



***Physician and Nurse Informatics  
Collaboration Boosts Clinical  
Practice, Engagement, and Overall  
Digital Experience***

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# *Physician and Nurse Informatics Collaboration Boosts Clinical Practice, Engagement, and Overall Digital Experience*

## Executive Summary

Physician and nurse informatics specialists typically practice within their respective disciplines. Little has been published on the power, best practices, and opportunities for these essential resources to train, partner, and collaborate for optimal effect within larger healthcare organizations. But recently, the Healthcare Information and Management Systems Society's (HIMSS) Physician and Nursing Informatics leadership committees jointly analyzed these specialties further by evaluating the current and future synergies and possible alignment for physician and nursing informatics.

This whitepaper reflects on the history and current state of the nurse-physician informatics professional relationship as an opportunity to align and standardize education, role definition and the overall effects of these specialties. This paper also explores the perspectives, commonalities, and opportunities for collaboration between these two specialties in acute care hospital settings. Recommendations and tools are also provided to stimulate strategic reflection on how to best leverage these resources within individual organizations.

## Brief History of Nursing and Physician Informatics

Healthcare requires a multidisciplinary team approach. Physicians and nurses have always closely aligned their respective specialized expertise and work practices for the best patient and business outcomes. Despite the best of intentions, these disciplines will periodically turn inward to accomplish their goals, making a reset necessary to reestablish a collaborative working relationship. Informatics specialists often reflect this dynamic as well when they come together for large major initiatives and then break apart to execute education, on-going clinical interactions and strategy with their respective disciplines. This paper will explore how this current model first emerged and offer some perspectives for enhanced collaboration in the future.

Both specialties emerged beginning in the late 1950s and have been essential to the evolution of digital care transformation to an automated and intelligent clinical environment. These informatics disciplines formalized their respective specialties starting in the late 1980s and refined the scope of their work leading into this century<sup>[1]</sup>. These specialists, with practical clinical experience and formalized technical education, act as intermediaries between the design, use case, and effect of technology solutions applied in healthcare. Physician informatics commonly specializes in theory and information processing for the practice of medicine, while nursing informatics often concentrates its focus on transforming information to optimize care outcomes and clinical effect. Both professional specialties offer unique and invaluable services to clinicians and patients, but the opportunity to align these practices for maximum value still needs to be developed.

Nursing informatics is defined as "... the specialty that transforms data into needed information and leverages technologies to improve health and health care equity, safety, quality and outcomes"<sup>[2]</sup>. The American Nurses Association (ANA) first recognized nursing informatics as a formal area of specialty in 1992, but in fact, its history is deeper, tracing its origins to the Crimean War. Florence Nightingale, a nurse and statistician, used data to improve care delivery<sup>[3]</sup>. Her work paved the way for future nurses to be at the intersection of data, nursing practice and technology in informatics.

Nursing research began in the 1960s on nurses' use of data and accelerated as personal computing developed. Formalized programs for nursing informatics emerged by the 1980s. The ANA formally recognized nursing informatics as a specialty in 1992<sup>[4,5]</sup>. Between 2000 - 2022, accelerated uses of, and advancement in, clinical technologies and capabilities increased the need for nursing informatics to promote usability and interoperability of data and systems.

Today, nurse informaticists practice in variety of roles including healthcare delivery, technology vendors, research and academia. Nurse informaticists analyze, design, implement, and evaluate healthcare information technologies to promote safe and effective clinical practice. They are innovators in the development of new care models and tools that advance nursing practice. They participate in the development of global and national policies and initiatives that empower healthcare consumers to utilize technologies to improve and maintain health. Nursing Informaticists lead interprofessional teams in the use of evidence to transform data into actionable knowledge and insight.

An advanced board certification in nursing informatics is offered by the American Nurse Credentialing Center (ANCC). The Chief Nursing Informatics Officer, or CNIO, is now an established executive role within a growing number of organizations, allowing for focused informatics strategy for nursing practice. These nurse leaders often establish their executive leadership influence from prior nursing experience, broad knowledge of nursing practices across all settings, and their technical expertise and ability to work with both IT and clinical leaders alike. The combination of clinical and technical knowledge uniquely positions the CNIO to implement transformational initiatives to improve quality, safety and efficiency of care delivery<sup>[6]</sup>.

Physician informaticians' scope of work in clinical informatics lies in analyzing, designing, developing, implementing, and evaluating information and communication systems that enhance individual and population health outcomes, improve patient care, and strengthen the clinician-patient relationship<sup>[7]</sup>.

Physician informaticians use their knowledge of patient care and their understanding of informatics concepts, methods, and tools to:

- Assess information and knowledge needs of healthcare professionals and patients
- Characterize, evaluate, and refine clinical processes
- Develop, implement, and refine clinical decision support systems
- Lead or participate in the procurement, customization, development, implementation, management, evaluation, and continuous improvement of clinical information systems such as electronic health records and order-entry systems

Ideally, physician informaticians and Chief Medical Information Officers (CMIOs) have the ability to form strong relationships with executive leadership, medical and IT staff. Most of them gain credibility among the medical staff by continuing to practice medicine and possess effective project and change management skills. It is critical that they have tremendous belief and enthusiasm in using IT systems to improve the delivery of care, and also possess effective listening and negotiating skills<sup>[8]</sup>.

## Informatics Specialties Side By Side

	Nursing Informatics	Physician Informatics
<b>Established as a clinical specialty</b>	1992 – American Nurses Association “Nursing Informatics”	2012 - American Board of Medical Specialties (ABMS) “Clinical Informatics”
<b>Published scope and standards of practice for specialty</b>	1st edition in 2006 Most current version is 3rd edition in 2022	<b>EN 13606-1.4:2007</b> Health informatics - Electronic health record communication standard EHCRA
<b>Board certification</b>	American Nurses Credentialing Center	American Board of Preventive Medicine & American Board of Pathology
<b>Education and Degrees</b>	Undergraduate courses, Certificate Programs, Masters in Nursing Informatics, Doctorate of Nursing Practice (DNP), Ph.D.	Certificate Programs and Masters in Health Informatics, Clinical Informatics Fellowships
<b>Focus of Specialty Role</b>	Work with their respective disciplines and caregivers to determine information management and technology effect, system evaluation, design, education, support for new or changing systems, care coordination, research, and analytic interpretation and application	
<b>Roles most frequently found in</b>	Inpatient hospital acute care, procedural and surgical, labor and delivery, critical care and emergency care, outpatient medical clinics, and schools of nursing	Inpatient hospital acute care, imaging, diagnostics, bio-analytics, clinical research, procedural and surgical, critical care, outpatient medical clinics, and schools of medicine
<b>Clinical Practice</b>	Come from acute care nursing into a dedicated informatics role. Expectation to maintain clinical RN licensure, but not to practice	Come from acute care and surgical specialties with the expectation to continue medical credentialing and often in hybrid roles splitting time between clinical patient care and informatics responsibilities
<b>EHR Documentation Support</b>	Commonly document structured care intervention tasks and clinical assessment findings. Informatics nurses work to optimize what nurses are asked to collect, visualization of entered values, trends in patient status	Commonly record narrative history, patient orders, and the clinical plan or care trajectory. Informatics physicians work to optimize the structure, background coding, and visualization of integrated system results for enhanced clinical decision making

<p><b>Other Common Clinical Technologies Supported</b></p>	<p>Nursing application examples include nurse call, integrated medical equipment such as vitals, telemetry and IV pumps, and communication systems</p>	<p>Physician application examples include imaging, laboratory, billing, virtual visit, analytics, digital capture (dictation and images), and communication systems</p>
<p><b>Typical Organizational Structure</b></p>	<p>Two common reporting structures:</p> <ol style="list-style-type: none"> <li>1. Report in nursing to Chief Nursing Officer or VP of Nursing with dedicated nurse informatics team and/or department</li> <li>2. Report to IT to Clinical Applications Director or Chief Information Officer in smaller groupings or individual assignments (CNIO)</li> </ol>	<p>Three common reporting structures:</p> <ol style="list-style-type: none"> <li>1. Report to Chief Medical Officer through medical staff office</li> <li>2. Report to Chief Information Officer</li> <li>3. Report to CEO</li> </ol>
<p><b>Top Recognized Executive Title</b></p>	<p>Chief Nursing Information Officer</p>	<p>Chief Medical Information Officer</p>

## The Promise of Informatics Professional Partnerships

The nurse and physician informaticist’s primary role is to bridge the communication divide between the clinical and IT leaders of organizations, and to use data and technology to improve healthcare. With their combined knowledge of clinical workflows and technology solutions, they can identify the root of problems and find ways to make effective changes. A successful example of this is partnering physician and nursing informaticists to work on specific practice areas to address needs. Together, they can bring efficiency data, reporting, or dashboards to the service area and highlight areas that need workflow improvements in essential clinical technologies, such as the Electronic Health Record (EHR). This collaboration can lead to solutions based off the data and best practices, which can result in broader and more effective changes. Being able to communicate with both the clinical staff and the IT staff will often lead to a better understanding of the proposed design solution and technical work, potentially delivering the solution to the service areas sooner.

Below are some examples of areas where clinical and IT staff could have an impact through regular collaboration.

- Clinical Workflow and User Centric System Design
- New Technology Support and Adoption
- Reporting, Data Visualization and Analysis
- System Education and Workflow Instruction
- Clinician Advocate for experience, stress and interactions with technology
- Subject matter expert and program sponsors or project team participants
- Resource for clinical technologies for the business (both to clinicians and IT)

The rapid shift to convert in-person provider visits to virtual care was a great example of nursing and physician informaticists partnering to accomplish improvements for their organizations<sup>[11]</sup>. Designing workflows, deploying technology solutions, and providing virtual training on the new care tool was a joint effort by both disciplines.

Although the reasons for burnout may differ between the nurse and physician, the technology that they use to provide care is often looked upon as a potential contributor. The causes of burnout may be addressed with a stronger emphasis on improving the clinician's experience through close collaboration among informaticists, clinicians, and vendors, combined with specific policy changes<sup>[12]</sup>. The nurse and physician informaticists are perfectly poised to gather data, identify trends, and implement solutions around the EHR, and other clinical technologies, to help identify factors that contribute to burn out and suggest solutions to combat it.

## Practice Variations and Opportunities to Align

The responsibilities of informatics specialists are very similar in terms of their interactions with clinical teams. They lend their expertise and consultative knowledge to enhance the experience caregivers have with technology integration and adoption.

There are five key areas where these practices have unique and distinct work:

1. EHR documentation
2. Education and onboarding
3. Job descriptions
4. Clinical practice expectations
5. Organizational structure

These core differences mirror the practice variances across the physician and nurse specialties. One major opportunity for alignment is the core work and influence that these professionals have within the IT portion of their roles.

There tends to be variations in the technology professional's viewpoint between how they work and interact with a nurse informatics specialist versus a physician informatics specialist. These two different relationships are often given separate IT project scoping, strategic business alignments, executive leader alignments, and caregiver support. Closing this gap holds great potential for the overall understanding, value, and effect these clinicians can offer in supporting organizational technologies. It is crucial to ensure that the physician informatics specialist and nursing informatics specialist are both at the IT executive table, and seamlessly connected into the larger IT organizational voice.

There has been a tendency for nursing and physician informatics to work in silos, with varying approaches and levels of success. For example, even though both have been focused on standardizing and streamlining documentation, it has usually been on various sections or components within the same EHR that are frequently used by only one of the specialties. Both nurses and physicians suffer from documentation burden, but the type of nursing and physician documentation is often quite different. Physicians usually focus on narrative notes and orders; nurses, on the other hand, focus on capturing discrete data elements in electronic flowsheets for aggregation and trending of their assessment data.

As Hawaii Pacific Health discovered, when they asked their nurses and physicians for recommendations to improve documentation, nurses offered more than physicians. This difference was attributed to the task-based documentation of nursing that impacts more users<sup>[13]</sup>. This variation in charting could explain the misalignment of nursing and physician informatics when optimizing the EHR, but it does not have to stay that way.

One project on defining an essential clinical dataset was able to reduce, on average, nursing admission documentation content by 48.5%, time by 30.6%, and number of clicks by 32%. They recommended that, for meaningful improvements across disciplines, organizations use a clinical and data driven process for decisions that impact clinicians<sup>[14]</sup>. Combining nursing and physician informatics could be replicated as a model to streamline processes for EHR optimization, or even recent technology implementations, that provide common benefits to both disciplines.

Without collaboration in areas such as documentation efficiency, each specialty may be unknowingly making the other's efforts more challenging. Past examples have included physician and nurse informatics looking at ways to streamline physician workflows by creating generic orders such as nurse communication. While this made ordering easier for the physicians, it resulted in nurses having to enter additional specific orders to accomplish the desired outcome. Collaboration between nursing and physician informatics allows for an understanding of entire workflows, such as the ordering process for streamlining efforts that benefit all clinicians involved.

Looking at this task from another perspective, one EHR vendor has a tool to measure provider efficiency; the “work with your clinical team” section measures the percent of notes and orders that have contributions by clinicians from various specialties<sup>[15]</sup>. This team-based care concept can be realized through nursing and physician informatics collaborating. In addition, the wealth of data captured in documentation can be used in clinical decision support, or in the development of AI/cognitive computing models. The amount and type of available data is only growing, especially with the addition of patient generated health data. Wearables and other sensory devices are increasing patient engagement, but to maintain that engagement nurses and physicians must work together to ensure that data is used to optimize patient outcomes<sup>[16]</sup>. With more data sources, and more ways to enter data that add to the complexity of workflows, the necessity for informatics collaboration will only increase.

Working together does take purposeful effort, as it is easy to get swept away by the daily work demands of each clinical area. This means that it's important to start from the leadership level of CNIO and CMIO, and within their teams. Some practical ways to ensure ongoing collaboration include allocating regularly scheduled time to connect on strategy and planning that also allows for maintaining a shared priorities document. Informatics leaders can also align team resources and find opportunities to work together. For example, nursing informatics resources can be partnered with provider informatics resources that have a shared clinical care area of knowledge, such as the emergency department, to work on projects that benefit multiple disciplines. The teams can further these efforts and strengthen international relationships by working together in other ways, such as holding, joint presentations within organizations and at national conferences that highlight their combined accomplishments.

Physicians typically are focused on the narrative history, the orders, and clinical decision making, while nurses document sequential tasks. Both, of course, document clinical findings and changes in physical

status. Currently, informatics education for new employees is tailored either to the physician or the nurse. As this paper has discussed, there are advantages to joint education that should be explored.

Outside of their support for the EHR, nursing and physician informatics often have fundamental differences in their practice. Many physicians in informatics roles frequently also work as direct patient care clinicians. They are able to experience firsthand the changes made to the EHR and technology, allowing them to be an example to their colleagues on optimizing its use. This ongoing direct experience gives providers the credibility needed among their colleagues to discuss how to best utilize digital solutions, especially within their specialty area. Nursing informaticists are usually fulltime in their informatics role, relying on their previous years of experience and the input of subject matter experts to ensure they are improving processes. The nursing informatics role is often responsible for a broad practice scope including inpatient, procedural and ambulatory areas. In addition, because patient care workflows cross several disciplines, they often support multiple clinical and non-clinical roles such as social work, physical therapy, respiratory therapy, and registration.

Stepping back from direct patient care gives informaticists the global knowledge they need to ask the important questions when considering changes to workflow or introducing new technology to clinicians. These differences in the approaches to informatics highlights another reason for nursing and physician informatics to partner. Optimal solution development comes from combining the knowledge of the physicians with their more in-depth, firsthand viewpoint with that of the nurses' ability to speak on the potential impacts of change along the entire continuum of care.

It is important for informatics leaders like the CNIO and CMIO, to understand their teams practice methods to ensure they are utilizing and sharpening these different skillsets. For nursing, this means practicing the lean concept of going to the “gemba,” or that place where the work happens. This helps informatics professionals stay grounded in the users' experience with the systems and tools they need to do their jobs<sup>[17]</sup>. It is key for nursing informatics to understand the multiple perspectives they support by visualizing the processes and seeking to understand the people doing the work.

On the other side, physicians should be encouraged to partner with nursing informatics to help broaden their understanding as they look to implement more global changes to ensure downstream effects of change are fully considered. One EHR vendor has an active patient safety council, which is very multi-disciplinary. It's comprised of physician and nursing informaticians, health IT professionals, and the collaborative effort from a matrix that analyzed the severity and priority of safety issues<sup>[18]</sup>.

Reporting hierarchy varies a lot. CMIOs typically report to CMOs but may also report to CIOs or CEOs; CNIOs ideally will report to CNOs. In highly matrixed organizations with multiple reporting lines, there may be better alignment between CMIO and CNIO, but, in most hospitals, the physician informaticians and nursing informaticians group are separate.



## Future Implications and Recommendations

A relationship of continuous collaboration between physician and nursing informatics specialties is essential. This opportunity is often reflected in the partnership of the CMIO and CNIO roles, which are essential in establishing a cohesive and supportive environment for technology adoption and innovation within a larger clinical environment. Outcomes depend on the quality of the practice environment and physician-nurse culture is one of the greatest influencing factors<sup>[19]</sup>.

These executive leaders and their teams represent two essential coalitions: the physician-nurse alliance and the caregiver-information technology dynamic for an organization. While some practice variations inherently exist between the scope of practice for physicians and nurses, the core objectives and mission must be aligned for quality decision making, organizational influence, and maximum effect to benefit the larger caregiver and patient population.

When aligned, physician and nurse informatics professionals may have powerful impact on the caregiver experience and overall environment of care. As the larger organization experiences a strong working partnership, clinician support and confidence in technology follows. The influence that a strong CMIO-CNIO relationship represents has direct implications for the outcomes, culture and caregiver experience within an organization. These six recommendations are key to building a collaborative relationship between these informatics professionals:

1. **Strategic alignment is critical** for the CMIO and CNIO. Shared goals and objectives should be formalized in regular strategic planning discussions to establish the roadmap of essential clinical technology priorities within an organization, specifically for the greater clinical and information technology workforces. These plans should also drive the prioritization of technological infrastructure and innovation priorities for information technology within an organization. The joint strategy for these executives along with the chief marketing officer, chief data officer, chief information security officer, chief financial officer, chief information officer, and chief networking officer should align clinical technology efforts to the larger mission and goals.

Two areas that can benefit from joint strategic support include evaluation of the EHR for clinician experience and work effort to gain efficiencies for all caregivers. Additionally, work must also move beyond the EHR to include a strategy for introducing new emerging technologies such as machine learning, assistive robotics, extended reality, business analytics, interoperable clinical environments, and quantum computing. Such a strategy is essential for the clinical informatics teams to engage within their organizations.

2. **Organizational clinical informatics governance** and decision-making team, with equal voice and representation, that bring together technical teams and the voice of caregivers. This structure should exist not only for projects but for ongoing touchpoints with clinicians. Formation and implementation of an “Informatics Steering Committee” is an example of a best practice to improve information flow, and to eliminate stovepipes and passive competition [20]. Subcommittees may be necessary to address discipline specific context and needs, but these group should ultimately bring back their work to share and integrate into the larger governance body.

3. Technology programs must pivot from discipline-specific solutions to dual solution design for maximum organizational effect. As specialty groups, vendors, executives, and others identify potential IT initiatives targeted at a specific physician or nursing group, it will be incumbent on the CMIO and CNIO to champion these solutions alongside one another and to push for solutions that are more inclusive, and close practice gaps and technology disparities for clinicians. For example, if a CMIO is asked to help deploy voice-activated-documentation-solutions for greater clinician efficiency, they should equally advocate to deploy this technology for nurses simultaneously. If the development of this solution does not work for the structure of nursing documentation, they should push vendors to provide equitable and shared solutions. Similarly, if nurses design advanced drug and titration calculators with pharmacy informatics, these tools should not only exist in the electronic medication administration record, but the CNIO should advocate that these tools also be available in the physician order entry workflows within the EMR.
4. Physician and Nursing informatics resources should go through **interdisciplinary onboarding and simulation training**, or practice labs, for ongoing initiatives and programs to ensure that both perspectives, workflows, and points of view are accurately considered and included in training approaches. While organizational reporting structure and services each team offers may vary, it is important that these clinicians learn how to engage with technology and clinicians using a multispecialty approach from the start. For example, physician and nursing informatics professionals could run through test scripts or case studies as part of their orientation with thought-provoking questions and discussions about the effect of the actions taken by a physician or a nurse, and their implications for other members of a care team utilizing the same technology (i.e., secure messaging, timing of orders, real-time documentation, and alerting). The informatics professionals should also advocate for interdisciplinary IT training and workflow awareness during major program initiatives that affect all staff.
5. **CMIOs and CNIOs should be the official executive roles for informatics.** Roles and job descriptions should be aligned and standardized, and these leaders should also collaborate beyond their primary institutions, including professional organizations, policy, legislative and advocacy groups; and jointly research and publish relevant technology topics. These roles should be equal and equitable in their organizational voice and influence. There are also opportunities to align colleges of medicine and schools of nursing at university settings for a more dynamic and comprehensive preparation to informatics practice.
6. **Recognize and support the differences** between the unique specialties when work requires a dedicated physician or nursing expert. These leaders should make the efforts to champion and disseminate support for each other's exclusive program initiatives, even when they perform separate and specific work.

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