

In Brief

An initiative of the Department of Health and Human Services Bureau of Primary Health Care demonstrates that system-wide changes to improve care for chronically ill, underserved patients are possible and sustainable. Through the bureau's Health Disparities Collaboratives, nearly 400 federally qualified health centers are focusing on the delivery of high quality care for people with diabetes and are testing and implementing system-wide changes using the Breakthrough Series model, the Chronic Care Model, and the Model for Improvement. This article describes that initiative and some of the results it has achieved collaboratively across the country.

Transforming Diabetes Health Care Part 1: Changing Practice

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The Bureau of Primary Health Care (BPHC), a division of the U.S. Department of Health and Human Services, oversees programs that offer care to people who are underserved by the United States health care system: the underinsured and the uninsured. In 1998, the BPHC set an ambitious goal: eliminating disparities in health care and guaranteeing underserved Americans 100% access to care by 2010.

This goal provided the impetus for the Health Disparities Collaboratives (HDCs), a cooperative project between the BPHC and the Institute for Healthcare Improvement (IHI). The BPHC planned to reduce health disparities by enlisting every BPHC-affiliated health center in the United States in an HDC, then spreading the health care innovations to all health center sites throughout the United States, thus improving the health care of millions of patients.

Diabetes was chosen as the first focus of this collaborative effort because of its importance as a cause of morbidity and mortality and because it disproportionately affects minorities, who make up a large proportion of underserved Americans. Diabetes is the sixth leading cause of death in the United States. It is also a common disease, affecting more than 16 million people, with 1.3 million adults diagnosed each year and evi-

dence of increasing prevalence in minority populations.¹ Diabetes care is complex, and levels of care are often suboptimal.² Innovative programs to address this disease and its consequences are increasingly crucial to minimize the devastating complications and premature deaths caused by diabetes.

The Health Center Movement

The health center movement began in the 19th century, when settlement houses were established in response to increased immigration and rising rates of poverty. Settlement houses such as Hull House, which was established by Jane Addams, integrated opportunities for health care, housing, sanitation, employment, and the arts into a socially conscious program that addressed the entire individual and the family unit. Like health centers, settlement houses were a focus of community life. They employed community residents and used democratic methods for policymaking. Unfortunately, most clinics that opened during the Progressive Era closed during the economic hardships of the Great Depression.

The 1960s witnessed a rejuvenation of the community health center spirit. The civil rights movement, and the women's and student health movements helped drive President Lyndon Johnson's War on Poverty. In 1962, the Public Health Service fund-

ed the first migrant health programs. However, although \$3 million was authorized, only \$750,000 was actually appropriated, and assistance was restricted to preventive services such as health education and environmental safety. In 1965, the Office of Economic Opportunity established the Neighborhood Health Center Program, and the first health centers were founded in Columbia Point in Boston, Mass., and in Mound Bayou, Miss. Six additional centers were established later that year. In 1970, the National Health Service Corps was created.

Today, a diverse and often high-risk population of 11 million people receive care at more than 847 health centers and 3,400 practice sites. The health centers provide care to hundreds of thousands of homeless people, families, and migrant and seasonal farm workers at urban, rural, frontier, and school-based sites.

HDC History and Structure

The diabetes initiative began in 1998 with a model project in which five carefully selected health centers were trained by the IHI in its Breakthrough Series (BTS) methodology³ to improve care for patients with diabetes. (See related article starting on p. 97.) Representatives from the five centers later served as mentors for centers involved in the first large-scale BPHC diabetes HDC, known as HDC 1999-Diabetes (HDC 1999-DM). The project was launched at a national meeting in January 1999 and involved 88 health centers (Table 1).

Each HDC is designed to include 13 months of Phase 1 activity (the development of new programs and processes), after which the teams enter Phase 2 (a continuing phase in which the programs and changes resulting from Phase 1 are spread to other

providers and sites). HDC 1999-DM completed Phase 1 in February 2000. A national celebration, providing an opportunity for all participating teams and colleagues from across the country to come together to share successes and learn from one another about sustained system-wide change, marked the end of the first phase of HDC 1999-DM and the beginning of HDC 2000-Diabetes (HDC 2000-DM), in which 125 new health centers participated.

Subsequent HDCs have focused on various health conditions but have always included a group of teams working on improving diabetes care (Table 1). HDC 2001-Diabetes (HDC 2001-DM), which began in February 2001 and ended Phase 1 activities in March 2002, focused on both diabetes and cardiovascular disease and involved 62 diabetes teams. HDC 2002-Diabetes (HDC 2002-DM), which began in July 2002 and ended Phase 1 activities in September 2003, focused on diabetes, cardiovascular disease, depression, and asthma, and involved 62 diabetes teams. HDC 2003-Diabetes (HDC 2003-DM) began in July 2003; is focusing on diabetes, cardiovascular disease, depression, and cancer; and involves 63 diabetes teams.

For management purposes, health centers participating in an HDC are divided into five regional clusters. Each cluster has a steering committee comprising clinicians, representatives from collaborative teams, chief operating officers from participating centers, and state diabetes officials. Within each cluster, a state primary care association (PCA) is selected as the "lead organization." The lead PCA employs cluster directors, coordinators, and clinical information specialists who are responsible for ongoing support for and guidance of the

participating health centers. The cluster staff works closely with staff from BPHC and IHI, as well as the diabetes prevention and control programs within each state. In addition, close partnerships have been developed with national clinical networks, such as the Migrant Clinicians Network, Health Care for the Homeless Clinicians' Network, and National Network for Oral Health Access.

A Strategy for Transformation

The collaboratives, adapted from the IHI's BTS, have three main components: a learning model, a care model, and an improvement model. The learning model, which is the educational portion of the initiative, consists of learning sessions and action periods. The learning sessions highlight evidence of the gap that exists between current care delivery and ideal care of diabetes and provide the scientific basis for interventions that have been demonstrated to close the gap, known as a "change package." The learning sessions also provide training in quality improvement methods. Participating in learning sessions empowers the interdisciplinary teams from each health center to become a community of active learners.

During action periods, which take place between learning sessions, teams implement the change package, apply the quality improvement techniques, share information through the collection and submission of data and progress reports, and participate in conference calls and e-mail list discussions. The learning sessions are a part of Phase 1, which ends with a national congress.

The care model, based on Wagner et al.'s Chronic Care Model,^{4,5} is the second major component of the HDC.^{4,5} It includes six elements: patient self-management, decision support, clinical information system, delivery system design, organization of health care, and community resources and policies.

The *self-management* element of the model focuses on patients' role in making diabetes management a part of their daily lives. Participating health centers use effective support strategies that include assessment, goal setting, action planning, problem solving, and follow-up. Addressing literacy and language issues is critical to success in this process. Self-management also includes an emphasis on understanding the dietary practices,

Table 1. HDC Collaboratives, Number of Teams, and Patients Enrolled

Collaborative	Number of teams	Registry size at the end of Phase 1	Registry size as of July 2003
HDC 1999-DM	88	13,387	28,715
HDC 2000-DM	125	18,114	45,299
HDC 2001-DM	62	12,624	19,065
HDC 2002-DM*	62	9,155	9,155
HDC 2003-DM**	63	NA	5,190
Total	390	53,280	107,424

*HDC 2002-DM completed Phase 1 at the end of September 2003.

**HDC 2003-DM began at the end of July 2003. It has not yet completed Phase 1, and its registry size is as of October 2003, not July 2003.

health beliefs, and family systems of the various cultures and ethnicities in the diverse populations served by the health centers.

The *decision support* element of the care model provides clinicians and patients with evidence-based guidelines and protocols, links primary care providers with specialists for expert advice, and provides training for all members of the care team. The appropriate use of interpreters, readily available information and education for staff on cultural practices, and an understanding of barriers to care and follow-up are key.

The *clinical information* system element includes the development of a registry through which health centers can track and manage the population of people with diabetes that are involved in the collaborative. Data can be entered into the registry and used to generate reminders, prompts, and care planning tools for patients, as well as to provide team members and patients with feedback about their progress.

To help with the clinical information system component of the care model, an electronic registry is offered to health centers that do not have an existing chronic care registry. The registry gives the care team access to pertinent clinical information about patients with chronic conditions. Its use facilitates coordinated care of patients with diabetes by presenting a one-page comprehensive, evidence-based summary of patients' past care and current needs (Figure 1). The electronic registry also promotes proactive care for all patients seen at the health center by providing clinical queries, such as "List all DM Patients with A1C > 7." The Migrant Clinicians Network used the registry to develop a tracking program for mobile patients with diabetes, assisting communication between sites and providing sites with up-to-date medical records.

The *delivery system design* element focuses on the delivery of patient care. This element requires not only determining the type of care needed, but also clarifying roles and tasks to ensure that patients receive needed care. Attention to delivery system design also ensures that centralized, up-to-date information about a patient's status is available and that follow-up is standard procedure.

Delivery system design also includes providing care that is congruent with patients' culture. For exam-

ple, delivery service design might include the planned use of *fotonovelas* (a story told through pictures that uses drama to educate), videos, and *promotoras* (a lay health promotion worker); extended office hours; provision of services at a farm worker or homeless site; encounters with multiple providers during one visit; group visits; and identification of resources to help patients with transportation and childcare.

The *organization of health care* element of the care model shifts chronic care to the forefront of a health center's business plan, ensuring that senior leaders (i.e., clinic managers and administrators) are integrally and visibly involved with the collaboratives. This reinforces the need for health centers to commit themselves to a culture of health education and preventive services. Cultural competency is reflected in the policies, attitudes, and practices of the organization, requiring ongoing professional and staff training. Resources are allocated for translation and interpretation, and the workforce reflects the cultural mix of the patients whenever possible.

The final element of the care model is *community resources and policies*. Health care systems can enhance care for their patients and avoid duplicating the community's efforts if they are aware of community resources and work collaboratively with these community-based programs. In addition, health centers can also make use of free or low-cost educational materials available from many state departments of health and other agencies. Health centers can also make use of partnerships with faith-based organizations, homeless shelters, *promotoras* and lay educators, hospitals and universities, exercise facilities, and diabetes prevention and control programs.

The third and final component of the collaboratives is the Model for Improvement, a means of testing and implementing rapid change in an organization. This model requires participants to ask three basic questions and use a quick-change method known as PDSA (plan-do-study-act) cycles.⁶ The questions are:

- What are we trying to accomplish?
- How will we know that a change is an improvement?
- What changes can we make that will result in improvement?

Teams define their specific aims, choose actions to accelerate improvement, and test the changes they make. The end of one PDSA cycle leads directly into the next, creating chains of linked cycles that provide rapid-cycle change and continuous improvement.

Assessing Improvement

To assess improvement, health centers must select relevant, clearly defined measures. Although improvement efforts should focus on system-wide change rather than measurement per se, the effectiveness of the improvement efforts is dependent on the ability to measure the impact of the systemic changes. The measures used in the HDC were selected by an expert panel of faculty and other advisory members, with input from health center participants. The measures were based on the latest guidelines, aligned as closely as possible with other efforts, such as those of the Health Plan Employer Data and Information Set and the Joint Commission on Accreditation of Healthcare Organizations, and are reviewed and updated as necessary.

During an HDC, data are reported monthly on selected measures, which include a set of required measures, plus a set of additional recommended measures (Table 2). Each team must select at least one of the additional measures. The information system used by the health centers provides data on each of the measures, the results are submitted to the national reporting site, and the data, which can be analyzed by team, state, cluster, or national grouping, are posted in graphic form. These data have helped to identify trends and opportunities for improvement and to determine tools or resources needed by the health centers. These data have also highlighted the health improvements of more than 107,000 patients with diabetes.

The measures used in the HDCs have changed during the past few years. In 1999, there was only one required measure: the rate of obtaining two hemoglobin A_{1c} (A1C) measurements within 12 months. Table 2 presents the current measures and the associated goals.

The accompanying article (p. 107) will detail the improvement made by applying the three elements of the BTS (the learning model, care model, and improvement model) at specific facilities that participated in the collaboratives.

Encounter Note				Orlando Community Health Center															
Vitals	Last Visit	This Visit	Hr	Encounter Provider				Encounter Type											
Date mm/dd/yy	01/01/03			Chart #	3000	Last	Sugar	First	Extra	MI		Age	63						
Weight	235.0			DOB	01/01/40	Sex	Male	Address	5 Thunder Way		City	bolder							
Height	5' 8.0"			State	CT	Zip	06513	Phone #		PCP	Dr. Grant								
Pulse				Language		Race	Hispanic	Insurance	Medicaid										
Resp Rate				Emer Contact		Emer Contact #													
BMI	35.7			Case Manager		Homeless	Not Homeless												
Temp				Migrant	Not Migrant	Clinic	OCHC												
Systolic BP	137			Laboratory Test Results				Consults and Education											
Diastolic BP	90			Test	Value	Date	PRef	Ref	Cons/Educat	Date	PRef	Ref	Dec						
Waist Circ In.				ALT					AdviseQuitTob										
Chronic Conditions																			
Diagnosed Conditions	Dx Date		D/C	Chol					Ca S-D Makin										
DM Type 2	01/02/02		<input type="checkbox"/>	Creat					CVD Educ										
Dyslipidemia	04/01/02		<input type="checkbox"/>	Fast Glucose					Dental Exam										
Hypertension	01/02/02		<input type="checkbox"/>	HbA1c	7.5	01/01/03			Depression Sc										
Potential Diseases																			
CAD			<input type="checkbox"/>	HDL					DM Edu										
CHF			<input type="checkbox"/>	LDL	110	01/01/03			Foot Exam	01/02/02									
DepressionNOS			<input type="checkbox"/>	LVEF					Nutrit Edu										
MetabSyndrome			<input type="checkbox"/>	MiA/I/Cr					Retinal Exam	09/01/02									
MicAlburia			<input type="checkbox"/>	Potassium					SM Goal Set	01/01/03									
Nephropathy			<input type="checkbox"/>	Triglyc					Wt Mgt Plan										
Neuropathy			<input type="checkbox"/>	Other Diagnostic Tests				Other Notes											
Post-MI			<input type="checkbox"/>	Test	Result	Date	PRef	Ref	Encount Note:										
PVD			<input type="checkbox"/>	CardioStrssTest					Meter Type:										
Retinopathy			<input type="checkbox"/>	ColonCaScreen					SM Goal Desc:										
Medications								Mr. Sugar is beginning a daily walk routine starting with 2 times per week. Ask about his exercise goal at his next encounter.											
Class	Name	Date	Contra	D/C	Vaccinations and Immunizations				Reminders										
ACE Inhibitor	Class	01/02/02	<input type="checkbox"/>	<input type="checkbox"/>	Vac/Imm	Date	PRef	Ref	Dec	ColonCaScreen 1									
Antiplat/thrombASA	Class	04/01/02	<input type="checkbox"/>	<input type="checkbox"/>	Flu Vac		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
ARB	Class	01/02/02	<input type="checkbox"/>	<input type="checkbox"/>	Pneumovax		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>										
Biguanides	Glucophage	04/01/02	<input type="checkbox"/>	<input type="checkbox"/>	Risk Factors														
Diuretic	Class	09/01/02	<input type="checkbox"/>	<input type="checkbox"/>	Family History	Date	D/C												
NDH-CCB	Class	01/02/02	<input type="checkbox"/>	<input type="checkbox"/>	FamHxDM		<input type="checkbox"/>												
Statins	Class	04/01/02	<input type="checkbox"/>	<input type="checkbox"/>	Behaviors		C P N												
Sulfonylurea	Class	01/02/02	<input type="checkbox"/>	<input type="checkbox"/>	SM BG	current	<input type="checkbox"/>												
Other Medications to Consider				Contra				Add											
AG Inhibitor	Class		<input type="checkbox"/>	<input type="checkbox"/>	TobUse/Smoke	past	<input type="checkbox"/>												
Beta Blocker	Class		<input type="checkbox"/>	<input type="checkbox"/>	C=current; P=past; N=never														
Calc Chan Blo	Class		<input type="checkbox"/>	<input type="checkbox"/>	Other Measures														
DHP-CCB	Class		<input type="checkbox"/>	<input type="checkbox"/>	Test	Value	Date	PRef	Ref										
Fibrate	Class		<input type="checkbox"/>	<input type="checkbox"/>	Exercise wk			<input type="checkbox"/>	<input type="checkbox"/>										
Glitnides	Class		<input type="checkbox"/>	<input type="checkbox"/>															
Insulin	Class		<input type="checkbox"/>	<input type="checkbox"/>															
Lipid Lower	Class		<input type="checkbox"/>	<input type="checkbox"/>															
Niacin	Class		<input type="checkbox"/>	<input type="checkbox"/>															
Other BP Med	Class		<input type="checkbox"/>	<input type="checkbox"/>															
OtherLipidMed	Class		<input type="checkbox"/>	<input type="checkbox"/>															
TZD/Glitazone	Class		<input type="checkbox"/>	<input type="checkbox"/>															
Chart # 3000				Sugar, Extra				Page 1 of 1				Date Printed: 11/12/03				Next Visit <input type="checkbox"/>			

Figure 1. Sample electronic registry summary page.

References

¹Centers for Disease Control and Prevention: National diabetes fact sheet: general information and national estimates on diabetes in the United States, 2002. Atlanta, Ga., U.S. Department of

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⁴Bodenheimer T, Wagner EH, Grumbach K: Improving primary care for patients with chronic illness. *JAMA* 288:1775-1779, 2002

Table 2. Required and Recommended Measures for HDC 2003-DM

Required Measures	Goals
1. Average A1C	< 7.0%
2. Patients with two A1C measurements in past year (at least 3 months apart)	> 90%
3. Documentation of self-management goal setting	> 70%
4. Cardiac risk reduction option 1: angiotensin-converting enzyme inhibitors or angiotensin receptor blocker medication	> 75%
5. Cardiac risk reduction option 2: statins	> 60%
6. Patients with blood pressure < 130/80 mmHg	> 40%
For clinic systems with an integrated dental clinic, the following measure is also required:	
7. Dental exam in past year	> 70%
Additional Recommended Measures	Goals
8. Patients with LDL cholesterol levels < 100 mg/dl	> 70%
9. Use of aspirin or other antithrombotic agent	> 80%
10. Patients who are current smokers	< 12%
11. Dilated eye exam in past year	> 70%
12. Comprehensive foot exam in the past year	> 90%
13. Microalbuminuria screening in past year	> 50%
14. Influenza vaccination in the past year	> 90%
15. One pneumococcal vaccine	> 90%
16. Dental exam in past year	> 70%

⁵Bodenheimer T, Wagner EH, Grumbach K: Improving primary care for patients with chronic illness: the chronic care model, Part 2. *JAMA* 288:1909–1914, 2002

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