

Chapter 6. Care Coordination

Health care in the United States is often fragmented. Clinical services are frequently organized around small groups of providers functioning autonomously and specializing in specific symptoms or organ systems. Therefore, many patients receive attention only for individual health conditions rather than receiving coordinated care for their overall health. For example, the typical Medicare beneficiary sees two primary care providers and five specialists each year.¹ Communication of important information among providers and between providers and patients may entail delays or inaccuracies or fail to occur at all.

Care coordination is a conscious effort to ensure that all key information needed to make clinical decisions is available to patients and providers. It is defined as the deliberate organization of patient care activities between two or more participants involved in a patient's care to facilitate appropriate delivery of health care services.² It is multidimensional and essential to preventing adverse events, ensuring efficiency, and making care patient centered.³ Patients in greatest need of care coordination include those with multiple chronic medical conditions, concurrent care from several health professionals, or many medications and patients undergoing extensive diagnostic workups or transitions from one setting of care to another. Effective care coordination requires well-defined multidisciplinary teamwork principled on the notion that all who interact with a patient must work together to ensure the delivery of safe, high-quality care.

Importance

Morbidity and Mortality

- Care coordination interventions have been shown to:
 - Reduce mortality among patients with heart failure.
 - Reduce mortality and dependency among patients with stroke.
 - Reduce symptoms among patients with depression and at the end of life.
 - Improve glycemic control among patients with diabetes.²

Cost

- Care coordination interventions have been shown to:
 - Reduce hospitalizations among patients with heart failure.
 - Reduce readmissions among patients with mental health conditions.
 - Be cost-effective when applied to treatment of depression.²

Measures

The National Priorities Partnership (NPP) identified care coordination as one of six national priorities for health care.⁴ The vision is health care that “guides patients and families through their healthcare experience,

Care Coordination

while respecting patient choice, offering physical and psychological supports, and encouraging strong relationships between patients and the healthcare professionals accountable for their care.” While measurement of care coordination is at an early stage in development, key goals include: coordinating transitions of care, reducing hospital readmissions, communicating medication information, and reducing preventable emergency department visits.

Measures reported in this chapter are organized around these NPP goals:

- Transitions of care
 - Adequate hospital discharge information.
- Hospital readmissions
 - Readmissions for congestive heart failure.
- Medication information
 - Provider asks about medications from other doctors.
 - Hospital electronic exchange of medication history.
- Preventable emergency department visits
 - Emergency department visits for asthma.

In addition, this chapter presents information from the National Survey of Children’s Health on effective care coordination and having a medical home.

Findings

Transitions of Care

Management: Complete Written Discharge Instructions

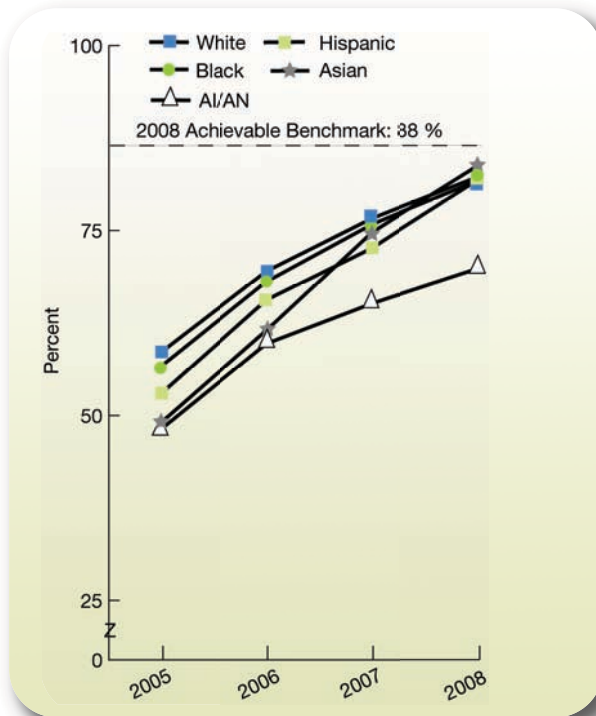
As health care conditions and needs change, patients often need to move from one setting to another. These transitions of care place patients at heightened risk of adverse events. Important information may be lost or miscommunicated as responsibility is delivered to new parties.

Effective care coordination begins with ensuring that accurate clinical information is available to support medical decisions by patients and providers. A common transition of care is discharge from the hospital. Giving patients and caregivers self-management support after discharge has been shown to reduce readmissions to the hospital and lower costs.⁵

Discharge from a hospital typically indicates improvement in a patient’s condition so that the patient no longer requires inpatient care. It also means that the patient and family must resume responsibility for the patient’s daily activities, diet, medications, and other treatments. The patient also needs to visit his or her personal doctor and know what to do if his or her condition deteriorates. Written discharge instructions are critical to help ensure that a patient receives the information needed to stay healthy after leaving the hospital.

Care Coordination

Figure 6.1. Hospitalized adult patients with heart failure who were given complete written discharge instructions, by race/ethnicity, 2005-2008



Key: AI/AN = American Indian or Alaska Native.

Source: Centers for Medicare & Medicaid Services, Quality Improvement Organization Program, 2005-2008.

Denominator: Hospitalized adult patients with a principal discharge diagnosis of heart failure.

Note: Complete written discharge instructions needed to address all of the following: activity level, diet, discharge medications, followup appointment, weight monitoring, and actions to take if symptoms worsen.

- From 2005 to 2008, the percentage of hospitalized adult patients with heart failure who were given complete written discharge instructions improved from 57.5% to 82.0% (data not shown).
- Improvements were observed among all racial and ethnic groups (Figure 6.1).
- In all years, American Indians and Alaska Natives were less likely to receive complete written discharge instructions compared with Whites. In 2005 and 2006, Asians and Hispanics were also less likely to receive written instructions than Whites, but these disparities were eliminated by 2008.
- The 2008 top 5 State benchmark was 88%.ⁱ At the current 12% annual rate of increase, this benchmark could be attained overall and by most racial and ethnic groups in less than a year. American Indians and Alaska Natives would require almost 3 years to reach the benchmark.

Also, in the NHQR:

- Significant differences in receipt of written instructions by sex were not observed.

ⁱ The top 5 States that contributed to the achievable benchmark are Colorado, Delaware, New Hampshire, New Jersey, and Utah.

Care Coordination

Hospital Readmissions

Outcome: Readmissions for Congestive Heart Failure

After discharge from the hospital for a chronic condition such as congestive heart failure (CHF), many patients will be rehospitalized. Rehospitalization signals a worsened state of illness and may reflect care that is not optimally coordinated. Rehospitalization also has significant cost implications since it is much more resource intensive than outpatient treatment.

Although not all rehospitalizations for CHF can be prevented, the risk of rehospitalization may increase when patients do not follow their discharge instructions. After discharge, patients need to take their medications regularly, adhere to recommendations related to diet and activity, monitor their weight, and look for signs and symptoms that their CHF is not under good control. When patients do not receive written discharge instructions that they understand, they may be less able to follow them. In addition, postdischarge care should be coordinated with patients' primary care physicians. Patients will need to arrange followup visits with their primary care physician, who can adjust medications early to help prevent rehospitalization.

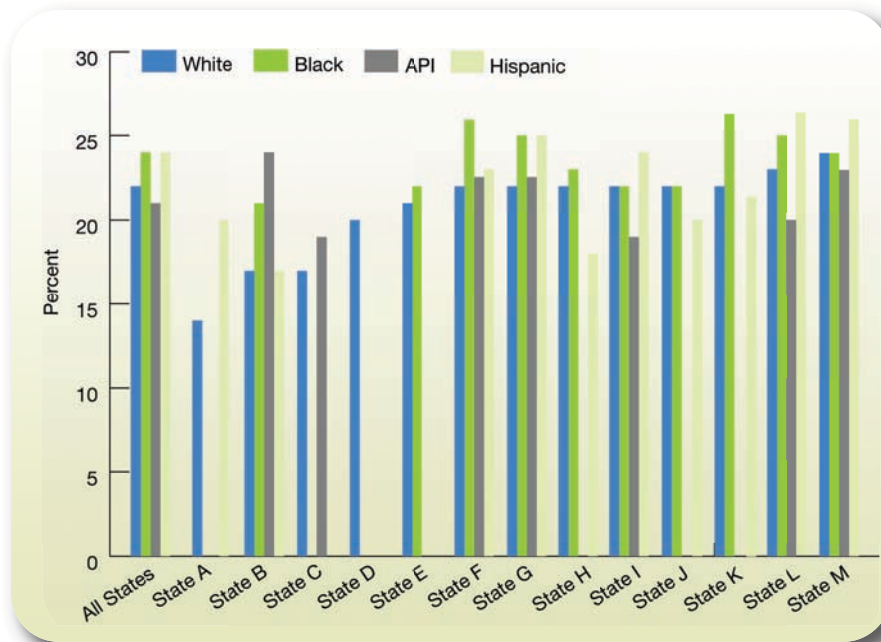
The estimates below are derived from data for 13 States participating in the Healthcare Cost and Utilization Project (HCUP) State Inpatient Databases that include data on race and ethnicity. They are based on all CHF admissions from January 1 to November 30, 2007. Rehospitalizations are defined as admissions to any hospital in that State with any principal or secondary diagnosis of CHF within 30 days of the discharge date of an index CHF admission.

In previous years, we reported on readmissions with a principal diagnosis of CHF only, so comparisons with previous reports would not be appropriate. It is also important to note that the figures reported below are not national estimates. The States in the analysis account for about one-third of all adult discharges for CHF in the Nation and may provide an indication of patterns in CHF readmissions.

Costs of CHF rehospitalizations were also examined. Total hospital charges were converted to costs using HCUP cost-to-charge ratios based on hospital accounting reports from the Centers for Medicare & Medicaid Services. Cost estimates refer to hospital costs and do not include costs of physician services. In these 15 States, the average cost per CHF readmission was almost \$13,000 and the total cost was more than \$880 million.



Figure 6.2. Rehospitalization for congestive heart failure, by race/ethnicity and State, 13 States, 2007



Key: API = Asian or Pacific Islander.

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, State Inpatient Databases, 2007.

Denominator: Patients hospitalized for congestive heart failure.

Note: Some States had insufficient data for this analysis for Blacks, APIs, and Hispanics.

- The percentage of State-level CHF hospitalizations resulting in rehospitalization for CHF ranged from a low of 14% to a high of 24% (see NHQR).
- Aggregating over all States, Blacks had higher rehospitalization rates than Whites (Figure 6.2). This was also observed in States B, F, G, and K.
- Aggregating over all States, no statistically significant differences were observed between APIs and Whites or between Hispanics and Whites. However, Hispanics had higher rates than Whites in States A, G, I, and L, and APIs had a higher rate in State B.

Also, in the NHQR:

- Overall, rehospitalization rates did not vary by age. Rates were higher among patients ages 18-64 compared with patients age 65 and over in one State, but the reverse was true in two other States.

Medication Information

Patients often seek care from many providers, and different providers may prescribe medications for the same patient. Patients are responsible for keeping track of all their medications, but medication information can be confusing, especially for patients on multiple medications. When care is not well coordinated and each provider is not aware of all the medications a patient is taking, patients are at greater risk for adverse drug interactions and adverse events related to overdosing or underdosing. In addition, providers need to

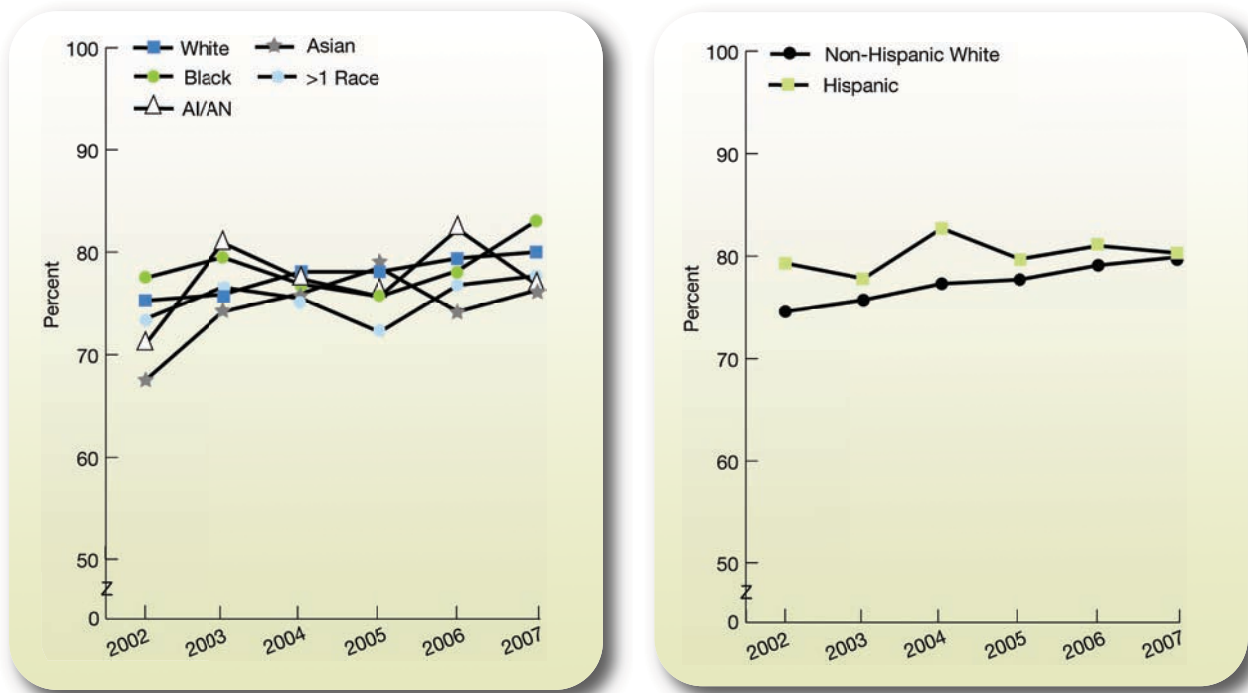
Care Coordination

periodically review all of a patient’s medications to ensure that they are taking what is needed and only what is needed. Medication reconciliation has been shown to reduce both medication errors and adverse drug events.⁶

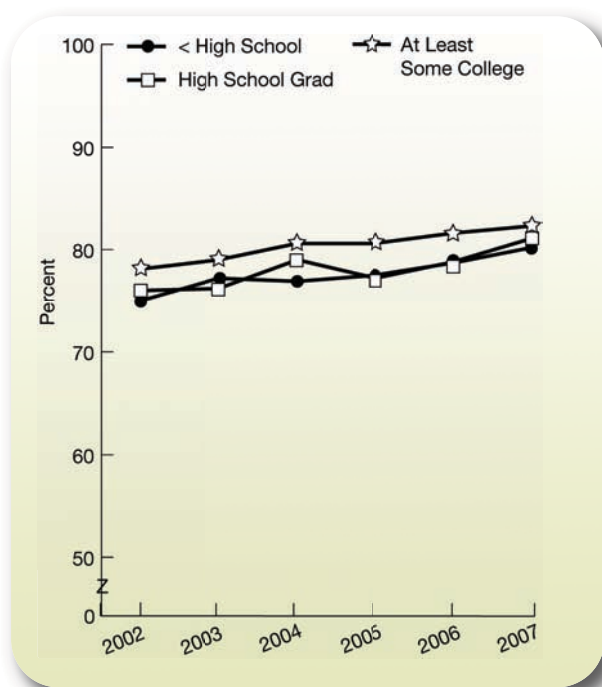
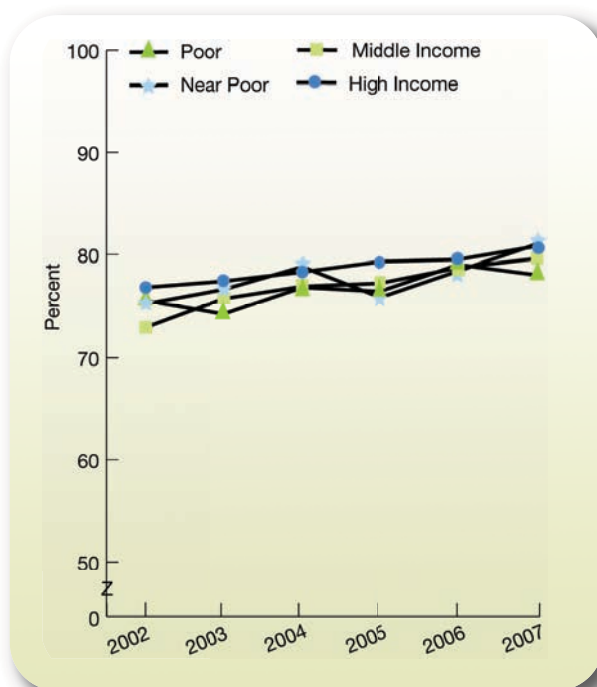
Management: Provider Asks About Medications From Other Doctors

Medication information generated in different settings may not be sent to a patient’s primary care provider. In the absence of communication from other providers, the patient is the primary source of medication information. Actively gathering and managing all of a patient’s medical information is an important part of care coordination.

Figure 6.3. People with a usual source of care whose health provider usually asks about prescription medications and treatments from other doctors, by race, ethnicity, income, and education, United States, 2002-2007



Care Coordination



Key: AI/AN = American Indian or Alaska Native.

Source: Agency for Healthcare Research and Quality, Center for Financing, Access, and Cost Trends, Medical Expenditure Panel Survey, 2002-2007.

Denominator: Civilian noninstitutionalized population who report a usual source of care.

- From 2002 to 2007, the percentage of people with a usual source of care whose health provider usually asked about prescription medications and treatments from other doctors improved from 75% to 80% (see NHQR).
- Improvements were observed among all racial, ethnic, income, and education groups (Figure 6.3).
- Consistent disparities related to race, ethnicity, or income were not observed. In most years, providers of people with less than a high school education were less likely to ask about medication from other doctors compared with providers of people with at least some college education.

Also, in the NHQR:

- In most years, health providers of children and older adults were less likely to ask about medications from other doctors.

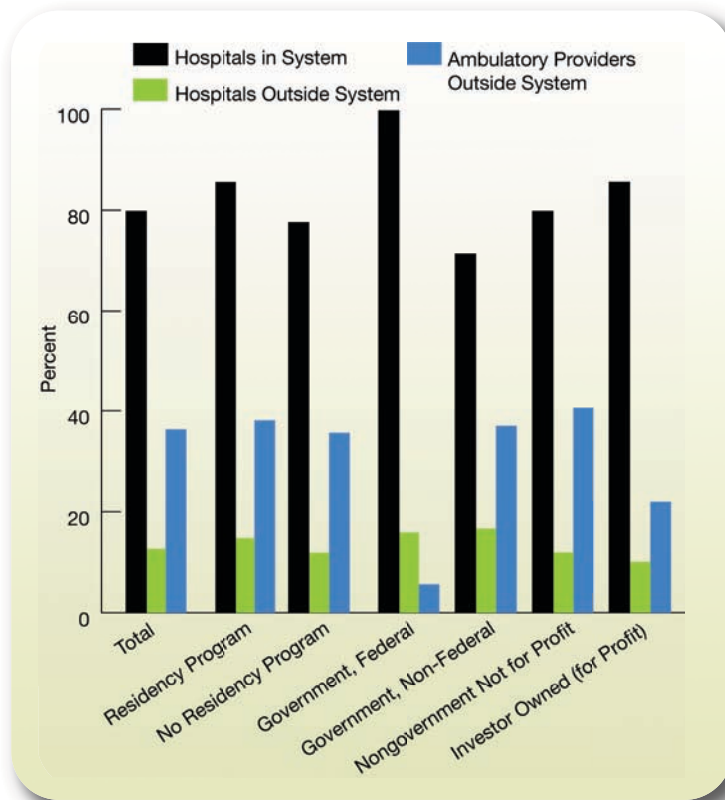
Structure: Electronic Exchange of Medication Information

Ideally, information about medications prescribed for a patient by one provider would be available to all providers taking care of that patient. One way to exchange this information efficiently is to build this function into health information technologies. The American Hospital Association recently surveyed hospitals about their use of health information technologies. Questions about whether a hospital electronically exchanged patient information on medication history with other providers were included and 1,963 hospitals responded.

Care Coordination

Data are shown by teaching status and ownership of the hospitals. Teaching hospitals and public hospitals provide a disproportionate share of care to low-income and minority patients.

Figure 6.4. Hospitals with electronic exchange of patient information on medication history, by teaching status and ownership, 2008



Source: American Hospital Association Annual Survey Information Technology Supplement, 2008.

- Overall, 80% of hospitals electronically exchanged patient information on medication history with other hospitals in their system, 13% exchanged information with hospitals outside their system, and 36% exchanged information with ambulatory providers outside their system (Figure 6.4).
- Hospitals with residency programs were more likely than non-teaching hospitals to exchange information with hospitals in their system.
- Federal hospitals were most likely to exchange information with hospitals in their system and least likely to exchange information with ambulatory providers outside their system.

Also, in the NHQR:

- Hospitals outside of metropolitan areas were less likely than metropolitan hospitals to exchange information with hospitals in their system but more likely to exchange information with hospitals outside their system. Hospitals with <100 or 100-399 beds were less likely than large hospitals to exchange information with hospitals in their system.

Preventable Emergency Department Visits

Potentially preventable, high-cost encounters with the medical system occur not only in hospitals, but also in emergency departments (EDs). There were more than 125 million ED encounters in 2008.⁷ ED crowding, boarding (i.e., holding patients until an inpatient bed is available), and ambulance diversion have become more prevalent and have given rise to increasing concerns about the quality of care delivered in EDs.

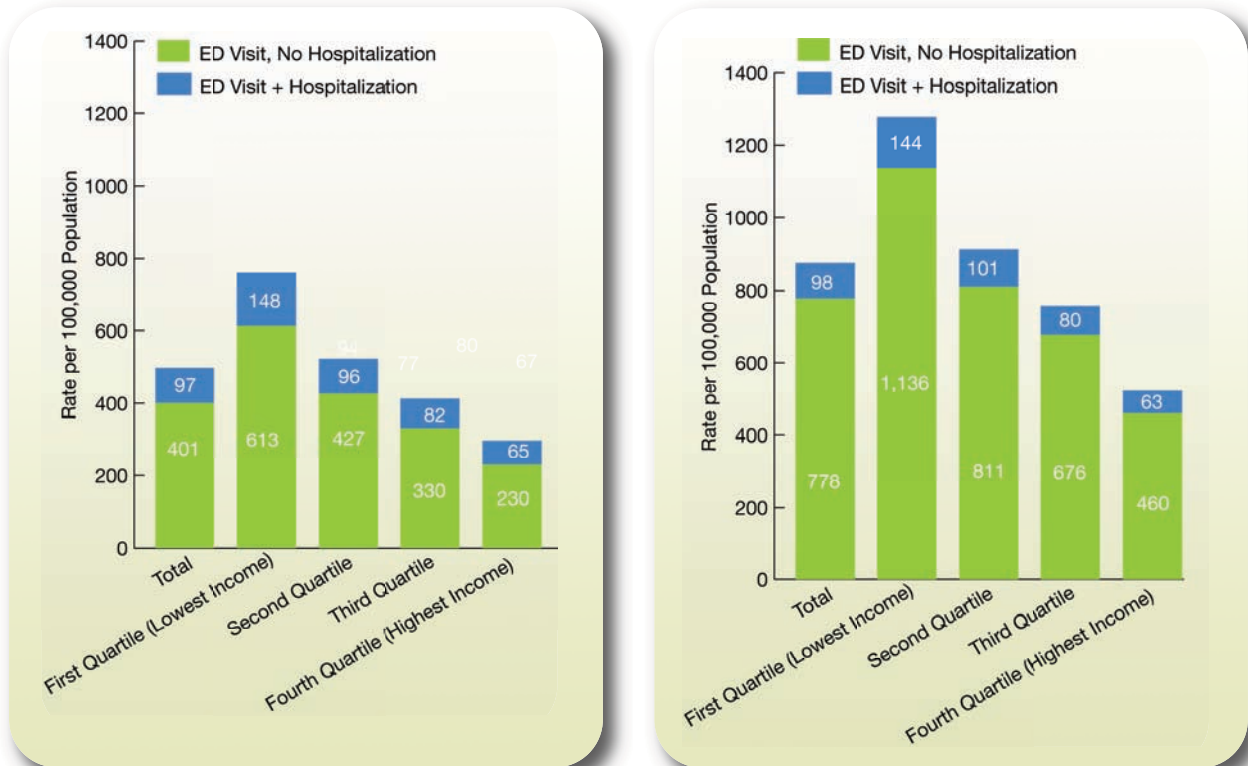
Some hospitalizations and ED encounters cannot be avoided, but appropriate ambulatory care can help keep some patients from having to visit an ED or from being hospitalized. Reducing potentially avoidable ED encounters, in particular, holds promise for reducing cost, improving quality, and enhancing efficiency.

Outcome: Emergency Department Visits for Asthma

Asthma is an ambulatory care-sensitive condition. Patients typically need to avoid environmental conditions that exacerbate their asthma, take their medications regularly, and monitor their symptoms. Good primary care can help patients with self-management and treatment adjustments before exacerbations of asthma become severe and require emergent attention. For this analysis, the adult and pediatric asthma measures from the AHRQ Pediatric Quality Indicator (PQI) software were applied to the 2007 HCUP Nationwide Emergency Department Sample (NEDS). Results related to area income are presented. While other studies have demonstrated higher ED visits for asthma among Blacks and Hispanics, the NEDS does not support analyses of race/ethnicity at this time.

Care Coordination

Figure 6.5. Potentially avoidable emergency department encounters for asthma among adults (left) and children (right), by area income, 2007



Key: ED = emergency department.

Source: Agency for Healthcare Research and Quality, Healthcare Cost and Utilization Project, Nationwide Emergency Department Sample, 2007.

Denominator: U.S. population.

Note: Annual rates are adjusted for age and gender.

- Overall, the rate of ED visits for asthma was 498 per 100,000 among adults (Figure 6.5). About 20% of ED visits for asthma among adults led to hospitalization (97 per 100,000) and 80% had other dispositions (401 per 100,000).
- Compared with adult residents of high-income neighborhoods, residents of all other income quartiles had higher rates of both ED visits for asthma that led to hospitalization and ED visits that did not end in hospitalization.
- Overall, the rate of ED visits for asthma was 876 per 100,000 among children, considerably higher than the adult rate. Only about 11% of ED visits for asthma among children led to hospitalization and 89% had other dispositions.
- Compared with children living in high-income neighborhoods, children living in the lower three income quartiles had higher rates of both ED visits for asthma that led to hospitalization and visits that did not end in hospitalization.

Also, in the NHQR:

- Compared with adult residents of large fringe metropolitan counties, residents of micropolitan and noncore counties had lower rates of ED visits for asthma that led to hospitalization and higher rates of visits that did not end in hospitalization, suggesting a different pattern of use of EDs in these areas.
- There were few significant differences in ED visits for asthma among children across urban-rural locations.

Focus on Care Coordination for Children

Children often have unique care coordination needs. Some children have or are at increased risk for chronic physical, developmental, behavioral, or emotional conditions. They may need services not only from medical specialists, but also from other therapists (e.g., nutritionists, occupational therapists, mental health care providers) and educational specialists. Therefore, appropriate and timely coordination of care across multiple providers may be particularly important during childhood.

Previously, the reports have presented information about care coordination for children using data from the National Surveys of Children With Special Health Care Needs. This year, we show information from the 2007 National Survey of Children's Health. This survey was sponsored by the Maternal and Child Health Bureau of the Health Resources and Services Administration and conducted by the National Center for Health Statistics of the Centers for Disease Control and Prevention. It collected information by telephone on more than 90,000 children under age 18, about 1,700 per State.

Two measures related to care coordination are presented here. One measure focuses on families who needed extra help arranging or coordinating a child's health care with two or more providers. Families that reported that they usually or always got as much help as needed in arranging or coordinating the child's health care were considered to have effective care coordination.

The second measure focuses on the medical home. The patient-centered medical home is one approach to organizing care around a person and helping each person stay as healthy as possible. A key characteristic of a medical home is a personal physician leading a team of health care professionals. These professionals collectively take responsibility for providing all the services that a patient needs or arranging for and coordinating care provided by others. In addition to coordinating care, medical homes provide care that is accessible, family centered, continuous, comprehensive, compassionate, and culturally effective.⁸

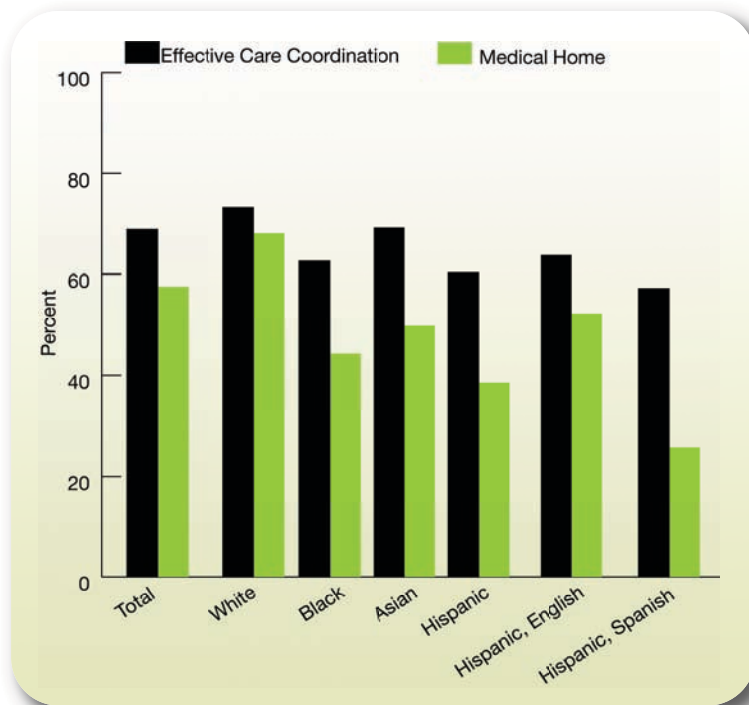
In the 2007 National Survey of Children's Health, several questions were asked to determine whether a child had a medical home:

- First, a child had to have a personal doctor or nurse.
- The presence or absence of family-centered, compassionate, and culturally effective care was assessed through a series of questions about the relationship between the provider and the child and family.
- Comprehensive and accessible care was assessed by whether the child had a usual source of care (other than an ED) when sick or when parents needed advice and by the ease of receiving needed referrals.

Care Coordination

- Coordinated care was assessed among children using health services from more than one health care provider by whether the child received needed help with coordinating that care and reported good communication across providers and between medical providers and schools.
- Continuous care, usually assessed by the length of relationship with the primary doctor or nurse, was not directly measured in the survey.⁹

Figure 6.6. Children with effective care coordination and with a medical home, by race/ethnicity and language, 2007



Key: Hispanic, English indicates that child is Hispanic and English is the primary language spoken at home; Hispanic, Spanish indicates that child is Hispanic and Spanish is the primary language spoken at home.

Source: Health Resources and Services Administration, Maternal and Child Health Bureau; Centers for Disease Control and Prevention, National Center for Health Statistics, National Survey of Children's Health, 2007.

Denominator: Children under age 18.

Note: Analyses performed by the Child and Adolescent Health Measurement Initiative, Data Resource Center for Child and Adolescent Health (<http://childhealthdata.org>).

- Overall, among families who needed extra help arranging or coordinating a child's health care with two or more providers, only 69% reported receiving effective care coordination (Figure 6.6). Black, Asian, and Hispanic children were less likely than White children and Hispanic children who speak Spanish at home were less likely than Hispanic children who speak English at home to receive effective care coordination.
- Overall, 58% of children had a medical home. Black, Asian, and Hispanic children were less likely than White children and Hispanic children who speak Spanish at home were less likely than Hispanic children who speak English at home to have a medical home.

- Of groups shown, Hispanic children who speak Spanish at home were least likely to receive effective care coordination or to have a medical home.

Also, in the NHQR:

- Children living in metropolitan areas were less likely than children living outside metropolitan areas and uninsured children were less likely than insured children to receive effective care coordination.
- Children ages 0-5 were more likely than children ages 12-17 to have a medical home.
- Uninsured children were less likely than insured children to have a medical home.

References

1. Bodenheimer T. Coordinating care—a perilous journey through the health care system. *N Engl J Med* 2008 Mar 6;358(10):1064-71.
2. Shojania K, McDonald K, Wachter R, et al. Closing the quality gap: a critical analysis of quality improvement strategies—Volume 7: Care Coordination. Rockville, MD: Agency for Healthcare Research and Quality; 2007. Available at: www.ahrq.gov/clinic/tp/caregapt.htm. Accessed November 5, 2010.
3. Powell-Davies G, Williams AM, Larsen K, et al. Coordinating primary health care: an analysis of the outcomes of a systematic review. *Med J Aust* 2008 Apr 21;188(8 Suppl):S65-S68.
4. National Priorities Partnership. National Priority: Care Coordination. Washington, DC. Available at: www.nationalprioritiespartnership.org/uploadedFiles/NPP/Priorities/4.pdf. Accessed January 10, 2011.
5. Coleman EA, Parry C, Chalmers S, et al. The care transitions intervention: results of a randomized controlled trial. *Arch Intern Med* 2006 Sep 25;166(17):1822-8.
6. Whittington J, Cohen H. OSF Healthcare's journey in patient safety. *Qual Manag Health Care* 2004 Jan-Mar;13(1):53-59.
7. Weighted national estimates from HCUP Nationwide Emergency Department Sample. Agency for Healthcare Research and Quality; 2008. Available at: <http://hcupnet.ahrq.gov>. Accessed November 3, 2010.
8. American Academy of Pediatrics, Medical Home Initiatives for Children With Special Health Care Needs Project Advisory Committee. Policy statement: the medical home. *Pediatrics* 2002(110):184-6.
9. Child and Adolescent Health Measurement Initiative. Measuring medical home for children and youth: methods and findings from the National Survey of Children With Special Health Care Needs and the National Survey of Children's Health. Portland: Oregon Health & Science University; 2009. Available at: <http://medicalhomedata.org/ViewDocument.aspx?item=436>. Accessed November 5, 2010.