable percentage of the country's community health centers, 37 academic health centers and large organizations such as the New York City Health and Hospitals Corporation.

Collaboratives with Medical Colleges

As ICIC staff and Collaborative participants were discovering, instituting change in practices and systems was a little like turning a battleship—possible, but difficult. In light of the challenges, ICIC staff began to wonder: What if you could expose physicians to the Chronic Care Model earlier in their careers?

With this goal in mind, ICIC made another key collaboration, partnering with the Association of American Medical Colleges to sponsor Collaboratives with teams in academic settings.

The logic was clear: academic settings were committed to implementing innovations that were evidence-based and shown to benefit patients. Educating tomorrow's health professionals in these practice improvements increased the possibility of their use in the care of future patients.

ICIC staff also believed reaching doctors early might help stem the flight from primary care medicine. "Fewer and fewer young docs are deciding to do primary care at the very time that the need for primary care docs is exploding," Austin said. One purpose of the academic Collaboratives was to "prove that you could make primary care more attractive to young residents. If you operate within a system, you don't have to create everything from scratch every time you have a new patient come in the door."

Over 15 months beginning in June 2005, teams from 22 academic centers throughout the United States implemented changes in the care of selected chronic conditions, including diabetes, asthma and chronic obstructive pulmonary disease, using the Chronic Care Model.

The teams engaged in an array of activities to improve clinical outcomes, including developing interventions to impact clinical inertia, broad use of provider-specific data, attention to improving self-management support, increased use of group and planned visits and changes to both the classroom curriculum and hands-on clinical training for medical residents.

Key results included:

- Teams that focused on diabetes showed improvements in process measures that correlate with quality diabetes care, such as giving patients regular eye and foot exams. Improvement in clinical patient outcomes, such as lowered LDL bad cholesterol) or lowered HbA1c (blood glucose level), was mixed.
- Most of the teams were able to make changes to their educational programs in chronic illness care that also aligned with teaching the competencies required by the Accreditation Council for Graduate Medical Education.

See Program Results for ID# 055278 for details.

From Sponsor of Collaboratives to Consultant and Adviser

After the academic Collaboratives, ICIC no longer provided primary funding for Collaboratives. But there was still keen interest in using this method to spur systems change. When health systems around the country expressed interest in Collaboratives, ICIC staff referred them on to IHI or others who had expertise in running them. ICIC staff continued to stay involved as consultants and occasionally as faculty for Collaboratives.

One of the health systems that pursued Collaboratives on its own was Integrated Health Partners, a group of some 170 affiliated physicians in the Battle Creek, Michigan area. See the Sidebar.

Building the Field: Program Goals

- Prove the validity and utility of the Chronic Care Model
- Help large numbers of practices implement the model
- Evaluate the impacts on care quality and patient outcomes
- Disseminate findings and other developments in chronic care

In 2007, prompted by a forward-looking Blue Cross/Blue Shield of Michigan, the physician group launched a Collaborative with local physicians and practice teams interested in implementing the Chronic Care Model. The Collaboratives soon expanded to include people all along the continuum of care for chronically ill patients: physicians in solo practice, discharge planners in hospitals, employers, social service agency workers and others. By the end of 2010, the effort was beginning to show results in improved patient outcomes.

TARGETED RESEARCH PROJECTS: IDENTIFYING GAPS IN THE CHRONIC CARE MODEL

When the ICIC program began, the Chronic Care Model was new and had been tested in one integrated health system (at Group Health). It was unclear whether the Model was robust enough to spin out to an array of medical settings. RWJF staff thought more research about the parts of the Model and its implementation would reveal any chinks in its armor.

Select Project Descriptions

Running concurrently with the Collaboratives, RWJF grants supported a targeted research grants program managed by ICIC. It funded 19 research projects to look at major knowledge gaps and barriers in how the Chronic Care Model was being implemented. Program staff hoped that findings would inform the work of the teams working in the Collaboratives and speed up the process of restructuring health care systems.

The targeted research grants ranged from \$100,000 to \$500,000 over one to three years, and yielded some useful findings and publications, Wagner said. A few had a substantive impact on the field, demonstrating both the potential for significantly improved care and the barriers getting in the way of that goal. Following are highlights from seven of the research projects:

Improving Patient Self-Management

A study led by Thomas Bodenheimer, M.D., at the University of California, San Francisco (Grant ID# 048996), found that patients who worked with their physicians to set health-related goals and make action plans remembered the plans three weeks later—and half had changed behaviors targeted in the plan. But while clinicians were favorable about goal-setting and action-planning, they said there was not enough time to cover these activities in a 15-minute primary care visit.

Results of the study spurred Bodenheimer and colleagues to develop a team-led model of primary care that augments physician and nurse staff with ancillary staff who conduct less clinical but equally important tasks, such as supporting patients in self-management.

His book, *Improving Primary Care: Strategies and Tools for a Better Practice*, coauthored with Kevin Grumbach, ²⁰ describes the model in detail.

Generic Planned Care—Good for Patients but Difficult to Implement

John Wasson, M.D., and his team at Dartmouth Medical School (Grant ID# 048998), found that using "Web-supported generic planned care"— a patient-centered practice model that focuses on collaboration with patients to increase their confidence in managing their health problems—results in a broad range of good outcomes for patients with many common problems. However, the typical primary care office cannot make changes to deliver generic planned care in a short period of time, despite being offered feedback, incentives, consultation, automated tools and information about what their patients need and how confident they believe they are in managing themselves.

Wasson continues to be a leading proponent of getting tools on the Web to help patients understand, document and communicate around their chronic condition.

Making Care Transitions Work

Eric Coleman, M.D., a researcher at the University of Colorado-Denver Health Sciences Center (Grant ID# 041863), tested an intervention designed to improve the process of transitioning patients from one care setting to another. Patients and their caregivers got tools to promote communication between care sites; patients were encouraged to take a more active role in their care and assert their preferences, and they received guidance from a "Transition Coach."

Patients in an inpatient setting receiving the interventions had reduced rates of rehospitalization, compared to a control group, and reported high levels of confidence in obtaining essential information for managing their condition, communicating with members of the health care team and understanding their medication regimen.

The research has led to a body of work that provides tools and supports, including a website, to improve the "handoffs" between care sites. A number of health systems, including Group Health, are utilizing the website.

Parent Mentors for Asthmatic Children

Glenn Flores, M.D., of the Medical College of Wisconsin (Grant ID# 052816) and Children's Health System (Grant ID# 049468), led a study to determine whether parent mentors were more effective than traditional asthma care in reducing childhood asthma

-

²⁰ McGraw Hill, 2007.

morbidity, costs and use of services while increasing families' quality of life and parental satisfaction with care and self-efficacy in managing asthma.²¹

Patients with parents who had high levels of participation in the program experienced significantly reduced asthma exacerbations and emergency department visits. Their parents reported improved efficacy in controlling problems at home and fewer missed workdays compared with patients receiving traditional care.

The research has had an impact, according to ICIC staff. A train-the-trainer program for parent mentors is ongoing at the University of Texas Southwestern Medical Center. "The study was important because of the population—a high-disparity group—and in proving that you did not need to do it all within the walls of the clinic with medical staff," Austin said.

Group Visits for Patients with Diabetes

Dawn Clancy, M.D., and Dennis Cope, M.D., researchers at the Medical University of South Carolina, instituted group visits for patients with uncontrolled diabetes to determine whether the American Diabetes Association standard of care (which includes 10 process-of-care indicators such as up-to-date blood tests, annual foot examinations, etc.) would be met better using this format (Grant ID#s 041867 and 045941).

Patients who received care in group visits showed statistically significant improvement in concordance with these care indicators compared with patients receiving usual care. While patients attending group visits showed a trend toward improved blood glucose levels compared with those in usual care, the difference was not statistically significant.

Chronic Care Model Implementation in a Free Clinic

Robert J. Stroebel, M.D., a researcher at the Mayo Clinic in Rochester, Minn., ²² organized a Salvation Army free clinic to deliver effective chronic illness care and then followed a population of uninsured clients with hypertension, diabetes and hyperlipidemia (Grant ID# 041860). Using a comprehensive approach to chronic disease management, the study patients achieved clinically significant improvement in the control of their chronic illnesses.

This was an important study, Austin said, because "an early knock on the Chronic Care Model was that you can only do it in large, integrated health care systems. Stroebel showed you could do it in a population that was disadvantaged."

See Appendix 3 for a summary of goals and results for all of the 19 targeted research projects.

²¹ Flores, a former RWJF Clinical Scholar, is the subject of a 2006 Grantee Profile.

²² Stroebel is currently (2011) chair of primary care internal medicine at Mayo Clinic.

Identifying Gaps, but Little Field-Building

The research studies contributed to the evidence base, but as a means for building the field of chronic care, they were disappointing, Wagner said. The main problem was that innovation in the field of chronic illness care was outpacing the much slower research process.

"We ran it like an academic grant review project," Wagner said, "which meant that the quality of the science got higher ratings than the relevance of the question. We were ahead of the field, but most of what we reviewed and some of what we funded wasn't innovative anymore."

"When you're trying to change the paradigm of care, trying to change a field," he continued, "I'm not sure investigator-initiated research is the way to go. It may be that more directed activities are better."

DISSEMINATION STRATEGIES: ENCOURAGING SPREAD OF THE CHRONIC CARE MODEL

Most ICIC activities focused on dissemination of the Chronic Care Model in a variety of ways. The series of Collaboratives, sponsored by ICIC and then by others, aimed to embed the Model into practices and health systems by demonstrating how it could be practically applied. The targeted research projects were designed to identify and overcome the barriers that got in the way of full implementation of the Model.

But the original vision for the program also called for ICIC to become the go-to information hub for the field of chronic care. To accomplish this, ICIC staff used traditional modes of dissemination: sponsoring annual meetings, presenting at national and international conferences, publishing in peer-reviewed journals, creating and managing a robust website and developing multimedia products describing the Model and its application. Seattle-based Pyramid Communications consulted with ICIC on many of these communications activities.

All of these activities focused on field-building, ICIC staff said, and cast ICIC in the role of "maven" in the field of chronic illness improvement. As part of this role, ICIC staff spent considerable time with policy-makers, academics and others seeking their advice or participation in planning policy-oriented meetings.

Following are highlights from ICIC's field-building and dissemination activities:

Annual Meetings

In the early years of the program, to help build the field of chronic illness care, ICIC hosted national congresses. Held in 2002, 2003 and 2004, the meetings included

presentations by scholars and practitioners highlighting new research on the then-current state of chronic care practice, as well as interactive breakout sessions on topics ranging from alternative quality improvement strategies and patient perspectives to international chronic care innovations.

The congresses also served as the venue for groups participating in the national Collaboratives to present their progress in implementing the Chronic Care Model. Summaries of the meetings are on the ICIC website.

Presentations and Publications

In addition to its own congresses, ICIC staff also presented at the meetings of other groups and organizations important in the redesign of chronic care. "We gave lots and lots of talks," Wagner recalled, "and a lot were in Washington, so people who have influence in these problems at least heard about the Model."

Several early meetings were pivotal. At a December 1999 meeting at the Washington headquarters of the NCQA, ICIC and RWJF staff presented the Chronic Care Model to NCQA leaders and encouraged them to use the model as a guide in developing performance indicators for chronic disease management. ICIC and NCQA subsequently created and tested accreditation standards and performance indicators based on the model and the assessment tool ICIC had created. ²³ A year later, the Joint Commission used the Chronic Care Model for their certification for chronic disease programs.

"Our role was sometimes kind of slight and tangential," Wagner concedes. "But this dissemination model has turned out—for serendipitous, environmental reasons—to have worked."

The ICIC team, as well participants in the Collaboratives and in the targeted research program, also regularly published in peer-reviewed journals. Others working in the chronic care field cited many of the key articles. "If you're trying to influence health policy and major decision-makers, there is no substitute for an article in a prestigious journal," Wagner said.

As of May 2011, ICIC staff had authored 99 articles in academic publications and made approximately 350 presentations (in addition to those done as part of Collaboratives), spreading the Chronic Care Model to a wide range of academic and practitioner audiences.

²³ The NCQA accreditation program influenced the creation of Bridges to Excellence—the most prominent national pay-for-performance program in the United States. Physicians, nurse practitioners and physician assistants meeting performance benchmarks can earn incentives, sometimes including substantial cash payouts. Insurers and employers fund these payouts from savings achieved through lower health care costs and increased employee productivity.

See the Bibliography for journal articles and other publications.

The ICIC Website

The original vision for the *Improving Chronic Illness Care* program imagined a "National Chronic Disease Management Center that would serve as a resource to assist health systems in integrating effective new chronic illness management approaches into their practices."

Launched in 2000, the ICIC website grew to be a virtual center—a compendium of tools, articles and resources for quality improvement in chronic care—and a major information source for the chronic care field.

Historical ICIC data show a sixfold increase in traffic over the program's lifespan. Web visitors come from 138 countries and territories. The top five countries of visitor origin are the United States, Canada, Australia, the United Kingdom and the Netherlands.

Multimedia Products

Over the course of the program, the ICIC program office produced three CDs in a series called "Chronic Illness Solutions." Each CD contains videos, chartbooks and collections of tools and resources targeted at a broad audience of providers, policy-makers, quality improvement experts and researchers. The ICIC website also contains much of the content of the first two CDs.

- "Tackling the Chronic Care Crisis" includes a 45-minute talk by Wagner that
 introduces the elements of the Chronic Care Model and describes the work of ICIC; a
 slideshow of the Model and its evidence base and slideshow notes; articles and
 resources; and video stories from the field. As of July 2011, ICIC had 1,238 online
 requests for the CD.
- "It Takes a Region" discusses the elements of the regional framework ICIC developed to understand the components of successful coalitions. RWJF staff used the framework in conceiving the *Aligning Forces for Quality* initiative. ICIC reported 152 requests as of July 2011.
- "Transforming Primary Care: What Works and What's Next" summarizes lessons learned over the course of the ICIC program, discusses the advent of the Patient-Centered Medical Home and shares the tools developed in the projects that incorporated the concept. ICIC reported 251 requests as of July 2011.²⁴

²⁴ The Patient-Centered Medical Home integrates the Chronic Care Model with additional primary care elements such as access, coordination of care and continuity.

A Key Dissemination Strategy: "Take the Model and Run With It"

A key aspect of ICIC's dissemination strategy was to be nonproprietary with the Chronic Care Model. "My belief is that if you get federal or philanthropic dollars you are obligated to put things out in the public domain," Wagner said. "I am loathe to copyright anything. We have the Model in a downloadable fashion. You can copy it to a DVD, take it, burn as many copies as you want."

ICIC also encouraged groups to adapt the Model to fit the environment in which they deliver health care. "They add things—and that's great," Wagner said. "I'd much rather they use it and tweak it than not use it. Our business model is an academic one. We're not looking for financial support from profits."

That approach has resulted in hundreds of derivatives of the Model and has enabled its key concepts to "get it into the water supply" of how chronic illness is addressed, according to Austin. "One of our markers for that," Austin said, "is there are now academic journals that are publishing the Chronic Care Model with no citation. It is the Xerox of models. It is a real sign of success that people think it is their model."

EVOLUTION OF THE PROGRAM: EMBEDDING THE MODEL

Midcourse Assessment

The first five years of the program focused intently on informing the health care field about the Chronic Care Model, showing organizations how to implement it and addressing gaps in the research about the model. In 2003, RWJF commissioned the Lewin Group, a Falls Church, Va., research firm, to conduct a midcourse assessment of ICIC (Grant ID# 046059). The goals were to:

- Examine the effectiveness of the ICIC program to date
- Explore issues related to the uptake of the Chronic Care Model and the effectiveness of current dissemination approaches and vehicles
- Describe the impact of the ICIC program and the Chronic Care Model on building the field of chronic illness care
- Identify strategic opportunities for further developing ICIC

Colleen Hirschkorn, M.B.A., R.N., senior vice president of the Lewin Group, led the assessment team. (The team did not examine the work of the Collaboratives, which the RAND/University of California at Berkeley team evaluated under a separate contract from RWJF.)

Interviews with 63 key informants who interact with ICIC or are key stakeholders in chronic illness care revealed both reason for encouragement and remaining barriers.

Among the pluses, respondents noted that other movements afoot in the field at the time, such as consumer-oriented health care, were very much complementary to the Chronic Care Model.

They also found a growing recognition at all levels that the health care system was not designed to adequately care for people with chronic illness. The aging of the population was creating an urgency to address system deficiencies in the face of looming increases in the demand for chronic illness care.

All of this pointed to a health care field at or near a "tipping point" where it could not ignore chronic illness care or view it in isolation from other health-related or broader societal issues.

But there were significant barriers to implementing the Chronic Care Model:

- Lack of financial incentives for provision of effective chronic illness care.
 Respondents identified financial disincentives as the single biggest impediment to changing chronic health care delivery.
- A lack of the necessary infrastructure to promote continuity and coordination of care across health care providers
- Lack of supportive health system leadership and culture

Respondents were uniformly positive, though, about the impact of ICIC and the Chronic Care Model on the field of chronic illness care, describing its effect as "dramatic," "tremendous," "substantial" and "major." Overall, there was a collective sense that ICIC had helped to push the field forward and shaped the way leading institutions talk about chronic illness care by providing an easy-to-understand framework for change.

In its report to RWJF in June 2005, ICIC staff said that, despite the ubiquity of the Chronic Care Model and the effectiveness of the Collaboratives, "we are still a good distance from a 'tipping point' that would improve care for the average American struggling with chronic illness. To reach that tipping point, we need to scale up chronic care improvement to move changes beyond early-adopter practices and larger, more advantaged delivery organizations."

The assessment reinforced what ICIC staff had long suspected. The Collaboratives, though a powerful process for practices with the resources to undertake them, would not achieve widespread and broad change in health care nationally.

"We really wanted to accelerate quality improvement at a population level," Wagner said. "Up to this time we had only worked with the best and the brightest—the top 10 percent. But how could we reach the 90 percent? Our interest was in how we could move

chronic disease care improvement, which we now know individual practices can do, to a broader level."

The Chronic Care Model as a Driver of National Health Care Quality Improvement

In 2007–2008, health care reform was on the national agenda, and there was renewed hope for significant system-wide changes in health care delivery.

Wagner was under no illusions that health reform was a cure all. "Even if we develop a single-payer system and all of the expectations that people have for it come to be," Wagner said, "we still have a quality improvement system that is mediocre. National payment reform isn't going to change that."

With quality improvement in mind, ICIC undertook steps to embed the Chronic Care Model as a key driver in the debate on health care quality.

The Patient-Centered Medical Home

The most significant development, according to ICIC staff, was growth of the Patient-Centered Medical Home concept (originally conceived by the American Academy of Family Physicians), which integrates the Chronic Care Model with additional primary care objectives such as access, coordination of care and continuity of care.

Beginning in 2008, and accelerating in 2010, the Patient-Centered Medical Home became a focal point not only for providers and systems engaged in quality improvement efforts in primary care, but also with purchasers and policy-makers as a vehicle for payment reform. The Patient-Centered Medical Home has been endorsed by 22 major professional associations.

To encourage spread of the Patient-Centered Medical Home, ICIC staff:

 Began a demonstration project in May 2008 to implement the concept in 65 safety-net practices in five regions of the country. Staff selected Regional Coordinating Centers to participate in the demonstration project, each collaborating with a group of safetynet clinics in their state.

The Collaboratives receive technical assistance on how to redesign their practices, including topics such as enhanced access, care coordination and patient experience. Funding supports a Medical Home Facilitator—to lead clinic-based quality improvement projects—and other activities. The work of the Regional Coordinating Centers began in April 2009, and the initiative continues through April 2013. The project is supported by the Commonwealth Fund, in partnership with Qualis Health, a nonprofit quality improvement organization. Read more at the ICIC website.

• Advised the NCQA on the development and implementation of the Physician Practice Connection—Patient-Centered Medical Home—an instrument designed to measure the extent to which practices have implemented the Patient-Centered Medical Home.

Helping Practices Address Challenges Locally

While ICIC was influential in the national debate, the real battle in quality improvement was still at the regional and local levels. "There are dramatic variations in not just care, but the organization of care, around the country," Wagner said. "So there is going to be a critical local element. We still have a lot of work to do with our basic mission, which is how do we work with an individual practice to help them improve their care."

To help practices, ICIC zeroed in on areas of challenge in implementing the Chronic Care Model.

- One was self-management support provided to people with chronic conditions (and their families) to help them understand their central role in managing a chronic illness, make informed care decisions and engage in healthy behaviors.
 - In collaboration with RWJF's *New Health Partnerships* program and IHI, ICIC created *Partnering in Self-Management Support: A Toolkit for Clinicians*, available online. The resource provides clinical practices with a set of tested resources and tools to share with patients and families in the day-to-day management of chronic conditions.
- With an eye to helping small practices, ICIC also advised an RWJF-funded project, Preparing the Physician Workforce to Improve Performance in Practice, that uses practice coaches to help practices implement the Chronic Care Model. Efforts in several states have included small practices.
 - With funding from the federal AHRQ, ICIC developed a training manual for practice coaches, available online. There is strong interest in practice coaching as a method for improvement, ICIC staff said.
- Utilizing AHRQ funding, ICIC also developed and tested a toolkit to integrate chronic care and business strategies in safety-net environments. The toolkit and a companion manual on practice coaching are available for download online.

International Spread of the Chronic Care Model

From the early days of the program, ICIC staff has nurtured relationships with those outside the United States working to improve chronic illness care in their own countries. The interest has been two-way. ICIC staff thought they had a lot to learn from other countries that were in many ways ahead of the United States in reorganizing their health systems. Other countries were finding that the Chronic Care Model fit what they were trying to achieve.

"We were very influenced by the work being done in Europe," Wagner cited as an example. "The major premise there is that chronic care takes place in primary care. We have got to get better organized in doing it. The best primary care systems are not in the United States."

Health systems around the globe have adapted the Chronic Care Model for their environment. Versions of the Chronic Care Model are being used in Australia, Canada, China, Denmark, Germany, Italy, New Zealand, Russia, Singapore, South Africa, Switzerland and the United Kingdom. Some of the adaptations appear on the ICIC website.

The ICIC staff also wanted to help address the chronic care epidemics in the developing world and worked with the World Health Organization (WHO), at its invitation, to adapt the Model for these countries. The major product of the partnership was a 2002 WHO global report that made the case for restructuring or developing primary care systems capable of providing high-quality chronic illness care. WHO has since adapted the Chronic Care Model to be relevant to low- and middle-income countries.

PROGRAM IMPACT

Findings from the Literature

In 2009, the national program team **examined journal** articles published since January 2000 that cited one of five key articles (published between 1996 and 2002) that together originally described the Chronic Care Model. The purpose was to track the extent to which the Chronic Care Model had infiltrated the delivery of care in the United States and beyond. The team identified 944 U.S. and international articles and analyzed 82 of them. The literature review addressed three broad questions:

- Does the Chronic Care Model improve the delivery of care and patient health outcomes?
- Is a complex, multicomponent model really necessary?
- Is the Chronic Care Model cost-effective?

The findings appeared in the January/February 2009 issue of *Health Affairs* ("Evidence on the Chronic Care Model in the New Millennium"); the abstract with a link to the full article is available on RWJF's website. Through its review, the article aggregates findings from the RAND/UC-Berkeley evaluation, four evaluations of the Health Disparities Collaboratives run by HRSA and a number of other independent studies.

Does the Chronic Care Model Improve the Delivery of Care and Patient Health Outcomes?

Evidence of the improvement in chronic care has mainly resulted from evaluations of practices that have participated in a Breakthrough Series Collaborative, as the major method that has assisted practices in the implementation of the Chronic Care Model. Information about the challenges of implementing and maintaining the model in real-world settings has particularly come from the experience of the ICIC Collaboratives and the HRSA Health Disparities Collaboratives.

Key findings from these evaluations, as identified through the ICIC team's literature review, include:

- The RAND evaluation of 51 organizations in four Collaboratives found that:
 - Practices were able to implement the Chronic Care Model—with an average of 48 changes across the six Model elements.
 - One year later, 75 percent had maintained the changes.
 - About 75 percent had expanded the use of the Model to additional disease conditions or practice sites.
 - Patients of practices using the Model received improved care. For example, patients of providers in a congestive heart failure Collaborative had fewer emergency department visits and 35 percent fewer days in the hospital than similar patients in a non-participating practice.
- Three large evaluations of HRSA's Health Disparities Collaboratives offered information about the effectiveness of the Chronic Care Model and the time required to notice health outcomes.
 - A study of 19 community health centers participating in diabetes Collaboratives and a similar study of asthma and diabetes patients found that, by one year, care processes (such as regular foot examinations for patients with diabetes or use of anti-inflammatory medication for asthma) improved significantly, but did not find improvement in intermediate health outcomes (such as blood glucose or blood pressure levels).
 - An expansion of the 19-center study to two years, found that, while only process improvements were evident early, health outcomes (such as blood glucose and lipid levels) were significantly improved two years later.
 - The Collaborative teams maintained process improvements and expanded them throughout their organizations.

The ICIC team concluded that these findings "bolstered emerging evidence that the Collaborative learning structure and the Chronic Care Model were effective models

for improving care processes, although teams may have to wait to see real improvements in clinical outcomes."

Is a Complex, Multicomponent Model Really Necessary?

The ICIC team noted the number of studies that address the importance of using an integrated approach to the improvement of chronic illness care. The Chronic Care Model incorporates six evidence-based elements that interact to enhance clinical quality, and Model-based interventions emphasize the redesign of practices across these six dimensions.

Key findings about the implementation of the Chronic Care Model include:

- According to the RAND evaluation, practices are able to implement some elements
 more easily and completely than others. For example, practices were most likely to
 have addressed information systems and least likely to have dealt with community
 linkages.
- Results of several observational studies indicated that composite measures of Chronic
 Care Model implementation were significantly associated with improved or higherquality care processes and outcomes. For example, blood glucose levels and heart
 disease risk for patients with diabetes were lowest in practices most aligned with the
 complete Model.
- The studies found that having multiple Model elements was associated with higher quality of care.

Is the Chronic Care Model Cost-Effective?

Evidence on the cost-effectiveness of the Chronic Care Model is "just beginning to emerge, and more research is needed to understand the costs and benefits to practices, payers, and patients," according to the ICIC team's 2009 review. Key points include:

- While some evidence indicates that improved disease control can reduce total patient
 health care costs, these savings take time to realize and often benefit the insurer rather
 than the patient's primary care practice.
- Redesigning a practice to conform to the Model may cost the practice in the short term. One study estimates an extra cost of \$6 to \$22 per patient in the first year.
- From a societal perspective, one study found that the reduction in serious health risks resulted in increased quality-adjusted life years at a cost-effective price.

Conclusions About the Impact of the Chronic Care Model on the Quality of Chronic Illness Care

The ICIC team offered these conclusions about the impact of use of the Model on the improvement of the quality of chronic illness care in its January/February 2009 *Health Affairs* article, which reported on its review of the literature:

- "[P]ublished evidence suggests that practices redesigned in accord with the CCM generally improve the quality of care and the outcomes for patients with various chronic illnesses. This finding appears to be consistent in both U.S. and international settings."
- "[T] the observational studies reviewed suggest that high-performing practices make changes across multiple elements of the CCM."
- Noting that most studies have addressed "highly motivated practices focusing on
 patients with a single chronic condition," the team cautions that "[o]nly limited
 evidence to date provides assurance that the practice changes become sustained and
 spread to the care of other illnesses or to other less motivated practices in an
 organization."
- "The combination of the effort required by busy practices, unsupportive reimbursement, and an uncertain business case have limited widespread implementation of the CCM except by very large organizations ... some type of external financial incentive and quality improvement support may be essential for widespread practice change, especially for small practices."

In her analysis of RWJF's efforts to improve chronic illness care, journalist Irene Wielawski described the impact of ICIC:²⁵

• "Improving Chronic Illness Care helped show how the architecture of medical care—office organization, staff deployment, hierarchy, and attitudes toward patients—affects the quality of care. The Chronic Care Model offers a process for changing that architecture so that clinicians and patients can work as partners in managing disease and preventing complications. ICIC grantees demonstrated the model's flexibility by adapting it to a wide range of primary care settings."

RWJF's Orleans summarized the influence of the *Improving Chronic Illness Care* program in this way:

• "The work done under ICIC to test and apply the Chronic Care Model was critical to the spread of national health care quality improvement, to the growth of the closely related, if not derivative, medical home model, to the design and implementation of RWJF's *Prescription for Health* national program and to the ongoing regional health

²⁵ *Anthology*, Volume X, p. 16.

care quality improvement demonstrations supported by the RWJF Quality/Equality team."

LESSONS LEARNED

National Program Office

- 1. Get input from experts early, and then periodically thereafter, as you develop and test a new model of care. At the beginning of the program, ICIC presented the Chronic Care Model at a meeting of experts and encouraged their feedback. "There was ample discussion, we took good notes and adapted the document in accordance with the consensus of the meeting," Wagner noted. "We took the next iteration to the smartest people in chronic care and again engaged in this whole process of listening and gathering feedback."
 - Engaging experts accomplished three things, Wagner said. (1) It improved the Model. (2) It built ICIC's confidence that they were on the right track. (3) It led to the formation of a network of experts familiar with the work and participation by people respected in the field.
- 2. Create a "big tent" for people interested in a field to work in. "We always knew our partners as peers and we never thought of ourselves as the experts in capital letters," Deputy Director Austin said. "It was always a joint voyage of discovery. We set up this big tent and said, 'Whoever wants to play can play.'"
- 3. **Form fewer, but more significant, partnerships.** As part of its midcourse assessment, ICIC staff determined that they were expending too much energy pursuing collaborations with a host of organizations. Moving forward, they decided to pursue a smaller number of strategic partnerships, such as with the NCQA. (Program Director/Wagner)
- 4. If you want to shift the paradigm of chronic illness care, learn from the places with better systems than the United States. The Chronic Care Model enjoyed significant uptake and adaptation in health care systems around the world. This gave ICIC opportunities to engage with and learn from systems that were farther along than the U.S. health care system. "We do other things well—hospital care, maybe—but the U.S. does not have the best models for primary care, which is where much chronic care takes place in other countries" Wagner said.

The Collaboratives

5. Collaboratives demonstrate that change is possible; they are less useful as a means for wide spread of the Chronic Care Model. "The Collaboratives are great for getting the vanguard practices and being able to point to them and say, 'see they can do it in this environment," Austin said. "It is really difficult, but it's not impossible.' The Collaboratives are not as useful for broad spread of the Model."

- 6. To be most effective, teams participating in Collaboratives need the enthusiastic support of senior leaders in their institution, and they need motivated physicians on the team. "There is such a thing as innovation fatigue," Austin said. "People working on this need support to keep it from becoming a project that flames out or has an end date."
- 7. Where strong leadership buy-in is lacking, create interventions to address the issue. The Maine regional Collaborative held a "Senior Leader Dinner" at month nine of the Collaborative in an effort to more actively engage organizational leaders and inform them of results to date. As a result of discussions occurring at this event, several teams reported specific, tangible improvements and resources provided by senior leadership to support their improvement efforts.
 - The North Carolina Collaborative included a Senior Leaders Breakout Session at one of its meetings to build support for the Collaborative and to make the business case for the Collaborative process and systems-level change. They also required advisory board members to attend a learning session to become thoroughly familiar with the Collaborative's processes and goals. (Maine Project Director; North Carolina Project Director)
- 8. Focus the Collaborative on chronic conditions with clear-cut care practices that can be measured. The Collaborative focused on preventing frailty in elderly people was not successful, ICIC program staff said, because of the complexity of the clinical messages and the paucity of successful primary care geriatric models. (Program Director/Wagner)
- 9. Explore ways to make participation in the Collaboratives more affordable. The ICIC team moved away from sponsoring national Collaboratives, in part because the cost in time and money prevented many health systems from participating. Working with teams from one state or region helped, but participants still voiced concerns about cost. Among the cost-saving strategies they suggested: convene meetings in less "luxurious" surroundings and use shorter, less intensive learning sessions or "mini-collaborative models." (Program Director/Wagner, Chicago Project Director)
- 10. Be realistic with organizations about the commitment of time, resources and tenacity required to participate in a Collaborative. Many teams in the seven regional Collaboratives reported that their participation took much more time than the estimates IHI gave them. For example, accomplishing changes in office systems was more time-consuming than expected, the Maine team reported. In Chicago, staff with the sponsoring organization noted that the high degree of "close coaching and hand-holding required to keep participating teams from abandoning their plans... exceeded our expectations and strained our resources." (Chicago Project Director, Maine Project Director)
- 11. Recruitment should focus on sites that are able to follow through with all aspects of the Collaborative process. Marketing material must realistically describe the specifics of participation. Site visits should assess whether a system has the

- capacity to do what the Collaborative process requires. (Rhode Island Project Director)
- 12. Make clear that the Collaborative participation is part of an ongoing quality improvement effort that will not end with the Collaborative. Systems change involves changing how the organization does business, a concept that "was foreign to many health care teams," the leaders of the North Carolina Regional Collaborative reported. Using the Collaborative model empowers staff to identify and address problems, thereby improving the work situation as well as improving outcomes for patients. (North Carolina Project Director, Deputy Director/Austin)
- 13. **Do not assume that people know how to work as a team.** "Teams vary widely in readiness and capacity," Maine Project Director Lisa M. Letourneau, M.D., M.P.H., reported. "We learned that, in order to work effectively in supporting the teams, we needed to better anticipate and tailor our activities to the capacity and needs of the specific organization."
- 14. Creating a patient registry is difficult; give Collaborative teams adequate resources to do it. Teams need information and small group sessions with knowledgeable faculty about how to set up registries *before* arriving at the first session of a Collaborative, several leaders of the regional Collaboratives said.
 - In Rhode Island, several sites had to abandon their registry due to technical difficulties and lack of system support. The Arizona teams benefited from having the assistance of an IT consultant. The co-chair of the North Carolina Collaborative suggested that future Collaboratives offer a standard registry with manpower assistance for data entry and baseline analyses. (Rhode Island Project Director, Arizona Project Director, North Carolina Project Director)
- 15. Offer teams organizationally targeted incentives to boost participation. The Arizona Collaborative gave "superstar" awards to encourage complete and timely submission of Senior Leader Reports. The North Carolina Collaborative gave away several personal digital assistants (PDAs) for the participants who attended the full schedule of meetings. The Rhode Island Collaborative offered reimbursement for staff of smaller practices that had to close down their sites to attend the learning sessions. (Arizona Project Director, North Carolina Project Director, Rhode Island Project Director)
- 16. Balance the content of learning sessions to address the different information needs of early adopters who grasp the concepts quickly and those who need more repetition. The North Carolina Collaborative addressed the challenge by offering breakouts for different levels. (North Carolina Project Director)

Targeted Research Projects

17. The traditional "research and publish" model may be too slow in a field where innovation is happening rapidly. The targeted research projects that ICIC funded

turned out to be less useful than hoped. "We were ahead of the field, but most of what we reviewed and some of what we funded wasn't innovative anymore," Wagner said. "When you're trying to change the paradigm of care, trying to change a field, I'm not sure investigator-initiated research is the way to go." For more information on these projects see Targeted Research Projects: Identifying Gaps in the Chronic Care Model.

Dissemination

- 18. Partner with teams who have expertise that is complementary to your own for achieving larger goals. ICIC's work with the Institute for Healthcare Improvement and network organizations demonstrated a promising mechanism for spreading innovation and improvements on a national scale. "Through the focused use of these collaborations," ICIC reported, "we have both recruited participants for the Collaboratives and created opportunities for dissemination of program findings in the future." (Program Director/Wagner)
- 19. **Engage a communications consultant with experience in the nonprofit world.**The consultant ICIC used had such experience and it proved important, Wagner said. "She helped with strategic planning and meeting facilitation and was a valued colleague from day one."
- 20. Consider engaging a local communications consultant. ICIC's Seattle-based consultant was able to come to all meetings and, thus, was involved more deeply in day-to-day planning and strategizing than an out-of-town consultant may have been. "The advantages of the local are obvious," Wagner said, "but the experience we had made the advantages more clear."
- 21. Be aware that no written dissemination is as valuable as a peer-reviewed journal article. "Having a brochure to hand out is not as important," Wagner said. "If you're trying to influence health policy and major decision-makers, there is no substitute for an article in a prestigious journal."
- 22. Give speeches and make presentations is a key means of spreading a new model. Wagner and his team gave several hundred presentations about the Chronic Care Model and that face-to-face, personal interaction made a difference in the uptake of the model. "You want to get ideas in front of as many relevant audiences as you can," Wagner said. "The website is fine, but it is for follow up. As an introduction to the model, it doesn't play much of a role."
- 23. Make sure multimedia products are accessible to those without sophisticated Internet or computer capability. Toward the end of the program, ICIC put a host of useful materials and research on a CD. Though much of the information is also available on the ICIC website, staff was concerned that those working in safety-net hospitals with fewer resources would not be able to access it. (Program Director/Wagner)

LOOKING FORWARD

The MacColl Center for Healthcare Innovation continues its work translating and disseminating the concepts of the Chronic Care Model. The ICIC website will continue to serve as an arbiter of information by and for the quality improvement community.

As of May 2011, funding continues for related aspects of ICIC's work:

- "Integrating Chronic Care and Business Strategies in the Safety Net," a grant of \$315,848 from the Agency for Healthcare Research and Quality, began May 2006
- "Transforming Patient Safety-Net Clinics into Patient Centered Medical Homes," a five-year grant of \$701,839 from the Commonwealth Fund, began May 2008
- "Achieving Best Practice for Patient Referral," a grant of \$350,688 from the Commonwealth Fund, began July 2009

Other RWJF-Supported Efforts

As of May 2011, RWJF is funding these initiatives aimed at improving chronic illness care:

- Aligning Forces for Quality (AF4Q) aims to lift the overall quality of health care in targeted communities, reduce racial and ethnic disparities and provide models for national reform. The \$300 million commitment to improve health care in 17 communities that together cover 12.5 percent of the United States is the largest effort of its kind ever undertaken by an American philanthropy.
- New Health Partnerships: Improving Care by Engaging Patients is a three-year, \$3.75 million dollar national initiative to accelerate change in the area of patient selfmanagement. Managed by IHI and supported in part by the California HealthCare Foundation, the initiative encompasses multi-level components directed by experts from leading organizations in chronic care and patient-centered care research, including the MacColl Center for Healthcare Innovation. See Program Results Report for more information.

Sidebars

IN THE TRIBAL COMMUNITIES OF CALIFORNIA'S PAUMA VALLEY, IT TAKES A VILLAGE TO COMBAT CHRONIC ILLNESS

Implementing the Chronic Care Model

Good health has eluded many American Indian and Alaska Native communities. Their health statistics are among the poorest of all U.S. racial and ethnic groups. In some native communities, more than half of adults ages 18 and older have diagnosed diabetes, with prevalence rates reaching as high as 60 percent. About one in five people in these communities has two or more chronic health problems.

The reasons for such ill health are many and complicated: displacement, isolation, cultural barriers, poverty, poor sanitation, unhealthy eating habits and lifestyle, among them.

Turning the Tide in California's Pauma Valley

The tribal communities that inhabit the rural Pauma Valley north of San Diego are no strangers to these dismal figures. But the tide may be turning, in large part because of the work of the Indian Health Council.

The council was created in 1970 in response to a shift in federal policy that returned to tribes the responsibility for managing their own health care systems. It was a daunting shift for California's 107 tribal entities, especially those with few members. The nine tribes in North San Diego County formed a consortium, raised funds and opened a health clinic in a tiny wood-frame house, formerly Roberto's Taco Shop.

By 2009, the clinic was splitting the seams of a 55,000 square-foot brick facility across the road from the original building. The growth is a testament both to how far health care has come in this tribal area and how deep is the need.

Corinna Nyquist, R.N., the clinic's director of ambulatory services, came to the Indian Health Council in 2001, after 10 years at San Diego's Scripps Clinic. Not being Native American, she said she was initially surprised at the degree of fatalism among the patients she saw. "It was like: 'My mom had diabetes, my dad had diabetes, my grandmother had it, my great-grandmother had it. They all lost their vision or lost limbs and it's going to happen to me,'" she recalled.

Such beliefs were among many reasons that patients received little preventive care, Nyquist said. "When I first started here, the only time we would see patients was when they were in a crisis. I said, this is not the way to take care of the community, this is not the way to take care of a patient, always doing crisis management."

Putting the Patient at the Center

Nyquist and other clinic staff began looking at ways to engage patients in managing their illnesses. "I think nurses can be used so much more as managers to really look at an individual's and a family's health care," she said. "How can we better manage it, how can we help them better manage it?"

The nurses gained a staunch ally in 2002, when Daniel Calac, M.D., joined the Indian Health Council as medical director. Calac grew up just five miles from the clinic on the Pauma Indian reservation. A Harvard Medical School graduate, board certified in internal medicine and pediatrics, he could have had his pick of East Coast, state-of-the-art, medical institutions. But something—he calls it fate—drew him back home.

Calac brought to the Indian Health Council a deep understanding of the American Indian community and a conviction that the best care centered on the patient, not the medical practitioner. "I have seen what it is like to have a doctor-centered approach to care dictating what happens to patients," Calac said. "From a community standpoint, from a Native American standpoint, it doesn't really jibe with high-quality care."

Aided by funding from the federal Indian Health Services' Special Diabetes Program, the Indian Health Council already had instituted a team approach with diabetes patients. They had also recruited specialists—an ophthalmologist, a podiatrist, a cardiologist—to come to the clinic to deliver services, increasing the likelihood that diabetes patients would follow up on referrals.

"We had done really well with the diabetic population," Nyquist said, "so we said, why can't we just do this across the spectrum. We have this whole team approach with diabetes, why don't we have it for everything?"

Targeting a Range of Chronic Illnesses

The opportunity to realize that dream came in 2007 when the Indian Health Council was one of 14 tribal health centers selected to participate in Innovations in Planned Care, a year-long Breakthrough Series Collaborative aimed at implementing the Chronic Care Model (what the Indian Health Service calls simply "the Care Model") into how they worked with patients with a range of chronic illnesses.²⁶

²⁶ The Institute for Healthcare Improvement developed the Breakthrough Series to help health care organizations make "breakthrough" improvements in quality while reducing costs. The driving vision behind the Breakthrough Series is that sound science exists on the basis of which the costs and outcomes of current health care practices can be greatly improved, but much of this science is unused in daily work. The Breakthrough Series helps organizations use the science by creating a structure in which interested organizations can easily learn from each other and from recognized experts in topic areas where they want to make improvements. A Breakthrough Series Collaborative is a short-term (6- to 15-month) learning

The team members selected six areas of patient health for which they would screen patients and measure outcomes: alcohol misuse, depression, domestic violence/intimate partner violence, tobacco use, obesity and blood pressure. The teams were cautioned to use measurement to guide improvement, not to judge performance.

The Collaborative process required teams to participate in intensive two-day "learning sessions" at eight- to 12-week intervals (some held in person and others Web-based) and in one-hour Web-based "action period calls" every other week. The regular contact, in person and online, enabled teams to exchange ideas and learn from each other as they measured their progress and implemented changes in their office and patient care routines.

Creating Microsystems of Change

To get started in making improvements, teams created "little microsystems" to test changes. At the Indian Health Council, the first microsystem centered on Mary Jo Moses, F.N.P., a family nurse practitioner who was enthusiastic about improvement and able to motivate others. Moses focused on patients she had seen several times within the previous 18 months. The 772 identified patients were assigned to her team, which included two medical assistants.

The team started each day in a 30-minute "huddle" to review the charts of patients scheduled for clinic visits. The goal was to identify and plan for needed medical tests or exams, including immunizations, mammograms and physicals.

This chart review proved challenging at first, Nyquist says, because of data entry errors and omissions. The clinic eventually trained all staff in data entry, rather than relying on one person, and the change helped improve the accuracy of the records.

Armed with information, the team was able to address patients' needs proactively. Team members also assured the patients that they would see someone who knew them and understood their health issues.

"One of the biggest complaints from patients," Calac says, "was turnover in the clinic. Who am I going to see next? Is it someone different?' Now there is not just one practitioner but one group of people responsible for delivering care for that one patient. Patients can expect follow up. They are contacted more frequently and they do not have to explain all over again what happened last time. From the patient standpoint, that has been a big improvement."

That sense of continuity also made a difference in how the medical staff feels about their jobs. "I have a lifeline to my patients—and they to me—through the use of the team,"

system that brings together a large number of teams from hospitals or clinics to seek improvement in a focused topic area.

Moses says. "I sleep better at night, and patients know there is a home with a group of people who care and know about their conditions."

Making Rapid Cycle Changes

During the pilot process, the team also undertook a number of "rapid cycle quality improvement" tests. They used a tool they had learned about at the Breakthrough Collaborative called Plan-Do-Study-Act (PDSA—shorthand for testing a change by planning it, trying it, observing the results and acting on what they learn).

One of the improvement projects focused on high blood pressure statistics. The team looked first at office processes. The clinic's blood pressure station was right inside the front door. When patients walked in, staff sat them down, took their blood pressure and then whisked them into an exam room. Staff wondered: What if they took patients into an exam room first and, after getting them settled and taking a bit of history, then took their blood pressure?

"We did that test in 20 minutes," Nyquist says. "With the next five patients that came in we took their blood pressure right away as usual and then five minutes later when they had been in the exam room we took it again. There was such a substantial difference in the readings that we implemented that procedure right away. There was no reason to be doing the blood pressure out in the middle of the hall."

They also explored why patients were not taking their medications as prescribed. "I've always hated the word noncompliance," Nyquist says. "If the patients don't take their medicine, have we looked at why? Has anyone asked whether they can afford \$50 worth of medication? Or whether they are comfortable with giving themselves insulin? Are we just tagging someone as noncompliant because it is easier for us to make that assumption rather than take ownership of what we are actually doing from patient to patient?"

By participating in health fairs and engaging with the elders in the community, clinic staff got more clues about patients' concerns and instituted some small but important changes in office procedures to help patients with their medications. They found out that many patients did not know why they were taking their medications, so the team asked the doctors to begin writing that down, in plain language: "for diabetes" (not hyperglycemia), "for high blood pressure" (not hypertension), "for high cholesterol" (not hyperlipidemia). The pharmacy was more than willing to include the information on the pill bottles.

"We asked a couple of community members, what do you think of that?" Nyquist said. "They said, 'That's great, now I know why I'm taking that pill.' These are really simple things. We have all gone through a transformation: instead of deciding what a patient needs and prescribing for them, we are involving them in their care."

Bolder Changes, Stiff Resistance

After a year in the pilot, the Indian Health Council was ready to roll out system changes more broadly. With the blessing of Calac and the clinic's leaders, Nyquist and the team redesigned care delivery throughout the medical clinic to reflect the new team approach.

The clinic's five primary care doctors were each assigned to a "pod," a care team that included nurses and medical assistants. Each pod was responsible for the care of some 800 patients. To reinforce the team concept, each pod shared an open office space to encourage communication and collaboration.

In addition, field nurses often joined the morning "huddles," as they were actively engaged with patients in the community and could help with broader needs, such as housing or home health aides.

The new system immediately met resistance from several physicians, mostly younger ones who were new to medical practice. "I was shocked," Nyquist says. "I would have expected it of older physicians stuck in their ways... But they were younger."

Nyquist suspects the resistance stemmed from old notions of hierarchy—"the physician on top, then maybe the nurse, then the medical assistant, then everybody else"—a model that she and Calac have never subscribed to. "We believe in using everybody to the highest point of their ability or their licensure," Nyquist said. "There is so much more that the nurses could be utilized for. Nurses should be obtaining histories, looking at chronic disease processes that haven't been followed up and doing education. Physicians generally are open to that."

The physicians not enamored of the care team concept have not stayed at Indian Health Council. "It was just not a good fit," Nyquist said. "We wanted to improve communication among the team members and to do better case management. Before, it seemed that everyone just felt, 'That's not my job.' Part of the team approach is that it is everybody's job, regardless of what your license is, to look at everything in the community. We are basically the community's public health system."

"It's amazing how implementing the Care Model has really blossomed. No one could have foreseen that a small \$30,000 grant could totally transform how we are providing care."

Daniel Calac, M.D. Medical Director Indian Health Council

Proving the Model With Data

Implementing the Care Model also required collecting patient data consistently. The pilot group of 14 health centers struggled with setting up patient registries and getting office staff to collect accurate data so that they could measure outcomes and improvement. By

the second round of the Breakthrough Collaboratives, there was a manual on how to do the measurements, gleaned from the pilot groups' hard experience.

To make tracking easier, certain measures were bundled together. There's a cancer bundle, for example, that includes cervical, breast and colon screening. "It's an all-ornothing screening," Nyquist says. "If you are good at screening for one but not for all three you get a lower number."

Tracking the numbers has been informative. The team found that colon screenings were very low—about 20 percent. Because no one had told them to, according to Nyquist, data entry was not recording colonoscopy referrals outside the Indian Health Council. "We did a manual audit and it went from 20 percent to 60 to 65 percent." The clinic immediately retrained everyone and included data entry staff on the care team so they would understand the context and the importance of the data.

Eventually, Indian Health Council staff completed the transfer of patient files to electronic medical records, extracting information manually in order to capture important data, such as: When did the patient get screened for that condition, what other screenings are they due for?

A Better Pathway to Health

The transformation in care delivery has resulted in consistent improvement in alcohol misuse screening, colorectal cancer screening and childhood immunizations; decreasing office visit cycle time; and improved continuity of care. Physical activity and exercise referrals have increased, and staff has noted that patients are taking control of their own personal health and well-being.

"Our community is very used to us telling them what they need to do," Nyquist says.

"Now we see patients taking the driver's seat. We tell them, 'If you need these tests, come in and demand them from us. You are in control and we are here to help you."

Calac says he now wants to involve the entire clinic in what he calls "the Big Team." Current plans are to extend the implementation of the Care Model to include the departments of community health, dental and behavioral health. He credits the Collaboratives with creating the will and process to institute widespread and lasting changes.

"Before the Collaboratives, I thought we were providing at least good care," Calac says. "But we weren't doing some things. One, we were not systematic about how we provided care. Two, we were not documenting what we needed to. By implementing the Care Model and putting some better algorithms and pathways in place, we are able to do a much better job. And we can take credit for it by showing the numbers. People know we are really doing a pretty good job."

THE INSTRUCTION MANUAL FOR DESIGNING HEALTH CARE DELIVERY IN BATTLE CREEK, MICH.

Redesigning health care delivery has been compared to "fixing a plane while flying at 10,000 feet."

In Battle Creek, Mich., nearly everyone who has anything to do with the "plane" is working on the fix. The Chronic Care Model is the instruction manual.

Battle Creek, Mich., seems an unlikely place to attempt a major transformation of health care delivery. Even before the 2008 recession that hobbled the automobile industry on which it is so dependent, this town of 52,000 had an anemic economy and depressing health statistics.

In Calhoun County, where Battle Creek is located, 10 percent of adults have diabetes, with an additional 40 percent pre-diabetic. In addition, more than 70 percent of residents in the county are overweight or obese.

But Thomas Simmer, M.D., chief medical officer and senior vice president of Blue Cross Blue Shield of Michigan, had a vision for improving health care in the region—and since the Blues covered more than 60 percent of the town's workers with commercial insurance, when the health plan talked, physicians listened.

In 2006, Simmer invited Integrated Health Partners, a group of some 170 affiliated physicians in the Battle Creek area, to get involved in an incentive gain program²⁷ designed to encourage physicians to manage patients with chronic illness more effectively and proactively. He urged Mary Ellen Benzik, M.D., Integrated Health Partners' medical director, and Ruth Clark, R.N., its executive director, to "start looking at the Chronic Care Model—the Wagner Model—and start looking at registries.²⁸ We got in the car," Benzik recalled, "and said, 'First, who is Ed Wagner and why do we care about his model? And second, what is a registry?""

Over the next few months, Benzik and Clark became educated about the Model, which replaces the traditional physician-centric office structure with one that supports clinical teamwork in collaboration with the patient. "As a family physician, it just seemed like the way you were supposed to deliver care," Benzik recalled.

²⁷ Incentive gain programs provide financial rewards to practices that implement changes that improve patient care quality and reduce costs.

²⁸ The "Wagner Model" is so-called after the director of Improving Chronic Illness Care, an RWJF program, Edward H. Wagner, M.D., M.P.H., a senior investigator at Group Health Research Institute and the founder and director of the MacColl Institute for Healthcare Innovation. Wagner and colleagues invented the Chronic Care Model. See Program Results for more information on the program.

With major funding from Trinity Health's Call to Care grant, and additional funding from the Battle Creek Community Foundation and the W.K. Kellogg Foundation, Integrated Health Partners, in collaboration with the Battle Creek Health System, launched Calhoun County Pathways to Health, an initiative to bring the Model to the Battle Creek health care delivery community.

Kellogg put Benzik in touch with Michael Hindmarsh, who was working as a consultant after 16 years as Group Health's Associate Director of Clinical Improvement. Hindmarsh came to Battle Creek and encouraged Benzik and her team to sponsor a series of Collaboratives²⁹ with local physicians and practices interested in implementing the Chronic Care Model.

A Collaborative is a rigorous year-long learning process in which teams of physicians, nurses and other practice staff implement changes in how they deliver care to patients and measure the outcomes. Blue Cross Blue Shield and the Kellogg Foundation agreed to provide funding for the effort. Benzik convinced Integrated Health Partners to buy a server to house a patient registry as an investment in the work.³⁰

Having dedicated funding for a "quality improvement infrastructure"—and a physician organization to champion the effort—was critical, Benzik emphasized. "An independent doctor floating out there can do this, but it is much better to have some type of aggregate group to sustain the change, to have the passion for the change," Benzik said. "Having a physician organization there to serve that role and having a funder there to support that role was critical to the success."

Focusing on Diabetes Care

The first collaborative, launched in May 2007, drew 14 physician-led practice teams representing various practice models—solo independent, small group independent, medium-sized independent and large employed—all focused on improving the care of their diabetic patients. The teams came together in three two-day learning sessions and a one-day Outcomes Congress. During the action periods between the group meetings, the teams implemented changes to align themselves with best practices for diabetes care. The teams were required to submit data reports and participate in conference calls on a monthly basis.

²⁹ The Breakthrough Series Collaborative was created by the Institute for Healthcare Improvement and was the primary method that the *Improving Chronic Illness Care* program used to spread the Chronic Care Model in practices and health systems.

³⁰ As of 2009, the computerized registry included patients with diabetes, asthma, coronary artery disease, congestive heart failure and hypertension. The registry houses clinical data on over 12,000 patients and allows electronic interfaces between physician practice electronic medical records systems (EMR) and the registry.

Some 10 practices completed the year-long process. Changes within the pilot group of 1,300 patients were encouraging: blood pressure readings improved by 8.5 percent, the number of patients with their diabetes under control increased 6.8 percent and LDL cholesterol readings under 100 increased 22 percent.

Office routines also improved. Practices began implementing evidence-based interventions such as eye exams, foot exams, flu vaccines, pneumonia vaccines and screening for depression.

"This endeavor has been a very sobering experience for us. We thought we were doing it right. We believed we were at the top of our game and we really learned otherwise."

Philip Ptacin, M.D. Family Physician DayOne Family Healthcare

Setting goals based on the Chronic Care Model, the practice redesigned its office care of diabetes and used its existing electronic medical record system to collect data. The most difficult and time-consuming part of the change was encouraging patients in the management of their disease.

"Usually an office visit might end with me saying, 'You really need to lose some weight,'" said Philip Ptacin, M.D., family physician at DayOne Family Healthcare. "The patient and I would both give lip service to that and I'd say, 'See you in three to six months."

The practice now devotes up to half of a planned office visit to discussing and problemsolving the patient's self-management goals. "We try to get them to pick something that is meaningful to them that they can really do," Ptacin said. "This is a shift in our attitude. In the past, if a patient wasn't taking their medications correctly, we would blame them for

their failure and excuse ourselves and call them that famous medical term, 'noncompliant.'"

The new approach yielded impressive improvement in patient outcomes. In the months after the collaborative, implementation of the Chronic Care Model spread throughout DayOne Family Healthcare and to the treatment of other chronic illnesses.

"The ability to track patients in the community is important. Otherwise, it's like fly-fishing. You just have to wait for somebody to come by who is either crashing and burning or is about to crash and burn."

"This is Bigger Than Physicians" Mary Ellen Benzik, M.D.

The first Collaborative helped to demonstrate what was possible, even in small practices. A second Collaborative, begun in 2008, engaged an additional 30 physician practices and achieved similar outcomes.

Meanwhile, Benzik and Clark were convening monthly meetings with an array of people who also had regular contact with chronically ill patients: hospital discharge planners,

employers, social service agency workers and others. "We realized that this was much bigger than physicians," Benzik said.

In May 2008, Integrated Health Partners sponsored the first of two Collaboratives focused on care management. The four participating teams were a cross section of people caring for and engaging with patients: staff from doctor's offices, visiting nurses, community mental health workers, hospital discharge planners, Medicaid workers, etc.

The first indication of just how difficult care management would be was trying to put together a group of "pilot" patients. "The team couldn't even figure out who were the common patients," Benzik said. "And we knew they had common patients."

Instead of trying to identify shared patients, the care management teams came together and used simulated patients to identify gaps in the care system. Then they did some Plan-Do-Study-Act (rapid cycle tests of change) to address the gaps. For example, the teams instituted a goal that patients be seen within 48 hours of discharge from the hospital by a primary care physician or a visiting nurse. "It's an opportunity to make sure their meds are correct, they understand their disease and they get their questions answered," Benzik said.

One patient, who had a history of readmissions, received one of the first post-discharge visits. The visiting nurse discovered that the man was taking his medications every other month so that he could save money to get his broken furnace fixed. The nurse contacted Battle Creek's Senior Services, which had a representative working with the Care Management Collaborative. Staff knew about a small, rarely used state program that would pay for a furnace once in a person's lifetime. The patient's primary care provider helped him do the paperwork to be eligible for the furnace "so he could afford his medicine, which impacted his health and his readmission potential," Benzik said.

The teams also worked with the inpatient psychiatric hospital to make sure that discharge summaries were getting to the right people and in a timely fashion. One psychiatrist did the rapid cycle-test with five patients and then the hospital expanded it all to patient discharges.

The care management group is looking at ways to develop its own registry that would allow the all those who touch the same patient to communicate basic information about the patient.

At the Outcomes Congress, the teams described what it was like to do case management across an entire community. The big take-away was that they learned the value of communicating with patients and with each other. "That made a huge difference," Benzik said. "They knew each other and could call each other and work together on a process of care. The foundation was strong relationships."

In part because of its work on care management, in 2009, the Institute for Healthcare Improvement, which developed the Collaboratives approach, selected Battle Creek Health System as one of five pilot sites for Michigan STAAR (STate Action on Avoidable Rehospitalizations). The two-year project focuses on two components: a multistate learning community to improve transitions of care and targeted technical assistance to address systemic barriers to reducing avoidable rehospitalizations.

Employers: Key Players in the Transformation

From the beginning, large employers have been eager to engage with the health care delivery transformation going on in Battle Creek. The Kellogg Company took the lead, joining with Pathways to Health in 2006. Soon a number of other companies added their voice to an advisory panel working to devise ways to engage Calhoun County residents in behaviors that enhance their wellness.

"We have a lot of employees and retirees, and ultimately the area of health care impacts everyone economically," Bill Greer, Kellogg's compensation consultant said. "We knew the quality of health care in the community was good. What we came to recognize was that health behavior was not so good."

The employers have devised a value-based insurance plan approach that they believe will lead to employee benefit packages that create healthier employees and lower costs. Participating employers include the Kellogg Company, the City of Battle Creek and Battle Creek Health System.

"Our economic development group has been very involved in Pathways," Benzik said.
"They feel if they can do something with health care—not even solve it, but do something—they can recruit to this county. If someone is looking at Kalamazoo County or Calhoun County and we can say we are doing something about health care across stakeholders, companies will think of moving another 20 miles."

Keeping a Finger on the Pulse of the Community

One key to Battle Creek's communitywide improvement plan is making sure that gaps in care are identified early. For that, Pathways to Health depends on an active consumer advisory council to be the eyes and ears in the community.

The council conducts focus groups around the county with different groups to ferret out any barriers to care. If a citizen can't get transportation to an appointment, for example, that information goes to the Pathways leadership team, which is made up of people who run many of the organizations and agencies that interact with patients. The council also produced a community resource guide, "Managing Your Chronic Disease," and linked the information in it to a local online database.

The Five-Year Test

When Pathways began in 2006, Benzik had in mind a five-year time frame. "If it has taken hold in five years, then you will know that it is integrated into how we do business," she said. At the beginning of 2011, most signs were pointing in the right direction.

Some 25 percent of diabetes patients and nearly 50 percent of cardiovascular disease patients had physicians who had participated in a Chronic Care Model learning collaborative. In focus groups, patients whose doctors went through a collaborative were saying things like, "I don't know what happened in the last year, but my doctor started asking me questions and asking what I thought of the care. Something different is going on."

"That gave us the chills when we heard that," Benzik. "That keeps you going. The idea that everybody—physicians, major employers, insurers, patients—is sitting around the table and interested in fixing this, is incredibly empowering," Benzik said. "The community wants it. They believe in it. They are ready for it."

Prepared by: Kelsey Menehan

Reviewed by: Mary Geisz and Molly McKaughan Program Officers: Anne Weiss and C. Tracy Orleans

Grant ID#: CDM

Program area: Quality/Equality

APPENDIX 1

Improving Chronic Illness Care National Advisory Committee

(Current as of the end date of the program)

Ronald E. Aubert. Ph.D.

Vice President, Clinical Analysis and Outcomes Research Medco Health Solutions, Inc. Franklin Lakes, N.J.

Carolyn Clancy, M.D.

Director Agency for Healthcare Research and Quality Washington, D.C.

Shan Cretin

General Secretary American Friends Service Committee Philadelphia, Pa.

Terry W. Crowson, M.D.

Medical Director, Medical Management and Government Programs HealthPartners Health Plans Bloomington, Minn.

Barbara Fleming, M.D., Ph.D.

Senior Clinical Advisor Centers for Medicare & Medical Services Baltimore, Md.

Sheldon Greenfield, M.D.

Executive Director, Center for Health Policy Research University of California, Irvine Irvine, Calif.

Margaret J. Gunter, Ph.D.

President and Executive Director Lovelace Clinic Foundation Albuquerque, N.M.

Charles Homer, M.D., M.P.H.

President and Chief Executive Officer National Initiative for Children's Healthcare Quality Boston, Mass.

Emmett Keeler, Ph.D

Senior Mathematician RAND Corporation Santa Monica, Calif.

Willard G. Manning, Ph.D.

Professor, Harris School of Public Policy and Department of Health Studies University of Chicago Chicago, III.

David Matchar, M.D.

Director

Duke Center for Clinical Health Policy
Research

Durham, N.C.

Cynthia D. Mulrow, M.D., M.Sc.

University of Texas Health Science Center Audie L. Murphy Memorial Veterans Hospital San Antonio, Texas

L. Greg Pawlson, M.D., M.P.H.

Executive Vice President National Committee for Quality Assurance (NCQA) Washington, D.C.

David Reuben, M.D.

Chief, Division of Geriatrics UCLA Center for Health Sciences and Medical Center Los Angeles, Calif.

Morris Weinberger, Ph.D.

Professor of Healthcare Quality Management Department of Health Policy and Management University of North Carolina at Chapel Hill Chapel Hill, N.C.

Nancy Whitelaw, Ph.D.

Senior Vice President and Director Center for Healthy Aging National Council on Aging Washington, D.C.



APPENDIX 2

The Collaborative Sponsorship Grants Program: Grantees and Key Results

Arizona State Diabetes Collaborative. Health Services Advisory Group (Arizona's Medicare Quality Improvement Organization), \$100,000, February 2003 to February 2004 (ID# 047302)

- Twelve teams participated in all aspects of the Collaborative; 16 completed some aspects, and 37 additional practices completed at least one of the quality improvement activities.
- Arizonans with diabetes in the study population benefited from significantly improved care in three core clinical measures (blood glucose levels, lipid level and self-management goal-setting).
- The Arizona Diabetes Initiative grew to nearly 300 interested stakeholders from over 100 organizations; all have embraced the use of the Chronic Care Model and are committed to facilitating its spread.
- The Arizona Department of Health Services developed a comprehensive chronic disease strategic plan that incorporates the Chronic Care Model.
- The state Medicaid provider, Arizona Health Care Cost Containment System, adopted the Chronic Care Model framework, including use of its concepts as a requirement for its contracted health plans.

Chicago Regional Chronic Illness Diabetes Collaborative. Midwest Business Group on Health, Regional Health Committee of the Institute of Medicine of Chicago, Illinois Foundation for Quality Health Care, \$96,833, April 2002 to April 2003 (ID# 045432)

- Sixteen of the original 21 teams completed the Collaborative.
- The chief of ambulatory care for the Cook County Bureau of Healthcare has implemented the Chronic Care Model as a strategic goal for his organization.
- The team with the largest pilot test population implemented several improvements, including a pre-post test for the "ABCs of Diabetes" education as well as integrating "health promoters" (lay educators) into the care team. The team reported a drop in average HbA1c (blood glucose level) for their pilot population of 0.92 points from

baseline over the first seven months of the collaborative, approaching their goal of a 1.0 point reduction.

Maine Regional Diabetes Collaborative. MaineHealth, \$100,572, January 2003 to January 2004 (ID# 047303)

- Some 13 teams from 12 primary care practices in the MaineHealth system, and one home health care organization completed the Collaborative.
- Teams achieved improvements across all focus areas (office systems, clinical improvements, self-management and provider satisfaction).
- Teams achieved marked improvements in clinical outcomes of diabetes care, including HbA1c, cholesterol and blood pressure levels.

North Carolina State-Based Diabetes Collaborative. North Carolina Department of Health and Human Services, \$100,000, January 2003 to August 2004 (ID# 047294)

- Some 13 of the 14 teams completed the process. Half of the teams represented federally qualified community health centers or rural health centers and all served at least 10 percent of the high-risk populations that were targeted (Medicaid, uninsured, ethnic minorities).
- By the end of the Collaborative, 11 teams had tested changes in all six domains of the Chronic Care Model, and six had implemented changes in all six.
- The teams reported positive patient outcomes on many of the markers for optimal diabetes care, including HbA1c, blood pressure and cholesterol levels.

Heart Failure GAP [Guidelines Applied in Practice] Project in Oregon. Oregon Medical Professional Review Organization, \$95,210, April 2002 to November 2003 (ID# 045434) and University of Oregon School of Architecture and Allied Arts, \$49,989, June 2004 to June 2006 (ID# 050787)

- Six of eight cardiologist-led teams completed the Collaborative. The teams increased adherence to heart failure treatment in published guidelines but few made changes to their practice processes, such as using a registry or incorporating planned visits.
- Under the second grant, researchers tested and refined a Patient Activation Measure (PAM) to assess consumers' active participation in their health care. As of 2006, 75 studies worldwide were using the PAM as a predictor or as an outcome measure.

Rhode Island Chronic Care Collaborative. Rhode Island Department of Health, Diabetes Prevention & Control Program, Quality Partners of Rhode Island (the state's Quality Improvement Organization), \$89,882, January 2003 to May 2004 (ID# 047305)

• Twelve health care sites (including four community health centers, three private practices and five hospital-based practices) tracked 1,057 patients with diabetes.

 Almost all teams made improvement in completing the implementation for several components of the Chronic Care Model, and outcome measures (such as blood glucose, blood pressure and self-management) moved in the desired direction.

Vermont Community Diabetes Collaborative. Vermont Program for Quality in Health Care, \$100,000, April 2002 to June 2003 (ID# 045433)

- Eight of the nine teams completed the Collaborative. Two teams made significant inroads towards clinical improvements.
- The majority of teams struggled with challenges within their parent organization that
 prohibited achievement of clinically significant improvement. However, nearly all of
 the organizations participated in a second collaborative in 2003.

APPENDIX 3

Targeted Research Grants Program: Grantees and Key Results

Drop-In Group Medical Appointments and Standard Assessment and Feedback for the Management of Pain in Primary Care. Tim A. Ahles, Ph.D., Dartmouth College, \$457,826, March 2001 to February 2004 (ID# 041865)

- Drop-in group medical appointments allow patients to interact with their
 physician/nurse team and receive education and self-management strategies related to
 their medical condition within a support group of patients with similar conditions.
 Researchers evaluated the feasibility of implementing this intervention in primary
 care practices and compared outcomes for patients with chronic pain who participated
 in the appointments with patients who received usual care.
- The study demonstrated the feasibility of implementation, with universally positive responses from both patients and providers. Four of seven participating practices continued the group visits after the implementation study phase. Patients receiving the intervention showed significant improvement at three months in functional interference and at nine months in vitality and health perception.

Integrating Self-Management Action Plans into Primary Care for Patients with Coronary Heart Disease Risk Factors. Thomas S. Bodenheimer, M.D., University of California, San Francisco, \$289,261, August 2003 to January 2006 (ID# 048996)

- This study assessed whether the discussion of a behavior-change action plan with patients in primary care visits improves self-care behavior, self-efficacy and health status compared with patients receiving usual care. Researchers also observed whether clinicians could incorporate action plans into primary care visits.
- About 53 percent of patients making an action plan were engaged in a behavior change related to the action plan at three-week follow-up. However, while clinicians

favorably viewed behavior-change goal-setting and action-planning, they did not have time to cover these activities in the standard 15-minute primary care visit.

Randomized Trial to Improve Transitions between Health Care Settings for Persons with Chronic Illness. Eric A. Coleman, M.D., University of Colorado at Denver and Health Sciences Center, \$345,967, March 2001 to March 2004 (ID# 041863)

- Researchers analyzed the effect on chronic illness care of enhancing information flow between health care settings and empowering patients and caregivers to meet health care needs during care transitions. Researchers also developed an indicator of care transition quality.
- Compared with those receiving usual care, inpatients receiving the interventions had
 reduced rates of rehospitalization. They also reported high levels of confidence in
 obtaining information for managing their condition, communicating with their health
 care team and understanding their medication regimen. The 15-item Care Transitions
 Measure was found to provide meaningful, patient-centered insight into care
 transition quality.

Testing a Managed Care Approach, Group Visits, in Disadvantaged Patients with Type 2 Diabetes. Dennis W. Cope, M.D., Medical University of South Carolina, \$260,706, March 2001 to May 2002 (ID# 041867), and Dawn E. Clancy, M.D., \$466,818, June 2002 to May 2005 (ID# 045941)

- Researchers at the Medical University of South Carolina compared quality of care
 (according to American Diabetes Association guidelines), health-related outcomes
 and patient satisfaction for uninsured/inadequately insured patients with type 2
 diabetes who participated in group medical visits compared with similar patients who
 did not participate.
- In a 2003 article in the *Diabetes Educator*, ³¹ researchers reported that patients receiving care in group visits exhibited increased trust in their physician compared with patients receiving usual care. These patients also noted better care coordination, community orientation and culturally competent care.
- In a 2003 article in Diabetes Care, ³² researchers reported significant improvement in 10 process-of-care indicators (such as up-to-date blood glucose levels, daily aspirin use and annual foot exams) for patients receiving care in group visits, with 76 percent having at least nine indicators up-to-date compared with 23 percent of patients not receiving such care.

³¹ Clancy DE, Cope DW, Magruder KM et al. "Evaluating Group Visits in an Uninsured or Inadequately Insured Patient Population with Uncontrolled Type 2 Diabetes." *Diabetes Educator*, 29(2): 292–302, 2003. Abstract available online.

³² Clancy DE, Cope DW, Magruder KM et al. "Evaluation Concordance to American Diabetes Association Standards of Care for Type 2 Diabetes Through Group Visits in an Uninsured or Inadequately Insured Patient Population." *Diabetes Care*, 26(7): 2032–2036, 2003. Available online.

In a 2007 article in *Journal of General Internal Medicine*, ³³ researchers reported that blood glucose, blood pressure and lipid levels did not differ significantly for patients receiving care in group visits and patients receiving usual care. However, at 12 months, patients in group visits were more in line with process-of- care indicators and had higher screening rates for breast and cervical cancer.

Randomized Clinical Trial of Collaborative Management in Chronic Obstructive Pulmonary Disease. David Coultas, M. D., University of Florida, \$324,892, May 2001 to November 2004 (ID# 041861)

- Investigators at the University of Florida conducted a randomized controlled trial that compared usual care, nurse-delivered standardized medical management and nursedelivered collaborative management of patients with chronic obstructive pulmonary disease (COPD).
- Nurse-assisted home care for COPD that included patient education, patient selfmanagement and enhanced follow-up did not result in clinically meaningful improvements in patients' health status or health care utilization.
- The prevalence of depressive symptoms was high (60%) among the patients with COPD. These symptoms were associated with increased physician visits, emergency room visits and hospitalizations.

Registry Development and Telephone Outreach to Asthma Patients: The Role of a Managed Medicaid Plan. Mark P. Doescher, M.D., University of Washington, \$118.517. March 2001 to June 2003 (ID# 041864)

- This study evaluated interventions aimed at improving asthma care at Community Health Plan of Washington (a managed Medicaid plan in Washington State). These included an automated registry of low-income, pediatric asthma patients as well as proactive, telephone-based family support from a nurse and completion of a written asthma care plan. Doescher and colleagues tested whether quality of life and functional status improved and avoidable utilization decreased. They also assessed cost-effectiveness.
- Because of the study experience, Doescher concluded: "Although the intervention resulted in modest benefits, few eligible families enrolled and, even among this select group of participants, telephone contact was difficult. Consequently, and contrary to the literature in more affluent settings, we conclude that the use of an insurance planlevel nurse to provide family outreach by telephone is not an efficient use of resources in our low-income, geographically dispersed setting. Alternative strategies to improve asthma care in our setting need to be developed."

³³ Clancy DE, Huang P, Okonofua E et al. "Group Visits: Promoting Adherence to Diabetes Guidelines." Journal of General Internal Medicine, 22(5): 620-624, 2007.

Evaluation of Community Readiness for Implementation of the Chronic Care Model. R. Adams Dudley, M.D., University of California, San Francisco, \$100,000, March 2001 to September 2002 (ID# 041866)

 Dudley and colleagues studied organizations that had accepted all or part of the Chronic Care Model to identify factors determining whether Model-related initiatives would succeed or fail. The investigators focused on the "Community: Resources and Policies" component of the Model. Findings of the study are discussed in a 2003 article in *Health Affairs*.

Improving Use of Community Resources to Support Chronic Illness Self-Management. Elizabeth G. Eakin, Ph.D., La Clinica Campesina Family Health Services, \$500,000, May 2001 to May 2004 (ID# 041862)

• This project evaluated a self-management community resource intervention among low-income English- and Spanish-speaking community health center patients with one or more chronic conditions. In a 2006 article in the *Journal of Advanced Nursing*³⁵ (see abstract), researchers reported a statistically significant association between the use of multi-level supports (e.g., family, individual, health care provider) and patients meeting physical activity guidelines and having better dietary behaviors.

Assessing the Chronic Care Model in Small Primary Care Practices. Chris Feifer, Dr.P.H., University of Southern California, Keck School of Medicine, \$42,063, August 2003 to December 2004 (ID# 048997)

• Researchers modified the ICIC's Assessment of Chronic Illness Care for use in small practices and piloted four versions—for diabetes, depression, flu vaccines and a combination of the three—with 20 small practices. The surveys assessed the strategies used by the practices to improve chronic disease care. On average, the practices had modest resources for onsite patient education; most relied on doctor-patient communication for self-care support.

A Randomized Trial of Community-Based Case Management by Parent Mentors. Glenn Flores, M.D., Children's Health System, \$39,415, October 2003 to March 2005 (ID# 049468) and Medical College of Wisconsin, \$251,003, March 2005 to July 2007 (ID# 052816)

This study assessed whether parent mentors working with minority families are more
effective than traditional asthma care in reducing childhood asthma morbidity, costs
and use of services while increasing families' quality of life, satisfaction with care and
self-efficacy.

³⁴ Mehrotra A, Bodenheimer T and Dudley RA. "Employer Efforts to Measure and Improve Hospital Quality: Determinants to Success." *Health Affairs*, 22(2): 60–71, 2003.

³⁵ Bull S, Eakin E, Reeves M and Kimberly R. "Multi-level Support for Physical Activity and Healthy Eating." *Journal of Advanced Nursing*, 54(5): 585–593, 2006.

• As reported in a 2009 article in *Pediatrics*³⁶ (see abstract), patients with high levels of participation in the program experienced significantly reduced asthma exacerbations and emergency department visits. In addition, their parents reported improved efficacy in controlling problems at home and fewer missed workdays compared with patients receiving traditional care. Average monthly patient cost was \$60.42, with a net savings of \$46.16 for high participants.

Self-Management Support in a Web-Based Medical Record. Harold I. Goldberg, M.D., University of Washington, \$98,993, March 2001 to January 2003 (ID# 041871)

• At two primary care clinics, physicians piloted use of a Chronic Illness Profile (a display of diabetes clinical data) and a Self-Management Module for generating short-term, achievable "action plans" that teach problem-solving skills and enhance self-efficacy for patients with diabetes. While a quarter of the physicians used the Chronic Illness Profile, this did not translate into a willingness to use the Self-Management Module. Ancillary providers such as nurses and pharmacists were nine times more likely to use the module than were physicians, suggesting that self-management support will be most cost-effectively delivered by non-physician staff. The findings appeared in *Joint Commission Journal on Quality and Patient Safety* in 2004. (See abstract on RWJF website.)

Tele-video Nursing for Congestive Heart Failure Self-Management: A Controlled Trial. Patricia K. Patterson, R.N., Ph.D., Oregon Health and Science University School of Nursing, \$97,935, March 2001 to December 2003 (ID# 041869)

 Patterson and colleagues investigated the effects of tele-video nursing support for self-management by people with heart failure. They found that effects varied. Patients who received the support experienced small to medium positive effects on emotional well-being, knowledge of heart failure self-care, functioning limited by emotional status and the impact of heart failure symptoms. However, patients who did not receive the support made changes in the desired direction with regard to energy/fatigue and negative effects on physical and emotional functions, while the supported patients did not.

Improving Self-Management and Healthy Lifestyles in Medicaid & Dual Enrolled Medicare People with Diabetes. Gayle E. Reiber, Ph.D., University of Washington, VA Puget Sound Health System, \$499,861, April 2001 to April 2003 (ID# 041872)

 Reiber and colleagues conducted a randomized clinical trial in Medicaid and dualenrolled Medicare patients with diabetes to determine if a community-based support

³⁶ Flores G, Bridon C, Torres S et al. "Improving Asthma Outcomes in Minority Children: A Randomized, Controlled Trial of Parent Mentors." *Pediatrics*, 124(6): 1522–1532, 2009.

³⁷ Goldberg HI, Lessler DS, Mertens K et al. "Self-Management Support in a Web-Based Medical Record: A Pilot Randomized Controlled Trial." *Joint Commission Journal on Quality and Patient Safety*, 30(11): 629–635, 2004.

- system facilitating diabetes self-management, participant support and health promotion would improve diabetes control and reduce health care utilization and charges.
- After one year, researchers found a modest reduction in blood glucose (HbA1c) levels in patients participating in the support program compared to patients receiving usual care. In addition, physical functioning improved significantly for the intervention patients; they reported fewer anxiety symptoms and reduced depression and were less likely to report poor health compared with patients in the usual care group.

Improving CHF [Congestive Heart Failure] Outcomes Through Automated Clinical Data Acquisition and Targeted Telephone Outreach. Douglas W. Roblin, Ph.D., Kaiser Foundation Hospitals, \$110,980, March 2001 to January 2003 (ID# 041873)

• This study investigated the clinical outcomes and quality of life for patients with CHF resulting from telephone-based acquisition of data ("telecare") critical to the management of CHF. After six months, patients from the telecare group engaged in self-management practices (such as checking ankles/feet daily for swelling and following a low-salt diet) and were more knowledgeable about signs of worsening CHF than patients receiving usual care.

Improving Self-Care Among Rural Underserved Diabetics Using Web TV. John B. Schorling, M.D., University of Virginia, \$89,188, March 2001 to March 2002 (ID# 041870)

• Shorling and colleagues developed the Pippin website for medically indigent patients with diabetes to help them become better self-managers of their diabetes. Participants reported that they enjoyed using the program and that it helped them care for their diabetes. Having mastered the Pippin program they also explored the Internet and used e-mail. While initially reluctant to learn a new technology, all patients expressed appreciation for the service and asked to participate beyond the three-month study period. Blood glucose levels improved, but further study was needed to confirm an effect.

Project CHANGE: Chronic Care and Access Changes Need Good Evaluation. Leif Solberg, M.D., HealthPartners Research Foundation, \$499,937, March 2001 to September 2005 (ID# 041868)

Solberg and colleagues evaluated the effect on the care of patients with diabetes, heart
disease or depression of an advanced access (same day) appointment system and of a
subsequent implementation of the Chronic Care Model. Researchers found an
increased proportion of primary care visits and an increase in continuity of care for
patients with each condition. Urgent care visits decreased but emergency visits and

hospitalizations did not change. An article in *Annals of Family Medicine*³⁸ in 2006 reported findings related to patients with depression.

Testing the Criterion-Related Validity and Exploring the Clinical Utility of the Patient Activation Measure. Ronald D. Stock, M.D., PeaceHealth Oregon Region and Sacred Heart Medical Center, \$337,334, August 2003 to February 2006 (ID# 048999)

- The study tested the criterion-related validity of the Patient Activation Measure (PAM)—an instrument to assess patient knowledge, skill and confidence for self-managing health care—and explored the perception of the measure's usefulness in clinical settings. Participants were patients with at least one of a set of chronic illnesses (such as heart disease or diabetes) who did (intervention group) or did not (control group) receive the Chronic Disease Self-Management Program developed at Stanford School of Medicine.
- Researchers reported study findings in an article in *Health Services Research*³⁹ in 2007. They concluded that if patient activation increases, patients will exhibit a variety of improved behaviors. See Program Results Report for the grantee's previous RWJF-funded work on the PAM.

Adapting the Chronic Care Model to Treat Chronic Illness at the Salvation Army Free Clinic. Robert J. Stroebel, M.D., Mayo Clinic Rochester, \$197,208, March 2001 to March 2003 (ID# 041860)

- At the Salvation Army Free Clinic, staff implemented the Chronic Care Model for uninsured patients with hypertension, diabetes and hyperlipidemia and compared clinical outcomes in the management of these conditions to community and national rates. Staff assumed that no more than 10 percent of uninsured patients would improve with usual care. Of 109 patients completing the study, 72.5 percent showed clinically significant improvement in the control of at least one chronic illness.
- Researchers concluded, in a 2005 article in *Journal of Health Care for the Poor and Underserved*⁴⁰ (see abstract): "The chronic care model was a useful template for the delivery of chronic disease care to an uninsured population at a free medical clinic."

Web-Supported, Generic Planned Care for Office Practice. John H. Wasson, M.D., Dartmouth Medical School, \$490,928, August 2003 to August 2006 (ID# 048998)

• This study addressed the use of "generic planned care"—the application of the Chronic Care Model across most common conditions, rather than a disease-by-

³⁸ Solberg LI, Crain AL, Sperl-Hillen JM et al. "Effect of Improved Primary Care Access on Quality of Depression Care." *Annals of Family Medicine*, 4(1): 69–74, 2006.

³⁹ Hibbard JH, Mahoney E, Stock R and Tusler M. "Do Increases in Patient Activation Result in Improved Self-Management Behaviors?" *Health Services Research*, 42(4): 1443–1463, 2007.

⁴⁰ Stroebel RJ, Gloor B, Freytag S et al. "Adapting the Chronic Care Model to Treat Chronic Illness at a Free Medical Clinic." *Journal of Health Care for the Poor and Underserved*, 16(2): 286–296, 2005.

disease focus. Researchers evaluated a patient-centered collaborative care model for patients with one of four chronic diseases or bothersome pain or emotional problems. They concluded that this type of care results in a range of good outcomes for patients with many common conditions. However, they did not find that typical primary care practices can make changes in a short time period to deliver generic planned care.

BIBLIOGRAPHY

(Current as of date of the report; as provided by the grantee organization; not verified by RWJF; items not available from RWJF.)

National Program Office Bibliography

Articles

Journal Articles

Bodenheimer T, Wagner EH and Grumbach K. "Improving Primary Care for Patients With Chronic Illness." *Journal of the American Medical Association*, 288(14): 1775–1779, 2002. Abstract available online.

Bodenheimer T, Wagner EH and Grumbach K. "Improving Primary Care for Patients with Chronic Illness: The Chronic Care Model, Part 2." *Journal of the American Medical Association*, 288(15): 1909–1914, 2002. Abstract available online.

Bonomi AE, Wagner EH, Glasgow R and Von Korff M. "Assessment of Chronic Illness Care (ACIC): A Practical Tool to Measure Quality Improvement." *Health Services Research*, 37(3): 791–820, 2002. Full article available by subscription. Abstract available online.

Boult C, Kane RL, Pacala JT and Wagner EH. "Innovative Healthcare for Chronically Ill Older Persons: Results of a National Survey." *American Journal of Managed Care*, 5(9): 1162–1172, 1999. Abstract available online.

Bovbjerg VE, Siscovick DS, Psaty BM, McCann BS, Koepsell TD, Raghunathan TE and Wagner EH. "Lipid-Lowering Medication and Risk of Injury." *Journal of Clinical Epidemiology*, 52(12): 1197–1200, 1999. Abstract available online.

Caruso LB, Silliman RA, Demissie S, Greenfield S and Wagner ED. "What Can We Do to Improve Physical Function in Older Persons With Type 2 Diabetes?" *Journals of Gerontology: Medical Sciences*, 55(7): M372–M377, 2000. Abstract available online.

CDC Diabetes in Managed Care Work Group. "Diabetes Mellitus in Managed Care: Complications and Resource Utilization." *American Journal of Managed Care*, 7(5): 501–508, 2001. Abstract available online.

Coleman K, Austin BT, Brach C and Wagner EH. "Evidence on the Chronic Care Model in the New Millennium." *Health Affairs*, 28(1): 75–85, 2009. Abstract available online.

Coleman EA, Grothaus LC, Sandhu N and Wagner EH. "Chronic Care Clinics: A Randomized Controlled Trial of a New Model of Primary Care for Frail Older Adults." *Journal of the American Geriatrics Society*, 47(7): 775–783, 1999. Abstract available online.

Coleman K, Mattke S, Perrault PJ and Wagner EH. "Untangling Practice Redesign From Disease Management: How Do We Best Care for the Chronically Ill?" *Annual Review of Public Health*, 30:385–408, 2009. Abstract available online.

Daniel DM, Norman J, Davis C, Lee H, Hindmarsh MF, McCulloch DK, Wagner EH and Sugarman JR. "A State-Level Application of the Chronic Illness Breakthrough Series: Results from Two Collaboratives on Diabetes in Washington State." *Joint Commission Journal on Quality and Safety*, 30(2): 69–79, 2004. Abstract available online. Interview with the lead author available online.

Daniel DM, Norman J, Davis C, Lee H, Hindmarsh MF, McCulloch DK, Wagner EH and Sugarman JR. "Case Studies From Two Collaboratives on Diabetes in Washington State." *Joint Commission Journal on Quality and Patient Safety*, 30(2): 103–108, 2004. Available online.

Davis RM, Wagner EH and Groves T. "Managing Chronic Disease Presents Such Challenges that the BMJ Is Devoting a Special Issue to It." *British Medical Journal*, 318:1090–1091, 1999. Full article available by subscription. Extract available online.

Davis RM, Wagner EH and Groves T. "Advances in Managing Chronic Disease: Research, Performance Measurement, and Quality Improvement Are Key" Editorial. *British Medical Journal*, 320:525–526, 2000. Full editorial available by subscription. Extract available online.

Edlefsen KL, Mandelson MT, McIntosh MW, Andersen MR, Wagner EH and Urban N. "Prostate Specific Antigen for Prostate Cancer Screening: Do Physician Characteristics Affect its Use?" *American Journal of Preventive Medicine*, 17(1): 87–90, 1999. Abstract available online.

Epping-Jordan JE, Pruitt S, Bengoa R and Wagner E. "Improving the Quality of Health Care for Chronic Conditions." *Quality & Safety in Health Care*, 13(4): 299–305, 2004. Abstract available online.

Fenton JJ, Levine MD, Mahoney LD, Heagerty PJ and Wagner EH. "Bringing Geriatricians to the Front Lines: Evaluation of a Quality Improvement Intervention in Primary Care." *Journal of the American Board of Family Medicine*, 19(4): 331–339, 2006. Abstract available online.

Finkelstein JA, Lozano P, Fuhlbrigge AL, Carey VJ, Inui TS, Soumerai SB, Sullivan SD, Wagner EH, Weiss ST and Weiss KB. "Practice-Level Effects of Interventions to Improve Asthma Care in Primary Care Settings: The Pediatric Asthma Care Patient Outcomes Research Team." *Health Services Research*, 40(6 Part 1): 1737–1757, 2005. Available online.

Finkelstein JA, Lozano P, Streiff KA, Arduino KE, Sisk CA, Wagner EH, Weiss KB and Inui TS. "Clinical Effectiveness Research in Managed-care Systems: Lessons from the Pediatric Asthma Care PORT. Patient Outcomes Research Team." *Health Services Research*, 37(3): 775–789, 2002. Abstract available online.

Gask L, Ludman E and Schaefer J. "Qualitative Study of an Intervention for Depression Among Patients With Diabetes: How Can We Optimize Patient-Professional Interaction?" *Chronic Illness*, 2(3): 231–242, 2006. Abstract available online.

Gensichen J, Muth C, Butzlaff M, Rosemann T, Raspe H, de Cornejo GM, Beyer M, Harter M., Muller UA, Angermann CE, Gerlach FM and Wagner E. "The Future Is Chronic: German Primary Care and the Chronic Care Model—The Comprehensive Principles in the Proactive Treatment of the Chronically Ill." *Z Arztl Fortbild Qualitatssich*, 100(5): 365–374, 2006. (Article in German) Abstract available online.

Glasgow RE, Davis CL, Funnell MM and Beck A. "Implementing Practical Interventions to Support Chronic Illness Self-Management." *Joint Commission Journal on Quality and Safety*, 29(11): 563–574, 2003. Abstract available online.

Glasgow RE, Funnell MM, Bonomi AE, Davis C, Beckham V and Wagner EH. "Self-Management Aspects of the Improving Chronic Illness Care Breakthrough Series: Implementation With Diabetes and Heart Failure Teams." *Annals of Behavioral Medicine*, 24(2): 80–87, 2002. Abstract available online.

Glasgow RE, Orleans CT and Wagner EH. "Does the Chronic Care Model Serve Also as a Template for Improving Prevention?" *Milbank Quarterly*, 79(4): 579–612, 2001. Abstract available online.

Glasgow RE, Wagner EH, Kaplan RM, Vinicor F, Smith L, Norman J. "If Diabetes Is a Public Health Problem, Why Not Treat It as One? A Population-Based Approach to Chronic Illness." *Annals of Behavioral Medicine*, 21(2): 159–170, 1999. Abstract available online.

Glasgow RE, Wagner EH, Schaefer J, Mahoney LD, Reid RI and Greene SM. "Development and Validation of the Patient Assessment of Chronic Illness Care (PACIC)." *Medical Care*, 43(5): 436–444, 2005. Abstract available online.

Groves T and Wagner EH. "High Quality Care for People with Chronic Diseases," Editorial. *British Medical Journal*, 330(7492): 609–610, 2005. Extract available online.

Gruman J and Von Korff M. "Self-Management Services: Their Role in Disease Management." *Disease Management & Health Outcomes*, 6(3): 151–158, 1999. Abstract available online.

Gruman J, Von Korff M, Reynolds J and Wagner EH. "Organizing Health Care for People With Seizures and Epilepsy." *Journal of Ambulatory Care Management*, 21(2): 1–17, 1998. Available online.

Heisler M and Wagner EH. "Improving Diabetes Treatment Quality in Managed Care Organizations: Some Progress, Many Challenges." *American Journal of Managed Care*, 10(2 Part 2): 115–117, 2004. Available online.

Hofer TP, Hayward RA, Greenfield S, Wagner EH, Kaplan SH and Manning WG. "The Unreliability of Individual Physician 'Report Cards' for Assessing the Costs and Quality

of Care of a Chronic Disease." *Journal of the American Medical Association*, 281(22): 2098–2105, 1999. Abstract available online.

Holland SK, Greenberg J, Tidwell L and Newcomer R. "Preventing Disability Through Community-Based Health Coaching." *Journal of the American Geriatrics Society*, 51(2): 265–269, 2004. Abstract available online.

Ibrahim MA, Savitz LA, Carey TS and Wagner EH. "Population-Based Health Principles in Medical and Public Health Practice." *Journal of Public Health Management and Practice*, 7(3): 75–81,2001. Abstract available online.

Katzelnick DJ, Von Korff M, Chung H, Porvost LP and Wagner EH. "Applying Depression-Specific Change Concepts in a Collaborative Breakthrough Series." *Joint Commission Journal on Quality and Patient Safety*, 31(7): 386–397, 2005. Abstract available online.

Leveille SG, Wagner EH, Davis C, Grothaus L, Wallace J, LoGerfo M and Kent D. "Preventing Disability and Managing Chronic Illness in Frail Older Adults: A Randomized Trial of a Community-Based Partnership With Primary Care." *Journal of the American Geriatrics Society*, 46(10): 1191–1198, 1998. Abstract available online.

Levine M, Phelan EA, Balderson BHK and Wagner EH. "Collaborative Treatment Planning for Older Patients in Primary Care." *Generations*, 30(3): 83–85, 2006. Abstract available online.

Lozano P, Finkelstein JA, Carey VJ, Wagner EH, Inui TS, Fuhlbrigge AL, Soumerai SB, Sullivan SD, Weiss ST and Weiss KB. "A Multisite Randomized Trial of the Effects of Physician Education and Organizational Change in Chronic Asthma Care: Health Outcomes of the Pediatric Asthma Care Patient Outcomes Research Team II Study." *Archives of Pediatrics and Adolescent Medicine*, 158(9): 875–883, 2004. Abstract available online.

Lozano, P, Schaefer JK, Finkelstein JA, Stout J, Wagner EH and Weiss KB. "Interventions to Improve the Management of Asthma in Primary Care Settings (Protocol)." *Cochrane Database of Systematic Reviews*, Issue 4. Art. No.: CD004537. DOI: 10.1002/14651858.CD004537, 2003. Abstract available online.

Ludman EJ, Simon GE, Grothaus LC, Luce C, Markley DK and Schaefer J. "A Pilot Study of Telephone Care Management and Structured Disease Self-Management Groups for Chronic Depression." *Psychiatric Services*, 58:1065–1072, August 2007. Available online.

McCulloch DK, Davis C, Austin BT and Wagner EH. "Constructing a Bridge Across the Quality Chasm: A Practical Way to Get Healthier, Happier Patients, Providers, and Health Care Delivery Systems." *Diabetes Spectrum*, 17(2): 92–96, 2004. Available online.

McCulloch DK, Price MJ, Hindmarsh M and Wagner EH. "A Population-Based Approach to Diabetes Management in a Primary Care Setting: Early Results and Lessons Learned." *Effective Clinical Practice*, 1(1): 12–22, 1998. Available online.

Newton KM, Wagner EH, Ramsey SD, McCulloch D, Evans R, Sandhu N and Davis C. "The Use of Automated Data to Identify Complications and Comorbidities of Diabetes: A Validation Study." *Journal of Clinical Epidemiology*, 52(3): 199–207, 1999. Abstract available online.

Paasche-Orlow MK, Schillinger D, Greene SM and Wagner EH. "How Health Care Systems Can Begin to Address the Challenge of Limited Literacy." *Journal of General Internal Medicine*, 21(8): 884–887, 2006. Available online.

Phelan EA, Williams B, LaCroix AZ, Grothaus L, LoGerfo JP and Wagner EH. "Effects of Provider Practice on Functional Independence in Older Adults." *Journal of the American Geriatrics Society*, 52(8): 1233–1239, 2004. Abstract available online.

Psaty BM, Weiss NS, Furberg CD, Koepsell TD, Siscovick DS, Rosendaal FR, Smith NL, Heckbert SR, Kaplan RC, Lin D, Fleming TR and Wagner EH. "Surrogate End Points, Health Outcomes, and the Drug-Approval Process for the Treatment of Risk Factors for Cardiovascular Disease." *Journal of the American Medical Association*, 282(8): 786–790, 1999. Full article available by subscription. First 150 words available online.

Ramsey SD, Newton K, Blough D, McCulloch DK, Sandhu N, Reiber GE and Wagner EH. "Incidence, Outcomes and Cost of Foot Ulcers in Patients With Diabetes." *Diabetes Care*, 22(3): 382–387, 1999. Available online.

Ramsey SD, Newton K, Blough D, McCulloch DK, Sandhu N and Wagner EH. "Patient-Level Estimates of the Cost of Complications in Diabetes in a Managed-Care Population." *Pharmacoeconomics*, 16(3): 285–295, 1999. Abstract available online.

Renders CM, Valk GD, Griffin S, Wagner EH, Eijk JT and Assendelft WJ. "Interventions to Improve the Management of Diabetes Mellitus in Primary Care, Outpatient and Community Settings." *Cochrane Database of Systematic Reviews*, 1: CD001481, 2001. Abstract available online.

Rothman AA and Wagner EH. "Chronic Illness Management: What is the Role of Primary Care?" *Annals of Internal Medicine*, 138(3): 256–261, 2003. Abstract available online.

Schaefer J. "Improving Outcomes for People With Chronic Conditions, Including Children." *Northwest Bulletin: Family and Child Health*, Schaefer J and Chiku T (eds). 16(2): 1, Spring 2002. Issue available online.

Schaefer J. "Outreach Worker Fosters Asthma Self-Management Among Patient Families." *Northwest Bulletin: Family and Child Health*, Schaefer J and Chiku T (eds). 16(2): 7, Spring 2002. Issue available online.

Schaefer J and Davis C. "Case Management and the Chronic Care Model: A Multidisciplinary Role." *Lippincott's Case Management*, 9(2): 96–103, 2004. Abstract available online.

Simon GE, Heiligenstein J, Revicki D, Von Korff M, Katon WJ, Ludman E, Grothaus L and Wagner E. "Long-Term Outcomes of Initial Antidepressant Drug Choice in a 'Real World' Randomized Trial." *Archives of Family Medicine*, 8(4): 319–325, 1999. Abstract available online.

Simon GE, Von Korff M, Rutter C and Wagner E. "Randomised Trial of Monitoring, Feedback, and Management of Care by Telephone to Improve Treatment of Depression in Primary Care." *British Medical Journal*, 320(7234): 550–554, 2000. Abstract available online.

Stevens DP and Wagner EH. "Transform Residency Training in Chronic Illness Care—Now." *Academic Medicine*, 81(8): 685–687, 2006. Abstract available online.

Von Korff M and Tiemens B. "Individualized Stepped Care of Chronic Illness." *Western Journal of Medicine*, 172(2): 133–137, 2000. Available online.

Wagner EH. "Chronic Disease Management: What Will It Take to Improve Care for Chronic Illness?" *Effective Clinical Practice*, 1(1): 2–4, 1998. Available online.

Wagner EH. "More Than A Case Manager." *Annals of Internal Medicine*, 129(8): 654–656, 1998. 100-words excerpt available online. Full article available by subscription online.

Wagner EH. "The Role of Patient Care Teams in Chronic Disease Management." *British Medical Journal*, 320(7234): 569–572, 2000. Extract available online.

Wagner EH. "Meeting the Needs of Chronically Ill People: Socioeconomic Factors, Disabilities, and Comorbid Conditions Are Obstacles," Editorial. *British Medical Journal*, 323(7319): 945–946, 2001. Abstract available online.

Wagner EH. "Quality Improvement Can't Be Optional," Editorial. *Effective Clinical Practice*, 4(6): 278–280, 2001. Available online.

Wagner EH. "Chronic Disease Care," Editorial. *British Medical Journal*, 328(7433): 177, 2004. Extract available online.

Wagner EH. "Deconstructing Heart Failure Disease Management," Editorial. *Annals of Internal Medicine*, 141(8): 644–646, 2004. 100-word excerpt available online. Full article available by subscription online.

Wagner EH. "Effective Teamwork and Quality of Care," Editorial. *Medical Care*, 42(11): 1037–1039, 2004. Available by subscription or purchase online.

Wagner EH, Austin BT, Davis C, Hindmarsh M, Schaefer J and Bonomi A. "Improving Chronic Illness Care: Translating Evidence Into Action." *Health Affairs*, 20(6): 64–78, 2001. Available online.

Wagner EH, Bennett SM, Austin BT, Greene SM, Schaefer JK and Von Korff M. "Finding Common Ground: Patient-Centeredness and Evidence-Based Chronic Illness Care." *Journal of Alternative and Complementary Medicine*, 11(Suppl. 1): S7–S15, 2005. Abstract available online.

Wagner EH, Davis C, Schaefer J, Von Korff M and Austin B. "A Survey of Leading Chronic Disease Management Programs: Are They Consistent With the Literature?" *Managed Care Quarterly*, 7(3): 56–66, 1999. Abstract available online.

Wagner EH, Glasgow RE, Davis C, Bonomi AE, Provost L, McCulloch D, Carver P and Sixta C. "Quality Improvement in Chronic Illness Care: A Collaborative Approach." *Joint Commission Journal of Quality Improvement*, 27(2): 63–80, 2001. Abstract available online.

Wagner EH, Grothaus LC, Sandhu N, Galvin MS, McGregor M, Artz K and Coleman EA. "Chronic Care Clinics for Diabetes in Primary Care: A System-Wide Randomized Trial." *Diabetes Care*, 24(4): 695–700, 2001. Available online.

Wagner EH and Groves T. "Care for Chronic Diseases: The Efficacy of Coordinated and Patient Centred Care Is Established, but Now Is the Time to Test Its Effectiveness," Editorial. *British Medical Journal*, 325:913–914, 2002. Extract available online.

Wagner EH, Sandhu N, Newton KM, McCulloch DK, Ramey SD and Grothaus LC. "Effect of Improved Glycemic Control on Health Care Costs and Utilization." *Journal of the American Medical Association*, 285(2): 182–189, 2001. Abstract available online.

Wagner EH and Simon GE. "Managing Depression in Primary Care: The Type of Treatment Matters Less Than Ensuring It Is Done Properly and Followed Up," Editorial. *British Medical Journal*, 322:746–747, 2001. Extract available online.

Wagner EH, Wickizer TM, Cheadle A, Psaty BM, Koepsell TD, Diehr P, Curry SJ, Von Korff M, Anderman C, Beery WL and Perrin EB. "The Kaiser Family Foundation Community Health Promotion Grants Program: Findings From an Outcome Evaluation." Health Services Research, 35(3): 561–589, 2000. Available online.

Journal Supplements

Journal of General Internal Medicine, 25(Suppl. 4), September 2010. Entire supplement available online.

- "Chronic Care and Education," Bowen JL, Wagner EH and Stevens DP. p. 569.
- "A Multi-Institutional Quality Improvement Initiative to Transform Education for Chronic Illness Care in Resident Continuity Practices," Stevens DP, Bowen JL, Johnson JK, Woods DM, Provost LP, Holman HR, Sixta CS and Wagner EH. pp. 574–580.
- "Joy and Challenges in Improving Chronic Illness Care: Capturing Daily Experiences of Academic Primary Care Teams," Johnson JK, Woods DM, Stevens DP, Bowen JL, Provost LP, Sixta CS and Wagner EH. pp. 581–585.
- "Developing Measures of Educational Change for Academic Health Care Teams Implementing the Chronic Care Model in Teaching Practices," Bowen JL, Stevens DP, Sixta CS, Provost L, Johnson JK, Woods DM and Wagner EH. pp. 586–592.

- "Assessing Chronic Illness Care Education (ACIC-E): A Tool for Tracking Educational Re-design for Improving Chronic Care Education," Bowen JL, Provost L, Stevens DP, Johnson JK, Woods DM, Sixta CS and Wagner EH. pp. 593–609. "Using the Teamlet Model to Improve Chronic Care in an Academic Primary Care Practice," Chen EH, Thom DH, Hessler DM, Phengrasamy L, Hammer H, Saba G and Bodenheimer T. pp. 610–614.
- "Implementation of a Chronic Illness Model for Diabetes Care in a Family Medicine Residency Program," YU GC and Beresford R. pp. 615–619.
- "Linking a Motivational Interviewing Curriculum to the Chronic Care Model," Abramowitz SA, Flattery D, Franses K and Berry L. pp. 620–626.
- "Incorporating Performance Improvement Methods Into a Needs Assessment: Experience With a Nutrition and Exercise Curriculum," Fluker S, Whalen U, Schneider J, Cantey P, Bussey-Jones J, Brady D and Doyle JP. pp. 627–633.

Chapters

Von Korff M. "Disability and Psychological Illness in Primary Care." In *Common Mental Disorders in Primary Care: Essays in Honour of Professor Sir David Goldberg*, Tansella M and Thornicroft G (eds). London: Routledge Press, 1999. Available for preview online.

Von Korff M. "Pain Management in Primary Care: An Individualized Stepped-Care Approach." In *Psychosocial Factors in Pain: Critical Perspectives*, Gatchel RJ and Turk DC (eds). New York: Guilford Press, 1999. Available for preview online.

Von Korff M and Wagner EH. "The Role of the Older Person in Managing Illness." In *New Ways to Care for Older People: Building Systems Based on Evidence*, Calkins E, Boult C, Wagner EH and Pacala JT (eds). New York: Springer Publishing, 2004. Available for preview online.

Reports

Improving Chronic Illness Care: Final Program Assessment. Falls Church, VA: The Lewin Group, 2003.

Schoeni PQ (ed). *Accelerating Change Today*(*A.C.T.*) *for America's Health: Curing the System*. National Coalition on Health Care and Institute for Health Improvement, May 2002. Available online.

Coleman CF and Wagner EH. *Improving Primary Care for Patients With Chronic Illness: The Chronic Care Model*. Bengoa R and Solinis RN (eds). Barcelona: Elsevier Espana, 2008 (In Spanish). Available for preview online.

Education or Toolkits

Toolkits, Toolboxes or Primers

Partnering in Self-Management Support: A Toolkit for Clinicians. MacColl Institute, Robert Wood Johnson Foundation and Institute for Healthcare Improvement, 2009. Available for download online.

Communications or Promotions

Grantee Websites

www.improvingchroniccare.org. The official website of Improving Chronic Illness Care contains information and links about all aspects of the program and about chronic illness care management in general.

The RAND/UC Berkeley Evaluation Bibliography

Journal Articles

The RAND Evaluation website contains an up-to-date list of articles and from the ICIC Evaluation.

Asch SM, Baker DP, Keesey J, Broder M, Schonlau M, Rosen M, Wallace PL and Keeler EB. "Does the Collaborative Model Improve Care for Chronic Heart Failure?" *Medical Care*, 43(7): 667–675, 2005. Available online.

Baker DW, Asch SM, Keesey JW, Brown JA, Chan KS, Joyce G and Keeler EB. "Differences in Education, Knowledge, Self-Management Activities, and Health Outcomes for Patients With Heart Failure Cared for Under the Chronic Disease Model: The Improving Chronic Illness Care Evaluation." *Journal of Cardiac Failure*, 11(6):405–413, 2005. Abstract available online. Full article available for purchase or by subscription online.

Baker DP, Brown JA, Chan KS, Dracup KA and Keeler EB. "A Telephone Survey to Measure Communication, Education, Self-Management, and Health Status for Patients With Heart Failure: The Improving Chronic Illness Care Evaluation (ICICE)." *Journal of Cardiac Failure*, 11(1): 36–42, 2005. Abstract available online.

Chan KS, Keeler E, Schonlau M, Rosen M and Mangione-Smith R. "How Do Ethnicity and Primary Language Spoken at Home Affect Management Practices and Outcomes in Children and Adolescents With Asthma?" *Archives of Pediatric and Adolescent Medicine*, 159: 283–289, 2005. Abstract available online.

Chan KS, Mangione-Smith R, Burwinkle TM, Rosen M and Varni JW. "The PedsQL(TM): Reliability and Validity of the Short-Form Generic Core Scales and Asthma Module." *Medical Care*, 43(3): 256–265, 2005. Abstract available online.

Cretin S, Shortell SM and Keeler EB. "An Evaluation of Collaborative Interventions to Improve Chronic Illness Care: Framework and Study Design." *Evaluation Review*, 28(1): 28–51, 2004. Available online.

Lin MK, Marsteller JA, Shortell SM, Mendel P, Pearson M, Rose M and Wu S. "Motivation to Change Chronic Disease Care: Results From a National Evaluation of Quality Improvement Collaboratives." *Health Care Management Review*, 30(2): 139–156, 2005. Abstract available online.

Mangione-Smith R, Schonlau M, Chan KS, Keesey J, Rosen M, Louis TA and Keeler EB. "Measuring the Effectiveness of a Collaborative for Quality Improvement in Pediatric Asthma Care: Does Implementing the Chronic Care Model Improve Processes and Outcomes of Care?" *Ambulatory Pediatrics*, 5(2): 75–82, 2005. Abstract available online.

Meredith LS, Mendel P, Pearson ML, Wu S-Y, Joyce GF, Straus JB, Keeler EB and Unutzer J. "Implementation and Maintenance of Quality Improvement for Treating Depression in Primary Care." *Psychiatric Services*, 57(1): 48–55, 2006. Abstract available online.

Nelson K, Garcia RE, Brown J, Mangione CM, Louis TA, Keeler E and Cretin S. "Do Patient Consent Provisions Affect Participation Rates in Health Services Research?" *Medical Care*, 40(4): 283–288, 2002. Abstract available online.

Pearson ML, Wu S, Schaefer J, Bonomi AE, Shortell SM, Mendel PJ, Marsteller JA, Louis TA, Rosen M and Keeler EB. "Assessing the Implementation of the Chronic Care Model in Quality Improvement Collaboratives." *Health Services Research*, 40(4): 978–996, 2005, Available online.

Schonlau M, Mangione-Smith R, Chan KS, Keesey J, Rosen M, Louis TA, Wu S-Y and Keeler E. "Evaluation of a Quality Improvement Collaborative in Asthma Care: Does It Improve Processes and Outcomes of Care?" *Annals of Family Medicine*, 3: 200–208, 2005. Available online.

Shortell SM, Marsteller JA, Lin M, Pearson ML, Wu S-Y, Mendel P, Cretin S and Rosen M. "The Role of Perceived Team Effectiveness in Improving Chronic Illness Care." *Medical Care*, 42(11): 1040–1048, 2004. Abstract available online.

Tsai AC, Morton SC, Mangione C and Keeler EB. "A Meta-Analysis of Interventions to Improve Chronic Illness Care." *American Journal of Managed Care*, 11(8): 478–488, 2005. Abstract available online.

Collaborative Sponsor Program Bibliography

Articles

Maine

Letourneau LM, Skog D, Devlin J, Babirak S, Callaharu T and Sears S. "Improving Diabetes Outcomes Through Team Based Collaboration." Unpublished.

Oregon

Hibbard JH. "New Roles for Patients and Consumers in Assuring High Quality Care." *American Medical Association Virtual Mentor*, 6(6): June 2004. Available online.

Hibbard JH. "Perspective: Moving Toward a More Patient-Centered Health Care Delivery System." *Health Affairs* Web Exclusive, October 2004. Available online.

Hibbard JH, Mahoney ER, Stock R and Tusler M. "Do Increases in Patient Activation Result in Improved Self-Management Behaviors?" *Health Services Research*, 42(4): 1443–1463, August 2007. Available online.

Hibbard JH, Mahoney ER, Stockard J and Tusler M. "Development and Testing of a Short Form of the Patient Activation Measure." *Health Services Research*, 40(6 Part 1): 1918–1930, 2005. Available online.

Hibbard JH, Stockard J, Mahoney ER and Tusler M. "Development of the Patient Activation Measure (PAM): Conceptualizing and Measuring Activation in Patients and Consumers." *Health Services Research*, 39(4 Part 1): 1005–1026, 2004. Available online.

SIDEBAR LIST

Two sidebars of projects not funded by RWJF but with interesting uptake of the Chronic Care Model:

- In the Tribal Communities of Pauma Valley, It Takes a Village to Combat Chronic Illness (California's Pauma Valley)
- The Instruction Manual for Designing Health Care Delivery (Battle Creek, Mich.)