The TIGER Initiative Foundation
The Leadership Imperative:
TIGER’s Recommendations for Integrating Technology to Transform Practice and Education

With Foreword by Angela Barron McBride, PhD, RN, FAAN

The TIGER Initiative Foundation

www.thetigerinitiative.org
FOREWORD

This TIGER Leadership Collaborative Report is the latest in a series of papers aimed at fleshing out what every nurse needs to understand about the informatics revolution underway. To date, the reports have focused on a range of topics—standards, competencies, faculty development, usability principles, virtual learning, consumer empowerment, etc.—and all presuppose a workforce of transformative nurse leaders who understand the importance of information technology to 21st century research, education, practice, and organizational effectiveness. Given the enormity of changes under way with full implementation of the Affordable Care Act, and the recommendations already made on this subject by various organizations, this new report seeks to provide further insights into how trends and pressures—rapid deployment of technology, the demand for quality, patient engagement, population-based care management, and required cost reduction—have accelerated the need for nurse leaders capable of, not only understanding these issues, but maximizing the opportunities they present.

This report speaks both to those who will be nursing informatics officers, taking the lead in creating and managing the techniques and schemas needed to support all aspects of nursing care, and the larger group of nurse leaders who need to understand the possibilities of information systems as a tool in redesigning healthcare. The latter are not likely to be the technical experts, but they need to know enough to understand why they should hire such expertise and then work with these specialists in the achievement of organizational goals. It is this outsized group of nurse decision makers, those who “get” the problems and the possibilities, who may find this report most helpful, because they need to fathom the issues of the day to encourage vision in their organizations. Since so many who are not “techies” wonder how you can automate without dehumanizing consequences, this report’s discussion of such polarities should be helpful in elucidating how it is possible to wring out unnecessary variation; that is, standardize and simultaneously use the same processes to customize so that all who have the same vulnerabilities get specialized attention.

As a nurse and member of a hospital board who is concerned with how you develop system-wide policies for 18 hospitals, I found this report to be particularly helpful in envisioning the kind of transformative leadership that we collectively need to encourage. The exemplars at the end of the report provided me with some concrete examples of what other organizations have done to develop protocols for best practices and to engage patients as full partners in decision making. I particularly found the section on “Reduction in Healthcare Costs” useful because it suggested some ways of instituting new processes that reduce cost without getting into the downward spiral that typically accompanies trying to “cut” your way to a more manageable bottom line. The question for every nurse and every hospital board is how you go about promoting transformational change in which the emphasis is not on transitory, isolated performance improvements by individuals, but on sustained, assimilated, comprehensive change of the whole. And this report offers one answer: nurse leaders knowledgeable about how information technology can help redesign practices so that they are standardized, evidence-based and clinically integrated, and reinforce the values of a caring culture.

Angela Barron McBride, PhD, RN, FAAN
Member, Board of Indiana University Health
Distinguished Professor-University Dean Emerita,
Indiana University School of Nursing (2014)

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EXECUTIVE SUMMARY

Leadership drives, empowers, and transforms. This updated TIGER Leadership Collaborative Report builds on the 2009 TIGER Leadership Development Collaborative Report by providing a leadership model, innovative nurse leader characteristics, tools for new ways of thinking, and information technology (IT) innovation exemplars. The tools and exemplars presented in this report illustrate the leadership imperative for improving the individual patient experience, improving healthcare outcomes, improving the health of populations, and creating healthcare delivery efficiencies. Healthcare has advanced since 2009 with continued health IT development becoming intertwined within every aspect of healthcare, translating into an interprofessional collaboration of clinicians, technology experts, informaticists, and engineers, to redefine what it means to deliver and receive healthcare.

The innovative nurse leader role incorporates a blend of people, processes, and technology for transforming and moving beyond past simplistic problem-solving approaches of overcoming complexity by utilizing data and technology to focus on managing the benefits of both technology and practice. Highlighting these characteristics are selected exemplars in which leaders brought together people, processes, and technology to provide solutions. These highlighted exemplars illustrate improved workflows, improved knowledge of evidence-based practice, and staff engagement. Innovative changes require leaders to have keen insight, extraordinary observational and listening skills, mediation expertise and management of group dynamics in addition to well-developed negotiating and information-sharing skills, the ability to motivate and engage, and the ability to remain focused on goals, objectives, and positive outcomes.

This Leadership Collaborative Report update includes an innovative nurse leader model, leadership exemplars, and a review of the technology landscape. The recommendations that follow build on the 2009 TIGER Leadership Development Collaborative Report recommendations, and provide guidance for incorporating technology into transformational practice changes to enhance patient, family, and economic outcomes.

Recommendations:

- Develop programs for nurse executives and faculty that stress the value of information technology and empower them to knowledgeably use health IT. Innovation will be advanced by the programs including the following elements:
  - Foster collaboration to move ideas into practice by leveraging the experience of all professionals and disciplines.
  - Accelerate the development and adoption of evidence and innovation into practice.
  - Transform the provider-vendor relationship to fund new initiatives.
  - Develop knowledge, competence and skills to engage with public policy initiatives.
- Expand and integrate informatics competencies into nursing leadership development programs. These expanded informatics competencies include an emphasis on evidence-based practice, inquiry and innovation, standardized terminologies, and the use of data analytics.
• Promote the sharing of best practices using health IT effectively to improve the delivery of patient care through leveraging and replicating the best practices of the industry. The emphasis on nursing’s role with patient outcomes and quality metrics provides a unique partnership to further health IT as a tool for efficiency and efficacy.

• Promote alignment with the ANCC Magnet Recognition Program® as a mechanism to demonstrate excellence in patient care outcomes through the use of technology as a tool to improve nursing practice.
OVERVIEW

“A qualification for leadership is that one can tolerate a sustained wide span of awareness so that one better sees it as it is” – 2

~Robert Greenleaf

This updated TIGER Leadership Collaborative Report focusing on leadership comprises a “span of awareness” that propels an agenda to transform healthcare and the TIGER mission of advancing the integration of health informatics to transform practice, education and consumer engagement™. Knowledgeable and engaged leaders are critical to navigating the changing healthcare environment, and to balancing the integration of practice and technology into a seamless experience for faculty, students, clinicians and patients. Leadership at global, national and regional levels must be engaged if the industry is going to fulfill the 10-year vision of TIGER (2006-2016), and create a new reality for how we educate healthcare professions and care for patients. The industry has a key opportunity to impact healthcare delivery, and to assure that all leaders have a wider span of awareness and are positioned to influence the impact of technology and informatics on transforming healthcare.

This updated report addresses the current state of health IT that leaders must know and be prepared to leverage, new skills and ways of thinking, innovation models and implications for interprofessional collaboration. Most importantly, it provides outstanding exemplar scenarios from organizations that have successfully implemented technology to transform care.

The TIGER Initiative, an acronym for Technology Informatics Guiding Education Reform, was launched in 2004 to bring together nursing stakeholders to develop a shared vision, strategies, and specific actions for improving nursing practice, education, and the delivery of patient care with health IT.

In 2006, the TIGER Initiative convened a Summit of nursing stakeholders to develop, publish, and commit to a plan to guide the future of nursing related to technology, and to determine what educational changes should occur to prepare nurses for the electronic age of healthcare. The TIGER Initiative Summary Report titled *Evidence and Informatics Transforming Nursing: 3-Year Action Steps toward a 10-Year Vision* captured strategies for a three-year action plan and the collective 10-year vision. This focus and the recommendations of the competencies for health IT in nursing helped to establish many of the competencies that are foundational for interdisciplinary health informatics programs across the country.\(^3\)

From 2007-2009, hundreds of volunteers joined the TIGER Initiative and collaborative teams were formed to accelerate the action plan within nine key topic areas: informatics competencies, education and faculty development, staff/professional development, leadership development, standards and interoperability, national health IT agenda, usability and clinical systems design, virtual demonstration center, and consumer empowerment. These reports are accessible on the TIGER Initiative Foundation website.

One of the highest priorities identified at the TIGER Summit was to develop revolutionary leadership that drives, empowers and executes the transformation of healthcare. *The TIGER Leadership Development Collaborative Report* (2009) urged the development of programs for nurse executives and faculty that stress the value of information technology and empowered them to use health IT knowledgably by expanding and integrating informatics competencies into nursing leadership development programs.

A milestone occurred in 2011, when TIGER became The TIGER Initiative Foundation, incorporated as a 501(c) (3) organization operating for charitable, educational, and scientific purposes. TIGER continues to work toward its vision to enable nurses and interprofessional colleagues to use informatics and emerging technologies to make healthcare safer, more effective, efficient, patient-centered, timely and equitable by interweaving evidence and technology seamlessly into practice, education and research fostering a learning healthcare system. As part of its continuing efforts to prepare the workforce to use technology and informatics to improve patient care, TIGER continues to recognize the value of revolutionary leadership to transform care.

**Charge to Update the TIGER Leadership Collaborative Report**

Since 2009, with the advent of federal legislation, including the American Recovery and Reinvestment Act (ARRA) and the 2010 Patient Protection and Affordable Care Act (PPACA or ACA), the healthcare environment has rapidly progressed requiring leaders in informatics to evaluate the current setting and strategically position the profession to have a proactive

\(^3\) S. Fenton, personal communication, June 1, 2008, AHIMA HIT Conference.
engagement and commitment to transformational leadership in order to impact outcomes through care delivery. Additional drivers of change have been the Institute of Medicine’s *Future of Nursing Report*\(^4\), the HIMSS *Nursing Informatics Position Statement*\(^5\), the American Nurses Association (ANA) action in spearheading a number of health IT initiatives and the American Organization of Nurse Executives’ (AONE) position paper on the *Nursing Informatics Executive Leader*.\(^6\)

As a result of the on-going recognition of the vital role nursing leadership plays in the successful adoption of health IT, the TIGER Initiative Foundation Board recommended an update of the TIGER Leadership Collaborative Report. Additionally, key informatics leaders from a variety of settings and experiences recommended that within the larger healthcare environment, the TIGER Leadership Team analyze national healthcare policy and incorporate the interprofessional movement in this updated report.\(^7\) The early stages of the TIGER Initiative focused primarily on nursing practice, leadership in nursing and competencies needed for proficient practice to maximize the use of health IT. More recently, the Initiative has positioned this collaborative effort with an interprofessional team focus to advance the next steps in furthering educational competencies to enhance practice required for healthcare delivery in the future. Engaged leadership within interprofessional teams will be critical to ensuring competencies and practice standards exist to fully realize the potential of health IT to improve healthcare delivery.

**Rapid Nationwide Deployment of Health Information Technology**

The ACA focuses on providing all Americans with access to quality and affordable healthcare, and puts into place a national health IT infrastructure to support transformation of the delivery system to accomplish full impact. As a component of the federal plan, health IT plays a critical role to ensure transparency, increase efficiency, engage consumers, and to provide data to effectively manage the cost and quality of care in the United States.\(^8\) The Health Information Technology for Economic and Clinical Health (HITECH) Act was passed as part of the ARRA. Under the HITECH Act there are two sets of standards established by the Office of the National Coordinator (ONC) for health IT to help providers meet meaningful use of electronic health records (EHRs) and to assure that EHRs across the nation meet an adequate standard for performance.

The first standard essentially outlines the metrics that providers and hospitals must achieve in order to meet Meaningful Use criteria and to merit financial incentives available under the Centers for Medicare & Medicaid Services (CMS) EHR Incentive Program. The second

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standard specifies the standards that the industry (vendors) must meet to certify their EHR products as a “meaningful use-certified products” under HITECH. In addition, the HITECH Act has outlined three phases of Meaningful Use with each of the stages building upon the previous requirements, thus moving the healthcare industry further with each stage. The unprecedented HITECH Act funding of approximately $25.9 billion invested in health IT has been successful in driving the rapid deployment of the national health IT infrastructure. Given this rapid deployment, the aggressive development of EHRs to meet the standards under the HITECH Act, and the related financial incentives, leadership must be vigilant to ensure these systems work as they are intended to work to improve quality and efficiency. Organizations that have achieved Stage 7 in the EMR Adoption Model (EMRAM) have proven outcomes in quality and efficiency. The image below is a snapshot of the U.S. EMRAM as of third quarter 2013.

![Image of US EMRAM 2013 Quarter 2-2013 Quarter 3 Comparison of Adoption Scores (Used with permission from HIMSS Analytics)](image_url)

**Focus on Quality**

The U.S. healthcare industry has produced an explosion of technologically innovative tools to manage complex conditions, but the industry overall has fallen short in demonstrating effectiveness in the foundations of healthcare quality, equity, and financial measures. Of particular concern is a shortcoming in quality improvement in approximately one-fifth to one-third of all hospitalized patients experiencing, potentially preventable failures in appropriate

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delivery of care. The national health IT infrastructure increases the ability to manage both individual and population health through providing large amounts of data—data that can potentially inform research, education, practice and policy. Couple this complexity with rising rates of chronic illness in the United States, and it becomes clear that the need for effective and engaged leaders to impact change is paramount.

Continuously learning health systems are ones which emphasize improvement as a core priority. Achieving quality care will only be realized when leaders in clinical informatics at all levels encourage and demand organizations employ digital systems that capture the patient experience reliably and when data are used for improvements. To further address quality issues, the implementation of standards and best practices that promote the interoperability of disparate systems will be needed to accurately capture information across the care continuum.

Improving healthcare quality is not something that can be solved by implementing health IT as the “magic silver bullet.” Rather, utilizing technology requires an interprofessional team approach in which nurse leaders take a significant lead and innovatively leverage technology solutions to impact the outcomes of individuals and populations. In many respects, aligning the nation with common goals and health IT standards to effect change is the primary goal of the HITECH Act and what is intended by “real meaning” in “meaningful use.” This health IT movement, can impact quality, presuming organizations can shift to a culture that expects and builds quality—from the bedside to the boardroom. This approach calls upon a stewardship within healthcare systems which focuses on a culture of teamwork, collaboration, and continuous development of and utilization of health IT.

**Leveraging technology and practice through transformational leadership**

Transformational leadership moves beyond solving problems and fixing broken systems and requires innovative thinking to improve the outcome in practice. The energy of transformational leadership transforms organizations to meet the healthcare needs of the future. Polarity thinking is a tool for bringing innovative changes successfully forward in an organization. In the literature, polarity thinking has also been called paradoxes, dilemmas, or tensions. Polarities are interdependent pairs that need each other over time to gain and maintain performance, and reach a higher purpose. In essence, polarity thinking supplements traditional problem-solving “either-or” approaches, with “both-and” thinking which is necessary to overcome hurdles in complex environments.

A fundamental polarity concept calls for leaders to leverage the *technology-practice* polarity. As we evolve into the digital era, neither practice nor technology exists alone. When the

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technology and practice polarities are both leveraged a synergy is created, such as a successful EHR implementation that yields quality patient outcomes that are safe and sustainable.

The Polarity Map shown in Figure 2 is a four-quadrant diagram. Each side of the map is divided into two poles (practice on one pole, technology on the other) and has an upside and a downside. Upsides are the positive results or outcomes obtained from focusing on that pole. Downsides are the negative outcomes that appear when there is too much focus on this pole and not enough focus on the other side. For example, when there is a focus on well-done technology, positive outcomes could be improved efficiencies, innovation, error reduction, information sharing, and integrated information. This is the “promise of technology.” However, if technology is implemented without attention to the parallel pair (practice), the predictable result is a move to the downside of the very thing being given the most attention. Many of the “unintended consequences” of technology are the content of the downside quadrant on a practice-technology Polarity Map. When technology designers, trainers, leaders, implementers, and users do not pay attention to the practice/work flow changes that must occur in the context of “practice-technology,” the energy naturally flows to the downside, which may result in poor workflow integration, duplicate documentation and ultimately end-user dissatisfaction.

![Figure 2: Polarity Map](image)

Since polarity thinking focuses on action, the next steps are crucial to leveraging the energy in the parallel pairs. Each Polarity Map is designed with a space for action steps and early warning signs. Action steps are interventions necessary to gain or maintain the upside of that pair. For example, action steps to keep the technology side strong might be: clarify the benefits and limitations of technology tools with all stakeholders; using adult learning principles, ensure the proper amount of time for users to learn the technology tools. On the practice side, an action step might be: provide time for the interprofessional team to do the transformation work necessary to integrate new technology processes into professional practice. Early warning signs are indicators that predict a swing to the downside. By identifying and watching for these signs, organizations can avoid or manage the side-to-side swings that tend to occur when issues are seen as problems to be solved rather than polarities to leverage.

The legacy of today’s interprofessional leaders will be their ability to lead and sustain healthcare transformation at the point of care. This ability depends on a willingness to supplement traditional problem solving (which they are great at) with “both-and” thinking. By using polarity thinking, transformational leaders have the potential to:

- Automate without dehumanizing.
- Achieve fiscal soundness without decreasing quality.
- Educate but not interfere with new ideas.
- Use evidence-based standardization without losing individualization.
- Enhance team competency without losing sight of the individuals on the team.
- Get the routine tasks done without compromising the professional scope.
- Innovate without losing stability.
- Reduce unintended consequences.

In summary, polarity thinking supplements traditional problem solving skills with a focus on “both-and” thinking and related action steps. This paves the way for healthcare leaders to leverage complexity, informatics knowledge, and professional expertise to effectively address the healthcare challenges of today and tomorrow. These challenges must focus on multiple efficiencies as exemplified by the Institute for Healthcare Improvement’s (IHI) Triple Aim.\(^\text{17}\)

The Triple Aim describes an approach to optimizing health system performance through the improvement of the patient experience of care (including quality and satisfaction), the improvement in the health of populations, and the improvement towards reducing the per capita cost of healthcare (establishing efficiencies).

**Triple Aim: Improvement in the Patient Experience of Care**

The development and implementation of innovative health IT communication platforms offer great promise in facilitating and enhancing two-way information exchange between providers and patients at every level of care. This two-way exchange has received increased emphasis from ONC as it drives toward its vision of individuals actively managing their health as partners in healthcare while leveraging information and technology. By 2020, the ONC anticipates that technology will support the goals of: 1.) increased self-management and prevention; 2.) seamless

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interaction with the healthcare system; and 3.) shared management of healthcare. To further this effort, the ONC is encouraging the broader use of the Blue Button Initiative to engage consumers in their healthcare by providing access to their health information electronically. The Blue Button is itself a symbol of a movement toward an improved healthcare system in which patients and healthcare providers use information technology to work together and improve health.

Recent developments in technology are bringing this vision to reality through the use of mobile devices, such as smartphones and tablets. Consumers are able to enter patient-reported data, such as blood pressure and blood glucose levels, into mobile phones to communicate with care providers and receive real-time feedback and care support. Using a combination of mobile and web-based tools, patient-reported data provides a rich new source of information, enabling the team to make adjustments in care, even when the patient is not physically present in the healthcare setting. Ubiquitous team communication between patient and provider teams demonstrates the ability to have positive impacts on quality, cost, effectiveness, and satisfaction. Use of health IT to gather real-time feedback from patients about their experience with the healthcare system and their health concerns enables clinicians to adjust care delivery rapidly, efficiently, and effectively. Assessment and intervention with patients outside of the traditional healthcare setting can be facilitated by real-time communication technology. An example of real-time communication exists with an interactive voice response telephone system. This technology calls patients and gathers information regarding issues related to their healthcare, such as early signs and symptoms, potential need for support with medication management, and follow-up care after hospital discharge. This real-time information enables nurses and providers to provide appropriate intervention in the management of large numbers of patients outside the care delivery setting.

Information technology tools provide nurse leaders with the opportunity to track and trend individual patient input in real time so they can implement effective strategies to address clinical issues and problems before these needs advance to a critical (and costly) level. These same tools allow nurse leaders to leverage reports that provide evidence of individual and aggregate patient trends over time. Thus, nurse leaders can evaluate and measure effectiveness of interventions and as trends emerge, the opportunity to discover gaps in the both the system and care delivery processes can be identified quickly. As a result, quality improvement strategies can be implemented more effectively. One innovative research study is using a patient engagement technology to measure the impact of electronic-based patient engagement tools (kiosk, web portal, mobile phones, and clinical alerts) on decision-making, adherence to care plans, and healthcare outcomes. The electronic-based patient engagement tools captured and analyzed patient reported outcomes to treatment. Before the patient left the office a kiosk was used to assess potential gaps in care immediately following a visit. The data were translated into descriptive analytics, clinical messaging, and stratified dashboards. As a result of this

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information, transformation of practice occurred in three areas: quality outcome improvement; improvements in patient-provider communications; and cost reduction. The factors for success included: patient use of technology to enter patient reported outcomes; clinician use of dashboards with subsequent changes in workflow in response to patient reported data, reduction in gaps in care as both provider and patient engaged in two way communication; increase in patient adherence to care plans; and improved performance in quality measures and reduction in costs.

Through use of health IT tools, trends and outcomes can be analyzed allowing nurse leaders to proactively identify patient populations at risk and even those who may fail to adhere to care plans based on statistically derived characteristics. Patient interactive reporting and platforms to collect data are now essential to achieving the national priorities. The patient will be instrumental in helping to increase quality and reduce costs. Therefore, nurse leaders must understand the value of deploying health IT that enables patients to become part of the healthcare transformation currently underway. Nurse leaders with the foresight to promote interoperable systems that transform healthcare will create organizations with market differentiators.

**Triple Aim: Improvement in the Health of Populations**

Nurse leaders have a pivotal role in leading adoption of interoperable health IT systems to better track and securely share patients’ complete health histories, care plans, and responses to treatment across diverse health IT products (such as electronic health records) across geographical settings. This can be accomplished through the use of health information exchanges (HIE), which have the capacity to share health information among organizations. In doing this, nurse leaders are demonstrating the use of national and state-level initiatives and infrastructure, in accordance with the National Quality Strategy (NQS) to improve care of the patient population. The NQS is a nationwide effort to align public and private interests to improve the quality of health and healthcare for all Americans. This involves working with community partners to provide consistent and accurate health information and messaging with a focus on prevention and wellness.

Nurse leaders are responsible for making positive changes in care delivery across the entire enterprise. Measuring the impact of health IT requires a leader who uses data captured as a byproduct of care delivery to generate new knowledge about how care needs to improve for the future. Through data mining techniques, nurse leaders leverage performance dashboards throughout the organization to provide the care-givers with the knowledge and tools they need to achieve continuous improvements and better quality at a lower cost. These dashboards contain performance metrics covering clinical quality and safety, market share, patient satisfaction, employee satisfaction, and financial results.

Nurse leaders will embrace clinical analytics to evaluate care outcomes across populations, identify patterns in care outcomes, and subsequently use the information to predict trends for the future and to enhance evidence-based knowledge. Through the use of clinical analytics, nurse leaders will create innovative IT strategies for healthcare delivery, outreach and follow-up.

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support for geographically distant patient populations (rural-dwellers, isolated or home-bound individuals, individuals with special needs, etc.). Nurse leaders will advocate for innovative models of care delivery and interprofessional collaboration to improve the outcomes associated with quality and increased consumer engagement. The information gathered from clinical analytics can be used by nurse leaders to influence healthcare at the local, regional, and national level. An invitational conference held in 2013, *Nursing Knowledge: Big Data Research for Transforming Healthcare*, addressed the need for nurse leaders to capture nursing information in ways that make it sharable and comparable—essential for “big data” research and ultimately, for improving care.\(^{24}\)

**Triple Aim: Reduction in Healthcare Costs**

There are numerous ways health IT can reduce costs and the innovative use of technology can be pivotal in spreading cost reduction across the organization. For example, health IT has the potential to streamline workflow and improve efficiency for nurses through the integration of electronic documentation solutions (such as EHRs) with phone communication devices (such as a nurse call systems) that combine a patient request with information about the patient (EHRs) to the nurse using wireless devices accessible from any location on the unit. These technologies often work in concert and create synergies of efficiencies and cost savings when implemented knowledgeably and inclusively.

Nurse leaders have an opportunity to leverage innovative telehealth and mobile health IT solutions to reduce preventable readmissions and Emergency Department overload. Telehealth is the use of electronic information and telecommunications technologies to support long-distance clinical healthcare, patient and professional health-related education, public health and health administration.\(^{25}\) The largest impact on costs through use of health IT may come from efforts in primary care targeting patients with chronic disease and disability. This moves the use of health IT upstream in the process where it can have the highest impact. Health IT can create enhancements to the home with assistive technology that combines video scanning for safety, patient entry of outcomes using touch control and voice activation that feeds into a care coordinator’s dashboard for surveillance and guidance. This offers the potential to improve functional outcomes and reduce adverse events and readmissions.\(^{26}\)

One of the most significant impacts on cost stems from use of health IT to leverage healthcare data, entered by both providers and receivers of care available in data warehouses and used for analytics. Through data analytics, patterns of care delivery and correlations between clinical and financial data can be analyzed to target areas of improvement.

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\(^{24}\) Big Data Proceedings Capturing Nursing Information for Big Data Research – And Improved Health Outcomes (2013). [Brochure]. University of Minnesota, School of Nursing.


THE INNOVATIVE NURSE LEADER

TIGER’s vision for an innovative nurse leader is one that drives, empowers, and executes the transformation of healthcare through use of health IT to achieve the Triple Aim by: improving the patient experience of care (including quality and satisfaction); improving the health of populations; and reducing the per capita cost of healthcare.

With significant changes in healthcare, spanning from value-based purchasing to the exponential growth of health IT, innovative nurse leaders drive the creation of new care delivery models and lead health IT innovation to support the newly formed care delivery models. The formation of new care delivery models can be enhanced through the use of informatics, workflow process transformation, and evidence-based practice. Innovative nurse leaders play a critical role in overseeing the adoption of health IT to generate new knowledge as a natural byproduct of care delivery; while infusing the new knowledge into care delivery to produce the best care at the lowest cost. To achieve this goal, innovative nurse leaders will build integrated cross-continuum team structures and processes of care, breaking down traditional care silos through use of health IT.

Nurse leaders will be working in an environment where patients are treated in patient centered medical homes, and in community settings ranging from urgent care centers to the work setting. Care will be delivered remotely through the use of mobile monitoring and innovative communications. They will be using on-line and electronic communication and telehealth strategies to enhance communication among providers and between patients and providers. As a result, nurse leaders' accountability for patient care oversight will extend well beyond the hospital setting. To support these new models of care delivery, innovative nurse leaders will be required to integrate an ever-expanding arsenal of health IT into practice.

Healthcare has advanced at a speed previously unimaginable, with health IT intertwined within every aspect of healthcare, from value-based purchasing to consumer engagement and genomics. In 2008, the Institute of Medicine (IOM), working together with the Robert Wood Johnson Foundation (RWJF), launched a two-year initiative to evaluate and assess the nursing profession, which is presented in the landmark publication The Future of Nursing: Leading Change, Advancing Health. This report highlights a number of “barriers that prevent nurses from being able to respond effectively to rapidly changing healthcare settings and an evolving healthcare system.” Recommendations for overcoming these barriers include opportunities for nurses to practice to the full extent of their education and training; achieving higher levels of nurse education through an improved educational system that fosters seamless progression; inclusion of nurse professionals as partners and experts in the care provider team; and more effective planning and policy development supported by improved data collection and information infrastructures.

Numerous advances in the nursing profession have been successfully initiated and are producing results. For example, nursing leadership input into healthcare has led to the creation of newly

formed person-centered, transprofessional care delivery models, with health IT as the foundation enhancing the use of data, information, and knowledge to create patient environments of the future. This newly developed transprofessional approach emphasizes collaboration of non-traditional experts across a wide variety of innovative areas and stretches the boundaries of what is commonly called ‘interprofessional’ collaboration.\textsuperscript{28} This approach involves a committed leadership that drives integrated teams of architects, technology experts, informaticists, engineers, and clinicians who work in parallel to redefine patient care experiences, improve outcomes, and increase efficiency. Achieving this goal, requires an innovative nurse leader with diverse expertise as depicted in the Innovative Nurse Leader Model (Figure 3).

\begin{figure}[h]
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\includegraphics[width=\textwidth]{innovative_nurse_leader_model}
\caption{Innovative Nurse Leader Model}
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The Innovative Nurse Leader Model illustrates the synergy of eight core domains of competency for innovative nurse leaders set within the context of the Triple Aim (improving the health of populations; improving the patient experience of care including quality and satisfaction; and reducing the per capita cost of healthcare). Each core domain represents a foundational competency. Within each domain there are specific skills required for nurses to lead health IT innovation successfully across a multitude of care settings, while demonstrating true processes of leadership. The core domains provide a framework—a tool—for nurse leaders to use in evaluating and strengthening their skills in working toward transforming healthcare with the use of innovative technologies.

**Professional Interoperability**

The model introduces the concept of professional interoperability, a term that engenders the critical importance of sharing knowledge and expertise within and across professional disciplines in a transparent, dynamic, and truly meaningful way. In the context of the Innovative Nurse Leader model, professional interoperability extends far beyond making systems and technology interoperable. Professional interoperability is the combination of highly developed professional skills and competencies applied effectively to share meaningful information, knowledge and expertise within and across diverse and often competing disciplines, in working toward innovative health IT solutions to healthcare challenges. Professional nurse leaders are ideally poised to take the lead in fostering these kinds of professional and interoperable relationships and collaborations.

**Public Policy Engagement**

Within the past decade, public policy has played a major role in shaping our healthcare delivery system through the development and deployment of the National Quality Strategy. Now, more than ever, innovative nurse leaders are positioned to work closely with local and national policy leaders and lawmakers through public policy engagement. Effective engagement requires a comprehensive understanding of policy processes, and the knowledge and skill to effectively evaluate the interconnections between policy, nursing, and health outcomes, as well as the critical role of health IT. Using this knowledge to develop programs of action grounded in the principles of professional nursing, the innovative nurse leader plays a major role in effecting positive change as our system of healthcare continues to evolve.

**Communication Skills**

Mastery of effective communication requires thoughtful articulations and ongoing active listening—skills that develop over time with dedicated practice and ongoing effort. These skills include understanding discipline-specific languages and philosophies, fostering interprofessional relationships, seamlessly managing change, and communicating using multiple modalities including available technologies and tools to promote effective engagement with others. The innovative nurse leader prioritizes the development and refinement of exquisite communication skills, and applies these skills to lead, inspire and motivate others in working toward common patient outcome focused goals.

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Strategic Vision
The innovative nurse leader helps to define the strategic vision of the organization by ensuring components of innovation are woven within the strategy to improve quality and reduce costs. The introduction of innovation within organizational strategic plans fosters creation of new healthcare delivery models and paradigms that are necessary for healthcare transformation. This requires a leader who recognizes the importance of research and the development of metrics to proactively measure the impact on health outcomes. In addition, it is important that the nurse leader possesses a level of competency to communicate this vision clearly and effectively to others.

Broad Knowledge Base
The innovative nurse leader invests time in both the acquisition and application of comprehensive knowledge across all domains of healthcare delivery. The national drive toward adoption and integration of health IT to improve outcomes and reduce cost combined with the growth of accountable care organizations has extended the scope of knowledge required by innovative leaders. Innovative leaders not only understand, but possess the ability to apply knowledge contained within national policies, evidence-based healthcare, management, informatics, and health IT. Furthermore, this knowledge must be applied across all settings of care, requiring knowledge in care coordination, healthcare reform and legislation related to payment for healthcare services.

Informatics Expertise
The innovative nurse leader applies informatics expertise in the multidisciplinary scientific endeavor of analyzing, formalizing and modeling how nurses collect and manage data, process data into information and knowledge and make knowledge-based decisions and inferences for patient care. The nurse leader uses this empirical and experiential knowledge to broaden the scope and enhance the quality of the professional practice. The scientific methods central to nursing informatics are focused on: (1) using a discourse about motives for computerized systems; (2) analyzing, formalizing and modeling nursing information processing and nursing knowledge for all components of nursing practice: clinical practice, management, education and research; (3) investigating determinants, conditions, elements, models and processes in order to design, and implement as well as test the effectiveness and efficiency of computerized information, telecommunication and network systems for nursing practice; and (4) studying the effects of these systems on nursing practice.
**Scientific Research and Scholarship**

The innovative nurse leader utilizes scientific research and scholarship expertise from transprofessional disciplines to interpret and evaluate scientific research. The purpose of which is to identify gaps in existing knowledge and to identify opportunities for new research at a level of competency sufficient to design and implement rigorous research studies, including the scholarly dissemination of findings. The innovative nurse leader has a deep understanding of the processes of transforming research into clinical practice and actively evaluates the effectiveness of these strategies in promoting the science and scholarship of the nursing profession.

**Workforce Development**

Mentorship is the cornerstone of effective workforce development and is incorporated into the daily activities of the effective innovative nurse leader. The innovative nurse leader is a leader of leaders, and recognizes the value of developing synergistic team cultures grounded on the philosophy that the whole is truly greater than the sum of the individual parts. This requires skill and expertise in the promotion and utilization of best practices to promote quality and safety and cultivating nursing expertise and professional advancement at all levels of nurse career development by ongoing sharing and dissemination of information, knowledge and wisdom.
TIGER Leadership Exemplars

The dramatic changes in the healthcare landscape have created both new demands and opportunities for healthcare leaders and organizations. The following six exemplars represent the TIGER vision by demonstrating how nurses, in a variety of settings and health IT adoption phases, utilize informatics tools, principles, theories and practice to make healthcare safer, more efficient, patient-centered, timely and equitable. In each case, nurse leaders, demonstrate how they drive, inspire, and execute transformational changes through the use of health IT. When nursing’s unique contributions are valued and embedded in the technology solutions, care coordination, clinical decision support, workflow and ultimately patient outcomes improve as evidenced in these exemplars.

In an effort to highlight “in the field” practice, the TIGER Collaborative sought exemplars from across the industry which illustrates the leadership model, and successful navigation to transform care delivery. The search for examples of excellence in leadership was guided by the following areas identified in article *The Future of Nursing: How HIT Fits in IOM/RWJF Initiative* (2010):

- Leaders in the Effective Design and Use of EHRs.
- Integrators of Patient Information.
- Full Partners in Decision Making.
- Care Coordinators Across Disciplines.
- Experts to Improve Quality, Safety, Efficiency, and Reduce Health Disparities.
- Advocates for Engaging Patients and Families.
- Contributors to Standardize Infrastructure Within the EHR.
- Researchers for Safe Patient Care.
- Preparing the Workforce.

The call for exemplars was sent to a variety of professional nursing and informatics leadership organizations representing public, private, inpatient, and community settings. After receiving submissions from organizations, each exemplar was evaluated using predetermined inclusion criteria.

All of the outstanding organizations that answered the Call for Exemplars clearly demonstrate the TIGER vision for revolutionary leadership that drives, empowers, and executes the transformation of healthcare through the use of health IT. While each of the submissions was unique, one common theme throughout all of them was a system-wide approach that blended people, processes and technology. The leaders of these organizations engaged comprehensive teams with representation across the organization to identify problem areas and develop innovative technology solutions.

Six exemplars were selected for their outstanding leadership that drove, empowered and executed the transformation of healthcare through the use of health IT. For additional

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information on these six exemplars plus other submitted exemplars, go to the TIGER Virtual Learning Environment (VLE).

**Kaiser Permanente Leadership Collaborative Exemplar** represents more than 49,000 nurses in a multi-system healthcare organization. Recognizing the “non-system-ness” of healthcare, a team of nurse leaders from Kaiser initiated a project to redesign care delivery. Data gathered from video ethnography of nurses providing care in a med/surg environment offered a summary of challenges, which evolved into the goals of the initiative. The nurses needed a healthcare system that would: simplify my path, support me with knowledge, and reduce my non-value added tasks. They learned that nurses operate in a highly complex, interdependent system that can only deliver the best outcomes if every part operates with both high reliability and excellence. One of their strategies was to interview key stakeholders across the organization to prioritize the current pain points as well as opportunities to improve care. Their call to action became: Accelerate the adoption of smart, standards-based, interoperable, patient centered technology that will make healthcare delivery safer, more efficient, timely and accessible. The aim was to leverage the power of the EHR, enabling technology and continuous performance improvement to transition from a chaotic environment to highly reliable, evidence-based care. From this collaboration between nursing, IT, and innovations, the KP SmartCARE strategy was developed. This work prioritized the major areas of nursing technology for KP, including Rapid Sign-On, Clinical Intelligence, Context Awareness/Workflow automation, and Clinical Mobile Communications.

The Kaiser Permanente Leadership Collaborative illustrates the leadership areas as leaders of effective design and use of EHRs and experts to improve quality, safety, efficiency, and reduce health disparities. Innovative nurse leader attributes that contributed to their success included a strategic vision that was developed with a broad knowledge base from stakeholders representing operations, technology, and informatics expertise across the enterprise. The use of ethnography demonstrated using innovative communication skills in order to learn about and represent the needs of caregivers in the organization.

**Department of Veterans Affairs (VA) Health Informatics Initiative Exemplar** represents a government healthcare system which embarked on a major initiative to improve quality through innovation and technology and workforce development. The VA is an EHR pioneer with 25 years of experience with clinical information systems. These aging systems required a transformation from a medical model to a patient-centered model of care. A comprehensive health informatics workforce development program was deployed to prepare a workforce capable of catalyzing, implementing, utilizing and supporting health IT innovations. Several large scale education and training programs were delivered via a virtual learning environment; corporate memberships to AMIA and HIMSS were obtained; partnership with AMIA was established to deliver a VA AMIA 10x10 certificate program; and standardized health informatics positions and career paths were created. Success factors included strong leadership endorsement and support, interprofessional collaborations, and partnering with outside agencies to create a sustainable program.

The VA Health Informatics Initiative illustrates the leadership areas of preparing the workforce, effective design and use of EHRs, and full partnership in decision making. The VA leveraged their informatics expertise and utilized different innovative nurse leader components to mobilize
workforce development initiatives, including professional interoperability and promoting scholarship to broaden the informatics knowledge base of caregivers in their system.

**North Shore Long Island Jewish Health System (NSLIJHS) Exemplar** represents system-wide interprofessional culture and professional practice transformation, supported by technology. The NSLIJHS leveraged the opportunity to implement a multi-site system wide electronic health record and made a commitment to advance interprofessional collaboration and practice. An enterprise-wide structure was developed to plan and lead the implementation, engaging leaders and clinicians across the enterprise, with a focus on people, processes and technology. Key success factors were creating an organizational model of care that was supported by evidence-based interprofessional care planning and documentation as well as more than 330 interprofessional Collaborative Care Councils. Preparation included transformation workshops focusing on scope of practice, partnership councils, and healthy work cultures. Rather than build to current state, NSLIJHS deliberately moved into an environment that supports best practice with evidence-based tools and clinical practice guidelines with content review and validation by interprofessional teams including physicians. Since implementation, further interprofessional care and interoperability has been advanced by sharing data content between the physicians’ history & physical and the patient profile history and assessment tool, as well as pulling shared data fields forward into an interprofessional discharge plan and summary. The impact of implementation has been positive with multiple anecdotes of success stories of teamwork and staff empowerment clearly indicating a change in culture and engagement as well as national quality awards. Post go-live infrastructures have been put in place to support practice optimization and all revisions are driven by metrics and supported by evidence.

The leadership at NSLIJHS supported a practice and technology approach to care transformation that was centered on their commitment to transform culture and practice at the point of care using technology. Components of the innovative nurse leadership model exemplified were strategic vision to set the approach to implementation, use of evidence-based tools and guidelines to enhance scholarship, fostering teamwork with councils and communication skills, expanding full interprofessional scope of practice enhancing workforce development and professional interoperability, and leveraging informatics expertise.

**Informatics Leadership Collaborative for Healthy Community Forum (HCF) Exemplar** represents collaboration within communities to improve quality through informatics and leadership. The HCF provides a unique partnership of multiple academic, and clinical settings, who recognized the need for a nursing workforce that has the knowledge and skill in evidence based practice and information technology to achieve positive patient outcomes. HCF utilized an innovative approach to facilitate the development of nurse competencies through the use of case studies. With an integration of established academic and clinical informatics competencies, interdisciplinary case studies have been created and implemented. These provide nursing students and frontline nurses with opportunities to meet the competencies. Aggregated patient data applied with an evidenced based practice approach was designed to improve patient outcomes.

The leadership areas of care coordination across disciplines and experts to improve quality, safety, efficiency, and reduce health disparities were demonstrated in the HCF. Attributes of innovative nurse leaders leading to the success of HCF include: professional interoperability in the community, scholarship as a foundation for workforce and academic informatics workforce
development, and integrating communication skills between academic and clinical settings to improve care through analytics and EBP.

**UCLA Health EHR Implementation Exemplar** represents academic medical centers and leadership in implementing an EHR. UCLA deployed an EHR on a massive scale and demonstrated the value of operational departmental ownership in the successful transformation. The UCLA deployment team used a structured, data-driven readiness program that designed a package of implementation initiatives to help to ensure a successful transition to the EHR. Driven by the Chief Nursing Informatics Officer, several unique modalities contributed to the success: availability of Sneak Peeks of high-volume and high-risk workflows, creation of readiness scorecards, a 24 x 7 personalization/customization laboratory and with 1:1 support to faculty and residents before and after implementation, and mobile competency checks. The development of a highly motivated and expert support team is transitioning the program to stabilization and optimization.

UCLA demonstrated the leadership area of effective design and use of EHRs in their implementation. Innovative nurse leader attributes that led to the success of UCLA’s EHR implementation included the strategic vision of the CNIO to assure that the infrastructure and activities were in place for workforce development in informatics. They utilized communication skills to assure that faculty, residents, and clinicians were prepared and supported throughout the transition.

**Brigham & Women’s OR Initiative Exemplar** represents optimization, leadership, and innovation post EHR implementation. This exemplar highlights the positive impact of nurse scientists engaging and partnering with front line nurses. Initially, one diagnosis was chosen to design and implement an assessment tool within the OR electronic record which increased awareness of potential risks of patient positioning injuries and focused nurses’ attention on interventions for prevention. This resulted in improved nursing documentation with clinical decision making at the point of care. There were significant improvements in patient outcomes as well as nursing knowledge and skill. Also impressive was the staff engagement and leadership efforts to support and promote evidenced-based practice.

The leadership areas exemplified in the Brigham & Women’s OR Initiative were as researchers for safe patient care and experts to improve quality, safety, efficiency, and reduce health disparities. They used innovative nurse leader components including professional interoperability and communication skills between research and the front lines in order to leverage their informatics expertise to develop their workforce in utilizing health IT to achieve positive outcomes in the OR.
CONCLUSION

Throughout the exemplars, innovative nurse leaders applied comprehensive knowledge in the areas of informatics, information systems, evidence-based clinical care, leadership, policy, and healthcare to improve care outcomes. A distinguishing characteristic of the Innovative Nurse Leader is the ability to lead the integration of innovative health IT across the entire continuum of care (not just the acute care setting) to improve care coordination both within and across care settings (transitions of care). This requires open-mindedness and a determination to implement technology under significant financial constraints with many unknown variables. Innovative nurse leaders have a strong strategic vision, outstanding leadership skills, and a foundation built on scholarship.

The Innovative Nurse leader is in a unique position to promote engagement across all levels within the organization, taking an enterprise-wide view of health, breaking down traditional silos of care delivery. This involves defining a system of transprofessional collaboration\textsuperscript{31} where all domain experts work in parallel to develop, implement, and evaluate health IT. This involves expertise in professional interoperability, or the ability to effectively lead and engage teams comprised of highly diverse individuals and groups. This requires strong motivational skills and the ability to energize and focus on knowledge transfer between a variety of professions to work effectively toward common value-based goals and objectives that result in a seamless continuum of healthcare delivery. The nurse leader drives the input from multiple professionals, spanning business, finance, evidence-based healthcare, health IT, and regulatory initiatives, in order to move beyond identifying gaps and create new care delivery models that advance healthcare.

The Innovative Nurse Leader understands discipline-specific languages and philosophies and utilizes this knowledge to effectively foster interprofessional relationships, a core component of successful collaboration. Using effective communication skills, the Innovative Nurse Leader encourages sharing of ideas by reaching across disciplines to develop new ways of improving healthcare through use of health IT. When guided by common principles and mutual understanding, the Innovative Nurse Leader is able to lead and optimize seamless change.

The Innovative Nurse Leader has a comprehensive understanding of hierarchical and organizational structure of both his/her organization and of collaborating organizations to

function effectively as a leadership champion within complex and often challenging dynamics. This requires keen insight, extraordinary observational and listening skills, understanding and leveraging polarities, mediation expertise and knowledge of group dynamics, as well as well-developed negotiation and information-sharing skills, the ability to motivate and engage, and the ability to remain focused on goals, objectives and positive outcomes.

The Innovative Nurse Leader will align internal and external stakeholders to explore new business models for care delivery using health IT as the lever for change. These new models will branch into acquisitions, strategic partnerships, use of simulation within health IT labs, and collaboration with members of the community. They will develop partnerships with cutting-edge organizations and leaders, both in and outside of healthcare, to support advancements aimed at improving the health of our population.

Innovative Nurse Leaders utilize technology to expand the role of the nurse with novel approaches to care such as the patient centered medical home, telemedicine, virtual care monitoring and robust post-acute care services to lower costs and improve quality. As business models evolve, Innovative Nurse Leaders will help propel forward the next generation of performance improvement through technology. This involves the use of data and powerful clinical analytics.

The Innovative Nurse Leader integrates clinical and administrative activities that are aligned with organizational strategic plans and masterfully utilizes metrics and data analytics for ongoing evaluation and effective outcome measurement. Understanding how to select the most appropriate tools and metrics for capturing and evaluating meaningful data and sharing this knowledge with others can be leveraged to support a strategic vision. In addition, the Innovative Nurse Leader uses optimal strategies and systematic evaluation to interpret data accurately and shares this process of evaluation with others to demonstrate how data are used to generate knowledge, promote improvement of clinical practice, improve patient outcomes and foster population health when effectively interpreted. These skills enhance the nurse leader’s ability to proactively identify opportunities to integrate health IT within new care delivery models to advance innovation whereby health IT is seamlessly interwoven within practice.

**TIGER Recommendations**

To drive transformational change, successful innovation in the use of health IT is contingent upon the nurse leader’s ability to create a culture of innovation and integrate technology within the leader’s plan for the organization. Technology enablers such as analytics and mobile solutions will be leveraged to promote transprofessional collaboration for the purposes of promoting the efficiency of care models. This requires an understanding of the role that technology can play in advancing healthcare, which requires acknowledgement of the importance of information science, building towards a collective wisdom that improves the patient experience of care, improves the health of population, and reduces cost. Our healthcare industry progress depends on the courage, vision, and inspiration of our leaders. The leadership imperative documented in this report proposes six recommendations to achieve the revolutionary vision that drives, empowers and executes the transformation of healthcare:
• Accelerate the development, adoption and integration of innovations into practice by supporting adoption of new ideas and best-practice processes that promote health improvement.

• Transform interdisciplinary relationships and care models to support innovation and fund initiatives for improving care delivery across the continuum and the health of the community they serve.

• Lead nursing engagement in public policy initiatives at federal, state, and local levels.

• Apply knowledge, resources and funding in the areas of clinical informatics, information technology, operations, policy, and healthcare to improve care outcomes. This requires the support of
  o Innovative care delivery models that supports care across the continuum.
  o Business models that allow for the testing of new health IT ideas.
  o Innovation across all levels of clinical practice and health IT.
  o Evidence-based practice activities.
  o Research as a core professional requirement.
  o Data-driven decision making.

• Promote and leverage alignment with the Magnet Recognition Program as a mechanism to demonstrate excellence in nursing using technology to improve nursing practice and the delivery of safer, more effective patient care across the continuum of healthcare needs required by populations.

• Leverage existing resources and initiatives to understand and promote current awareness of the status of the industry. There are a multitude of available resources to assist the nurse leader including, TIGER, American Nurses Association (ANA), Institute of Medicine (IOM), American Medical Informatics Association (AMIA), Healthcare Information and Management Systems Society (HIMSS), American Organization of Nurse Executives (AONE), National Institutes of Health (NIH), American Nursing Informatics Association (ANIA), Agency for Healthcare Research and Quality (AHRQ), National Quality Forum (NQF), Sigma Theta Tau International (STTI), National Library of Medicine (NLM), Department of Health and Human Services (DHHS), Office of the National Coordinator for Health IT (ONC).

The opportunity for every nurse and healthcare leader is to work with the capital and people resources available to promote sustainable improvements to the healthcare environment that touches the patients and families served by our institutions. This report and its recommendations provide insights on making this a reality.
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TIGER Executive

Sally Schlak, MBA, RN
Senior Director, the TIGER Initiative Foundation

Co-chairs

Karen Carroll, PhD, NEA-BC, RN
Director Nursing Informatics & Innovation,
Ann & Robert H. Lurie Children’s Hospital of Chicago

Beverly Bell, MHA, BS, FHIMSS, CPHIMS, RN
VP Clinical Implementation and Consulting
Siemens Corporation

Workgroup Chairs

Susan McBride, PhD, RN-BC
Professor & Sr Advisor to West Texas HIT REC
Texas Tech University Health Sciences Center
School of Nursing

Rayne Soriano, MS, RN
Manager of Clinical Informatics and Clinical Transformation Program,
Kaiser Permanente, KP-IT and National Patient Care Services

Rosemary Kennedy, PhD, MBA, FAAN, RN
President & CEO
eCare Informatics

Advisory Members

Dana Alexander, MSN, MBA, FHIMSS, FAAN, RN
VP Integrated Care Delivery and Chief Nursing Officer Caradigm

Judy Murphy, FACMI, FHIMSS, FAAN, RN
Deputy National Coordinator for Programs & Policy at the Office of the National Coordinator for Health IT, Department of Health and Human Services

Workgroup Members

Maria Arellano, MS, RN
Clinical Product Manager
American Healthtech

Diane Bedecarré, MS, RN-BC
Workforce Development Co-Lead, Health Informatics Initiative (WSC), Office of Informatics and Analytics, Department of Veterans Affairs

Michelle Troseth, MSN, RN, DPNAP, FAAN,
Chief Professional Practice Officer, Elsevier Clinical Solutions

Cathy Fulton, DNP, ANP-BC, FNP-BC, BC
Clinical Assistant Professor
Indiana University School of Nursing
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For additional information please contact:

Karen Carroll, PhD, NEA-BC, RN
Director Nursing Informatics & Innovation, Ann & Robert H. Lurie Children’s Hospital of Chicago
Kcarroll@luriechildrens.org

Beverly Bell, MHA, BS, FHIMSS, CPHIMS, RN
VP Clinical Implementation and Consulting Siemens Corporation
beverly.bell@siemens.com

Sally Schlak, MBA, RN
Senior Director, The TIGER Initiative Foundation
sschlak@himss.org

TGER Website: http://www.thetigerinitiative.org/