ISSUE BRIEF

Transforming Quality of Care in North Carolina

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North Carolina is entering a period of transformative change in health care, as health system consolidation, health care reform, and payment reform combine to dramatically reshape health care. In this turbulent time, maintaining focus on quality of care will be critical. North Carolina has been a national leader in efforts to improve quality of care, starting from classic research in the 1950s on the measurement of quality and culminating in major statewide efforts to improve care through the North Carolina Area Health Education Centers Program, Community Care of North Carolina, the North Carolina Hospital Association, Medicaid, Blue Cross and Blue Shield of North Carolina, academic centers, and many other partners. The purpose of this issue of the NCMJ is to highlight initiatives to improve quality across the continuum of care and across the state. This overview puts these initiatives in context and addresses 3 fundamental questions: Can quality of care be measured and improved? What does the landscape of quality in North Carolina look like now? What should North Carolina’s priorities be for improving quality of care moving forward?

Health care in the United States has always been dynamic, with ongoing changes occurring in medications, technology, and payer relationships. Now, however, we are entering a period of not just usual but transformative change, as health system consolidation, health care reform, and payment reform combine to dramatically reshape health care. In this turbulent time, maintaining focus on quality of care is critical. The quality of health care in the United States has always been a paradox: Our technical advances and improvements in outcomes for specific diseases and conditions are celebrated around the world, but overall health outcomes and quality of health care for the US population have steadily worsened compared to other countries [1]. Recognizing these trends more than a decade ago, the Institute of Medicine of the National Academies issued reports that called attention to substantial and pervasive problems with quality of care in the United States [2, 3]. Medical errors are one of the leading causes of death nationally, and McGlynn and colleagues [4] have demonstrated that almost half of patient encounters across the continuum of care do not meet evidence-based and consensus-based measures of quality of care. North Carolina has been a national leader in efforts to improve the quality of health care, from classic research in measurement of quality to major statewide efforts to improve care through the North Carolina Area Health Education Centers (AHEC) program, Community Care of North Carolina (CCNC), the North Carolina Hospital Association (NCHA), Medicaid, Blue Cross and Blue Shield of North Carolina (BCBSNC), and academic centers. The purpose of this issue of the NCMJ is to highlight the statewide organizations that are working together to improve quality of care and to describe specific ongoing projects that are occurring across the continuum of care—in health departments [5, 6], physicians’ offices [7], intensive care units (ICUs) [8], labor suites [9], and rural hospitals [10, 11]. For example, Randolph and coauthors describe the Center for Public Health Quality and its work to promote quality improvement (QI) in local health departments across the state [6], and their sidebar provides details of some of the QI projects undertaken in Macon County [5]. In other sidebars, Garrison and Brown show how a QI project enhanced care for patients with asthma [7], Avalos and Lemon describe their efforts to prevent central line–associated bloodstream infections in a medical ICU [8], and Wright and coauthors offer insights gained during their efforts to eliminate early elective deliveries [9]. In addition, Hawthorne and Masterson describe the use of Lean principles to improve the quality and safety of health care delivery at 2 rural hospitals [10, 11], and in an accompanying sidebar, they provide examples of specific Lean events at those hospitals [11].

In this issue brief, we address 3 questions: First, can quality of care be measured and improved? Second, what does the landscape of quality look like now in North Carolina? Third, what should our priorities be moving forward?

Can Health Care Quality be Measured and Improved?

Clinicians often question whether quality can be measured accurately. Unlike more concrete measurements—for example, the level of sodium in a serum sample—quality is perceived as being subjective and based solely on reputation (eg, Dr. X is a provider of high-quality care because he is at Y).
under professional control, such as specific drugs, operative aspects of care refer to those aspects care is between technical and interpersonal aspects of care can be used in research or in routine clinical practice. and there are now reliable and valid outcome measures that these measures—whether the instruments measure what important outcomes include patient satisfaction [18], quality aspects of care, such as accessibility of care and continuity of care, were suitable. As major initiatives increased the numbers of hospitals and doctors, emphasis began to be placed on process: the question of whether what was being done was appropriate—whether the right tests, medications, and operative techniques were being used [14, 15]—and whether other process measures, such as accessibility of care and continuity of care, were suitable. Finally, spurred by Wennberg’s work demonstrating variations in medical care between neighboring communities within a relatively small area [16, 17], outcomes of care began to be emphasized starting in the 1990s; from this perspective, high-quality care is that which achieves the best outcomes. For example, in considering care for hypertension, the best care is that which lowers the rate of stroke or other sequelae. In addition to survival and major morbidity, important outcomes include patient satisfaction [18], quality of life [19], functional status [20], and cost [21]. Great attention has been paid to the psychometric features of these measures—whether the instruments measure what they intend to measure with both reliability and validity—and there are now reliable and valid outcome measures that can be used in research or in routine clinical practice. Another key distinction in the measurement of quality of care is between technical and interpersonal aspects of care [22, 23]. Technical aspects of care refer to those aspects under professional control, such as specific drugs, operative techniques, or hardware, whereas interpersonal aspects of care emphasize the quality of the patient experience. Some clinicians are skeptical about the validity of measurements of patient satisfaction, but the psychometric features have been established for more than 20 years [18]. In a trend led by the American Board of Medical Specialties and large integrated providers such as Kaiser Permanente, measurement of patient satisfaction has evolved into measurement of patient experience, with a shift in focus from the episodic (“How satisfied were you with this visit or hospitalization?”) to the ongoing (“Do you have problems making appointments in a timely fashion?”).

As cost of care has become an urgent issue, measurement of cost and cost-effectiveness has become a critical component of studies of quality of care. Such measurement is challenging, however, as patients and providers are often confused about the language of cost. Most patients are familiar with what they are charged, but there is often a dramatic difference between what is charged and what is covered by insurance. Moreover, the allowed insurance payment is yet again quite different from the cost of providing the care, which includes both the direct cost of supplies and personnel and the indirect costs of the infrastructure necessary to provide care. Specifying the perspective is also important when considering cost. The perspective of the patient (who, from a cost standpoint, is impacted chiefly by copays and coinsurance) is different from the perspectives of the physician, the hospital, the payer, and society.

Another key conceptual issue is the measurement of care provided to specific populations. Traditionally, health care has focused on individual patients who are seen in the office or the hospital, and public health professionals have led efforts to address risk factors for disease in the broader population, such as obesity prevention and smoking cessation programs. Increasingly, however, clinicians refer to populations for whom they are providing care, such as the patients in a primary care practice with diabetes or the patients receiving care from a transplant service. This shift has occurred in part because focusing on a target population—a denominator of care—allows effective measurement of access, quality, and cost. The worlds of public health and clinical medicine are beginning to merge. As a recent Institute of Medicine report [24] underscored, closing the gap between public health and primary care is critical to improving the health of the overall population.

Can quality be improved? Most current activity is based on ideas developed by Deming [25] more than 50 years ago. Drawing on observations of automobile assembly-line techniques, he called for improving the manufacturing process so that defective cars were not made, rather than waiting until manufacturing was complete to inspect the cars and reject any that were defective. His ideas, adopted initially by Toyota, led to dramatic improvements in quality and ultimately to the legendary rise of the Japanese automobile industry.

Deming’s ideas have direct relevance to health care. The top portion of Figure 1 depicts the traditional goal of quality assurance: Look for “bad apples,” be they doctors or hospitals,
FIGURE 1. How the Goal of Continuous Quality Improvement Differs from that of Quality Assurance

A

Number of episodes of care

Number of episodes of care

Remove "bad apples"

Continuous quality improvement

Quality assurance

Quality

 minimum standard

minimum standard

All do better

Note: The goal of quality assurance (A) is to ensure that all episodes of care meet a minimum standard (indicated by the vertical line); episodes on the low-quality side of the curve are eliminated by removing “bad apples” from the system. In contrast, the goal of continuous quality improvement (B) is to improve the quality of every episode of care, thereby moving the whole curve to the right, in the direction of higher quality.

and “reject” them, by removing their licenses or closing them down. Over the past generation, increasing work in many health care settings has improved our ability to identify and modify processes in health care that lead to bad outcomes. The goal of continuous QI, shown in the bottom portion of Figure 1, is to move the entire quality curve to the right, by improving the average quality score rather than simply weeding out poor performers. Experience has allowed the development of specific QI techniques (including rapid cycling, QI coaches, and registries), the extension of QI approaches to access to care and efficiency of care, and the broader adoption of Lean culture, which consists of systematic attempts to remove waste from processes of care.

So what is the current status of quality measurement and QI? Although there will continue to be discussion of new measures and of which measures are best, no one doubts that it is now both feasible and important to explicitly measure quality as we deliver and pay for care. Moreover, quality is no longer merely an academic issue. Quality was moved onto the national political agenda dramatically by 2 key Institute of Medicine reports published in 2000 and 2001: To Err is Human [2] and Crossing the Quality Chasm [3]. After the recession in 2008, in which the bankruptcies of General Motors and Chrysler were attributed in large measure to the cost of health care for their employees, the advocacy of major international corporations [26] called additional attention to the economic impact of the poor performance of our health care system [27].

The North Carolina Health Care Quality Landscape

North Carolina has developed a number of large-scale collaborative efforts to improve the quality of health care. The scale and impact of these efforts is unique nationally. The oldest and best developed is CCNC, which over the past 15 years has developed a statewide system of 14 networks devoted to the care of Medicaid patients [28, 29]. As DuBard describes in her commentary [30], CCNC’s major contributions to quality of care have been statewide involvement of primary care clinicians and community partners, the spread of evidence-based practice guidelines for chronic disease, claims-targeted care management, and many specific statewide interventions—including interventions for emergency department overuse, asthma, diabetes, transitions of care, generic medications, and medication reconciliation. The NCHA has been a national leader in interventions for patient safety and transparency, and its NC Quality Center offers valuable leadership, as discussed in the commentary by Koeble and Campione [31]. The AHEC program, collaborating with CCNC and many other organizations, has led the Improving Performance in Practice program [32] and the Regional Extension Center initiative, both of which are working to improve office systems to support QI in rural and underserved practices, as reported in the commentary by Batish [33]. The state’s Medicare Quality Improvement Organization, The Carolinas Center for Medical Excellence, has supported the use of electronic health records (EHRs) and other aspects of QI, many of which are described in the commentary by McArdle [34]. Finally, as discussed by Barco and Chauncey [35], BCBSNC has consistently advocated for QI; their work over the years has led to North Carolina having many more practices and clinicians being recognized by the National Committee for Quality Assurance than any other state of comparable size. These organizations, supported by leadership and funding from The Duke Endowment and the Kate B. Reynolds Foundation and by ongoing work in academic centers, have made North Carolina a national leader in QI.

Delivery of health care in North Carolina is also changing dramatically. Most visible is the consolidation of health care providers into large integrated systems, which has proceeded with blinding speed. According to a letter from the North Carolina Medical Society dated August 10, 2011, there were 196 independent cardiology practices in the state in 2009, but there were only 4 such practices by mid-2011. President of the NCHA William A. Pully reports that inde-
pendent hospitals in the state have followed a similar pattern of consolidation (written communication, December 4, 2012). This dramatic trend is occurring for many reasons, including contracting leverage, capital needs for EHRs, fear of changes in the environment, and the need to manage populations under accountable care organizations. Operational integration will take much longer than acquisition but will offer opportunities for efficiency and for more systematic approaches to patient care. In the short term, however, consolidation adds significantly to the total cost of care, since providers are able to negotiate higher rates with commercial insurance companies and therefore get paid more despite performing the same amount of clinical work.

Another major change has been the spread of health information technology. A widespread conviction based on experience with integrated systems and experience in other countries is that adoption of health information technology will improve efficiency and enhance quality and safety. Therefore, in early 2009 the federal government invested substantially in many aspects of health information technology. The transition has proved both costly and difficult, as EHRs reduce productivity and access in the short term and mid term, and practices wanting to use EHRs to improve quality of care have required sustained support [36]. In North Carolina, the large integrated health systems are moving as quickly as possible to implement system-wide records. Carolinas HealthCare System and Mission Health System have chosen Cerner Corporation’s EHR, and all of the other systems in the state have chosen Epic System’s EHR. AHEC has also helped more than 1,100 individual practices install EHRs; the scale of AHEC’s work is unique nationally, as is their integration of EHR adoption with QI and with the meaningful use incentive program of the Centers for Medicare & Medicaid Services (CMS). In addition, working with AHEC, BCBSNC has introduced the North Carolina Program to Advance Technology for Health, which provides funding, training, and help with EHR maintenance to practices that could not otherwise afford an EHR system [37].

Unfortunately, the attempt to develop a statewide health information exchange has failed. Over the long term, the failure to develop an integrated information structure will be a major limitation on QI. Epic EHR systems will provide some ability to share clinical information, but a robust statewide infrastructure would have allowed care management and transparency across systems and payers. Mission Health System and New Hanover Regional Medical Center have led the development of more robust regional health information exchanges, which are beginning to demonstrate the potential of sharing clinical information across sites. CCNC has made its informatics center [29] into a major resource for improving care for Medicaid patients, driving case management for the sickest patients and providing clinicians with information at the point of care. Perhaps the most promising current projects are the collaboration of CCNC with BCBSNC and CMS on the Southern Piedmont Beacon Community Program [38] and a multipayer demonstration project of advanced medical homes in rural counties [39]. These projects are attempting to integrate information across insurers and to drive case management and clinical care. I believe that such information, aggregated by primary care practices, is a precondition for major improvements in care.

As this article goes to press, the Governor has proposed a dramatic plan to reorganize Medicaid. Details are still pending, but key elements of the plan include the development of 3–4 competing statewide coordinated care networks; integration of medical, mental, and other aspects of care; and capitated payment. This proposal is further evidence of the transformative nature of our times, and it provides an object lesson in the importance of maintaining a focus on quality and transparency.

Mental Health

No description of North Carolina’s health care landscape would be complete without some mention of mental health care. A previous issue of the NCMJ laid out both the challenges and the opportunities for the future. In the late 1980s and the 1990s, in North Carolina as in other states, funding for mental health care was largely carved out from medical care, and overall mental health funding has declined significantly compared to funding for other aspects of health. In North Carolina, the well-intentioned but incomplete reform of the public mental health system, combined with downturns in the economy during the past decade, has greatly weakened the public mental health system. The significance of these trends is substantial, and many people believe that the overall health cost curve cannot be shifted without attention to mental health care—both care for those with severe and persistent illness and care for those with mood and other disorders, the latter of which could be sensibly integrated with primary care [40]. For purposes of quality of care, it is critical that mental health conditions be included in the list of comorbid conditions that greatly affect outcomes and that QI initiatives include attention to mental health care, if possible.

Priorities for the Future

The health of North Carolina’s citizens has faced challenges over the past 2 generations. In the 1940s, North Carolina had one of the highest rates of rejection of draftees in World War II, which represented striking evidence of the poor health status of its citizens compared to those of other states [41]. In 2012, after 2 generations of investment and economic development, the prevalence of diabetes and obesity (9.3% and 27.8%, respectively, in 2010) were continuing to increase in North Carolina, immunization rates for children 19–35 months of age had dropped to below 90% for the first time in 8 years, and the rates of infant mortality and low birth weight remained high compared with other states [42]. America’s Health Rankings [42] rated North Carolina
33rd among US states in 2012 (up from 35th in 2011). There has been some progress, but it has been painfully slow.

Why haven’t we made more progress? Borrowing from Berwick [43], one answer is that the health care system needs to be redesigned at 4 levels: patients’ experiences and expectations; the microsystems that actually provide care; the organizations that support those microsystems; and the social/political/economic environment that shapes those organizations.

Patient Experience and Expectations
Up to 75% of health care costs are driven by patient lifestyle choices such as smoking, inactivity, and poor diet. Providers, payers, and policymakers need to align incentives for healthy and affordable health care decisions. This includes both lifestyle choices and choices made in ongoing health care, from involvement in care for chronic diseases to decisions about elective procedures. It is also important that patients trust that clinicians’ and payers’ recommendations are aligned with improving patient health rather than increasing profits. Access to care and continuity of care are key drivers of patient experiences and can be measured directly as we put together “balanced scorecards” for clinical care. Finally, we need more transparency in terms of cost and clinical quality/outcomes, consistent assessment and improvement of patient experience, and greater patient involvement in the process of care through patient advisory councils and similar structures.

Microsystems of Care
Many of the commentaries in this issue illustrate the potential of microsystem changes to improve quality across the continuum of care. The scale and variety of these efforts is remarkable and sets North Carolina ahead of the field nationally. The poster child for microsystem transformation is Medicare’s focus on hospital readmissions. Beyond specific projects, prioritizing which quality measures are most important is critical. Small offices and current EHRs cannot improve scores on multiple measures of quality simultaneously; hospitals and even large academic systems can only work on limited numbers of problems at one time. Moreover, few existing measures capture the multiple comorbidities that are characteristic of the sickest and costliest patients. Related to the number of measures is the reality that different payers track different measures; in many ways, we live in a quality Tower of Babel. The solution is for payers, providers, and the public to collaborate and to do the hard work of prioritizing what is most important to the health and economy of North Carolina. In other states, the insurance commissioner has played a critical role in setting the quality measures to be used and in requiring transparency, in much the same way that we regulate the content and labeling of foods and drugs.

Sustainability of QI depends on payment reform. Traditional payment systems reward volume and procedures, and they encourage lack of coordination of care and siloed providers. It is no accident that serious work to improve transitions of care only began with changes in payment to hospitals for readmissions! Furthermore, ratcheting down on fee schedules can have a perverse effect, as providers and hospitals may respond by increasing volume. Transitioning from our current fee-for-service system will be difficult and complex. Internal disagreements among provider organizations are also common when clinicians’ interests, financial perspectives, and administrative necessities collide. Better physician leadership and collaboration with payers are needed to transition from medical piecework to value-based systems.

Supporting Organizations
Local efforts to improve quality of care are necessary but not sufficient. As Stackhouse mentions in his commentary, clinicians and their organizations have ongoing reservations about the process [44]; we must continue to engage them. More broadly, the state will continue to need statewide organizations and initiatives such as CCNC, the NC Quality Center, AHEC’s Improving Performance in Practice program and Regional Extension Center, and the North Carolina Health Quality Alliance. These statewide collaborative efforts are what set North Carolina apart from other states. These efforts need both policy support and financial support. To build a system that supports quality, we must bring providers, communities, and employers into the process; provide independent review; coordinate statewide initiatives; and address disparities across regions, races, and rurality.

Often unremarked is the inevitable transition that the workforce must undergo as we move from a hospital-focused system with siloed professionals to one that places greater emphasis on primary care, community-based care, and interprofessional teams. This workforce will be critical for QI. In recent years, many new training programs for nurse practitioners and physician assistants have begun, and 2 medical schools have expanded. However, large majorities of physicians, nurse practitioners, and physician assistants now go into subspecialties, and interprofessional education is just beginning. AHEC has led efforts to train new kinds of primary care providers and teams of providers [32, 33, 45, 46]. Collaboration between community colleges and traditional health affairs campuses will also be necessary, even as we emphasize social accountability for our educational institutions [47, 48].

Environment
QI requires a nonpunitive and trusting environment, adequate financial information, clinical resources, and determined leadership. Although North Carolina has made significant progress—by passing tort reform in 2011 [49], by establishing the CCNC informatics center, and by launching the multipayer project—several critical barriers remain. Trust is sorely lacking among patients, providers, payers,
and the government. As we look at other countries’ universal health coverage and their better health outcomes, a notable difference is the willingness of their citizens to accept government leadership.

The economic recession and slow recovery have added to our challenge by decreasing funding for systematic change at the state level while increasing demand for affordability and improved outcomes. Political gridlock at the federal and state levels has hindered efforts to create health information exchanges, reform mental health care, expand coverage, and fund pilot programs that could help us learn how to improve the organization and effectiveness of health care. Finally, health care reform itself will significantly reduce the funding to hospitals across the state, just as we must begin to transition workforces from hospitals to ambulatory and community settings. The community benefit that has traditionally been provided by hospitals must be preserved even as funding streams change focus.

We have come a long way, but we still have a long way to go. Moving forward, our goal should be a focus on the Triple Aim [28] of improving health outcomes, ensuring better patient experiences, and increasing affordability—and we should strive to achieve these goals all at the same time and as soon as possible. We believe that the Triple Aim should become the standard for setting metrics, determining program priorities, and making decisions. This will require collaboration, leadership, accountability, and a laser-like focus on outcomes and behavior change.

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References
36. Ryan AM, Bishop TF, Shih S, Casalino LP. Small physician practices in New York needed sustained help to realize gains in quality from use of...
49. 2011-400 NC Sess Laws 1712-1717.