COMMENTARY

Transforming Care in the Physician Workplace Through Electronic Data Exchange

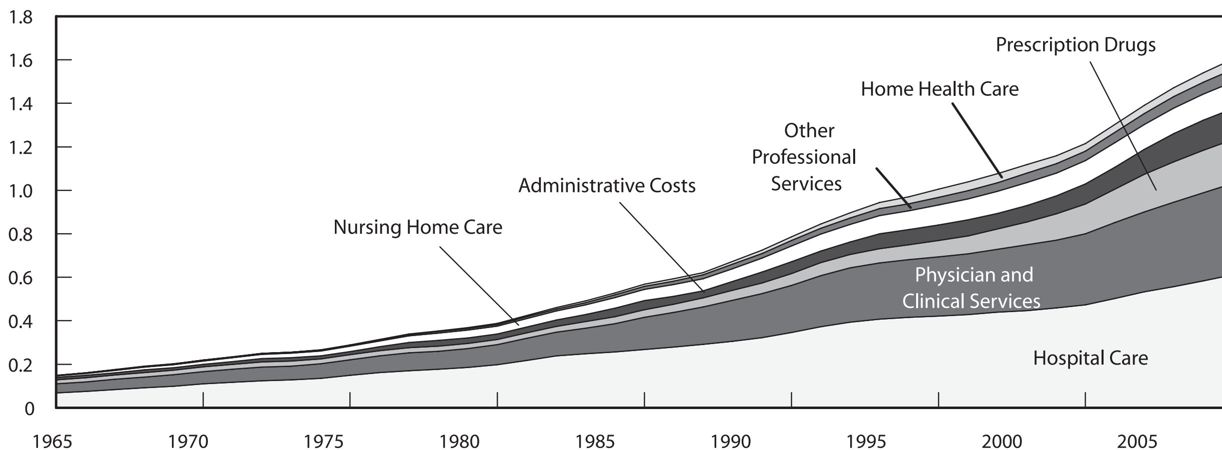
Holt Anderson; Gary Bowers

In 2007 total national health expenditures were expected to rise 6.9%—2 times the rate of inflation. Total spending was $2.3 trillion in 2007 or $7600 per person. Total health care spending represented 16% of the gross domestic product (GDP).[1] Health care spending in the US is expected to increase at similar levels for the next decade reaching $4.2 trillion in 2016 or 20% of GDP.[1] (See Figure 1.)

A study by the Congressional Budget Office, *Technological Change and the Growth of Health Care Spending*, published in January 2008 estimates that the percentage of GDP spent on health care will grow from 16% in 2006 to over 20% within a few years due to the aging population and growth in chronic care expenditures, and if left unchecked, will approach 49% of GDP by 2082.[2] (See Figure 2.)

"The danger of missing information is increased with the dispersal of care among multiple specialists serving patients with a variety of chronic conditions."

Figure 1.
Real Spending on Health Care in Selected Categories, 1965 to 2005 (Trillions of 2005 dollars)



Source: Congressional Budget Office based on data on spending on health services and supplies, as defined in the national health expenditure accounts, maintained by the Centers for Medicare and Medicaid Services.

Note: Spending amounts are adjusted for inflation using the gross domestic product implicit price deflator from the Bureau of Economic Analysis.

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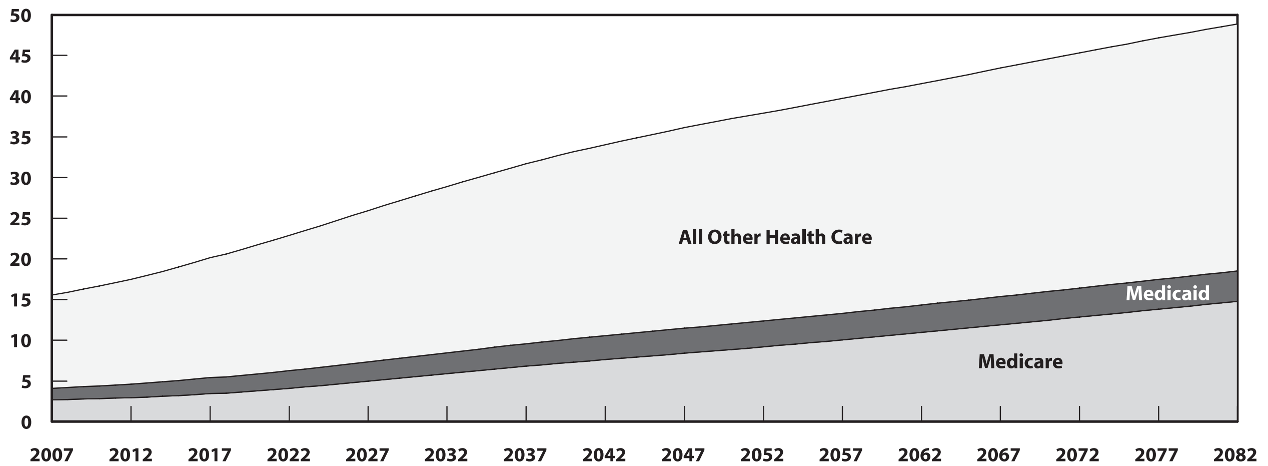
Figure 2.
Projected Spending on Health Care as a Percentage of Gross Domestic Product, 2007 to 2082 (Percent)



Source: Congressional Budget Office.
Note: Amounts for Medicare are net of beneficiaries' premiums. Amounts for Medicaid are federal spending only.

The fiscal impact of these increases in overall spending for health care in relationship to limited growth in tax revenues or corporate profits will force choices that may accelerate the number of uninsured and underinsured individuals and increase pressure on reimbursements to practitioners, hospitals, and other related services. Often cited reports including those from the Institute of Medicine of the National Academies such as *To Err is Human* and *Crossing the Quality Chasm* highlight the human and economic costs of inefficient and paper-based care and encourage a swift movement to electronic health records and secure electronic health record exchange.[3,4] Work is being done by the North Carolina Healthcare Information and Communications Alliance (NCHICA) and others to build an economic business case that will support the transition to electronic health records in the practice setting where the cost and change in work flow have deterred adoption up to this point.

The Role of Quality in Improving Health Care Safety and Outcomes

The North Carolina Medical Society established the Quality of Care and Performance Improvement Committee to examine the relationship between better information management and practitioner job satisfaction and improvements in the quality of care provided. Evidence is emerging that practitioners who use electronic health records keep their patients healthier through built-in structured reminders and avoid mishaps by using electronic prescribing with automatic drug-to-drug interaction checking.[5] The current system of prescribing and dispensing medications in the United States has widespread problems with safety and efficiency. Experts predict that a shift to electronic prescribing (e-prescribing) systems could avoid more than 2 million adverse drug events annually, of which 130 000 are life-threatening.[6] E-prescribing also has enormous potential to create savings in health care costs through reduction of adverse drug events and in improved workflows. One recent study estimated the potential savings at $27 billion per year in the United States.[7]

By design, practitioners also are in a better position to take advantage of incentive programs such as Bridges to Excellence and increased reimbursements from Medicare. The Bridges to Excellence North Carolina initiative is one that encourages the use of electronic health records in practitioner offices to improve health care for partner health plan members. In North Carolina the Bridges to Excellence program provides funds to practices that are certified by the National Committee for Quality Assurance as having certain electronic and process capabilities and that serve members of health plans whose employers have subscribed to the Bridges to Excellence program. This program is showing participating employers that employees served by physicians who have electronic health records are healthier, have chronic conditions better under control, and have fewer trips to emergency departments. In turn, the health plan saves money, providing the business justification for paying incentives to physicians using electronic health records.[8]

Better and More Timely Information at the Point of Care Drives Quality

Lack of timely and reliable information about a patient has the effect of slowing accurate diagnosis and treatment. Such a delay can be frustrating for physicians and dangerous for patients, especially if knowledge about allergies and medications is not available when prescription orders are being entered. The danger of missing information is increased with the dispersal of care among multiple specialists serving patients with a variety of chronic conditions.

In a recent request for proposals, the Agency for Healthcare Research and Quality stated that the burden of providing treatment and supportive services for individuals with complex health care needs continues to increase.[9] In 2000, 60 million Americans had multiple chronic conditions, and it is projected that this will rise to over 81 million by 2020.[10] Yet care for these patients is often fragmented across multiple settings and across providers—with limited or no communication or coordination and no sense of overarching responsibility. Patients often do not seek services until there is some crisis in their condition, a crisis that may have been avoided had they sought care earlier or if their care had been better coordinated. Also, these transitions in care are often accompanied by changes in a patient's functional status which may further complicate future care needs.[9]

Information management is key to addressing these issues because it provides physicians with better and more organized information which saves them time and achieves better diagnoses and treatments (and healthier patients). Furthermore, the time saved can translate into more patients served. While there is a steady increase in the numbers of practitioners and practices adopting electronic health records, the cost and required workflow changes present barriers to many practitioners. However, a business case is being made for overcoming these barriers as peer practitioners show evidence of the benefits of electronic health records and payers begin to offer incentives for their use.

Health Information Exchange Networks

As more practitioners adopt electronic health records, additional issues arise. Of primary concern is the ability to share information collected across provider groups as needed to serve patients. As such, hospitals and health systems are building referral networks in their communities to connect radiology, labs, and pharmacies through community health information exchange (HIE) networks. In order for these networks to succeed, they must address a number of issues including data compatibility and privacy. Following a 2004 Presidential Executive Order, the US Department of Health and Human Services established the Office of the National Coordinator of Health Information Technology (ONC). The Office of the National Coordinator was tasked with facilitating privacy and security, developing and recommending standards for certification of applications, harmonizing codes, and building a "network of [community] networks, that will enable most Americans to have an electronic health record by 2014."[11]

Sixteen hospitals in western North Carolina have been recognized as leaders for their early implementation of a community HIE network which is called WNC Data Link. Their vision was to create a network to connect all of the regional hospitals to enable the sharing of electronic longitudinal records for patient care. Through WNC Data Link authorized physicians can quickly access patient lab results, medications, radiology reports, discharge summaries, histories and physical examinations, and other information from any hospital in the region via the Internet. WNC Data Link has become particularly valuable as patients transfer between hospitals and also in emergency departments where immediate access to patient information is vital. The next phase of this initiative will link physician practices and other providers to this network.

North Carolina has a number of unique capabilities and organizations that can lead the transformation from an inefficient, paper-based system of care to a high-quality environment that enhances the practice of medicine, improves efficiencies and outcomes, and makes our state even more attractive for business. NCHICA is being recognized nationally for its past and current activities as described below.

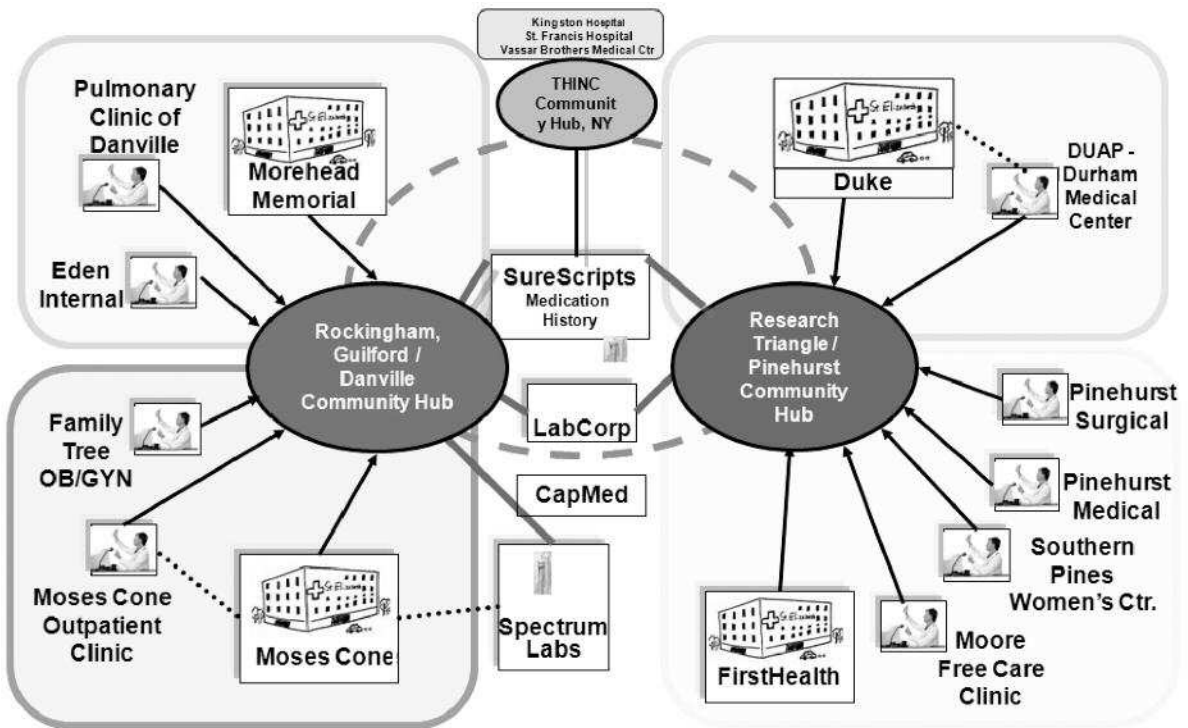
1. **North Carolina is involved in national efforts to transform health and care through the North Carolina Healthcare Information and Communications Alliance (NCHICA).**

NCHICA was formed in 1994 by Executive Order of the Governor of North Carolina as a nonprofit organization with a mission of "improving health and care in North Carolina by accelerating the adoption of information technology and associated policies."[12] NCHICA fosters collaboration among all sectors of health and care and works on policy and technology solutions that enable secure health information exchange.

North Carolina has received significant funding for 2005-2008 to participate in national efforts to develop better laws and regulations that enable exchange for treatment purposes. At the request of the Office of the Governor, NCHICA applied for and received a contract from the Agency for Healthcare Research and Quality (AHRQ) and the Office of the National Coordinator for Health Information Technology (ONC) to study business practices, laws, and regulations that have the effect of impeding the exchange of electronic health information that is required for treatment purposes.[13] Among the barriers revealed by the study, the most prominent was confusion over the Health Insurance Portability and Accountability Act (HIPAA) and the labyrinth of state and federal laws and regulations governing consents and privacy. After a legal analysis was completed, a legal work group developed recommendations for solutions and how changes might be implemented. North Carolina and 33 other states collaborated on this phase of the work that concluded at the end of 2007. In the next phase, underway in 2008, North Carolina will collaborate with other states in the development of intrastate and interstate consents and interorganizational agreements that will enable the secure exchange of information in a consistent manner that takes into consideration concerns over liability and standards.

Another major project involves North Carolina and a select group of states in the development of policies and technologies to support 2 phases of the Nationwide Health Information Network (NHIN): Architecture Prototypes and Trial Implementations. North Carolina participated in the development of the Architectural Prototype of the NHIN in 2006 and early 2007. This development was led by IBM with a subcontract to NCHICA. This phase included participation by the organizations shown in Figure 3.

Figure 3.
Nationwide Health Information Network, Phase 1



Source: North Carolina Healthcare Information and Communications Alliance, Inc.

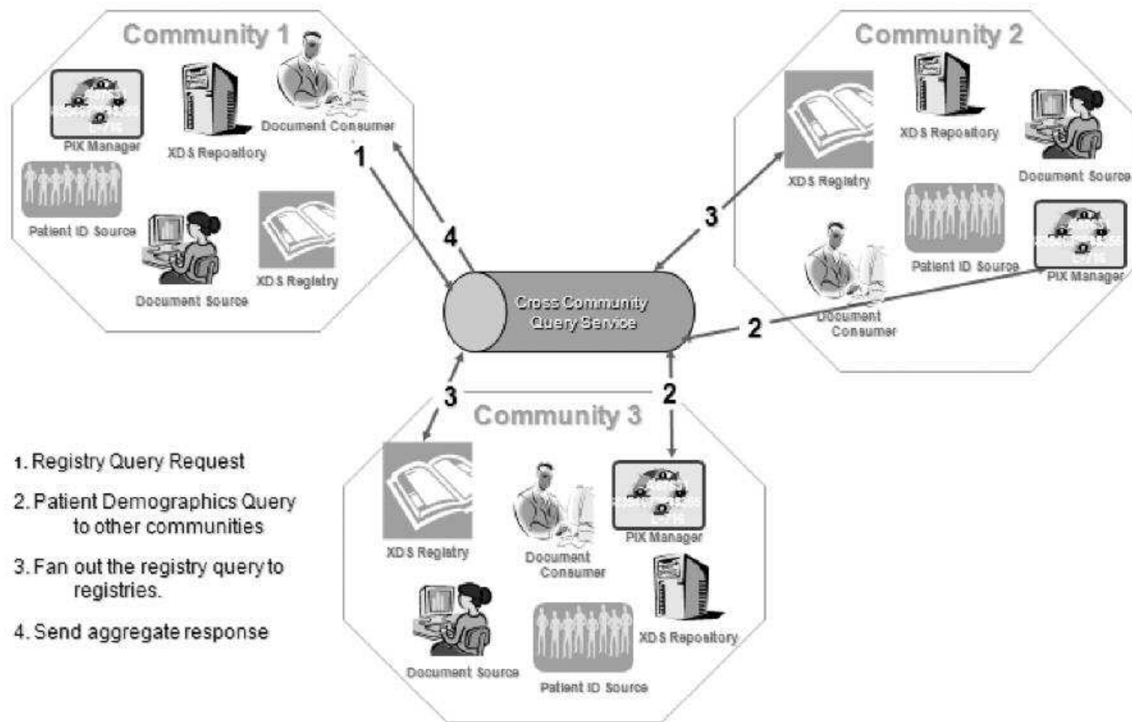
As communities continue to build their own HIE capabilities, the challenge will be to connect neighboring communities, regions, and states. The vision is for this network to eventually become nationwide and possibly worldwide. It is clear that the best business case for greatest value can be made for the community HIE network where over 90% of all traffic will occur. Less justifiable is the cost to construct and maintain a cross-continental capability that would be rarely used. However, if the "network of networks" is constructed for clinical exchange on the local level, the connections and security capabilities would be useful for national and regional activities such as public health and claims/payments that cross community boundaries. Figure 4 graphically displays how a locator and switching service might be established to serve multiple communities in a region. The connections in a nationwide "Network of Networks" are represented in Figure 5.

2. **The North Carolina Health Information Exchange (NC HIE) Council was formed to develop consensus strategies and actions that will keep North Carolina on the forefront of health information exchange efforts.**

The NC HIE Council was formed in 2007 as a consensus-building body of knowledgeable individuals representing the leading sectors of health and care in North Carolina. The Council includes representatives from the following:

- North Carolina State Health Director or designee
- North Carolina State Chief Information Officer or designee
- North Carolina Consumer Advisory Council on Health Information
- North Carolina Medical Society
- North Carolina Hospital Association
- North Carolina Nurses Association
- North Carolina Health Information Management Association
- North Carolina Association of Pharmacists
- North Carolina Health Departments
- North Carolina Office of Emergency Medical Services
- North Carolina Association of Free Clinics
- North Carolina Division of Medical Assistance
- North Carolina Division of Mental Health, Developmental Disabilities, and Substance Abuse Services
- North Carolina Association of Health Plans
- Health Information Exchange
- Private-sector behavioral health organizations
- Long-term care/nursing homes
- Laboratory service providers
- Radiology service providers
- NCHICA CIO Roundtable
- At-large members appointed by NCHICA Board of Directors

Figure 4.
Nationwide Health Information Network, Architecture



Source: North Carolina Healthcare Information and Communications Alliance, Inc.

Figure 5
Nationwide Health Information Network, Architecture

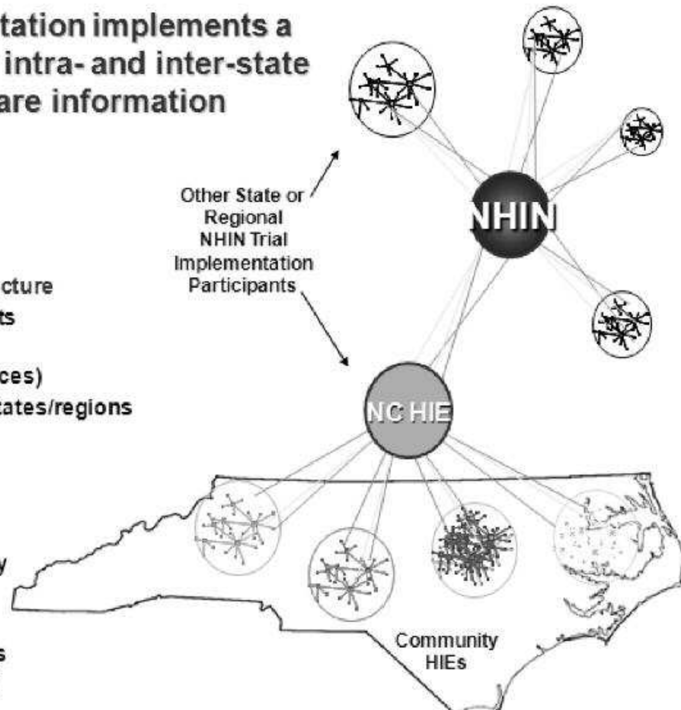
The NHIN Trial Implementation implements a "network of networks" for intra- and inter-state exchange of healthcare information

NC HIE

- Convener, Educator, Facilitator
  - Privacy/security framework
  - Standards/reference architecture
- Incubator for piloting new concepts
- Utility for Foundational Services (e.g., EMPI, Record Locator Services)
- NHIN compliant linkage to other states/regions

Community HIEs

- Encourage EHR adoption and "last mile" connectivity
- Develop real-time patient summary and data aggregation capabilities
- Provide training and education
- Engage non-provider stakeholders (payers, employers, public health)



Source: North Carolina Healthcare Information and Communications Alliance, Inc.

It is the mission of the NC HIE to enable the timely and secure exchange of electronic health information among its authorized members for the purposes of:

- Improving the quality of health and care provided to individuals in North Carolina.
- Improving the efficiency of the health care system in North Carolina.
- Enhancing patient safety in North Carolina.
- Improving the overall health of North Carolina's residents.

The NC HIE Council will develop policies and procedures that facilitate these objectives and may contract with one or more health care information service providers to operate a health information exchange network to fulfill this mission.

3. The North Carolina Consumer Advisory Council on Health Information was formed in response to privacy concerns.

In 2006 NCHICA established the North Carolina Consumer Advisory Council on Health Information in response to consumer concerns regarding privacy and the move to electronic health records with the attendant ability to share personal information across networks. These concerns connect broadly with the vision of a national and international capability to move information to any point on the globe. The Council is expected to become informed about both North Carolina and national initiatives and to advise NCHICA on policy and technology matters.

4. A series of regional town meetings will be held in the spring and summer of 2008 to inform North Carolina residents of NCHICA efforts and how they can become engaged in the process.

At the urging of its members, NCHICA will undertake a series of educational town meetings in various regions of North Carolina in the spring and summer of 2008. NCHICA representatives will share information about state and national initiatives and solicit feedback regarding local priorities that will help shape future efforts. Expected attendees are physicians and nurses, hospital administrators and chief information officers, business and political leaders, and other individuals interested in increasing health information exchange to improve quality of care and to positively impact the cost-effectiveness of the health system in North Carolina. This is particularly important as we balance the increasing demand for services with the limited resources to pay for those services.

The future looks bright for transforming health and health care practices in North Carolina from the inefficient, paper-based environment of today to the advanced electronic systems of tomorrow. Such a transformation will support health professionals in their delivery of high-quality care to their communities and will elevate North Carolina into a position of national leadership. **NCMJ**

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