The Chief Nursing Information Officer’s Impact on Electronic Health Record Implementation
Stephanie S Poe, DNP, RN

Stephanie S Poe, DNP, RN, is Director of Nursing and Clinical Quality and Chief Nursing Information Officer at The Johns Hopkins Hospital. She is responsible for the strategic and tactical nursing leadership in the development, deployment, re-engineering, and integration of information technology to support clinicians and patient services. Dr. Poe holds a joint appointment with The Johns Hopkins University School of Nursing. She is a respected author and speaker on a wide variety of interdisciplinary quality, safety, informatics, and evidence-based practice topics. Dr. Poe was one of the original developers of the Johns Hopkins Nursing Evidence-Based Practice Model. She has extensive experience developing informatics competencies in nurse leaders and bedside nurses and guiding clinical information system design to embed evidence-based nursing practices into clinical workflow.

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The role of Chief Nursing Information Officer (CNIO) is emerging as a major transformational leader in this era of healthcare reform. The CNIO provides strategic and operational nursing leadership in the selection, development, deployment, re-engineering, and evaluation of electronic health record (EHR) technology. The American Nurse Credentialing Center’s Magnet Recognition Program® provides a framework for nursing excellence, a roadmap for the CNIO to achieve these aims. This framework includes transformational leadership; structural empowerment; exemplary professional practice; new knowledge; innovation and improvement; and empirical outcomes. This article discusses how one CNIO at an academic medical center serves as a transformational leader within this framework for excellence.

The role of the Chief Nursing Information Officer (CNIO) is relatively new to healthcare. The Health Information Technology for Economic and Clinical Health (HITECH) Act has heralded an unprecedented era of health information technology (HIT) transition, driving hospitals and eligible providers to rapidly implement electronic health record (EHR) technology in the hope of receiving Medicare and Medicaid incentive payments.1 The CNIO provides strategic and operational nursing leadership in the selection, development, deployment, re-engineering, and evaluation of EHR technology.

The CNIO role facilitates the journey toward clinical excellence in this new era. The Magnet Recognition Program® of the American Nurses Credentialing Center (ANCC), which recognizes healthcare organizations for nursing excellence, lists five components that provide direction for achieving excellence.2 These components frame the work of the CNIO and include transformational leadership; structural empowerment; exemplary professional practice; new knowledge, innovations, and improvements; and improving empirical outcomes.

The aims of this article are to discuss the CNIO role in transforming informatics-supported care, highlight the strategic importance of building nursing intellectual capital for use and oversight of EHRs, and identify ways that one academic medical center CNIO champions innovation, collaboration, and professional development in informatics-supported care.

Chief Nursing Information Officer as Transformational Leader
Transformational leaders inspire team members to embrace a shared vision, encourage them to use innovative problem-solving methods, and develop the leadership capacity of team members by providing both support and challenges.3 The CNIO creates the vision, influences IT decisions, and leads nurses to where they need to be to meet the challenges of an increasingly technologic environment. By building relationships involving staff within and outside of nursing, the CNIO controls destabilization during a time of rapid change.

The Institute of Medicine4 outlines five core health professional competencies: deliver patient-centered care, practice evidence-based medicine/nursing, focus on quality improvement, use IT, and work in interdisciplinary teams. In collaboration with the Chief Medical Information Officer and the Chief Information Officer, the CNIO ensures that IT is designed to support the performance of these competencies. As a transformational leader, the CNIO drives healthcare quality by advocating for and assisting in the development of metrics, quality tools,
and infrastructure. To champion adoption of innovation, the CNIO operates within a shared-governance framework, enabling meaningful staff input, shared decision-making, peer accountability, and coaching. The CNIO ensures that technology is an enabler for nursing and clinical care, and that patient safety is incorporated into every aspect of clinical work flow.

Transformational leadership behaviors (charisma, inspirational motivation, intellectual stimulation, and individualized consideration) make possible desired follower outcomes, such as shared vision, increased self-esteem, challenging or meaningful work, being coached or mentored, and feeling valued. The CNIO assures that the nursing IT vision is in sync with the broader clinical informatics vision, and manages the process by which this vision is achieved.

At The Johns Hopkins Hospital (JHH), the CNIO creates a climate that promotes staff engagement, inspires cultural transition and adoption of innovation, stimulates thinking and originality, and considers the impact of IT on individual work flows and patient and organizational outcomes.

Structural Empowerment

Structural empowerment is a term used to describe an organization’s ability to organize and mobilize human and material resources to accomplish its goals. The CNIO builds a clinical informatics infrastructure that supports the organization’s ability to achieve its HIT outcomes. Serving as ‘bridges’ between clinicians and professional and technical IT teams, nurse experts that operate within this infrastructure possess technological competency and expertise in clinical practice and policy. They provide direction and support interdisciplinary staff empowerment.

At JHH, the clinical informatics department is under the strategic and tactical direction of the CNIO. The team consists of a nursing informatics manager and five nurse project leaders, three of whom work closely with IT specialists and co-ordinate interdisciplinary clinical input into the design, testing, implementation, and evaluation of their designated IT applications (provider order entry, clinical documentation, and use of bar code technology for laboratory specimen identification and transfusion verification). A fourth project leader serves as the clinical IT liaison to groups that develop and revise clinical protocols to ensure that required changes to order sets and clinical documents are identified early, designed to meet protocol requirements, and support timely protocol implementation.

The fifth project leader co-ordinates the activities of a 400-plus clinical informatics support pool. This support pool takes advantage of local expertise, and is made up of nurses, physicians, and other clinicians from various clinical departments. These experts provide clinical IT support during activations, post-implementation follow-up, system testing, changes in clinical services, downtime recovery periods, and focused quality-improvement projects. The internal support pool has proven to be less costly than external consulting support, improves interdisciplinary collaboration, provides clinical expertise to newly deployed units, enables quick resolution of go-live matters, and allows participants to take lessons learned back to their home units.

Exemplary Professional Practice

The CNIO recognizes that it takes the collaborative efforts of all team members to ensure healthcare quality. Exemplary professional practice refers to a thorough knowledge of nursing’s role, application of that role with other members of the healthcare team, and use of new knowledge and evidence. The American Nurses Association includes informatics competencies in the standards of practice for all nurses.

IT is an integral part of care delivery, the need to build the intellectual capital of bedside nurses (knowledge, skills, and experience) in the use and quality oversight of IT is essential. Research has shown that nurse staffing and employer support for ongoing professional development combined with the resources that support the knowledge work of nurses lead to high-quality, safe care, and organizational outcomes. Safe, effective, IT-supported care requires a unique set of competencies: computer skills, informatics knowledge and skills, and risk-identification knowledge and skills. The CNIO champions the professional development of nurses to ensure that these core competencies are supported and measured.

Pre-activation training classes are helpful and necessary, but cannot keep pace with the continuous clinical and IT knowledge explosion and unit-level variations in the local application of the EHR. There is a pressing need to develop unit-based expertise. At JHH, the CNIO has developed a collaborative peer-coach program. Centrally supported and locally administered, this program supports the training of unit-based nurse coaches to help develop knowledge and skill in the safe use of IT. Peer coaches support the local transition to HIT, champion adoption, serve as the communication liaison between local nurses and other healthcare team members and centralized informatics and IT support staff, and share lessons learned with their peers to identify best practices in informatics-supported care. Coaches take responsibility for competency testing of their defined cohorts and sharing of knowledge and expertise with their clinical colleagues.

New Knowledge, Innovations, and Improvements

Nurses are ethically and professionally compelled to contribute to new knowledge, innovation, and quality improvement. Healthcare, and HIT technology, are continually evolving, requiring evidence-based process redesign and new models of care. Clinicians who do not keep up with advancements provide substandard care. Contribution to patient care is the goal and information systems should be patient-centric rather than provider-centric. The CNIO advances evidence-based decision-making and encourages staff to use HIT to answer important clinical questions.

The CNIO at JHH works with the CMIO and IT leadership to design and implement the interdisciplinary EHR. By engaging clinicians from all departments to contribute to design specification and usability testing, clinical leaders follow guiding principles that frame this work. These principles include simplification, standardization across the organization—with the ability to customize documents and flow sheets to accommodate population specific requirements—use of a ‘divide and conquer’ approach, and shared, re-usable observations. The CNIO has advocated for nursing assessment to be documented to an agreed-on standard to ensure best practices.
The interdisciplinary EHR design team for nursing documents and flow sheets is under the direction of the CNIO and the clinical informatics team, and is co-led by clinicians and IT nurses. The provider design team is under the direction of the CMIO, and includes a member of the clinical informatics team to ensure standardization and compatibility with nurse-developed documents and flow sheets. At times, these two groups make joint decisions, in terms of problem lists, multidisciplinary planning, and rounds.

The nurse-led team uses the Simulation Center in an innovative way to enhance usability testing and system walk through activities. Simulation Center activities are scenario-based, interdisciplinary, and include a criteria-based evaluation. They are conducted by large teams of clinicians, and evaluations are used to refine both EHR and workflow redesigns.

The CNIO promotes the development and implementation of research and uses relevant results to improve systems of care delivery, and informatics-supported clinical practice. Currently, the CNIO at JHH serves as the advisor for a nursing doctoral candidate who is studying the best ways to incorporate standardized nursing terminology into electronic documentation of nursing assessments, diagnoses, plans, interventions, and evaluations.

The CNIO recognizes that HIT is continually changing and that designing systems to enhance adoption is an iterative process. By keeping abreast of new technologic innovations, the CNIO evaluates their potential to support emerging clinical and regulatory standards and to improve organizational efficiency and patient outcomes. The CNIO advocates the collection, analysis, and distribution of data and reports related to the quality and safety of EHR systems and develops action plans to improve performance.

The CNIO ensures that staff nurses are involved in improvement of clinical processes and the IT that supports these processes. At JHH, the CNIO ensures that unit-based peer coaches engage staff in the continuous improvement of IT to ensure that IT supports rather than hinders patient-care activities. Additionally, coaches monitor staff use of the EHR and appropriateness and completeness of clinical documentation and identify work-arounds and system configuration problems that pose risks to patients, and participate in problem-solving and resolution.

**Empirical Outcomes**

There is no doubt that informatics performed ‘correctly’ supports quality, safety, and evidence-based practice. The Institute of Medicine recommended strategies to support nursing staff in ongoing acquisition of knowledge and skills, including the provision of staff education and training as new changes are introduced as well as to foster interdisciplinary collaboration, including commitment of resources to build nurse expertise and interdisciplinary practice mechanisms. Nursing excellence requires asking not what one does, or how one does it, but rather, what difference one has made.  

The CNIO advocates for the measurement of both patient outcomes and workforce outcomes. Measuring patient outcomes includes a focus on decision support and designing systems for safety, early detection of risk, continuity of care, and patient satisfaction. Measuring workforce outcomes includes use of at-the-elbow support, numbers of staff driven changes, effectiveness of collaboration/communication, and overall staff satisfaction.

The CNIO helps to transform informatics-supported care by building nursing intellectual capital for use and oversight of EHRs, advancing patient and organizational outcomes by serving as a champion of innovation, interdisciplinary collaboration, and professional development in informatics-supported care. This transformational leadership position is a valuable asset to organizations in this era of technologic reform.

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