



## COMMISSION ON A HIGH PERFORMANCE HEALTH SYSTEM

# THE NEW YORK CITY HEALTH AND HOSPITALS CORPORATION: TRANSFORMING A PUBLIC SAFETY NET DELIVERY SYSTEM TO ACHIEVE HIGHER PERFORMANCE

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**ABSTRACT:** The New York City Health and Hospitals Corporation (HHC) is a mission-driven, \$5.4 billion, public benefit corporation serving 1.3 million New York City residents—the largest municipal hospital and health care system in the United States. In response to external pressures, HHC has undertaken a series of improvement initiatives that appear to be transforming its organizational culture, systems, and care processes. This case study describes how HHC is achieving higher levels of performance through a common clinical information system that promotes information continuity across care settings, care coordination to improve chronic disease management, teamwork and continuous innovation to improve the quality and value of care, and access to appropriate care that is responsive to patients' needs. Factors that the organization's leaders identify as critical to successful change include strategic use of information technology, leadership to promote collaborative learning and staff initiative, spread of best practices, alignment of financial incentives, and transparency of results.

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## EXECUTIVE SUMMARY

The New York City Health and Hospitals Corporation (HHC)—the largest municipal hospital and health care system in the United States—serves a diverse and primarily low-income population of 1.3 million, including 400,000 uninsured patients. HHC has weathered financial and management difficulties that gave it a controversial reputation in the past. It has recently achieved notable success in adapting to meet the challenges of its external environment, while also maintaining its core commitment to provide broad access to care without regard to patients' ability to pay or their immigration status. This case study describes how HHC is seeking to transform its organizational culture, systems, and care processes to achieve essential attributes of a high-performing integrated delivery system.

HHC is organized into seven regional networks. A workforce of 39,000 professionals (including 3,000 physicians) provides medical and behavioral care through 11 acute-care hospitals, four skilled nursing facilities, six large diagnostic and treatment centers, one certified home health care agency, and more than 80 community-based ambulatory care satellites. HHC facilities are the primary network of its subsidiary MetroPlus Health Plan, with more than 320,000 members enrolled in public coverage programs. HHC maintains affiliations with several medical and academic institutions in New York City to bring high-caliber physicians into public hospitals and community health centers.

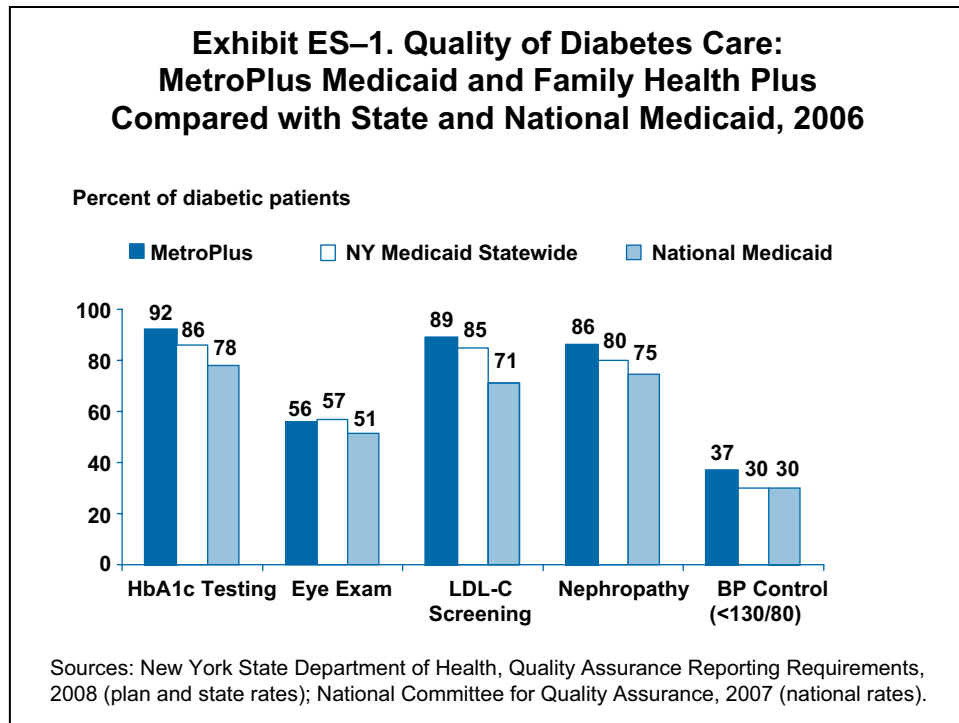
### **Information Continuity**

A common clinical information system links HHC's professional staff and facilities and promotes continuity of care across inpatient, outpatient, and long-term care settings. This system integrates electronic medical records (EMRs), inpatient computerized physician order entry (CPOE), medication management and reconciliation, and other technologies. The system helps improve patient safety, quality, and efficiency by reducing medical errors, improving productivity, and supporting good clinical care. HHC hospitals and networks are spearheading or participating in pilots and initiatives to promote interoperable exchange of clinical information with other community providers.

### **Care Coordination and Transitions**

HHC has made marked improvements in management of chronic diseases such as diabetes and heart failure through collaborative initiatives to spread best practices, educate patients

about self-management, designate staff for care management, and implement electronic registries (Exhibit ES-1).



- The Queens Health Network reports that about 50 percent of its diabetic patients have their diabetes under control, compared with only 10 percent four years ago. With support from The Commonwealth Fund, the network is evaluating the effectiveness of several diabetes care management models.
- Self-management “contracts” with asthma patients and EMR-prompted guidance on medication management have contributed to a 22 percent decline in the rate of pediatric asthma hospital admissions and a 45 percent decline in the rate of adult asthma hospital admissions during the past four years. The Commonwealth Fund supported an evaluation of an “Asthma Buddy” to help pediatric patients manage their symptoms and communicate with physicians.
- Using an evidence-based tool embedded in the EMR, primary care physicians (PCPs) screen their patients for depression and make treatment decisions or referrals to behavioral health specialists based on severity scores.



- The Commonwealth Fund is supporting a Bellevue Hospital project to test whether emergency room (ER) coordinators can reduce nonurgent ER use by guiding patients to establish relationships with PCPs. Hospitals in Queens are implementing ER coordinators to identify and transition high-risk ER patients to the care of community physicians.
- In an effort to reduce hospital readmissions, the Queens Health Network is beginning a pilot in which multidisciplinary “bridge teams” will facilitate comprehensive discharge planning and follow-up for high-risk patients. Heart-failure patients enrolled in an intensive case management program at HHC’s Bellevue Hospital Center have experienced one-third fewer hospital readmissions over one year.
- HHC is increasing its use of telehealth to remotely monitor homebound patients with serious chronic disease, with promising results among those with diabetes.

HHC operates as an open system with physicians in the community, who can refer patients to the hospital for various services. Community-based physicians in the Queens Health Network can use specialized software to schedule diagnostic tests or specialty appointments for their patients and receive test and consultation reports back. HHC is now rolling out this software across its system.

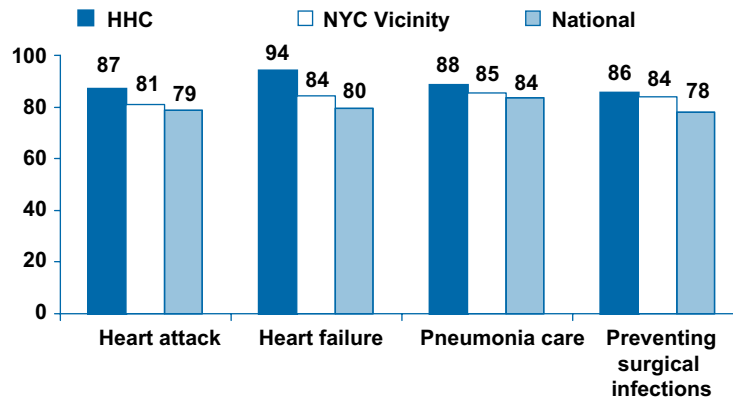
### **Teamwork and Continuous Innovation**

HHC has undertaken a multiyear campaign to increase patient safety by promoting a fair, just, and open culture of learning, prevention, and accountability. Under its Transparency Initiative, HHC publishes data on infection and death rates at its hospitals. Collaborative initiatives to implement evidence-based practices—embedded in the EMR as standing orders and protocols, or promoted through daily goal-setting and checklists—have been associated with improvements in hospital quality, such as:

- outperforming local and national averages on Centers for Medicare and Medicaid Services (CMS) measures of treatment for heart attack, heart failure, and pneumonia, and prevention of surgical infection (Exhibit ES-2);
- a 55 percent to 78 percent reduction in observed cases of selected hospital-acquired infections in intensive care units (ICUs);
- a 50 percent decrease in pressure sores in HHC hospitals; and
- an 11 percent lower inpatient mortality rate over five years, saving an estimated 550 lives in 2007 and 1,350 lives since 2003.

## Exhibit ES–2. Hospital Quality Indicators: HHC Compared with New York City and National Averages, April 2006–March 2007

Percent of hospital patients receiving appropriate and timely treatment or prevention



Source: New York City Health and Hospitals Corporation (HHC) analysis of CMS Hospital Compare data. Averages reflect eight measures for heart attack, four measures for heart failure, seven measures for pneumonia, and two measures for surgical infections.

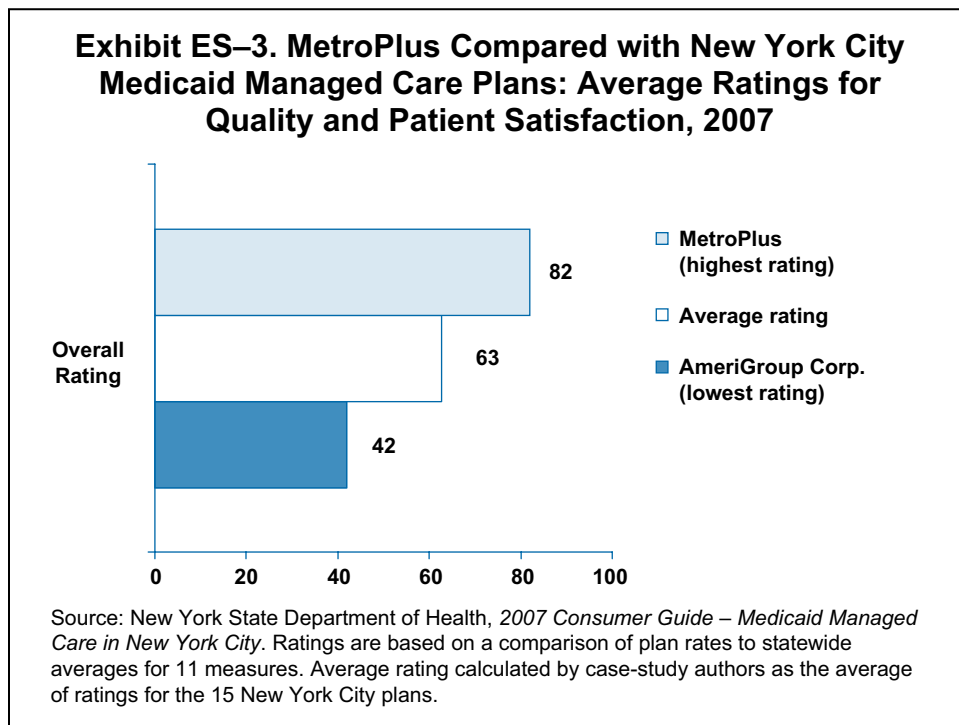
### Access to Appropriate Care

HHC is committed to offering health care services to New Yorkers regardless of their financial and immigration status. HHC helps its patients enroll in public coverage programs and assists the neediest patients with reduced-fee arrangements. Highlights of other initiatives include:

- Collaborative primary care teams designed improvements that reduced waiting times and total visit length to less than 60 minutes at most primary care clinics. “Open-access” scheduling reduced missed primary care appointments by up to 50 percent.
- The EMR prompts physicians to offer age-appropriate preventive services during routine clinical visits to promote cancer screening, HIV testing, and smoking cessation. Patient navigators facilitate access to diagnostic and screening tests.
- HHC has invested \$30 million to expand language services for patients, who speak more than 100 different languages, including medical interpretation training for staff and volunteers, telephonic interpretation services, and multilingual publications and signage. The Commonwealth Fund is supporting evaluation of remote simultaneous medical interpreting at Bellevue Hospital, with positive initial results.
- A \$1.3 billion capital campaign is modernizing facilities and creating “state-of-the-art therapeutic environments” that promote efficient provision of patient-centered care.

## Recognition of Results

Several HHC hospitals and facilities have been recognized for outstanding performance. Accolades include the American Nurses Credentialing Center’s Magnet Recognition for Excellence, Healthcare Information and Management Systems Society’s Nicholas E. Davies Innovation Award (twice), *Hospitals and Health Networks* “Most Wired” designation, and the Joint Commission’s Ernest Codman Award. CEO Alan D. Aviles was the first public hospital executive to receive the CEO Information Technology Achievement Award from the Healthcare Information and Management Systems Society and *Modern Healthcare* magazine. MetroPlus Health Plan was the highest-scoring New York City Medicaid managed care plan on quality and satisfaction measures rated by the state’s Department of Health (Exhibit ES-3).



## Insights and Lessons Learned

HHC’s leaders have learned that organizational transformation requires galvanizing champions and addressing organizational culture issues that are an impediment to innovation and risk-taking. Specific strategies include making use of clinical information systems, using collaborative initiatives to develop internal capacity for improvement, and empowering frontline teams to design and make rapid changes. Operational success comes from aligning financial incentives and management strategy by contracting exclusively with fully capitated managed care plans and expanding relationships with community providers to attract additional Medicaid-insured patients.

Because of its ongoing transformation and improving levels of performance, HHC is increasingly a “provider of choice” for the people of New York City, an organization where concern for clinical quality and the patient experience go hand-in-hand with a commitment to serving those in need. Despite significant successes, HHC continues to face financial challenges serving the uninsured while also competing for insured patients. Garnering resources is critical but must be accompanied by leadership, accountability, motivation, and stakeholder agreement to achieve a commonly held mission.

# THE NEW YORK CITY HEALTH AND HOSPITALS CORPORATION: TRANSFORMING A PUBLIC SAFETY NET DELIVERY SYSTEM TO ACHIEVE HIGHER PERFORMANCE<sup>1</sup>

## INTRODUCTION

Public hospitals and other health care safety-net providers play a vital role in American health care through their commitment to serving uninsured, low-income, and other vulnerable patients. A recent Institute of Medicine (IOM) report asserted that “even within the context of insurance reform, segments of America’s most disadvantaged populations will continue to rely on traditional safety-net providers for their health care services, not only because these may be the only providers available and accessible, but also because many of these providers are uniquely organized and oriented to the special needs of low-income and uninsured populations.”<sup>2</sup> While warning that adverse forces threaten the viability of safety-net providers, the IOM also encouraged them to “embrace the positive aspects of current change” by developing more integrated and accountable delivery systems that emphasize performance and service.

Created by New York State legislation in 1970, the New York City Health and Hospitals Corporation (HHC) is the largest municipal hospital and health care system in the United States—a mission-driven, \$5.4 billion public benefit corporation serving 1.3 million New York City residents. Like other safety-net delivery systems, HHC’s political and market environment requires that it compete on at least two fronts: for scarce public resources to finance care for the uninsured and for the loyalty of publicly insured patients who have a choice of providers in a managed care marketplace. HHC has recently achieved notable success in adapting to meet these challenges, while also maintaining its core commitment to provide broad access to care without regard to patients’ ability to pay or their immigration status.

This case study describes how HHC is transforming its organizational culture, systems, and care processes to achieve several essential attributes of a high-performing integrated delivery system. These attributes include:

- 1) **information continuity** to ensure that patients’ clinically relevant information is available to all providers at the point of care and to patients;
- 2) **coordination of care** across multiple providers and management of transitions across care settings;

- 3) **teamwork** among providers who are mutually accountable to reliably deliver high-quality, high-value care and **continuous innovation** to improve quality, value, and patient experience; and
- 4) **easy access** to appropriate care that is culturally competent and responsive to patients' needs.

### **A Brief History: The Impetus for Change**

A brief sketch of HHC's recent history offers a glimpse of the organization's impetus for change.<sup>3</sup> Placing the city's public hospitals (some of the oldest in the nation) under a quasi-independent authority offered greater management flexibility, especially in the areas of purchasing and hiring. Nevertheless, the system faced challenges from its inception due to a lack of fiscal discipline, frequent turnover in senior leadership, a tendency to engage in crisis management, and a structure in which the medical teaching mission of its academic affiliates took priority over patient care. Its reputation suffered further damage during the late 1980s and early 1990s when, according to an independent evaluation, "draconian budget cuts, demoralized staff and soaring service demands" seriously jeopardized patient care, resulting in three HHC hospitals being denied accreditation.<sup>4</sup>

In response, former Mayor Rudy Giuliani sought to privatize some HHC hospitals, and an advisory commission he appointed recommended that the city dispose of the public hospitals altogether, citing problems of poor quality and inefficiency. The State Court of Appeals blocked the mayor's privatization plan.<sup>5</sup>

These political and performance challenges served as a wake-up call to HHC's leaders and advocates, inducing an organizational restructuring that included negotiating a more equitable relationship with HHC's academic affiliates (including the introduction of performance and service targets) and downsizing to survive financially. The introduction of mandatory Medicaid managed care in the 1990s spurred HHC to place greater emphasis on ambulatory care—an aspiration since the 1980s—as it began competing with the city's voluntary hospitals for Medicaid patients. HHC initiated a series of successful service and clinical improvements starting in 2001, while also emphasizing continuity of leadership, systemwide strategic planning, and board-level accountability for achieving performance objectives. This organizational transformation has accelerated in recent years under the leadership of current president and CEO Alan Aviles and New York City Mayor Michael Bloomberg, even as financial pressures have returned.

## **Organizational Background**

HHC serves a diverse and predominantly low-income population: 93 percent of patients are racial and ethnic minorities or immigrants speaking more than 100 different languages. About 400,000, or nearly one-third, of its 1.3 million patients are uninsured; most of the rest are covered by Medicaid. HHC also plays a vital role as the safety-net provider for undocumented immigrants who are ineligible for coverage under public programs.

A workforce of 39,000 health care professionals (including nearly 3,000 physicians) provides a broad array of health care services, with an increasing emphasis on comprehensive primary care, prevention, and early detection of disease. Facilities include:

- eleven acute-care hospitals, including six regional trauma centers and several centers of excellence for diabetes, burn care, AIDS, sexual assault, stroke, sickle cell anemia, Parkinson's disease, multiple sclerosis, and perinatal care;
- six large diagnostic and treatment centers (family health centers) that offer a high volume of primary and select specialty care;
- eighty community-based ambulatory care satellite clinics, including numerous child and teen health centers and school-based clinics;
- four skilled nursing facilities and a certified home health care agency.

These resources are organized into seven regional networks located within the five boroughs of New York City (Exhibit 1 and the Appendix for a list of networks and facilities). Altogether, HHC provides one-sixth of New York City's inpatient care, one-third of its emergency services, 40 percent of hospital-based inpatient and outpatient behavioral health care, and almost 5 million outpatient clinic visits annually.

HHC facilities are the primary network for its subsidiary, MetroPlus Health Plan, started in 1985, which currently enrolls more than 320,000 members in Medicaid managed care, Medicare Advantage, the State Children's Health Insurance Program (SCHIP), and state coverage expansion programs. MetroPlus also contracts with community physicians whose patients typically use HHC facilities. HHC has an ownership stake in HealthFirst Health Plan in partnership with a consortium of voluntary New York City hospitals; about 70,000 of that plan's 480,000 members are HHC patients. Most publicly insured HHC patients are enrolled in one of these two health plans under capitated (prepaid) managed care contracts that cover their comprehensive care needs.

## Exhibit 1. New York City Health and Hospitals Corporation (HHC) Regional Networks



Source: New York City Health and Hospitals Corporation.

HHC is governed by a board of directors appointed by the mayor.<sup>6</sup> The city's health commissioner chairs its quality assurance committee. Affiliations with several leading medical and academic institutions in New York City (Appendix A) help ensure a continuing supply of high-caliber physicians to augment HHC's workforce in medically underserved areas, while also providing medical residents with a valuable learning experience in urban public hospitals and community health settings. The majority of the physicians working at HHC are employed by affiliate institutions (2,478 of 2,966 in 2007).

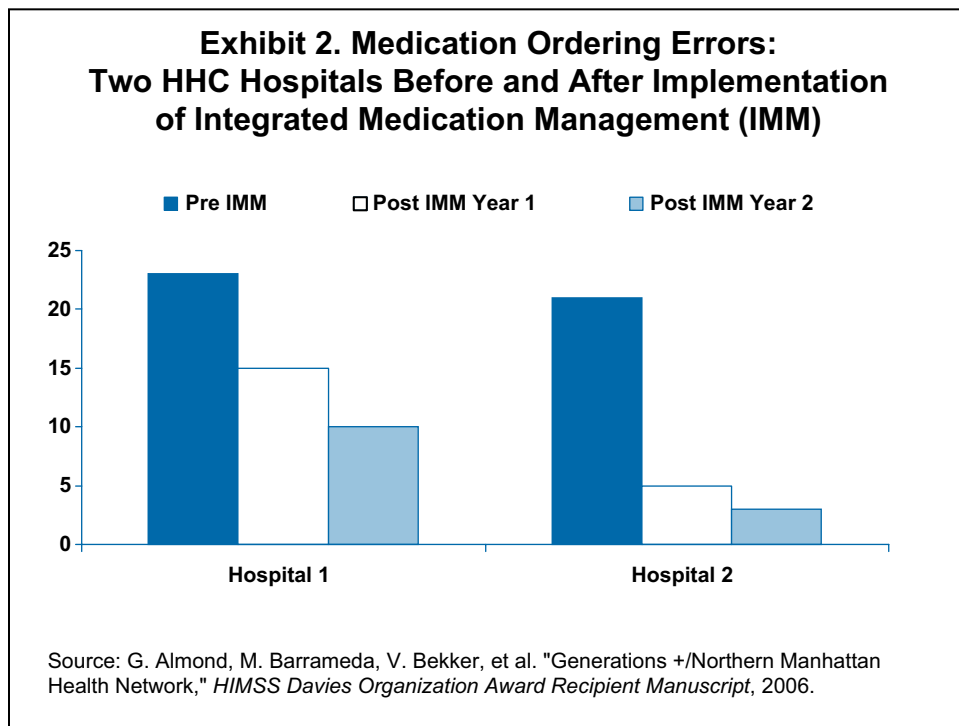
### INFORMATION CONTINUITY

#### Improving Patient Care with a Clinical Information System

A common clinical information system links HHC's professionals and facilities and promotes continuity of care across inpatient, outpatient, and long-term care settings. This system integrates electronic medical records (EMRs), inpatient computerized physician order entry (CPOE), medication management and reconciliation, and other technologies, supported by a clinical data warehouse for analytic decision support. A picture archiving and communications system allows clinicians to view digital radiology images, sonograms, and electrocardiograms from any location. A survey in one HHC regional network found that more than 90 percent of EMR users agreed that patient information is available anywhere, anytime within the system and that the EMR aids in patient safety.<sup>7</sup> The clinical information system helps improve patient safety, quality, and efficiency within HHC facilities. For example:



- Documentation of all critical clinical information in the medical record (“summary list”) increased from 4 percent to 100 percent following implementation of EMRs in Queens Health Network hospitals.<sup>8</sup>
- In the Generations+/Northern Manhattan Regional Network hospitals, electronic medication ordering reduced medication errors (incorrect and incomplete orders) by 40 to 70 percent (Exhibit 2).<sup>9</sup>
- Nurses use medication carts equipped with a wireless computer to verify the correct medication, dosage, and dosage interval at the patient’s bedside, which not only prevents errors but also improves productivity, reducing the time to administer medications by 50 percent in one regional network.<sup>10</sup>
- In outpatient clinics, patients receive a printed copy of their medication list at the end of their visit, to promote understanding of and adherence to their treatment regimen.



HHC has invested more than \$100 million over the last 10 years to build this information infrastructure (plus hardware and ongoing maintenance and training costs), with grant support made possible under a federal waiver to implement mandatory Medicaid managed care in New York. A commitment to use a single third-party EMR software platform (Ulticare, now Misys) was initially made in 1991, although implementation was phased in over the decade among HHC facilities (as a result,

the EMR is interoperable within but not across the regional networks). Modules for emergency room (ER) and behavioral health settings were developed by in-house teams in collaboration with vendor partners because suitable off-the-shelf software was not available. As one of the first to implement EMRs in New York City and the nation, HHC is now planning to upgrade the EMR to attain system-wide interoperability and enhance its functionality and ease of use.

### **Information Exchange with Community Providers**

Several HHC hospitals and networks are spearheading or participating in pilot projects and initiatives to promote interoperable exchange of clinical information with other community providers who treat HHC patients. In Queens, for example, thousands of HHC patients have been issued smart cards that store a basic personal health record (including diagnoses, prescriptions, drug allergies, and lab results) on an embedded computer chip. Information is updated after every visit and can be viewed using inexpensive readers attached to a computer USB port. HHC has provided a smart card reader to every ER in Queens to make patients' vital medical history accessible to clinicians in emergencies.

With state grant support under the Health Care Efficiency and Affordability Law for New Yorkers, Elmhurst Hospital has convened a regional health information organization (RHIO) to extend the use of smart cards to patients of community providers. A second phase of the project, now funded by the state, will allow the RHIO to develop Internet technology to exchange clinical information in real time between HHC and community providers with EMR systems. Separately, HHC hospitals in the Bronx are participating in another RHIO to develop a secure, Web-based longitudinal patient record that can be shared across providers while also complying with privacy regulations.

HHC will be seeking convergence among these pilots and initiatives as it rolls out data-exchange technologies across its system. Along these lines, HHC is collaborating with the New York City Department of Health to ensure interoperability with EMRs implemented in community health centers under a city initiative.

### **CARE COORDINATION AND TRANSITIONS**

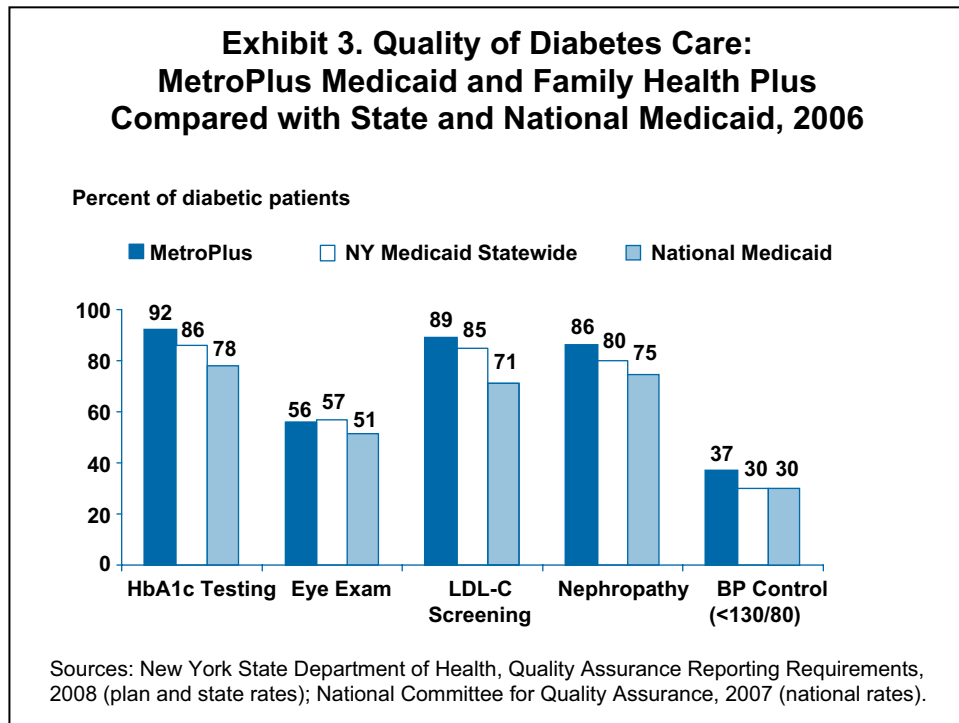
HHC has developed several chronic care management programs focusing on patients with asthma, diabetes, depression, and heart failure. HHC's affiliated managed care plans fund some of these programs to promote primary care continuity and reduce avoidable hospital admissions. Other programs are provided to all eligible HHC patients. HHC has made marked improvements in chronic-disease management through collaborative initiatives

to spread best practices, educate patients about self-management, designate staff for care management, and implement electronic registries.

The Queens Health Network is given special attention because it serves as a pilot site for building a more robust care management infrastructure, as HHC prepares to expand the role of care managers systemwide. In Queens, the nurse care managers work in a multifunctional care management department, rather than in a specific inpatient or outpatient unit, to help coordinate care across treatment settings and levels of care.

### Improving Diabetes Care Management

More than 50,000 diabetic patients are now being tracked in an Intranet-based electronic patient registry, fed from EMRs. This e-registry allows physicians to identify which patients need chronic care services or interventions to control their diseases. Measurement and associated interventions appear to be promoting better management, as diabetes quality measures exceed both state and national averages among HHC patients enrolled in the MetroPlus Health Plan's Medicaid and state coverage programs (Exhibit 3).



In the Queens Health Network, nurse care managers develop care plans, educate patients on disease self-management, and provide telephone support to patients. Patients with persistent uncontrolled diabetes can be referred to specialty centers for short-term intensive treatment, returning to primary care for ongoing management once their

diabetes is under control. Retinal cameras have been installed in outpatient clinics so that diabetic patients can have their eyes checked without making a separate appointment to see an ophthalmologist (the image is read by the ophthalmologist later). As a result of better disease management, 52 percent of patients had controlled their blood sugar levels at the end of 2007, compared with only 10 percent in 2003. Following the lead of the Queens Health Network, the goal is to double the number of patients with well-controlled diabetes systemwide by the end of 2009.

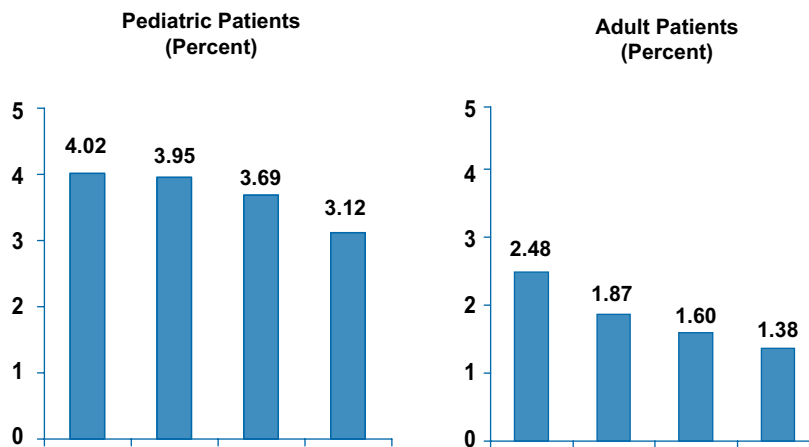
With grant support from The Commonwealth Fund, the Queens Health Network is conducting a randomized controlled trial to test the effect of three diabetes care models on service use, medical costs, clinical outcomes, and patient behavior.<sup>11</sup> Two of the care models use nurse care managers and vary the level of engagement by primary care providers; the third model uses nurse practitioners as care managers with expanded roles including prescribing and test ordering. Results should help inform HHC's strategy for expanding the use of care managers in its other regional networks.

HHC's home health care division, in collaboration with Metropolitan Hospital Center and MetroPlus health plan, is using telehealth technology to remotely monitor the status of a growing number of patients with serious chronic diseases. Early results among diabetes patients are promising: 70 percent are reducing their average monthly blood sugar levels, and about half are achieving control. Several nurses, along with a triage team, review patients' glucometer readings daily and intervene promptly by telephone with those whose values are outside normal ranges. Blood pressure and pulse are also monitored. Patients whose values are within range receive congratulatory telephone calls as positive reinforcement. Managers credit this immediate feedback as a key to the intervention's success.

### **Enhancing Asthma Self-Management and Outcomes**

For patients with asthma, the clinical information system supports the creation of individualized self-management "contracts" or action plans, including detailed instructions on the use of medications and flow meters as well as strategies to avoid asthma triggers. EMRs prompt physicians on the use of corticosteroid treatment when indicated, and physicians must document reasons for diverging from clinical guidelines. For MetroPlus health plan members who receive care from HHC providers, these approaches have contributed to a 22 percent decline in the rate of pediatric asthma hospital admissions and a 45 percent decline in the rate of adult asthma hospital admissions during the past four years (Exhibit 4), while also increasing the number of patients' symptom-free days.

#### Exhibit 4. Asthma Hospital Admission Rates: MetroPlus Patients Receiving Care from HHC Providers, 2004–2007



Source: New York City Health and Hospitals Corporation.

HHC is testing a computerized, handheld “Asthma Buddy” to help pediatric asthma patients learn to manage their asthma symptoms and communicate with medical professionals. During a six-month pilot at HHC’s Coney Island Hospital, none of the 69 participating children were admitted to the hospital and only one visited the ER, compared with 2.4 emergency visits per month and one hospitalization every seven weeks before the pilot.<sup>12</sup> Preliminary results from a larger evaluation, supported by The Commonwealth Fund, are not as promising, however.<sup>13</sup>

#### Improving Detection and Treatment of Depression

Mental illness often co-occurs with physical illness and can impede treatment success while increasing cost, yet it often goes undetected in primary care settings where people receive the majority of their care. To address this problem, HHC has embedded an evidence-based screening tool for depression (PHQ-9) in the EMR. This past year, primary care physicians screened more than 70,000 of their patients. HHC has set a goal to screen more than 100,000 patients in 2008, including all diabetic patients.

To make efficient use of resources and avoid bottlenecks in specialty care, patients with mild to moderate depression are initially being treated in primary care settings focusing on medication management, while those with severe depression are referred to behavioral health specialists. Nurses work in collaboration with physicians to provide follow-up support and adjust medications as needed. Because this collaborative care

approach represents a major shift in practice and culture, primary care physicians receive education and ongoing support from specialists to help them develop skills and confidence in treating depression. Behavioral health professionals are co-located in some outpatient primary care clinics to facilitate consultation and referrals, often on the same day.

### **Promoting Primary Care Connections to Reduce Avoidable Hospital Use**

In collaboration with the two affiliated health plans, the Queens Health Network is beginning a test in which “bridge teams”—comprised of an attending physician or a nurse practitioner, a social worker, and a financial counselor—will facilitate comprehensive discharge planning for patients with complex needs. These patients are typically frail or elderly and have been readmitted for chronic conditions often without receiving appropriate outpatient care. The teams will track patients for six months to ensure they receive outpatient follow-up care, including social and behavioral health services, within HHC or in the community, to help prevent readmission.

Regional networks and hospitals are trying a number of care coordination approaches in an effort to reduce nonurgent and unnecessary use of the ER. For example:

- The Commonwealth Fund is supporting a project at Bellevue Hospital Center to test whether ER coordinators can change patients’ future care-seeking behavior by identifying those who are using the ED for nonurgent problems and guiding them to establish permanent relationships with primary care physicians.<sup>14</sup>
- In the Queens Health Network, care managers identify community ER patients at risk for repeat visits, facilitate transfer of patient information to their community-based physicians, and offer recommended care plans to help prevent future ER visits.
- The Generations+/Northern Manhattan Health Network has established a 24-hour calling service in which triage nurses use clinical algorithms built into the EMR to direct patients to appropriate care. Nurses make immediate referrals for urgent needs or schedule a clinic appointment for nonurgent needs. The treating physician can refer to a record of the call when patients present for care.

HHC is seeking to create a more robust primary care network by extending systemwide the “community health network” model in use at its Queens Health Network for 10 years. In this “open-system” approach, hospitals develop collaborative relationships with community-based primary care doctors and offer referral services for diagnostic and specialty services for their patients. Community physicians are credentialed with admitting or visitation privileges in HHC hospitals.

To facilitate these relationships across its system, HHC is rolling out software called HHC Connectx, developed in the Queens Health Network, which permits community physicians to electronically schedule their patients for diagnostic tests or specialty consultations at HHC facilities and receive electronic test results and consultation reports from HHC. HHC has extended the use of its EMR to a few large community practices that have a significant number of patients enrolled in two of its regional networks (this approach is being superseded by the RHIO model described above).

Primary care and specialist physicians in HHC outpatient clinics periodically rotate into inpatient units where they serve in a capacity equivalent to a hospitalist. This rotation helps them maintain a clear sense of the inpatient environment and allows them to contribute their perspective as outpatient providers. It also establishes relationships across settings that help break down barriers and facilitate communication as patients transition from one setting to another. The number of physicians participating in such rotations has diminished as HHC makes greater use of dedicated hospitalists on some inpatient units.

### **Reducing Hospital Readmissions for Heart Failure Patients**

HHC has undertaken a systemwide initiative to improve outcomes among patients with heart failure by combining reliable inpatient care with post-discharge support. At Bellevue Hospital Center, for example, a multidisciplinary team integrated heart failure–related services across the continuum of care and created an intensive case-management program for high-risk patients hospitalized for heart failure. The goal of the intervention is to empower patients to take an active role in their treatment and manage their symptoms and lifestyle, while also addressing language barriers and other psychosocial needs to help prevent exacerbations and rehospitalizations.

- A case manager identifies eligible patients using an EMR-generated list, refers them for a home visit within 24 to 72 hours or facilitates nursing home or cardiac rehabilitation placement when requested, encourages ambulatory patients to attend a follow-up clinic visit within one week of discharge, and monitors care to ensure compliance with evidence-based practices.
- For those who agree to receive a home visit, a visiting nurse assesses rehospitalization risk and mental health and provides self-care education, addressing topics such as diet and exercise, daily self-monitoring techniques (weight, blood pressure, heart rate), and when to seek help for exacerbations.
- A designated primary care physician conducts the initial follow-up clinic visit with support from the case manager and a multidisciplinary team including a social worker, nutritionist, pharmacist, and a cardiologist expert adviser as needed. Patients

are then referred to their regular primary care physician for ongoing follow-up along with ongoing symptom monitoring by the visiting nurse service.

- Those who enrolled during the first seven months of the program (October 2006 to May 2007) had one-third fewer hospital admissions during the subsequent 12 months, compared with their experience in the year prior to enrolling in the program.

## **TEAMWORK AND INNOVATION TO PROMOTE QUALITY AND VALUE**

HHC's journey of systemwide continuous improvement began in 2001 with an ambulatory care redesign project conducted in collaboration with the nonprofit Primary Care Development Corporation (described in the next section). Closely following on this, multidisciplinary teams participated in a chronic disease collaborative with Edward Wagner of the MacColl Institute for Healthcare Innovation and in a breakthrough series collaborative with the Institute for Healthcare Improvement to improve chronic care management for diabetes and heart failure. These experiences showed the importance of systematically training staff on a common framework and methodology for rapid improvement and using data and education on best practices to drive change.<sup>15</sup>

Ongoing collaborative initiatives are leveraging the talent and commitment of staff (who may earn continuing medical education credit for their participation) to accelerate performance improvement across the system, focusing on chronic disease management (as described in the previous section) and patient safety in hospitals. To support systemic change, evidence-based guidelines are embedded in the EMR as standing orders and protocols. The EMR also facilitates routine teamwork, such as ensuring accurate information transfer during patient "hand-offs" from one clinician or service to another.

### **Improving the Quality of Hospital Care**

Collaborative initiatives to implement evidence-based care practices—including those advocated by the Institute for Healthcare Improvement's 100,000 Lives Campaign—appear to be improving quality of care and saving lives in HHC hospitals.

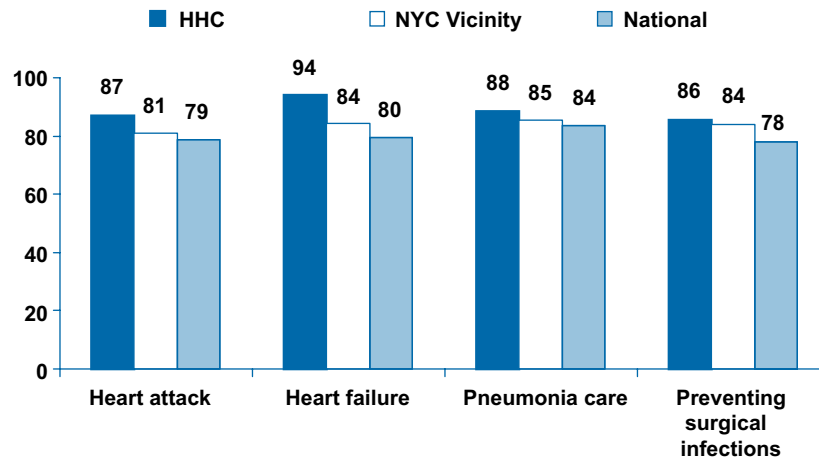
- HHC hospitals exceeded New York City and national averages on measures of appropriate and timely treatment for heart attack, heart failure, and pneumonia, and prevention of surgical infections, as reported on the Centers for Medicare and Medicaid Services (CMS) Hospital Compare Web site (Exhibit 5).
- Critical care teams implemented a bundle of evidence-based clinical practices to help prevent hospital-acquired infections among ICU patients, resulting in a 55 percent reduction in observed cases of central line-associated bloodstream infections and a 78 percent decrease in ventilator-associated pneumonia (VAP) from 2005 to



2007 (Exhibit 6). In Bellevue Hospital Center’s medical ICU, for example, team members use a daily goals checklist to assure a common understanding of treatment goals for each patient.<sup>16</sup> As a result, adherence to the evidence bundle now averages above 90 percent, as compared with 30 percent before the intervention, and no cases of VAP have been detected on the ICU for up to 20 months.

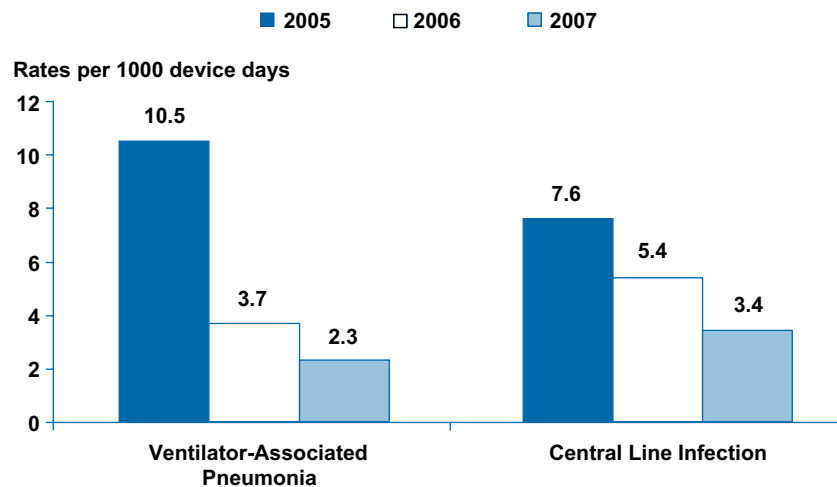
**Exhibit 5. Hospital Quality Indicators: HHC Compared with New York City and National Averages, April 2006–March 2007**

Percent of hospital patients receiving appropriate and timely treatment or prevention



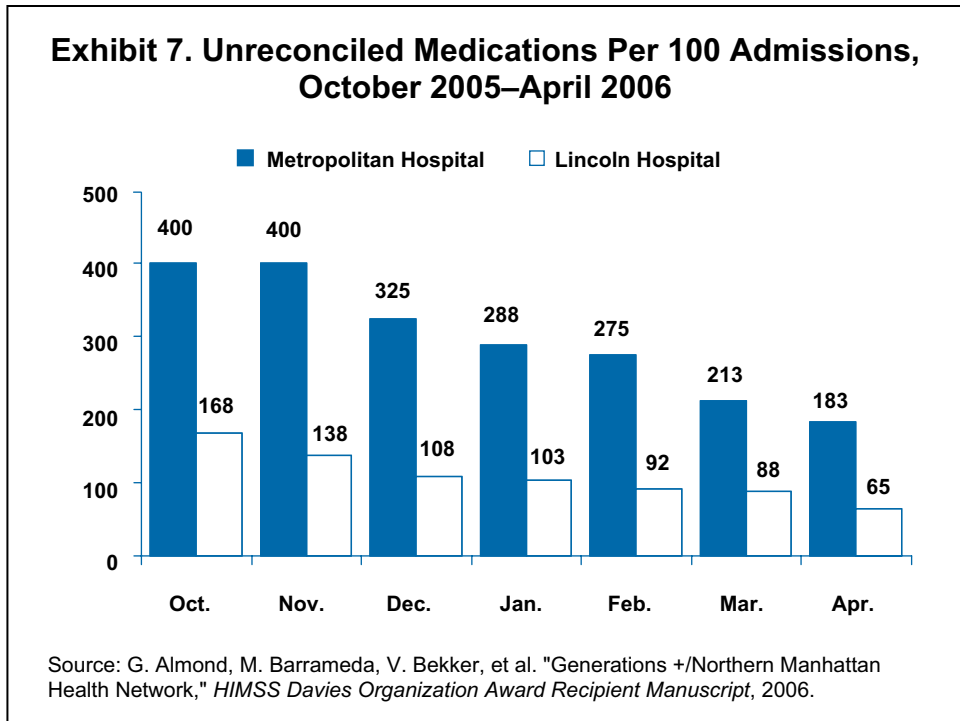
Source: New York City Health and Hospitals Corporation (HHC) analysis of CMS Hospital Compare data. Averages reflect eight measures for heart attack, four measures for heart failure, seven measures for pneumonia, and two measures for surgical infections.

**Exhibit 6. Hospital-Acquired Infection Rates for 11 HHC Intensive Care Units, 2005–2007**

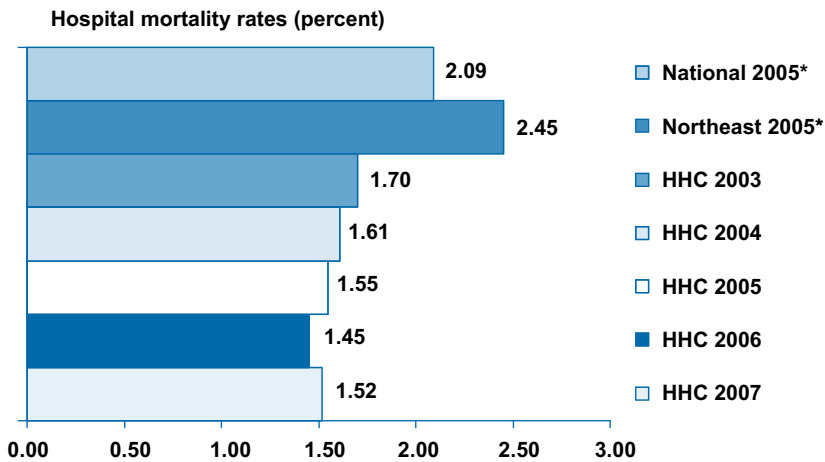


Source: New York City Health and Hospitals Corporation.

- Creation of rapid response teams that proactively intervene with patients at risk of clinical deterioration has been associated with a 75 percent reduction in cardiac arrests occurring outside the ICU at Bellevue Hospital and reductions of 50 percent at both Coney Island and North Central Bronx Hospitals.
- Unreconciled medications decreased by 54 percent to 61 percent at Metropolitan and Lincoln Hospitals after they instituted an automated procedure that compares patients' medication use before, during, and at the conclusion of a hospital stay to identify and correct potentially harmful discrepancies and errors (Exhibit 7).
- HHC's in-hospital mortality rate (unadjusted for changes in case-mix) fell almost 11 percent systemwide from 2003 to 2007, even as patients were admitted with more complex conditions, and was 26 percent below the national average in 2005 (the latest year for which national data are available) (Exhibit 8). This improvement translated to an estimated 550 fewer in-hospital deaths in 2007 and 1,350 fewer deaths since 2003.



**Exhibit 8. Hospital Mortality Rates of HHC Hospitals Compared with National and Northeastern Regional Averages, 2003–2007**



Source: New York City Health and Hospitals Corporation and New York State Department of Health.  
\*Most recent data available.

Other teams are engaged in improving developmental care in neonatal ICUs, expanding palliative care services at end of life, reducing pressure ulcers (incidence declined by 50 percent in 2007), screening and treating patients at risk for developing blood clots (deep vein thrombosis), improving management of severe sepsis, and preventing patient falls.

**Creating a Culture of Safety**

HHC recently initiated a multiyear campaign to improve patient safety by promoting a culture of learning, prevention, and accountability. As one of its first steps, HHC surveyed its employees using a standardized safety culture survey from the federal Agency for Healthcare Research and Quality.<sup>17</sup> Results revealed that most staff perceived the culture as punitive when errors are committed. In response, HHC’s leaders engaged a patient safety expert, David Marx, to lead training and guide the creation of a “just culture” that responds constructively to error and permits discussion and learning from “near misses”—events that could have caused patient harm but did not, either by chance or through timely intervention. This effort culminated in a new code of conduct that distinguishes between individual misbehavior and system flaws requiring correction.

This patient safety philosophy is being put into practice through multifaceted interventions. Senior executives are conducting “walk rounds” on patient wards to assess patient safety concerns shared by frontline staff; HHC staff members are participating in ongoing safety-related training, such as how to conduct a rigorous root cause analysis; and

patient safety officers are continuously reviewing safety practices in the clinics. Findings from analyses and staff feedback are used to design approaches for reducing adverse events. An annual “Best Patient Safety Practice Fair” recognizes facilities and teams with awards for innovations and successes. HHC will resurvey its staff annually (it recently completed the second year) to gauge whether it is succeeding in creating a culture of safety and use this feedback to fine-tune its strategy over time.

### **Improving Efficiency and Value**

With the support of leadership at all levels of the organization, frontline teams are being empowered to test new approaches to improve efficiency of services. For example, use of voice recognition software by radiologists permits electronic transmission of their interpretation reports in less than one minute, compared with a turnaround of 2.5 to seven days prior to implementation, while saving \$600,000 in transcription costs annually in one regional network.<sup>18</sup> Over the coming year, staff at several HHC facilities will be trained in the “lean thinking” approach to improving process efficiency based on the Toyota Production System model, which HHC has renamed “Breakthrough.” To gain the support and participation of frontline staff and unions, HHC has pledged that these improvement activities will not be used to reduce overall staffing levels (e.g., no layoffs), although retraining and redeployment may be necessary in some circumstances.

These recent efforts build on a decade of restructuring that reduced average hospital length of stay by 40 percent (from 7.9 to 4.7 days), removed 2,400 hospital beds from service, and reduced the workforce by 9,000 employees. During the 1990s, HHC revamped its affiliation contracts with academic medical centers to incorporate a workload-based compensation model with performance targets, resulting in a 15 percent reduction in costs along with perceived improvements in morale and service arising from clearer communication of expectations.<sup>19</sup> The system has also realized operational efficiencies through consolidation of services and volume purchasing.

To improve administrative efficiency, HHC recently consolidated its Medicaid managed care, contracting exclusively with its two affiliated plans—MetroPlus and HealthFirst. These plans pay HHC global capitation (prepayment for a comprehensive set of benefits) that aligns incentives to support prevention and care coordination. The improved margins from capitated contracts also help cross-subsidize care for the uninsured. HHC had previously contracted with 18 managed care plans, which created unnecessary administrative expense. Moreover, their use of fee-for-service reimbursement undermined efforts to keep patients healthy and out of the ER and hospital. HHC largely maintained its managed care patient population after the consolidation. Because patients tend to

be more loyal to their physician than to their plan, MetroPlus continues to broaden its network to include more community-based primary care providers, who now care for about half its members. Whenever possible, however, MetroPlus automatically assigns patients who lack a usual source of care to HHC clinic physicians, who tend to be more responsive to the health plan's agenda since it aligns with HHC's organizational goals.

### **Promoting Accountability and Rewarding Improvement**

HHC's president and CEO Alan Aviles announced a Transparency Initiative early in 2007, through which HHC publicly publishes information on infection and death rates for each of its hospitals and for the system as a whole in comparison to state and national averages. It is the first health care system in New York State to do so. In spring 2008, HHC expanded the scope of performance information reported on its Web site to place greater emphasis on ambulatory care quality. Aviles anticipates that these efforts will hold the organization publicly accountable for its performance and thus help promote continued internal motivation to improve patient safety.

HHC's board and leadership are directly engaged in quality and safety. For example, the board's quality assurance committee, chaired by the New York City Commissioner of Health (who is one of HHC's ex officio board members), meets weekly to review a comprehensive set of indicators for every HHC facility, on a rotating basis, so that each facility's performance is assessed quarterly. These weekly reviews allow the board to identify emerging trends, evaluate improvements, and pinpoint the need for corporate-wide initiatives.

Over the past five years, MetroPlus health plan has distributed \$42 million in quality incentive payments to promote improvement in target indicators under New York State's Quality Assurance Reporting Requirements (QARR) program for Medicaid managed care plans, as well as other strategic goals it shares with HHC. The incentive program has evolved over time to include three related components.

- Since 1998, the health plan has made annual QARR awards of \$10,000 to HHC facilities and individual community-based primary care providers who achieve the highest performance on each of 17 quality indicators.<sup>20</sup>
- A medical provider performance pool, instituted in 2002, makes quarterly incentive payments to HHC facilities and community-based primary care providers that achieve above-average results on 14 process-of-care indicators focused on preventive care. All providers receive quarterly profiles of their performance on

these indicators. MetroPlus is pilot testing rewards for individual HHC physicians under this program.

- A chronic disease pay-for-performance program, developed by a joint HHC–MetroPlus workgroup in 2005, rewards HHC facilities that achieve targets or improvements in selected diabetes and asthma outcome measures (Exhibit 9).

**Exhibit 9. MetroPlus Chronic Disease Pay-for-Performance Metrics for Asthma**

Utilization Rate per Thousand (Population)		Percent Utilizing at Acute Level (Individual)	
Point Category	Point Threshold	Point Category	Point Threshold
ER Benchmark	≤ 25 visits per 1,000	% Utilizing ER	≤ 20%
ER % Improvement	≤ -10%	% Improvement in ER Utilization	≤ -10%
IP Benchmark	≤ 5 visits per 1,000	% Utilizing IP	≤ 4%
IP % Improvement	≤ -10%	% Improvement in IP Utilization	≤ -10%

Source: A. Saperstein, *Driving Quality Through Incentives in a Municipal Hospital System*, Quality Colloquium, August 20, 2007. ER = emergency room; IP = inpatient.

These incentives are associated with improved performance, although they are part of a broader set of overlapping initiatives, all of which are likely to contribute to better care. For example, MetroPlus also funds outreach workers in HHC clinics to identify and contact individuals in need of preventive or chronic care and follow-up and employs health educators and nurses to support the care team in managing chronic diseases.

**ACCESS TO APPROPRIATE CARE**

HHC is committed to offering health care services to New Yorkers regardless of their ability to pay or immigration status. Through its HHC Options program, HHC helps patients enroll in public coverage programs and links uninsured patients with a primary care provider, thereby promoting access to primary and preventive health care. HHC Options also helps patients by offering a sliding-fee scale to patients with income up to 400 percent of the federal poverty level and recently eliminated outpatient fees and reduced pharmacy copayments to \$2 for the neediest patients. Requiring uninsured patients to receive financial counseling to qualify for reduced fees also helps to identify

those that are eligible but not enrolled in public coverage programs. This has the dual benefit of lowering financial barriers for patients while also reducing the burden of uncompensated care at HHC.

A commitment to serving society's most vulnerable also means that HHC must address social risk factors that can be a barrier to care. HHC promises confidentiality so that immigrants need not fear legal sanctions for seeking treatment in HHC facilities, for example, and provides services at the Mexican consulate to help immigrants get connected to a regular source of primary care.

### **Improving Responsiveness through Ambulatory Care Redesign**

In collaboration with the nonprofit Primary Care Development Corporation, HHC in 2001 launched an Ambulatory Care Restructuring Initiative to reduce patient waiting times at clinic visits.<sup>21</sup> Dozens of collaborative teams learned rapid-cycle improvement concepts and were empowered to envision, design, and implement changes. Strategies included minimizing hand-offs, broadening the scope of responsibility of some staff, and bringing services such as financial counselors directly to the exam room rather than referring patients elsewhere. Several clinics were physically redesigned to improve flow and efficiency. Others employ facilitators who help patients get to the right place for the right service. Through a series of such changes over a three-year period, patient visit cycle times have been cut from an average of about two-and-one-half hours (and up to four hours at some clinics) to less than 60 minutes at most HHC primary care clinics.

In phase two of the project, HHC clinics instituted patient-centered “open-access” scheduling, which has reduced missed appointments (i.e., the “no-show” rate) by as much as 50 percent. Because patients often fail to keep appointments made far in the future, clinic staff now phone patients to remind them to make an appointment shortly before a follow-up visit is due. Many HHC facilities schedule non-urgent appointments within four to five days of the request and are continuously striving to improve this measure to less than three days. Walk-in care is accommodated but discouraged. Facilitating timely access to care with a familiar provider or cluster of providers promotes provider-patient relationships and partnerships, which in turn fosters preventive care, earlier detection of health issues, and better management of chronic conditions.

### **Promoting Access to Preventive Care for Early Detection and Treatment of Disease**

HHC partnered with the New York City Department of Health and Mental Hygiene to develop a patient navigator program that helps patients negotiate the care system to receive cancer screenings and diagnostic procedures.<sup>22</sup> The bilingual navigators are paraprofessionals

who receive training to explain procedures to patients in non-clinical terms, help patients obtain insurance coverage or assistance, and facilitate adherence with scheduled appointments. The program initially targeted colonoscopy but has been expanded to include breast, cervical, and prostate cancer screenings. Physicians can refer any patient for assistance, particularly those who are uninsured. Using an electronic tracking system, each navigator assists as many as 60 patients per month; the program has facilitated over 30,000 colonoscopies since its inception. Evaluation of a pilot project at Lincoln Medical and Mental Health Center in the Bronx found that patient navigators, in combination with a streamlined referral process, reduced missed appointments (no-shows) from 67 percent to 5 percent and were associated with a 10-percentage-point increase in the rate of screening colonoscopy in the surrounding community.<sup>23</sup> The higher procedure completion rate also leads to greater reimbursement revenue.

HHC conducts community- and school-based health education campaigns and offers free preventive health screenings to the public. To facilitate routine screenings during clinical visits, the EMR prompts physicians to offer age-appropriate preventive services. These and other interventions (such as patient navigators) have contributed to a near-tripling in the number of screening colonoscopies performed systemwide over the past four years, and a 50 percent increase in HIV testing in each of the past two years. Likewise, screening for smoking status and referral to a smoking cessation program has helped more than 25,000 patients quit smoking over the last three years.

In response to the health needs of patients affected by the events of 9/11, a World Trade Center Environmental Health Center was established in 2006 at Bellevue Hospital Center, formalizing the hospital's experience in treating these patients in collaboration with community-based organizations. Additional sites were recently established at Gouverneur and Elmhurst Hospitals. HHC plans to join with other community-based organizations in an outreach campaign to increase awareness of these resources.

### **Expanding Language and Interpretation Services**

A majority of the population in the communities served by HHC facilities speaks a language other than English as their first language. Communication barriers resulting from limited English proficiency can jeopardize health outcomes and increase medical costs. In response, HHC has invested \$30 million in recent years to expand language services and has hired a senior manager dedicated to help facilities incorporate a standardized set of best practices for accommodating the needs of patients with limited English proficiency (LEP). Services include a central dispatch office for interpreting services, standardized medical interpretation training for bilingual and multilingual staff and volunteers, telephone



interpretation services, forms and publications translated in 11 languages, and multilingual signage in facilities. An internal LEP Web site houses a multilingual collection of patient educational resources. Patients' language preferences are documented in the EMR to facilitate appropriate services.

The Commonwealth Fund provided a grant to help evaluate the effectiveness of remote simultaneous medical interpreting using a system known as TEMIS (Team/Technology Enhanced Medical Interpreting System) at Bellevue Hospital.<sup>24</sup> This followed a successful trial at the Gouverneur Diagnostic and Treatment Center. Using this technology, physicians and patients wear wireless headsets so that a centrally located interpreter (many of whom are blind or visually handicapped) can interpret the conversation as the participants speak (Exhibit 10). Initial results indicate that this method improves the privacy, speed, reliability, and efficiency of interpretation, thereby reducing linguistic and medical errors and the length of physician visits.<sup>25</sup> Andrew Wallach, M.D., chief of internal medicine at Bellevue Hospital Center, calls TEMIS “the single best tool I’ve ever seen to communicate with [non-English-speaking] patients” because it mimics real-life conversation and permits greater attention to nuances of communication, including body language. Based on this experience, the City Council recently funded an extension of the system to the Kings County Hospital Center and the East New York Diagnostic & Treatment Center in Brooklyn.

### **Exhibit 10. Remote Simultaneous Medical Interpreting**



Source: New York University School of Medicine, Center for Immigrant Health, [www.med.nyu.edu/cih/language/research.html](http://www.med.nyu.edu/cih/language/research.html).

## **Modernizing Facilities to Support Patient-Centered Care**

HHC is undertaking a \$1.3 billion capital campaign to modernize its facilities and realize its goal of creating “state-of-the-art therapeutic environments” that will promote the efficient provision of patient-centered care for all New Yorkers. The following are two examples at the Bellevue Hospital Center.

- Bellevue Hospital opened a \$27 million Critical Care Pavilion in 2003, making it one of the largest and most sophisticated in the United States. It consolidates 40 critical-care beds (encompassing four ICUs) and 16 “step-down” beds on one floor to facilitate the efficient provision of multi-specialty care in one location and ease the transition of patients as their conditions improve. Critical care nurses work at decentralized nursing stations near patient rooms and can cover any of the four units as needed. An overhead delivery system avoids clutter by attaching IV lines and suction and electrical devices to a ceiling-mounted arm that swivels for ease of use. Recognizing that meeting family needs is equally as important as providing good patient care, the ICUs maintain a 24-hour family visitation policy as well as a “family council,” which convenes critical care staff to meet with families and learn how the ICU team can better serve them.
- In 2005, Bellevue opened a new \$115 million Ambulatory Care Pavilion to better meet community demand for services. Architectural and engineering principles support the “open-access” model by maximizing the efficient use of space, minimizing waiting time, and enhancing patient experience (Exhibit 11).

### **Exhibit 11. Facilities Modernization at Bellevue Hospital Center: Ambulatory Care Pavilion and Critical Care Pavilion**

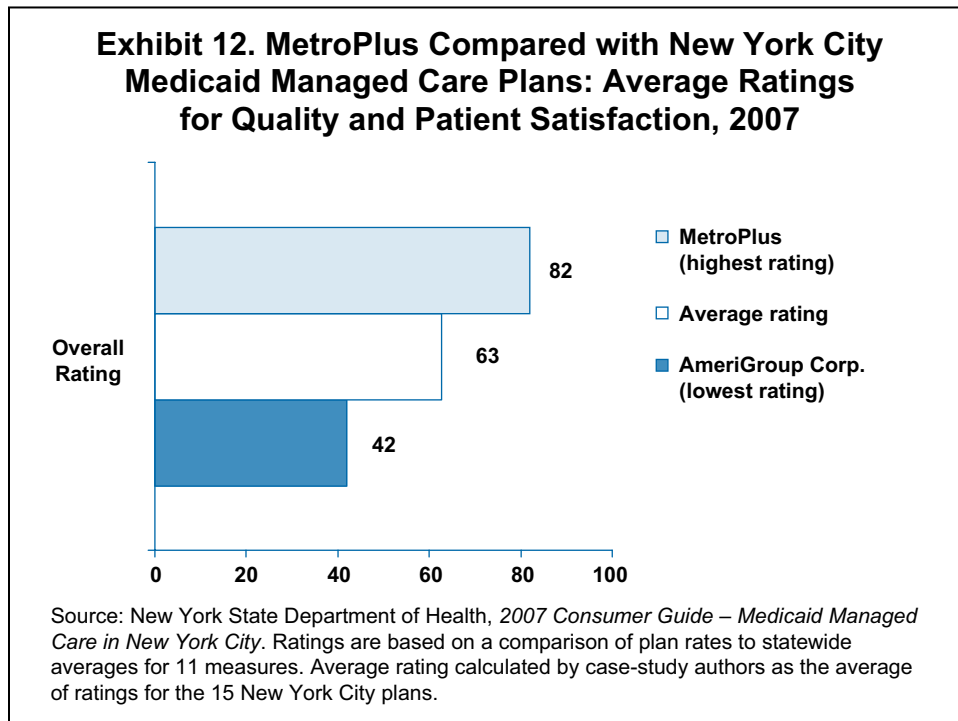


Source: New York City Health and Hospitals Corporation.

## RECOGNITION OF RESULTS

HHC's vitality can be judged by historical comparison. In contrast to the challenges of the 1990s, today HHC enjoys the political support of the mayor and full accreditation of its hospitals, none of which were identified for closure or restructuring by the New York State Commission on Healthcare Facilities for the 21st Century. Notable recent public and professional recognition includes the following:

- In 2005, 2006, and 2007, MetroPlus Health Plan was the highest-scoring New York City Medicaid managed care plan on clinical quality and patient satisfaction measures rated by the New York State Department of Health (Exhibit 12). In 2007, MetroPlus was the only Medicaid managed care plan in New York City to receive three stars for diabetes care and for overall member satisfaction.<sup>26</sup>
- Elmhurst Hospital Center received Magnet Recognition for Nursing Excellence, bestowed by the American Nurses Credentialing Center to less than 3 percent of hospitals in the United States. In 2006, Bellevue Hospital Center's Psychiatry Inpatient Unit team was named the "Best Nursing Unit in the New Jersey/New York Metropolitan Area" by the magazine *Advances for Nurses*—a first for a public hospital.



- The Generations+/Northern Manhattan Health Network received the 2006 Nicholas E. Davies Innovation Award from the Healthcare Information and

Management Systems Society (HIMSS) for innovative use of EMRs to improve health care delivery. The Queens Health Network earned a Davies Award in 2002. Jacobi Medical Center and North Central Bronx Hospital have been listed among the 100 “Most Wired” U.S. hospitals by *Hospitals and Health Networks*.

- CEO Alan Aviles was presented with the 2007 CEO Information Technology Achievement Award by HIMSS and *Modern Healthcare* for his leadership in promoting the strategic use of health information technology. HHC is the only public hospital system in the nation to receive this distinction.
- The Joint Commission honored Sea View Hospital Rehabilitation Center and Home with its 2007 Earnest A. Codman Award for an initiative that reduced the rate of incontinence by half, from 79 percent to 38 percent of facility residents, thereby improving residents’ safety, quality of life, and dignity.
- The Joint Commission and the National Quality Forum recognized HHC’s transparency initiative with the 2008 Eisenberg Award for Innovations in Patient Safety and Quality at the Local Level. The Joint Commission previously honored HHC’s Sea View Hospital Rehabilitation Center and Home with its 2007 Earnest A. Codman Award for an initiative that reduced the rate of incontinence by half, from 79 percent to 38 percent of facility residents, thereby improving residents’ safety, quality of life, and dignity.

## **INSIGHTS AND LESSONS LEARNED**

HHC’s leaders have learned that organizational transformation requires galvanizing champions and addressing organizational culture issues that are an impediment to innovation and risk-taking. The CEO, Alan Aviles, is seeking to reinvent the culture to “find the right balance between competition and collaboration.” On the one hand, this means harnessing the positive energy that comes from competition for recognition, driven by institutional pride of purpose at HHC’s facilities and their academic affiliates. An overemphasis on competition in the past led to a balkanized system where there was little systemwide learning. Countering this tendency requires fostering a sense of collaboration among different parts of the system to share expertise, best practices, and data for collective improvement. In other words, this strategy is about leveraging HHC’s assets and size to make the organizational whole greater than the sum of its parts.

In practical terms, HHC is seeking to inculcate this organizational culture by participating in and sponsoring structured collaborative initiatives centered on disease management and patient safety—areas in which professionals share a common interest in

improving patient care. HHC's "activist agenda" tends to attract professionals who share its vision for serving society's most vulnerable. Participation in collaborative initiatives provides a mechanism to develop and leverage human talent and commitment in a way that accelerates performance improvement across the system. As a result of their participation in these efforts, medical school faculty who practice at HHC have become leaders in advancing the medical school curriculum to incorporate such practices.

HHC's foray into collaborative improvement projects earlier in the decade pointed out the importance of information technology as an enabling tool for performance improvement, as described in an earlier case study by Thomas Bodenheimer.<sup>27</sup> Because of limitations in HHC's information system at that time, improvement teams initially had to manually enter data into disease registries to track diabetes patients. In response, HHC's leaders rapidly improved its capability to generate electronic registries and performance feedback directly from the EMR system. HHC continues to enhance and make strategic use of its clinical information system to drive change and increase the reliability of care in multiple ways, such as by automating preventive care reminders and providing clinicians with guideline-based decision support tools.

To make collaborative improvement work, HHC's leaders at all levels must act as champions in support of workforce teams as they make rapid-cycle changes, and they must engage frontline clinical staff to share their experience in developing better practices and finding solutions to common challenges. In doing so, managers have learned that making staff-driven improvements in operations and clinical care has led to a more patient-centered approach to care across the organization's broad service network. Moreover, clinician leaders have come to appreciate that multidisciplinary, team-based care is the only practical way to provide the intensified level of services needed to successfully help patients manage a chronic disease, for example.

Alignment of financial incentives and management strategy also have been key to HHC's operational success. This has included enrolling more of its vulnerable population in public coverage, expanding its relationships with community providers, and focusing managed care contracting on fully capitated plans. These tactics allow HHC to align its strategy and capture more revenue to fund improvements that sustain and expand the organization's mission. To avoid past pendulum swings in which corporate strategy alternately emphasized either centralization or decentralization of control, HHC's leaders are seeking a balance: while giving individual facilities an appropriate level of management autonomy to meet local needs, they are also identifying opportunities for consolidating services and insisting on local buy-in to systemwide strategic objectives.

HHC's success also speaks to the commitment of current Mayor Michael Bloomberg and other civic leaders to finance the safety net and improve public health in New York City during a time of relative economic prosperity. Because of this political and economic support, "HHC seems to be doing far better now than could have been imagined in the past," says Howard Berliner, Ph.D., a professor of health services management and policy at The New School. New York State has relatively generous funding for Medicaid, compared with other states, plus coverage expansion programs for low-income families not eligible for Medicaid, which has helped make the environment more conducive to introducing transformative change, although certainly not ensuring its success. HHC's own history testifies to the challenges of successfully managing a large public system. Securing adequate resources is critical, but they must be accompanied by accountability, leadership, agreement, and motivation to achieve a commonly held mission.

Like other public hospital systems, HHC faces future financial challenges because of the uncertain economic environment for the nation's safety net. The corporation ended fiscal 2006 with a \$1.6 billion loss on operations, the result of a one-time recording of all prior-year obligations related to retiree health insurance of \$2.4 billion; otherwise, it would have recorded net operational income in excess of \$600 million. In fiscal 2007, HHC recorded net operating income of \$427 million. These positive results are not expected to continue, as they were largely dependent on large retroactive supplemental Medicaid payments that will not recur. In addition, changes to federal Medicaid rules promulgated by the Bush administration (currently under judicial and legislative review) threaten to reduce current-year payments dramatically. These fiscal challenges will be exacerbated by state and city budget constraints.

The quality improvement results achieved by HHC to date are impressive, but by no means do they represent attainment of perfection. The recent death of a patient in the waiting room of HHC's King County Hospital psychiatric ER, for example, points to the need for continued diligence to prevent lapses in quality and patient safety in HHC facilities.<sup>28</sup> Relative success implied by outperforming the Medicaid average still leaves much opportunity to raise the bar on performance. While there is no excuse for suboptimal quality, HHC's experience should also be understood in the context of social risk factors affecting a predominantly poor population, and the consequent challenges to successful care provision—such as lack of telephone service, or frequent moves that can make care continuity and follow-up difficult. HHC is demonstrating signs of progress in addressing such barriers through innovation and collaboration with both colleagues and patients, and sometimes through sheer diligence, such as making repeated attempts to contact patients about abnormal test results.

The challenge facing HHC—and other organizations—is to make performance gains permanent by “hardwiring” the learning from individual projects and initiatives into the way that the organization routinely does business. Those who are leading performance improvement at HHC, such as Eric Manheimer, M.D., network director at Bellevue Hospital Center, say that continued progress will require deepening levels of teamwork, developing more sophisticated data systems, and evaluating progress to ensure that changes really are producing the intended results.

In this regard, transparency is an essential component of the care improvement process, not only to help patients make informed decisions about their care, but also to foster honesty and awareness regarding performance and the need for improvement. Sustaining improvement requires leadership diligence and measurement verification to overcome the human tendency to revert back to former behaviors. For example, the Bellevue Hospital Center’s ICU director conducts random weekly audits to check compliance with evidence-based practices and educate new team members on system principles as needed. Revealing “the bad with the good” encourages team members to innovate to continuously improve performance, Aviles says.

## **CONCLUSION**

HHC’s experience shows that public safety-net delivery systems need not be considered the “provider of last resort” and that providing broad access to care is not at odds with providing high-quality care. Because of its ongoing transformation and improving levels of performance, HHC is increasingly a “provider of choice” for the people of New York City, an organization where concern for clinical quality and the patient experience go hand in hand with a commitment to serving those in need. Sustaining and building on these recent improvements will require continued organizational and civic leadership to ensure the management and financial support necessary for higher performance.

## APPENDIX A. MAJOR HHC FACILITIES AND AFFILIATIONS

### HOSPITALS

Bellevue Hospital Center  
Coney Island Hospital  
Elmhurst Hospital Center  
Harlem Hospital Center  
Jacobi Medical Center  
Kings County Hospital Center  
Lincoln Medical & Mental Health Center  
Metropolitan Hospital Center  
North Central Bronx Hospital  
Queens Hospital Center  
Woodhull Medical & Mental Health Center

### AFFILIATIONS

New York University School of Medicine  
University Group Medical Associates, P.C.  
Mount Sinai School of Medicine  
Columbia University, Health Services,  
College of Physicians & Surgeons  
New York Medical Alliance, P.C.  
SUNY Downstate  
Downtown Bronx Medical Associates, P.C.  
New York Medical College  
New York Medical Alliance, P.C.  
Mount Sinai School of Medicine  
Medical Associates of Woodhull, P.C.

### DIAGNOSTIC & TREATMENT CENTERS (FAMILY HEALTH CLINICS)

Cumberland  
East New York  
Gouverneur Healthcare Services  
Morrisania  
Renaissance Health Care Network  
Segundo Ruiz Belvis  
Medical Associates of Woodhull, P.C.

SUNY Downstate  
New York University School of Medicine  
New York Medical College  
Columbia University, Health Services,  
College of Physicians & Surgeons  
New York Medical College

### LONG-TERM CARE FACILITIES

Coler Goldwater Specialty Hospital  
& Nursing Facility  
Dr. Susan Smith McKinney Nursing  
& Rehabilitation Center  
Gouverneur Healthcare Services

Sea View Hospital and Rehabilitation  
Center & Home  
Roosevelt Island Medical Associates, P.C.  
SUNY Downstate  
Roosevelt Island Medical Associates, P.C.  
Staten Island University Hospital

Source: New York City Health and Hospitals Corporation.



## APPENDIX B. HHC REGIONAL NETWORKS

The **Central Brooklyn Health Network** is comprised of: an acute care facility, Kings County Hospital Center; a diagnostic and treatment center, East New York Diagnostic & Treatment Center; a long-term care facility, Dr. Susan Smith McKinney Nursing & Rehabilitation Center; and six extension clinics.

The **North Brooklyn Health Network** is comprised of: an acute care facility, Woodhull Medical and Mental Health Center; a diagnostic and treatment center, Cumberland Diagnostic & Treatment Center; 12 extension clinics; and one school-based program.

The **Generations+/Northern Manhattan Health Network** is comprised of: three acute care facilities, Harlem Hospital Center, Lincoln Medical & Mental Health Center, and Metropolitan Hospital Center; three diagnostic and treatment centers, Renaissance Health Care Network, Morrisania, and Segundo Ruiz Belvis Diagnostic & Treatment Centers; 20 extension clinics; and 15 school-based programs.

The **North Bronx Health Network** is comprised of: two acute care facilities, Jacobi Medical Center and North Central Bronx Hospital; and four extension clinics.

The **Queens Health Network** is comprised of: two acute care facilities, Elmhurst Hospital Center and Queens Hospital Center; 15 extension clinics; and five school-based programs.

The **Southern Manhattan Healthcare Network** is comprised of: an acute care facility, Bellevue Hospital Center; one diagnostic and treatment center/long-term care facility, Gouverneur Healthcare Services; one long-term care facility, Coler-Goldwater Specialty Hospital & Nursing Facility; eight extension clinics; and one school-based program.

The **Southern Brooklyn/Staten Island Health Network** is comprised of: an acute care facility, Coney Island Hospital; one long-term care facility, Sea View Hospital Rehabilitation Center & Home; six extension clinics; and four school-based programs.

Source: New York City Health and Hospitals Corporation.

## NOTES

- <sup>1</sup> Information on HHC was synthesized from telephone interviews with or presentations by the individuals noted in the Acknowledgments section and from a review of The Commonwealth Fund grant reports, HHC community reports, president's remarks, and other documents on the HHC Web site ([www.nyc.gov/hhc](http://www.nyc.gov/hhc)). Other sources are noted below.
- <sup>2</sup> Institute of Medicine Committee on the Changing Market, Managed Care, and the Future Viability of Safety Net Providers, *America's Health Care Safety Net: Intact but Endangered*, ed. M. E. Lewin and S. A. Altman (Washington, D.C.: National Academy Press, 2000).
- <sup>3</sup> Background on HHC's history was obtained in part from E. Ginzberg, H. Berliner, and M. Ostow, *Improving Health Care of the Poor: The New York City Experience* (Transaction Publishers, 1997); and R. Halasz, "Company History: New York City Health and Hospitals Corporation," *International Directory of Company Histories* (St. James Press, 2004); with additional information provided by interviewees.
- <sup>4</sup> B. Lambert, "A Time of Trauma for Hospital Agency," *New York Times*, Aug. 16, 1987; L. Belkin, "Hospitals Ravaged by Cuts, Report Says," *New York Times*, Oct. 22, 1991.
- <sup>5</sup> A. Mitchell, "New York City Picks 3 Hospitals Intended for Private Management," *New York Times*, Mar. 12, 1994; E. Rosenthal, "A Mayoral Panel Urges Dismantling of City Hospitals," *New York Times*, Aug. 16, 1995; A. Finder, "Court Deals Blow to Giuliani's Hospital Privatization Plan," *New York Times*, Mar. 31, 1999.
- <sup>6</sup> Of the 16 HHC board members, the mayor essentially appoints 15, including five nominated by the New York City Council (one representing each of New York City's five boroughs) and five city officials who serve ex officio (currently the commissioner of the Department for the Aging, commissioner of Human Resources Administration, commissioner of the Department of Health & Mental Hygiene, executive deputy commissioner of the Division of Mental Hygiene, and deputy mayor for Health & Human Services). The board appoints the HHC president, subject to the mayor's concurrence.
- <sup>7</sup> G. Almond, M. Barrameda, V. Bekker et al., "Generations+/Northern Manhattan Health Network," *HIMSS Davies Organizational Award Recipient Manuscript*, [www.himss.org/ASP/davies\\_organizational.asp](http://www.himss.org/ASP/davies_organizational.asp).
- <sup>8</sup> D. M. Carr, "Queens Health Network Healthcare Information System Model: A Model for Electronic Physician Order Entry," *HIMSS Davies Organizational Award Recipient Manuscript*, [www.himss.org/ASP/davies\\_organizational.asp](http://www.himss.org/ASP/davies_organizational.asp).
- <sup>9</sup> C. A. Igboechi, C. L. Ng, C. S. Yang et al., "Impact of Computerized Prescriber Order Entry on Medication Errors at an Acute Tertiary Care Hospital," *Hospital Pharmacy*, Mar. 2003 38(3):227–31.
- <sup>10</sup> Almond, Barrameda, Bekker et al., *Davies Award Manuscript*.
- <sup>11</sup> [Comparing Diabetes Care Management Models to Improve Primary Care Access](#), Commonwealth Fund grant #20050172, Rand David, M.D., and Debra Brennessel, M.D., principal investigators.

- <sup>12</sup> The Commonwealth Fund, “Asthma Buddy May Help Kids Breathe Easier, Stay in School,” *The Commonwealth Fund Quarterly*, Fall 2003.
- <sup>13</sup> [Improving Asthma Management for Children in New York City: Evaluation of the Asthma Buddy Program](#), Commonwealth Fund grant #20040160, Arnold Saperstein, M.D., principal investigator.
- <sup>14</sup> [Using Emergency Department Coordinators to Link Adults to Primary Care Clinics](#), Commonwealth Fund grant #20040868, Robert Hessler, M.D., Ph.D., principal investigator.
- <sup>15</sup> This experience is documented by Thomas Bodenheimer, M.D., in *Innovative Chronic Care Programs in Public Hospitals and Health Systems* (Washington, D.C.: National Association of Public Hospitals and Health Systems, May 2005), and by Karen Scott Collins, M.D., M.P.H., former HHC deputy chief medical officer, in *Profiles in Improvement: Karen Scott Collins of New York City Health and Hospitals Corporation* (Boston: Institute for Healthcare Improvement, undated audio, [www.ihl.org](http://www.ihl.org)).
- <sup>16</sup> This intervention was modeled after a process developed at Johns Hopkins Hospital. See P. Pronovost, S. Berenholtz, T. Dorman et al., “Improving Communication in the ICU Using Daily Goals,” *Journal of Critical Care*, June 2003 18(2):71–75. Hospital leaders noted that a widely read magazine article by Boston surgeon and author Atul Gawande was influential in convincing local physicians to adopt this intervention (A. Gawande, “The Checklist,” *The New Yorker*, Dec. 10, 2007, 83(39):86).
- <sup>17</sup> Agency for Healthcare Research and Quality, *Hospital Survey on Patient Safety Culture*, <http://www.ahrq.gov/qual/hospculture>. HHC received responses from 44 percent of its employees in the first year and 63 percent of employees in the second year that it conducted the survey.
- <sup>18</sup> Almond, Barrameda, Bekker et al., *Davies Award Manuscript*.
- <sup>19</sup> J. I. Boufford, L. Gage, K. W. Kizer et al., [New Approaches to Academic Health Center Affiliations: Public Hospitals and the Department of Veterans Affairs](#) (New York: The Commonwealth Fund, 1999).
- <sup>20</sup> A. Saperstein, *MetroPlus Health Plan Quality Improvement Initiatives*, presentation at the United Hospital Fund Quality Strategies/Quality Programs Conference, Jul. 17, 2007; *Driving Quality Through Incentives in a Municipal Hospital System*, presentation at the Quality Colloquium, Aug. 20, 2007.
- <sup>21</sup> For additional information on this topic, see I. A. Singer and M. Regenstein, *Advanced Access: Ambulatory Care Redesign and the Nation’s Safety Net* (Washington, D.C.: National Association of Public Hospitals and Health Systems, Dec. 2003).
- <sup>22</sup> M. Krauskopf, *Hospital Based Screening Navigation: Launching the NYC Navigator Network*, presentation at the New York Citywide Colon Cancer Control Coalition Summit, New York City Department of Health and Mental Hygiene, June 5, 2008. Building on HHC’s experience, patient navigators are being deployed in other New York City voluntary hospitals with centralized training and logistical support from the Department of Health and Mental Hygiene.

- <sup>23</sup> D. Nash, S. Azeez, D. Vlahov et al., “Evaluation of an Intervention to Increase Screening Colonoscopy in an Urban Public Hospital Setting,” *Journal of Urban Health*, March 2006 83(2):231–43.
- <sup>24</sup> [\*Evaluation of Remote Simultaneous Interpreting, Phase One\*](#), and [\*Remote Simultaneous Medical Interpreting: Assessing Medical Outcomes, Phase Two\*](#), Commonwealth Fund grants #20020109 and #20040414, Francesca Gany, M.D., M.S., principal investigator.
- <sup>25</sup> F. Gany, L. Kapelusznik, K. Prakash et al., “[The Impact of Medical Interpretation Method on Time and Errors](#),” *Journal of General Internal Medicine* Nov. 2007, 22 Suppl 2:319–23; F. Gany, J. Leng, E. Shapiro et al., “[Patient Satisfaction with Different Interpreting Methods: A Randomized Controlled Trial](#),” *Journal of General Internal Medicine* Nov. 2007, 22 Suppl 2:312–18.
- <sup>26</sup> New York State Department of Health, *A Consumer’s Guide to Medicaid Managed Care in New York City* (Albany: State of New York, 2008).
- <sup>27</sup> Bodenheimer, *Innovative Chronic Care Programs in Public Hospitals and Health Systems*.
- <sup>28</sup> A. Hartocollis, “Video of Dying Mental Patient Being Ignored Spurs Changes at Brooklyn Hospital,” *New York Times*, July 2, 2008. The New York State Mental Hygiene Legal Service and the New York Civil Liberties Union had previously sued the hospital over alleged deficiencies in its psychiatric center, according to news accounts (Associated Press, July 1, 2008). In response, hospital officials have agreed to take improvement actions, including increasing staff and reducing waiting time in the ER, training staff on crisis prevention, and checking on patients in the waiting room every 15 minutes (HHC Press Release, July 1, 2008).

## RELATED PUBLICATIONS

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