American Academy of Nursing

Artificial Intelligence Landscape Analysis

A Readiness Scan for Nursing's Adoption and Integration

July 2026

American Academy of Nursing

PROJECT PARTNERS AND ACKNOWLEDGEMENTS

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Acknowledgments
The American Academy of Nursing would like to acknowledge **Paige Palmer**, **Vivian Deng**, and **Julie Huang** for their assistance in the preparation of this report. Special appreciation to Helen Burstin, MD, MPH, MACP, and her dedicated team at the Council of Medical Specialty Societies for their collaboration, and to Pete Clardy, MD, and his committed team at Google for Health, who were instrumental in shaping an interprofessional collaboration.

This report was made possible by funding from Google.org. Any findings or conclusions expressed in this report do not necessarily reflect the views of Google.org.

Publication Date: 2026

Suggested Citation: American Academy of Nursing (2026). Artificial Intelligence Landscape Analysis: A Readiness Scan for Nursing's Adoption and Integration. Washington, DC.

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Introduction

Artificial intelligence (AI) has existed for more than 70 years and within the last five decades, health care has integrated its use across a spectrum of varied applications (Hirani et al., 2024). While its practical use in the health care setting was originally limited, it was in the early 2000s when the emergence of deep learning allowed for advances to occur more rapidly (Kaul, Enslin, & Gross, 2020). The complexity of AI and its learning capacity have been defined in its subfields (machine learning, deep learning, neutral networks) and methods (supervised, unsupervised, semi supervised, and reinforcement learning) (Choi et al., 2020). AI is also revolutionizing existing health care technology itself. For example, electronic health records, which house massive amounts of data, can provide a greater volume of patient data and demonstrate longitudinal trends that elevate the rigor and sophistication of research methodologies and findings (Delaney, et al., 2017). While EHRs were initially lauded for their ability to gather and store large amounts of data, AI is now being incorporated via predictive analytics on patients' conditions and streamlining workflows.

Further, predictive, prescriptive, generative, and agentic AI are being leveraged to transform the health care industry in clinical practice, systems integration, health professions education, and research. The commitment to its use is no longer debatable, rather understood to be inherent. This reality is occurring in the most esteemed research and policy bodies in the United States. The National Institutes of Health (2025) called for public comments to launch its first AI Strategy, signaling a foundational need to investigate the best applications of its use. The National Academy of Medicine (NAM) (2025) released its comprehensive report Generative Artificial Intelligence in Health and Medicine: Opportunities and Responsibilities for Transformative Innovation as part of its Learning Health Systems Series. This publication discussed the evidence of AI use and effectiveness, early use of AI, risks and opportunities of integration, as well as the "application cadence readiness," as it was described by NAM.

With a grounded understanding that AI will be a tool widely integrated into health care, attention on readiness or "application cadence readiness" must be understood so that its adoption is informed not by one set of stakeholders, but by the wide myriad of individuals who will be engaged in its use. At the same time, health systems, state legislatures, and federal agencies are accelerating their approval for varying conditions of AI use. At the federal level, dating back to 2016, updated in 2019 and most recently in 2023, the Office of Science and Technology Policy's National Artificial Intelligence Research and Development Strategic Plan: 2023 Update reaffirmed the federal government's commitment to a sustained investment in AI research. It also echoed growing emphasis on the importance of ethical, safe, and trustworthy AI development. The plan outlined priorities including advancing foundational AI research, developing human-AI collaboration, ensuring long-term safety, and expanding the AI workforce. This updated strategic plan created more emphasis on international cooperation to establish shared norms and standards.

More recently, and in accordance with an Executive Order on removing barriers to American AI leadership, Winning the AI Race: America's AI Action Plan (2025) identifies over 90 federal policy actions organized around three pillars: accelerating innovation, building AI infrastructure, and leading in international diplomacy and security. Its priorities include innovation, removing

regulatory barriers to AI development, and workforce development among others. As a continuation of this work, on March 20, 2026, the White House released its National Policy Framework for Artificial Intelligence, establishing federal primacy over AI development regulation while preserving states' authority in areas of traditional powers, including public health and safety (White House, 2026).

In 2024, federal agencies issued 59 AI-related regulations — more than double the number in 2023 and originating from twice as many agencies (Stanford Institute for Human-Centered Artificial Intelligence, 2025). State legislatures have shown comparable momentum: in 2025, all 50 states and the District of Columbia introduced AI-related legislation, with 38 states adopting or enacting approximately 100 measures addressing a wide range of AI use cases (National Conference of State Legislatures, 2025).

In 2026, the National Conference of State Legislatures' Artificial Intelligence Legislation Database (2026) shows 1,405 pieces of legislation introduced across 49 states. In relation to education/training, effect on labor/employment, health use and responsible use, 516 bills were introduced in 49 states. When examining health care and AI alone, at the time of this report, 44 states have introduced 286 bills. The main themes include transparency and mandating use-case specific transparency provisions, disclosing the use of AI chatbots, liability, payor use of AI for utilization management and prior authorization, and AI sandboxes (Seigel et al., 2026). Of particular interest to health care providers, 30 bills were introduced to include prohibitions of AI chatbots representing themselves as licensed professionals (Seigel et al., 2026).

At the global level, the World Health Organization's 2025 report on the state of nursing identified digital tools and AI as an emerging policy priority, underscoring that the conversation around AI in health care has moved decisively from the margins to the center. This requires constant vigilance from all those involved in the health care industry to ensure its ethical, effective, and responsive use. The position of the American Academy of Nursing (2026), underscores this view as it supports

> *...the responsible and ethical use of artificial intelligence as a transformative force in health care to support, rather than supplant human wisdom and nursing clinical judgment. As a discipline grounded in the delivery of ethical, compassionate, holistic, and effective care, nursing has a vital role in shaping how AI is designed, governed, implemented, and evaluate.*

The rapid and expansive growth in AI technology presents a remarkable opportunity for advancing innovations in person-centered care and health care delivery. As AI rapidly impacts health care delivery, health professions education, and research, it is essential to strengthen and continue developing strong policies that safeguard individuals, clinicians, families, communities, and institutions, govern privacy, and uphold data protection (p. 1).

Hence, AI is best understood as a tool. AI may support greater efficiency, but cannot replace clinical judgment, critical thinking, or the humanity that defines the clinician-patient relationship. The full extent of its capabilities and limitations remains unknown, even as technology advances at a pace that exceeds the health care system's ability to fully absorb it. Meanwhile, the challenges

that have long defined that system — affordability, access, workforce shortages, diminishing coverage, and persistent health disparities — remain as pressing as ever. No technology resolves these challenges by itself. The relationship between the tool and the human using it demands deeper examination, and with it, a fundamental question: is today's workforce, and tomorrow's, prepared for the ethical and responsible use of AI in health care?

This landscape analysis aims to describe the attitudes and perceived readiness of the nursing profession to answer this question. To conduct the analysis, several searches were completed to source information on nurses' attitudes and perceptions of AI. Wider internet searches provided large-scale surveys completed by global information service companies as well as publishers. To capture as many viewpoints as possible, smaller studies at universities and health systems were included to determine if perceptions at the national level align with ones at the institutional level. Finally, to amplify the report and consider the context around nurses' perceptions of AI, the regulatory, legislative, and national nursing entities' positions were reviewed as well as a search through CINAHL Ultimate and PubMed for the latest research.

For the purposes of this report, it is important to define the context in which the profession was considered. Specifically, this analysis and front-line assessment focus on registered nurses, students in programs for which they will sit for the registered nursing licensure exam, and advanced practice registered nurses, as well as the students within these programs.

To that end, Registered Nurses (RNs) and nurses are used interchangeably in this report. By way of background, nurses are the largest group of health care professionals in the United States and internationally (World Health Organization, 2025). They will therefore be exposed to and influential in the technological changes presented by artificial intelligence (Ronquillo et al., 2021). AI is poised to significantly transform nursing practice and the workforce by augmenting clinical decision-making and streamlining processes.

Overall, at present, target areas for AI in nursing include improving administrative processes; nurse staffing; automated workflows; clinical decision support; patient education; and diagnostics (Cato & Tiase, 2025; Hassanein et al., 2025). AI tools aim to help nurses reduce the burden of tasks that are currently time-consuming, including documentation (Sengstack et al., 2020), scheduling, and charting. It can also improve care and outcomes by allowing nurses to spend more time with patients and improving prediction abilities, flagging risks earlier.

Executive Overview

The research undertaken to understand attitudes and readiness within the nursing profession reflects a path divided, a profession where the interest and adoption of AI tools are moving in a positive and upward trajectory, but the training both in academic institutions and practice settings remain inconsistent and hesitations continue about its ethical use.

Convergence of these two paths lies in viewing nurses as not the end users but as co-creators. The voice of nursing's expertise from the start of AI development to integration must be the bridge that aligns enthusiasm, ethical use, and training. This report is organized around three major themes that emerged from that inquiry: Readiness and Attitudes on AI Use and Adoption; Educational Context and Perceptions on AI Readiness; and Perspectives on the Ethical Use and Bias of AI Tools.

Readiness and Attitudes on AI Use & Adoption

- Nurses' attitudes about AI are not monolithic and vary widely from ambivalent to optimistic. Nurses self-identify as among the most ready and willing (of health professions) to see how generative AI can work for them, including to relieve pain points such as documentation burden and burnout.
- The pace of AI integration among nurses has accelerated sharply, but policy, governance, and training have not kept pace, creating risk for nurses, patients, and health systems.
- Segments of the nursing workforce hold apprehensions about AI's potential to erode clinical decision-making, compromise patient privacy, and expose clinicians to legal risk. Governance, transparency, and nursing input into AI design were identified as areas to overcome this concern.

Educational Context and Considerations Regarding Academic Integrity

- There exists a need to systematically strengthen and integrate AI into nursing education. Curricula should include competencies to ensure nurses are prepared to critically evaluate, safely apply, and meaningfully contribute to the design of AI tools in clinical practice. Accrediting bodies are at varying stages of integrating AI into their standards.
- While AI has been a part of nursing education, AI can further enhance it. Concerns surrounding AI usage in nursing education include preserving academic integrity and critical thinking.

Perspectives on the Ethical Use and Bias of AI Tools

- Nurses have a moral responsibility in relation to human aspects of care. Nursing intuition remains a priority.
- Nurses have an ethical obligation to understand AI tools but require continued guidance. Nurses must know when and how to question AI outputs and critically question automation and algorithmic bias.

Nurse Readiness and Attitudes Surrounding AI Use & Adoption

1.1 Nurses' attitudes about AI are not monolithic and vary widely from ambivalent to optimistic. Nurses self-identify as among the most ready and willing (of health professions) to see how generative AI can work for them, including to relieve pain points such as documentation burden and burnout.

Optimism in the Context of Reducing Burden and Improving Patient Outcomes

Overall, there appears to be a higher level of optimism within the nursing profession on the potential benefits AI could have on their work, workflow, and clinical outcomes. A survey from the Health Management Academy (2024) highlighted that nurses' attitudes about AI adoption are highly adaptable based on exposure to relevant facts and information (Health Management Academy, 2024). The share of nurses who reported support for leveraging AI to safely automate certain nursing work increased 24 percentage points after message testing that presented information about AI (Health Management Academy, 2024). Further, Wolters Kluwer (2025a) notes that nurses, compared to other health care professions, are "the most optimistic segment with regard to AI's potential" (p. 2). Facing significant burnout considerations experienced by the profession, 54% of nurses expressed interest in using technology to reduce the time required to organize data and make decisions (Wolters Kluwer, 2025b).

Additionally, 45% felt that generative AI would reduce burden (Wolters Kluwer, 2025b). However, others still held hesitations. A total of 33% of nurses reported it was too soon to understand the full implications of AI use on their daily practice (Wolters Kluwer, 2025b). Many nurses identified the integration of AI into onboarding and training could help staff be more productive, confident, and consistent across teams (Wolters Kluwer, 2025b).

One year later, these general findings are closely replicated in a similar study conducted by Elsevier, in which 59% of nurses surveyed believe that AI tools will help improve patient outcomes in the next 2-3 years; 53% believe clinical AI tools will increase the quality of patient consultations in the next 2-3 years; 53% currently perceive AI tools as improving patient care; and 46% currently perceive AI tools as increasing their autonomy (Elsevier, 2026). The 2026 Wolters Kluwer survey reinforces an increasing belief that AI will support nurses' daily work; 64% of respondents felt that generative AI would reduce burden in their clinical practice; and 61% of nurses reported that generative AI is enabling them to spend more time on patient care (Wolters Kluwer, 2026).

Considering the data from these 2025 and 2026 studies, there appears to be a growing trend in optimistic outlooks regarding AI usage. Compared to a 2024 survey from the McKinsey & Company and the American Nurses Foundation (ANF), only 42% of nurses were hopeful that AI would improve quality of care and patient outcomes (McKinsey & Company & ANF, 2024).

However, these views are not universal. A qualitative systematic review of nurses' perceptions of AI adoption in health care, which included studies from six countries (including the U.S., Bangladesh, Finland, Turkey, Egypt, and China), identified common themes across the studies from these countries. It is suggested that nurses' attitudes and optimism conflicted at times with respect to AI

adoption (Joo, Liu, & Ho, 2025). While some nurses saw AI as increasing their workload burden, others saw it as a tool that would enable greater efficiency in care and free up time for patient interface (Joo, Liu, & Ho, 2025). More broadly, nurses agreed that AI is a tool to supplement their practice and that it cannot replace the human attributes nurses bring to care, including their clinical experiences and intuition (Joo, Liu, & Ho, 2025).

Pace of Adoption and Workforce Comparisons

Adoption of AI tools in nursing practice is not uniform and does not occur in isolation. It is shaped by experience, professional culture, and the degree to which nurses feel heard within the settings where they practice. Several patterns have emerged that illuminate both the pace of adoption and the conditions that accelerate or constrain it.

Conventional wisdom suggests that those who are considered digital natives are more likely to adopt technology at a faster rate. How early in life a person is exposed to technology may impact their resistance to or enthusiasm for its use (Harrington, 2018). However, more recent available data suggests interest in AI adoption is relatively consistent across the age of nurses (McKinsey & Company & ANF, 2024).

Career stage is a factor in the pace of adoption of new technology with early- to mid-career nurses (4-6 years of experience) being the most receptive to AI; and more tenured nurses (10+ years of experience) showing the highest level of ambivalence, neither supporting nor opposing AI use (Health Management Academy, 2024).

And, while nurses have been relatively more optimistic than other health care professionals, they are conversely slower to adopt AI compared to physicians. In a recent study it was found that 41% of nurses reported using AI tools in their daily practice compared with 57% of physicians (Elsevier, 2026). Around half (55%) of nurses reported that they believe AI will save them time within the next 2-3 years compared to 70% of doctors, while 54% of nurses believe AI will routinely be used to analyze medical images compared to 65% of doctors (Elsevier, 2026).

Importantly as well, 41% of nurses believe their views are never or are rarely adequately represented in organizational decisions compared to only 19% of doctors, indicating that doctors feel far more heard and represented in organizational decisions on AI (Elsevier, 2026).

1.2 The pace of AI integration among nurses has accelerated sharply, but policy, governance, and training have not kept pace, creating risk for nurses, patients, and health systems.

Speed of AI Integration and Most Common Use in Clinical Practice

Given AI's historical trajectory and the more recent surge of interest within the nursing profession, assessing the pace at which nurses are integrating AI into practice is essential. Understanding where the profession currently stands offers a clearer picture of progress, and a basis for projecting when AI use may become universal across nursing practice.

In the clinical setting, 70% of nurses reported using AI at least once a week for professional purposes in 2026, compared to 46% in 2025 (Wolters Kluwer, 2026). AI integration in the clinical setting has increased both in scope and depth. In 2026, just 18% of nurses reported that they never use AI tools at work compared to 34% of nurses in 2025 (Wolters Kluwer, 2026). Further, the proportion of nurses who report using AI multiple times daily has risen to 32% in 2026 compared to 16% in 2025 (Wolters Kluwer, 2026). Similarly, through an informal survey and small sample of 135 RNs from Arkansas State University, 80% of RNs reported that they are using AI tools in clinical care and more than 25% rely on them daily (Arkansas State University, 2026).

The tasks for which nurses report using AI include documentation, summarizing information, generating patient educational materials, and verifying drug interactions (Wolters Kluwer, 2026). Elsevier reported the tasks for which nurses are using AI tools include professional education and upskilling (42%), patient education (40%), and medical research (34%) (Elsevier, 2026). Nurses are using clinical-specific AI tools for medical research (40%), documentation (40%), patient monitoring and alerts (34%), and patient care decision support (33%) (Elsevier, 2026).

One area of emerging use is ambient documentation. According to one study that drew on Epic Clarity data from 29,467 encounters in a large health system across 5 units and 4 hospitals, it was calculated that ambient documentation, with at least 60% capture, can save 20.6 minutes of time during a nurse's 12-hour shift (Weirich, Martin, & Corbin, 2026). Higher level performance is seen when a leading-unit performance is applied system-wide, saving 36.3 minutes of a nurse's time (Weirich, Martin, & Corbin, 2026). The authors of this research noted that ambient documentation is not a standalone solution, but an opportunity to redesign nursing workflow (Weirich, Martin, & Corbin, 2026).

As noted, ambient AI listening tools are increasingly being deployed across health care settings to automate nursing documentation, promising reductions in charting time and improvements in nurse-patient interaction. However, meaningful risks, including hallucinations, have been reported in a study by Asgari and colleagues. Of the cases reviewed, involving 12,999 clinician-annotated sentences, approximately 2% of medical notes were incorrect and roughly 4% had critical omissions (Asgari et al., 2025). A significant concern is that these ambient AI listening tools have largely been designed around physician workflows, inadvertently marginalizing nursing perspectives and the nuanced, contextually important data nurses contribute to patient documentation (Topaz, 2025).

The Policy and Training Gap

Based on the findings of this report, nurses are adopting AI at a rate that institutional policy and formal training have yet to match. Both the National Academy of Medicine (2025) and the American Academy of Nursing (2026) have been clear: policies and governance structures must be in place to deploy AI responsibly and ensure its trustworthy use in clinical settings. Yet while usage has grown sharply, the governance structures, published policies, and training infrastructure necessary to support safe and responsible use remain underdeveloped.

Only 26% of nurse respondents in a 2025 survey and 36% in 2026 reported having published policies in place for generative AI use (Wolters Kluwer, 2026). In 2025, only 22% reported required formal training before deploying the tools in nursing workflows (Wolters Kluwer, 2025a). Elsevier found approximately half of nurses thought their institutions are good at providing access to AI tools (51%), governance (51%), and training (46%) (Elsevier, 2026). And yet, 42% of the nurses surveyed reported that keeping up to date with the latest technology and tools is challenging (Elsevier, 2026). Arkansas State University found that nurses' experience with training on AI varies. While nearly half (48%) received formal employer-led instruction, 23% relied on on-the-job trial and error, 19% learned through peer-to-peer collaboration, 6% received training from vendors, and 3% had no training (Arkansas State University, 2026).

A 2025 qualitative systematic review of nurses' perceptions suggests that the population of nurses reviewed felt they need time to learn and become comfortable using AI tools (Joo, Liu, & Ho, 2025). For some nurses, the demand to integrate AI quickly caused concern over their ability to learn how to use the tools in a way that would not negatively impact care when time with patients is already stretched thin. Overall, they expressed clear hesitations that they could not accommodate training on new tools without taking time away from patients (Joo, Liu, & Ho, 2025).

The data present a consistent and concerning picture: nurses are operating in an environment where AI adoption is expected but institutional support is uneven, formal training is far from standard, and the time required to develop competence competes directly with the demands of patient care.

The AI Enabled Patient in Clinical Encounters

The policy and training gap facing nurses is further compounded by a dynamic emerging on the other side of the clinical encounter. Patients are increasingly arriving at appointments having conducted their own AI-facilitated research from Large Language Models (LLMs), shifting the nature of clinical interactions and placing additional demands on nurses who are themselves still developing AI literacy (Wolters Kluwer, 2026). This adds burden to an already stretched workforce. Nurses must now not only apply AI tools in their own practice, but contextualize, clarify, and at times correct AI-generated information that patients have brought with them.

When a patient interacts with a chatbot, such as describing symptoms, the responses generated are based on pre-existing patterns from training data, often yielding generic or repetitive answers that lack clinical specificity (National Academy of Medicine, 2025). Addressing this in the clinical encounter increases the time nurses must dedicate to patient education. Without sustained administrative policy, governance, and continual training, the patient's reliance on AI-generated information could impact their health.

Education and Literacy Needed to Adopt AI Tools in Practice Settings

Responsible AI adoption in nursing begins with an educated workforce. Yet, the structures needed to build and sustain that education remain largely absent or in progress. According to the National Council of State Boards of Nursing's (NCSBN; 2021) revised Model Rules and the standards related

to RNs' and APRNs' professional accountability, nurses must "maintain competence through ongoing learning and application of knowledge in nursing practice" (p. 2). The NCSBN has encouraged consideration of whether and how AI competency should be incorporated into licensure and continuing professional development (Zhong et al., 2025). However, after reviewing all publicly-posted state Board of Nursing licensure requirements, continuing education specifically on AI or its clinical implications were not found. Similarly, no concrete requirements surrounding AI could be found within the credentialing or certification process for APRNs, though its importance continues to be discussed.

While continuing education and certification requirements are not the sole indicator of literacy, their absence represents a meaningful gap. This education and AI literacy development must be over the course of a nurse's professional career rather than a one-time investment or required training module (American Academy of Nursing, 2026). As the American Academy of Nursing notes, "Comprehensive AI fluency research, including competency frameworks, educational strategies, workforce readiness, and evaluation of learning outcomes, is needed to guide education of current and future health care professionals" (p. 3).

AI literacy "does not mean that every [...] clinician should become a data scientist...they should be able to critically evaluate the strengths and limitations of the AI systems they use" (Lee & Jeffery, 2026, p. 73). Clinicians should be trained on how AI technologies such as machine learning models are developed, how to interpret risk scores and outputs, and what performance metrics mean in a specific population (Lee & Jeffery, 2026). Furthermore, team workflows should proactively adjust for AI technology incorporation, for example by creating new roles that specifically monitor AI outputs and establishing guidance and protocols on the scope of AI's function within the team (Lee & Jeffery, 2026). While nurses may have fears that AI will replace their roles (Simpson, 2024), AI has the potential to create new and evolving roles for nurses such as AI educators, AI specialists, nurse AI data analysts, etc. (Shepherd & McCarthy, 2025).

Clinicians must also cultivate a mindset of continuous learning that remains open to change and to the evolving integration of AI in practice (Lee & Jeffery, 2026; Robert, 2019). Moreover, AI literacy among nurse leaders is needed as well and frameworks have been developed to address this gap. For example, Cato et al. (2020) apply nursing informatics' Data-Information-Knowledge-Wisdom (DIKW) framework to help nurse leaders evaluate AI-driven Clinical Decision Support (AI/CDS) tools. The authors note that most current applications stop at the "knowledge" level rather than reaching "wisdom," where judgment and decision-making come into play (Cato et al., 2020). Using real-world examples, they show how AI can augment nurses' decision-making without replacing clinical judgment (Cato et al., 2020). This literacy is essential for nurse leaders to use a concrete framework such as the DIKW in order to vet whether a proposed AI/CDS fits nursing workflow, is transparent and explainable to nurses, and can identify training gaps before implementation.

Administrative Practices and Policies

Education and literacy are just two elements of what is needed for successful implementation. Without the institutional policies and governance structures to support it, even a well-prepared

workforce cannot deploy AI safely or responsibly. The establishment of institutional administrative practices and policies is equally foundational to responsible AI use in health care, when it is still susceptible to significant risks and liabilities. These include exposure of sensitive patient data, internal security vulnerabilities, and the potential to fundamentally alter how clinical care is delivered. Nurses and other clinicians involved in AI use must understand how a tool's underlying algorithms, data sources, potential biases, and security vulnerabilities could place patients and health systems at risk. Unlike traditional software, many contemporary AI models, including deep learning systems, lack intrinsic explainability and cannot account for how they arrive at conclusions. Often the internal workings of a program are not shared or understood, preventing explainability for nurses and patients (Webb, 2024).

As the National Academy of Medicine (2025) has emphasized, policies and best practices must evolve in concert with the technology itself. Governance frameworks and accountability mechanisms are needed across health systems and organizations. This includes strengthening standards for testing and training LLMs and generative AI on diverse data sets. Health care providers should also be required to complete training and certification on the use of LLMs and generative AI in clinical settings (National Academy of Medicine, 2025). HIPAA compliance (Health Insurance Portability and Accountability Act), data management and sharing policies, and ongoing examination of emerging AI models must be sustained within each institution. The understanding of administrative policy is as critical to patient safety as the AI literacy of nurses using these tools.

Furthermore, the 2025 surveys by Wolters Kluwer suggest that there is an administrative readiness gap. Organizations are not yet prepared to harness generative AI's value and potential in both policy and administrative practices. While 77% of nurse leaders rated generative AI as important to their administrative productivity, only 46% said they feel ready to deploy it effectively (Wolters Kluwer, 2025a). This mirrors the training gaps identified by nurses working in clinical practice.

1.3 Segments of the nursing workforce hold apprehensions about AI's potential to erode clinical decision-making, compromise patient privacy, and expose clinicians to legal risk. Governance, transparency, and nursing input into AI design were identified as areas to overcome this concern.

Clinical Decision Making and Deskilling

Eliot (2024) discussed the term "algorithmic brittleness." It relates to the vulnerability that can occur within an algorithm when it encounters unexpected data that creates critical failures. In an ideal circumstance, an algorithm would perform as expected under certain, specific conditions for which it was trained. However, the accuracy of its results can change quickly when exposed to new training environments. In a new environment, algorithms cannot generalize across datasets, and brittleness occurs because the data is no longer robust or reliable. Essentially, in algorithmic brittleness, domains of health care are not uniform, so errors are increasingly possible (Eliot, 2024).

This algorithmic brittleness increases nurses' perceptions that AI could undermine clinical decision making since vulnerabilities are a part of the data. Further, a more commonly noted

limitation of LLMs is “hallucination” or “confabulation.” These occur when the output from the generative AI tool is incorrect or not based on fact (Farquhar et al., 2024; Cross, Choma, & Onofrey, 2024). In these cases, the user believes the information presented is seemingly accurate and it is not easily discoverable to find incorrect information (Webb, 2024).

Because of this, nurses have voiced their interest in what is described as human-in-the loop (Olawade, 2026) oversight. The overall delivery of nursing care is influenced by many complex factors. Therefore, it is important to recognize that AI documentation tools, alerting systems, and workflow automation features may inadvertently increase cognitive load, shift invisible labor to nurses, or introduce subtle forms of productivity surveillance, all of which require careful evaluation and clear governance safeguards (American Academy of Nursing, 2026). Additionally, when AI-generated recommendations conflict with their clinical judgment, nurses may experience moral distress, underscoring the need for transparent escalation pathways and shared decision-making protocols (American Academy of Nursing, 2026).

In their 2025 health care survey, Wolters Kluwer notes that more than half of nurses (53%) said they worry about generative AI undermining decision-making skills or causing overreliance on algorithmic outputs (Wolters Kluwer, 2025). In their 2026 survey, this worry rose to 70% of nurses reporting concerns surrounding “deskilling” because of overreliance on AI (Wolters Kluwer, 2026). The vast majority of nurses (90%) said that AI-generated clinical content should be validated by a human-in-the loop (Wolters Kluwer, 2026). Similarly, the Health Management Academy reported survey findings of AI’s impact on patient care quality and experience as a top concern (73% of respondents) (Health Management Academy, 2024).

Concerns arising from deskilling and overreliance on AI points to a broader and closely related issue: trust. For nurses to engage with AI confidently and responsibly, nurses note that the AI tools and systems must be trustworthy. Nurses surveyed in 2024 included trust in the accuracy of the AI tool (61%) as a significant hesitation (McKinsey & Company & ANF, 2024). To foster greater trust, a large proportion of nurses surveyed noted that having nursing input into design of AI tools is important (73%), along with evidence of AI’s effectiveness on quality and patient safety (69%) as well as clear guidelines and regulations on using AI (69%) (McKinsey & Company & ANF, 2024). At the same time, 42% believe AI tools are trustworthy (Elsevier, 2026). When asked what would improve trust in AI, nurses’ top responses were AI being easy to use (65%), comprehensive in nature (62%), transparency (61%), safety (60%), and providing quality sources (60%) (Elsevier, 2026).

Regulatory and Policy Concerns

Beyond concerns about clinical decision-making, nurses have identified a parallel set of apprehensions regarding the regulatory landscape rooted in ethics, privacy, and legal accountability. Nurses expressed privacy and security concerns (57%) as a top risk with generative AI adoption (Wolters Kluwer, 2025a), while concerns surrounding patients’ health data privacy and security; the lack of clear ethical guidelines, standards, and political and legal frameworks;

reduction in nurses' critical thinking skills; and health inequities are also cited (Joo, Liu, & Ho, 2025).

At the Jefferson Health system, a top staff concern around AI for those surveyed related to the legal ramifications of AI integration in care (Twenter, 2026). At another system, while a small sample of nurses, 71% of those surveyed felt that clearer legislation or institutional policies would increase their confidence in using AI tools (Arkansas State University, 2026). Respondents also reported not feeling legally protected if an AI tool causes patient harm (64%) (Arkansas State University 2026).

Since many of these concerns lie at the state or institutional level, it is important to note that over 40 states have introduced and/or passed legislation regarding the intersection of AI and health care writ large (National Conference of State Legislatures, 2026). Importantly, very few of these are specific to AI and nursing. A growing concern among the profession is protecting the RN title. Signed into law in March 2026, Washington State's HB 2155 updates the state's Nurse Practice Act to ensure that only licensed human professionals can use nursing titles such as "nurse," "registered nurse," or "RN," and provide nursing services. AI, chatbots, hospital robots, and automated triage tools cannot be identified as a nursing entity (HB 2155, 2026). In April 2026, the Delaware General Assembly enacted legislation clarifying that nonhuman entities, including AI-powered agents, are not eligible for licensure as professional nurses, advanced practice registered nurses, registered nurses, physicians, or physician assistants (HB 191, 2026). A handful of other states, including Alaska, Illinois, and Maine, have introduced legislation in an effort to codify that AI may not be considered a substitute for nursing intelligence, which would apply to facility operations such as determining nurse-patient staffing ratios, clinical decision-making, or limit nursing care (National Conference of State Legislatures, 2026).

Taken together, these findings underscore that segments of the nursing profession are calling for protections, guidelines, and legal clarity that would allow them to use AI responsibly and with confidence that their practice is protected and its use will not expose patients, institutions, or themselves to undue harm.

Cocreators in Design

Nurses, out of all health care professionals, generate the most data in health systems through extensive documentation and therefore play a critical role in creating and shaping the data that trains AI systems (Ronquillo et al., 2021). In essence, nurses are not just the end-users of AI but also the primary source of the data it depends on. They are uniquely suited to contribute to the design of technology that supports patient care and workflow processes, such as clinical documentation and other vendor products.

However, nurses have been underrepresented in digital health leadership and are often referenced as end-users of technology as opposed to co-creators (Dornan, 2025). This must be addressed structurally and culturally to ensure nurses engage in leadership roles as designers, evaluators, and decisionmakers in AI development (Dornan, 2025). In terms of how AI is altering the nursing workforce, Yakusheva et al. further emphasizes the importance for nurses to lead in AI's evolution in health care to support both patients and nurses (2025). Nurses, working with computer

scientists, can bridge the gap between industry and practice to ensure the right questions are asked, and that technologies assist with patient care in a purposeful way (Yakusheva et al., 2025).

Section Summary

Nurses' attitudes toward AI are neither uniform nor static. While optimism is growing, particularly around AI's potential to reduce documentation burden, alleviate burnout, and improve patient outcomes, enthusiasm varies by career stage, training opportunities, and the degree to which nurses feel represented in organizational decision-making as well as co-creation of the AI tools being implemented. Adoption has accelerated rapidly in recent years, yet there remain continued reservations about the pace and implications of AI integration.

Essentially, enthusiasm for AI has outpaced preparation for its use. Adoption of AI tools across the health care system has moved faster than the training infrastructure needed to support responsible use. Training cannot be a single event, nor can it occur in professional silos. AI literacy requires a continuum of learning sustained across the arc of an individual's career. Nurses will need foundational knowledge as well as ongoing development to use AI effectively in daily practice, interpret algorithmic outputs, and respond appropriately to automated recommendations.

The infrastructure needed to support responsible adoption has not kept pace with its use in the professional setting. Institutional policies for generative AI, formal training, regulatory frameworks at the state and national levels, and governance structures, were identified as foundational for safe and effective use. Equally foundational is the recognition that nurses are the profession that generates the most data in health systems through documentation, making them uniquely positioned as co-creators in the design, evaluation, and governance of the tools they are being asked to use in their practice.

Nurses also express substantive concerns about AI's effect on clinical judgment, privacy, and legal accountability. The risks of algorithmic brittleness, hallucination in AI outputs, deskilling, and the erosion of decision-making skills through overreliance on AI emerged as persistent hesitations across the literature. Nurses identified that being a part of the AI design, establishing legal protections, and having trust in the tools would provide them with more confidence in usage.

Educational Context and Considerations Regarding Academic Integrity

2.1 There exists a need to systematically strengthen and integrate AI into nursing education. Curricula should include competencies to ensure nurses are prepared to critically evaluate, safely apply, and meaningfully contribute to the design of AI tools in clinical practice. Accrediting bodies are at varying stages of integrating AI into their standards.

Curriculum Adoption and AI Competencies in Nursing Education

Preparing nurses for an AI-enabled practice environment requires a deliberate and layered approach to education. At present, the landscape in education suggests a lack of critical competencies and curricula needed to build AI literacy and effective use.

Given the level and complexity of what could be taught versus what is necessary to be taught in the educational programs, it is important to view AI in nursing education both horizontally and vertically. Students should receive training on AI at the beginner level and advance towards proficiency and competence (vertical), while also having training on AI across curricula content and specialty areas like acute care, primary care, and others (horizontal) (Dornan, 2025). Yet realizing this vision requires confronting a foundational barrier: the current state of nursing education has not yet caught up to the demands of an AI-enabled practice environment.

A critical gap in nurses' understanding stems from AI being mostly absent from nursing education. Nursing education programs are still working to effectively incorporate minimum nursing informatics competencies into curricula (Ronquillo et al., 2021). While some nursing schools and colleges have adopted AI more quickly, it remains more of a specialized area of focus as a graduate degree or certificate[1] rather than a threaded content area through the undergraduate or graduate curriculum. Adding minimum AI competencies will help to ensure that nurses have the skills and education necessary to serve as collaborators in AI technology development and implementation, as opposed to only serving as end-users of technology (Ronquillo et al., 2021).

National bodies within higher education in nursing have worked to address this need. The American Association of Colleges of Nursing (AACN) acknowledges AI as an "emerging topic" in the field of informatics within *The Essentials: Core Competencies for Professional Nursing Education* (2021, p. 59), which are considered the gold standard for nursing education at the baccalaureate level and higher.

Revised in 2026, Domain 8 of the AACN *Essentials*, "Informatics and Healthcare well as their impact on patients (AACN, 2026). While these serve as Technologies," now includes several sub-competencies that point to the necessity of both entry- and advanced level nursing education curricula to ensure that students are able to demonstrate proficiencies in understanding how technology and information are utilized as the foundation on which the creation and uptake of AI literacy and adoption strategies should be built, development of them largely remains insular at the institutional level, often times with more questions being generated than can be answered, given AI's growth and scale.

Regarding the national nursing accrediting agencies recognized by the U.S. Department of Education, the three main national bodies are in varying stages of adoption when it comes to AI content in nursing educational programs.

- The Commission on Collegiate Nursing Education (CCNE) is an autonomous accrediting agency of AACN. CCNE's *Standards for Accreditation of Baccalaureate and Graduate Nursing Programs* (Amended 2026), does not mention AI, however, the standards are based on the AACN Essentials noted above.

[1] Examples of specialized AI graduate and certificate programs include Chamberlin University, Florida State University, the University of Alabama, the University of Texas at Austin and the University of Central Florida College of Nursing.

- The Accreditation Commission for Education in Nursing (ACEN) is a nonprofit, non-governmental organization. ACEN's *2023 Accreditation Manual for Nursing Education Programs* (Revised 2025) does not directly state the integration of AI in nursing education, however "…evaluators and staff cannot use open-source artificial intelligence for any program-related materials during a review process or formulating a report" (p. 20). In a recent article considering the role of AI in nursing education, ACEN does recognize the need for its more formal integration as part of the education and accreditation process (DeLoach, Ard, & Nunn-Ellison, 2026).
- The Commission for Nursing Education Accreditation (CNEA) is the National League for Nursing's autonomous accreditation division. NLN-CNEA's Standards for Accreditation (June 2026) similarly do not have a direct reference to AI. However, in the NLN's *Vision Statement: Artificial intelligence (AI) in Nursing Education* (2025) it states, "Measurement for AI literacy and competency in nursing education and practice is warranted to further align them with nursing standards as outlined by accreditation bodies in the U.S." (p. 4).

It is also important to note for context, ACEN and CNEA are recognized by the Council for Higher Education Accreditation (CHEA). In 2025, CHEA released their *Guiding Principles for Artificial Intelligence in Accreditation and Recognition,* which notes that AI should support, not substitute, human decision-making, ensuring that accreditation and recognition processes remain under human control and free from bias. Equally central is the principle of transparency and accountability, requiring that AI systems be used only with verifiable data and that their use may not manipulate or obscure collected information (CHEA, 2025).
The steps taken by some schools of nursing and national bodies signal the profession beginning to organize around AI education. Work remains to prepare consistent curricular integration, adequate institutional resources, and a shared commitment to treating AI literacy as a foundational requirement rather than a specialized credential. Without this, the gap between what nurses need to know and what they are being taught will continue to widen.

Rapid Growth in AI Utilization Has Surpassed Strategies to Instill AI Literacy and Adoption

The challenge, however, is not only what is being taught, but whether the educational system itself can keep pace with the speed at which AI is reshaping the environments nurses are being prepared to enter. As AI becomes more ubiquitous, strategies for augmenting AI literacy and adoption in nursing education must prioritize safety, efficacy, and be ethically grounded. Prioritizing these elements presents an inherent challenge regarding the efficiency and pace at which these strategies can be developed and implemented. Principally, "the rapid deployment and uptake of AI tools have outpaced the development of comprehensive educational strategies designed to build AI literacy" (Porter & Foronda, 2024, p. 131).

Further, nurse educators must be informed about existing usage of AI, be able to gauge the level of AI literacy among faculty and students, and understand the potential risks when gaps in AI literacy exist. A 2025 review of nursing student and faculty attitudes, perceptions, and intentions for AI use

in nursing education demonstrates that nursing has been slower to adopt AI compared to other disciplines (Ostick et al., 2025).

The implications of this lag between the classroom and clinical setting create a constant pressure to update content. For every cohort of nurses that enters practice without adequate AI preparation, the profession's ability to engage as informed and accountable clinicians in an AI-enabled health care system is further delayed.

2.2 While AI has been a part of nursing education, AI can further enhance it. Concerns surrounding AI usage in nursing education include preserving academic integrity and critical thinking.

AI Tools in Nursing Education

Research on AI in nursing education reveals a consistent pattern: the tools hold genuine promise for enhancing learning, but their responsible integration depends on the preparation and support of both students and faculty.

A scoping review on AI in nursing education conducted by Lifshits and Rosenberg (2024) found over 6,500 articles related to nursing and AI. Narrowing the focus and further refinement, 15 empirical studies were examined regarding AI implementation in nursing education through a SWOT (Strengths, Weaknesses, Opportunities, Threats) framework. They found that AI tools consistently offered a better learning experience, enhanced ways to increase student knowledge, and showed better student demonstrability of skills (Lifshits & Rosenberg, 2024). These tools included virtual reality, augmented reality, virtual simulation, and chatbots (Lifshits & Rosenberg, 2024). Key strengths included increased student satisfaction, improved critical thinking, and the ability to practice clinical interventions without fear of failure.

Opportunities identified across the 15 studies included improved learning outcomes, enhanced emotional regulation, and expanded exposure to diverse clinical scenarios. However, the review also identified weaknesses, including technical and usability issues, insufficient or delayed feedback mechanisms, language and cultural barriers within AI platforms, and environments that did not fully replicate clinical settings. The authors concluded that while AI offers significant benefits for nursing education, continuous evaluation is essential to manage its limitations and maximize its educational potential.

One mode of student learning that has flourished is simulation, which has been incorporated into nursing education for over a century (Singleton, 2020). Early on, mannequins and other artificial human forms were used to assist students with understanding anatomy and physiology. In more recent decades, technology has propelled simulation to produce more sophisticated models that provide students with hands-on learning and the capability to respond in real time. A notable example of a program mirroring clinical scenarios includes mannequin patients who are decompensating and require resuscitation.

Additional AI initiatives in nursing simulation include the use of virtual reality, human patient simulators, telehealth, and scenario creation, among others. Often cost-prohibitive, simulation

equipment is not equally integrated into all nursing programs. This factor, combined with the rapid evolution of AI, has led to varying levels of exposure among nursing and other health professions programs (Bienstock & Heuer, 2022). A positive outcome of simulation is the opportunity for interprofessional training and teamwork (Bienstock & Heuer, 2022). For example, medical, nursing, and other health professions students can engage in treating a robotic patient that responds to the clinical decisions of students using algorithms that mimic patient conditions and behavior, such as cardiac output, verbal responses, and reactions to medications.

Another mode of AI that is being implemented in the academic arena are LLMs, which can ease cognitive load and support rapid data analysis as well as decision-making, while challenges include questions of validity, reliability, and ethical use (Blomquist et al., 2025). It was suggested that nursing faculty should prepare students to utilize LLMs responsibly through the National Council of State Boards of Nursing's five rights of nursing delegation framework (Blomquist et al., 2025).

According to the authors, nursing faculty should teach students to view LLMs as a tool to support and sharpen their problem-solving skills, rather than replacing critical thinking, encourage consideration of when LLM use is appropriate in contrast to when it is necessary to have solely human-generated output; ask if there is a more appropriate person or information source to perform a task; use primary sources to verify an LLM output; and finally, collaboratively develop an understanding of the prompts and use of LLMs that can be used to obtain the desired output (Blomquist et al., 2025).

At the same time, nursing faculty may be concerned about AI's impact on their workload and established teaching processes, including the significant amount of time to learn about using AI or having fears about being replaced by it (De Gagne, 2023). To address these concerns, De Gagne (2023) emphasizes that nursing faculty should receive proper training and support for AI implementation in education that is designed to help them understand the capabilities and limitations of AI. Ultimately, AI can help faculty, alongside students, realize gains in efficiency. For example, AI tools can assist faculty with routine tasks like attendance monitoring and progress tracking, freeing up time for tasks that require their unique expertise (De Gagne, 2023).

AI's Potential to Enhance Delivery of Nursing Education

A core component of AI in nursing education relates to instruction on how to use and understand clinical AI tools. Beyond this application, AI stands to reshape nursing education itself. Nursing education can stand to benefit from AI through opportunities such as personalized feedback and suggestions, language translation, interactive learning, and adaptive learning for students (Ostick et al., 2025). AI has an ability to support "precision education," in much the same way "precision health" has revolutionized care in recent decades (Glauberman et al., 2023). For example, AI can "supercharge" simulations, which are commonly used in nursing education, by creating scenarios that are increasingly realistic and personalized to each students' needs through virtual and augmented reality (Glauberman et al., 2023). AI "tutors" could also help nursing students with assignments and provide specific and immediate feedback. Thus, while academic rigor and

standards should be upheld, AI offers the opportunity to move beyond a “one-size-fits-all” approach to a more dynamic one.

In a scoping review published in 2025, the authors used the Joanna Briggs Institute methodology (registered on the Open Science Framework) to examine how AI tools, large language models, and chatbots are being used in nursing education as the profession continues to understand and apply AI tools (Doston et al., 2025). In a comprehensive review of PubMed, PsycINFO, Academic Search Complete, and CINAHL Complete, 38 studies were identified showing AI applied to simulation training, predictive analytics, debriefing, tutoring, and curriculum development. Simulation and predictive analytics show the most opportunity, but ethical concerns and a lack of longitudinal outcome data are needed for further validation (Dotson, et al., 2025). Similar to Glauberman et al., 2023, Doston and colleagues conclude that AI in nursing education offers potential for personalized learning and performance prediction and call for more research in the area.

Academic Integrity and Ethical AI Use in Nursing Education

While a major goal of AI in nursing education is to support the efficiency and efficacy of learning, notable potential harms and risks of AI integration could include academic integrity violations, overreliance on AI-produced information, knowledge gaps due to trusting inaccurate information provided by an AI chatbot, and the loss of writing and critical thinking skills (Ostick et al., 2025; Topaz et al., 2025). Additionally, concerns over student and patient privacy and confidentiality emerge as an ethical issue if AI usage results in a data breach (De Gagne, 2023).

Nursing students’ understanding of what constitutes appropriate and ethical usage of AI in their own academic work may vary. One 2025 study by Dodson et al. posed a series of case scenarios to 119 first-year baccalaureate nursing students and asked them to respond whether the hypothetical usage of generative AI in each scenario should be deemed ethical vs. non-ethical. Students had an average accuracy rate of 93%, demonstrating a strong ability to differentiate (Dodson et al., 2025). However, one case scenario revealed a more significant gap in understanding. The unethical scenario described a student using generative AI to provide a detailed response for an assignment. The student made only minor edits and alternations to the generative AI response yet still submitted the response as his own work. This time, only 88% of students accurately identified this as unethical, suggesting different understandings of academic dishonesty (Dodson et al., 2025).

Structured education surrounding ethical use of AI in academia can enhance ethical competencies among nursing students (Abuadas et al., 2025). The evidence denotes that clear and consistently communicated academic policies on AI use are foundational to developing the ethical discernment nursing students will need to carry into clinical practice.

Critical Thinking, Clinical Reasoning, and the Risks of Overreliance

Beyond academic integrity, an existing challenge in nursing pedagogy is how to assess whether AI tools, if any, can be used safely and effectively without devaluing and undermining the organic, critical thinking that underpins the fundamentals of nursing, such as patient assessment, communication between patients and providers, and actively asserting privacy of patient

information. LLMs are pointed to as a common example of why the relationship between AI use in clinical nursing education and students' own reasoning skills should be questioned, acknowledging that students could readily rely on an LLM application to develop a patient's plan of care (National Council of State Boards of Nursing, 2024).

Potential harms of AI in nursing education include decreased learning, inaccurate conclusions, and inappropriate application (Porter & Foronda, 2024). Additional challenges of AI in nursing education include an overreliance on technology that leads to declines in relationship and communication skills; algorithm biases that potentially widen disparities; and privacy and security concerns related to personal information collection (Glauberman et al., 2023). Lee and Jeffery (2026) argue that nurses must develop a critical mindset, "a habit of clinical skepticism toward AI outputs," (p. 73) to continuously validate AI outputs against their own clinical judgments.

Overall, the aim is not to limit AI used by students, but to ensure that its integration strengthens rather than supplants the critical reasoning, ethical judgment, and relational skills that define nursing practice.

AI in Nursing Research

Nursing research must also be considered in the context of nursing education as it is traditionally and most commonly housed within the academic infrastructure. Similar questions around ethical use, methodologies, and integration of AI exist in this context. Nurse scientists are both patient advocates and researchers whose understanding and usage of AI will impact patient care while working to ensure nurses maintain their commitment to human-centered and compassionate care. In a published report of the findings from the University of Pennsylvania School of Nursing's *AI and Nursing Science Summit*, 48 experts in nursing, medicine, data science, ethics, and industry considered guidelines for integrating AI into nursing science (Demiris, et al., 2026). Four opportunities, five challenges, and five overarching guidelines were identified (See Table 1).

With respect to areas of funding for nursing research, Dzikowicz et al., (2025), reviewed grants (R01, R21, and K08), funded by the National Institutes of Health (NIH) from 2013-2023 that were nursing and AI related. A total of 370 NIH grants were found, marking an over 1,000% increase in the last 10 years. Cognition and aging, chronic disease self-management and predictive analytics were the most common focus areas of the grants. The authors note that while funding is increasing for AI, nurse-led projects are limited and suggest that more focus be placed in preparing researchers for AI-integrated nursing science (Dzikowicz et al., 2025).

To address training, Cary et al. (2025b) developed the Human-Centered Use of Multidisciplinary AI for Next-Gen Education and Research (HUMAINE) model that aims to support scientists with AI/ML competencies focused on algorithms that cause bias. The HUMAINE curriculum will advance scientists' research, in multiple fields, to ensure they are addressing structural inequities. While the authors note that HUMAINE must be further expanded, it is one of the strategies being used to advance ethical use of AI in practice.

Table 1. Opportunities, Challenges, and Guidelines for AI Nursing Research

Developed from the content as cited in Demiris, et al., 2026

Opportunities	Challenges	Guidelines
Evaluating The Impact of AI on Nursing Workflow	Ensuring AI Literacy Among Nurse Scientists	Expand *AACN's Essentials Domain 8* on Informatics and Healthcare Technology
Examining The Impact of AI On the Speed of Research Translation and on Reduction of The Cognitive Burden of Synthesizing Clinical Findings	Using Appropriate Tools to Assess Model Integrity and Data Set Completeness	Expand The Participation of Nurse Scientists in Interdisciplinary AI Working Groups That Address the Development, Design, Deployment, Evaluation, And Policy-Making Regarding AI
Using Existing AI Approaches to Tailor Patient Education Materials and Ensure Their Validity	Safeguarding The Integrity of Nursing Practice	Apply Rigorous Methods, Metrics, And Implementation Science Frameworks in Deployment of AI-Based Solutions
Using AI To Extract Profiles of Patient Need from Large Data Sets	Addressing The Validity of AI Systems	Recognize The Financial Implications of the Integration of AI Using a Nursing Science Perspective
	Bridging The AI Development-Research Gap	Demonstrate Ways to Promote the Ethical Integration of AI In Healthcare

Section Summary

Nursing education can be enhanced by implementing AI tools that can offer more personalized learning, adaptive simulations, and immediate feedback. However, faculty and academic institutions still carry hesitations. Academic integrity violations, overreliance on AI-generated content, erosion of critical thinking and clinical reasoning, and privacy concerns represent persistent challenges that require clear university policies and deliberate pedagogical strategies.

Currently, AI's advancement in clinical settings has outstripped the profession's ability to prepare nurses adequately before they enter practice, creating a gap that widens with each graduating cohort.

Finally, similar to nursing practice readiness and nursing education, AI literacy, protection of patient data, and being "co-creators" of AI tools, models, and frameworks, remains consistent for the future of nursing science. Further, professional identity and AI model integrity were raised as concerns for nurse scientists.

Perspectives on Ethical Use and Bias of AI Tools

3.1 Nurses have a moral responsibility in relation to human aspects of care. Nursing intuition remains a priority.

Upholding Humanity within Nursing Care

It is important to critically examine the uniquely human role in patient care as AI technology proliferates. The "very essence of nursing" is "a profession steeped in empathy and human understanding" (Porter & Foronda, 2024, p. 132). AI cannot replicate human aspects of nursing care, which are "an essential and moral responsibility of nurses" (George & Griswold Pierce, 2025, p. 47). Nurses must be responsible for ensuring that AI will not compromise human interactions and relationships, which are central to patient-centered care, and ensure AI does not alter the goals of patient care (Birkholz et al., 2025).

In relation to their humanity, nurses have "embodied knowledge," that is, knowledge in the mind, body, and emotions that is attuned to sensory perceptions and contextual details that AI does not or cannot capture (Green, 2025, p. 406). AI technology is not yet able, for example, to perceive a patient's facial expressions that may indicate pain or detect certain indicative body odors (Green, 2025). Nurses receive extensive clinical training, and their role is to attend to all pieces of information they have to make decisions related to patient care.

While AI is now an additional tool that offers valuable information, it is only one source. Nurses should continually engage with the question of whether the AI's outputs align with their own intuition and assessment (Green, 2025). The exploration of how human aspects of nursing will evolve as technology advances is similarly critical. As robotics technology powered by AI is increasingly used in care, the profession must define boundaries for which skills and tasks can appropriately be delegated to technology. Harrington (2018), for example, discusses robots used in nursing practice and questions whether robots can be programmed to show care and emotions.

Nurses have an ethical obligation to understand AI tools but require continued guidance. Nurses must know when and how to question AI outputs and critically question automation and algorithmic bias.

Understanding Nursing's Code of Ethics in Relation to AI Tools

While exploration of ethical AI development, implementation, and governance is important, it may be currently lacking in research. In a scoping review, Von Gerich et al. (2021) note that articles on AI technology in nursing mainly focus on the tools' functionality. Notably, 36.6% of the articles did not include any discussion on ethics while no articles discussed the specific ethical issues of the AI's use in nursing (Von Gerich et al., 2021). Ethical development and use of AI, specific to nursing, is considered a critical area to research further for the field moving forward. The research can then inform practice guided by nursing's Code of Ethics.

The American Nurses Association's Code of Ethics for Nurses contains multiple provisions addressing AI in the most recent iteration (American Nurses Association, 2025). Provision 3.2 notes that "…nurses establish and maintain trust by balancing clinical and ethical judgment with the use of augmented intelligence or artificial intelligence (AI) in nursing practice" (American Nurses Association, 2025). Provision 4.1 maintains that "systems and technologies that assist in clinical practice are adjunct to, not replacements for, the nurse's knowledge and skill. Therefore, nurses are accountable for their practice even in instances of system or technology failure" (American Nurses Association, 2025). Provision 7.5 speaks to the need for nursing practice to integrate technology, including for nurses to contribute to its development and recognize that AI can expand nursing capacity while acknowledging its potential harms (American Nurses Association, 2025). The American Nurses Association's position statement on *The Ethical Use of Artificial Intelligence in Nursing Practice* further underscores that AI technology is supportive to, and not a replacement for, nursing practice and human connection (American Nurses Association, 2022).

Moreover, AI transparency includes the disclosure of training data, design logic and purpose, decision-making processes, and limitations of an AI model. As AI technologies mushroom, transparency is important because AI tools may not be grounded in the same values as nursing. For example, there is the risk of market-driven efficiency goals being prioritized over ethical and safe patient care (Ronquillo et al., 2021). Lacking transparency, a nurse may not be able to assess an output for alignment with ethical and moral principles (George & Griswold Pierce, 2025). To facilitate greater ethical development and use of AI, George and Griswold Pierce (2025) outline a process for nurses' ethical analyses in alignment with the American Nurses Association Nursing Code of Ethics. The five main questions are: "Is there beneficence (i.e., doing good)? Is there non-maleficence (i.e., doing no harm)? Is there justice? Is there veracity (i.e., is it the truth and is it beneficial to all patients…)? Finally, does the AI system facilitate or detract from patient autonomy?" (George & Griswold Pierce, 2025, p. 51).

Ethical risks also include privacy concerns, the risk of fatal results or serious harm if an LLM "hallucinates" when generating text relied upon by patients or clinicians, the potential for AI to dehumanize care through standardization, and unclear accountability mechanisms in the case of

AI errors (George & Griswold Pierce, 2025). For example, LLMs are already being implemented to facilitate patient message responses by health care professionals at some health systems. This raises the risk of inaccuracies in responses that are not caught or adequately scanned by clinicians before sending; reporting indicates that up to one-third of the AI-generated messages were sent to patients unedited (George & Griswold Pierce, 2025). There are also concerns if a patient is messaging with AI as opposed to the human clinician without disclosure (George & Griswold Pierce, 2025).

This is particularly salient as the profession seeks to maintain its integrity against misconceptions that AI can fundamentally replace nurses (Demiris et al., 2026). The University of Minnesota's AI in Nursing Ethics Initiative, which evaluated the opportunities and challenges associated with four key AI domains (machine learning, generative AI, natural language processing, and robotics) assessed the implications of these technologies for nursing practice (Ball Dunlap, et al., 2026). The authors noted that threats of AI include risk of dehumanization and bias, devaluation of the nursing role, and that AI cannot replace the intuition and moral judgement that is core to the profession, furthermore stating, “The nurse must act as the guardian of the ethical environment, with a moral obligation to demand transparency, challenge opaque systems, and uphold the profession’s virtues” (Ball Dunlap, et al., 2026, p. 5).

Addressing Bias in AI Usage

AI models require vast amounts of data for training to build robustness. The use of electronic health records (EHR) and other data sources that AI tools are trained on, which nurses contribute to, is not morally neutral (Von Gerich et al., 2021). This is because the training of AI tools on data implicates questions of patient privacy, autonomy, harm, and justice (Von Gerich et al., 2021).

A phenomenon known as automation bias occurs when humans are overly trusting of automated technology-produced outputs in comparison to their own intuition and judgement. Furthermore, the development, training, or deployment of AI may contain multitudes of pitfalls that would result in biased outcomes (i.e., algorithmic bias). "There is an ethical imperative for nurses to have a minimum basic understanding of how [AI] tools come to be developed, what informs them, and the implications of using such tools on their clinical judgement and practice” (Ronquillo et al., 2021, p. 3710). This responsibility is no different from nurses’ responsibility to understand and demonstrate competency in any tool and technology they will use in practice. As part of ethical practice regarding AI and its limitations, nurses should question “How are these models evaluated and monitored? What auditing tools are in place to make certain that a model is well calibrated? What systems exist to detect when a prediction is incorrect?” (George & Griswold Pierce, 2025, p. 48).

Additionally, the potential for algorithmic bias in AI technologies runs counter to the aims of nursing practice (Ronquillo et al., 2021). Nurses need to consider the ways in which bias can occur as AI technologies are developed, implemented, and governed. Bias can result from the data itself (under-or over-representation of certain populations), system design, or operations (Green, 2025; Cary, 2023). AI is largely trained on data that reflect existing societal structures and biases, which can be magnified once implemented (Porter & Foronda, 2024). Cary et al. outline a framework for

nurses to advance health equity and mitigate bias in AI with the Bias Elimination for Fair AI in Healthcare (BE FAIR) framework, which educates nurses on biases and guides on how to manage this when AI technology is used in health care (Cary et al., 2025a).

It should be noted that AI models can also be used to address and mitigate biases. In one example, a machine learning model demonstrated high accuracy in detecting stigmatizing language within electronic health records (Xavier et al., 2025).

Section Summary

Nursing's ethical foundation places the profession at the center of one of the most consequential questions in modern health care: how to integrate AI in a manner that preserves humanity, judgment, and moral accountability that define nursing practice. As AI tools proliferate, the nursing profession must actively define the barriers impeding their ethical clinical judgement, which includes nurses' relationships with patients that no algorithm can yet perceive or replicate.

The review proposes that transparency is paramount. Without visibility into an AI tool's training data, design logic, decision-making processes, and known limitations, nurses cannot assess whether its outputs align with ethical and clinical standards, nor can they prevent inherent systemic biases that may exist in AI implementation. Ethical decision-making frameworks grounded in beneficence, nonmaleficence, justice, veracity, and patient autonomy offer a structured path forward. At the same time, more research is needed on the ethical dimensions of AI in nursing.

Frontline Assessment Analysis

To amplify the data in published literature, the American Academy of Nursing conducted two focus groups to evaluate if the themes identified throughout this report were comparable in the current practice and educational environments. Participants included a mix of 17 Chief Nursing Officers (CNOs), Chief Nursing Informatics Officers (CNIOs), and nursing academic leadership (including Deans, Associate Deans, and Professors). The makeup of the location and type of institutions that were part of the focus groups included Academic Health Centers (AHC) (n=7: 1 Midwest, 4 South, 1 Southwest, 1 West), large health systems (n=5: 1 Midwest, 2 Northeast, 2 Southwest), industry (n=4: 1 Midwest, 2 Northeast, 1 Southeast), and one research agency (n=1: Northeast). To structure the focus groups, the main themes identified above were evaluated as a method to validate as well as identify any new or emerging trends. Appendix A lists the full set of focus group questions.

Focus Group Themes

Current Use of AI

Practice leaders reported their institutions focused on reducing time spent on tasks that are currently burdensome, including EHR chart summarization, documentation, staffing/scheduling, and budgeting. Ambient documentation was repeatedly mentioned as a use case. Additionally, some organizations are implementing a system-wide private, secure chatbot due to concerns that clinicians are entering private health information into publicly available LLMs like Claude.

Academic leaders noted that AI is helping with literature reviews as part of library resources. Students are using AI for a wide variety of tasks, while faculty adoption varies. Some in academia are using AI for data analysis and to assist with substantive presentations and publications.

Aims for AI in the Next 5 Years

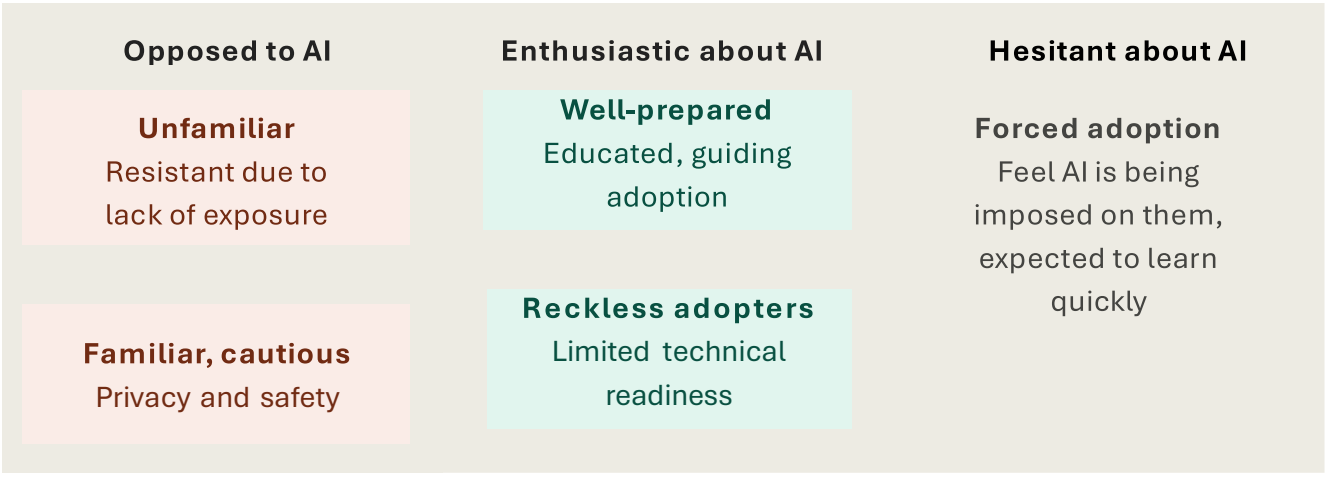
Participants noted a desire to see AI redefine care, as opposed to simply augmenting current practices. AI can provide rich resources at both the patients' and clinicians' fingertips, which will shape clinical interactions in the future. Organizations are seeking to deploy AI for greater predictive analytics to be proactive about metrics rather than reactive. For example, staffing data can be connected with patient outcomes in the quality database to support leaders in making appropriate predictions based on quality metrics. Additionally, AI can serve as a real-time coach for nurses to receive immediate feedback on their practice and advance "upskilling." Other aims discussed include precision nursing education and cost reduction. Participants noted as well that AI is enabling care beyond traditional brick-and-mortar establishments and in medically underserved communities.

Nurses' Attitudes on Willingness and Readiness for AI

A spectrum was discussed ranging from early, enthusiastic adopters to very hesitant and fearful adopters. Some observed a generational divide, whereby older generations express more hesitation than younger generations who are digital natives. The sentiment expressed about the largest group within the nursing profession is cautious optimism. However, there remains a segment within both the academic and practice settings that is firmly opposed and sees no value in AI whatsoever.

For those generally opposed to AI, they can be subcategorized as individuals who are resistant due to unfamiliarity and those who are familiar, but who have legitimate concerns about privacy and safety aspects of AI. For those enthusiastic about AI, they can be subcategorized as individuals who are well-educated and prepared to lead AI adoption as well as those who are recklessly adopting AI without a sufficient technical background to use it responsibly. There are also those using AI who view it as forced upon them with the expectation that they will pick it up rapidly. This overarching view of the nursing profession's adoption was described as five phenotypes of adoption (See Figure 1).

FIGURE 1. FIVE PHENOTYPES OF NURSING'S AI ADOPTION



Participants noted that attitudes can vary depending on how and why an AI tool is implemented. When an AI tool is supplementing workflows, there is generally high adoption and support for its adoption. However, when a tool dramatically changes workflows, there is greater resistance. It was noted that many nurses hone their style of care delivery over years and asking them to complete tasks in a completely new way is a large ask and can be viewed as a burden. It was also suggested that nurses engaging in union negotiations are more hesitant and resistant to AI.

In academia, many students are using AI even when advised not to. Concerns were discussed related to retaining critical thinking, which is vital to the role of a nurse in the clinical setting. Concerns were also raised about innovation and originality if there is an overreliance on AI tools. Moreover, participants in the academic setting noted a need to ensure faculty guide students on how to use AI responsibility to catch hallucinations and errors.

Concerns & Hesitations for AI Adoption

Often-cited concerns and hesitations about AI adoption in nursing care included: AI adding complexity to care, lack of preparedness and education on AI, nurses not involved in decision-making, lack of trust in output, the potential of bias and ethical concerns, fear of job loss or replacement, and legal risk when AI errors or breach of confidentiality occur. Nurses view AI as just one more thing to add into workflows, which are already complex. Nurses are concerned about the quality of information and outputs from AI given the potential for hallucination and other errors.

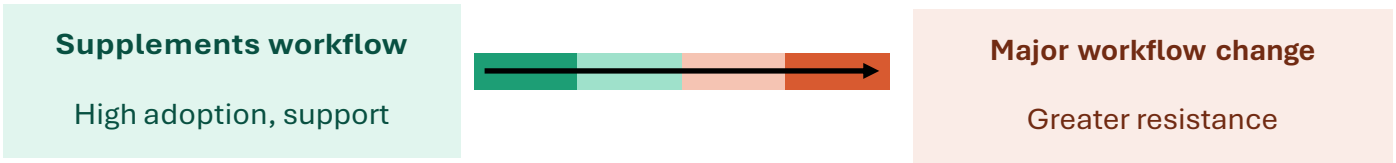
Additionally, nurses have concerns that nurses are often not part of the design and development of AI models. Further, they may also be excluded from decisions about how AI is implemented, with those decisions instead made by Chief Financial Officers or others focused on efficiency gains, such that AI is imposed on nursing practice in ways nurses cannot influence. An additional hesitation surrounding adoption of AI is related to the possibility of AI being used for surveillance of nurses, and as efficiency improves it may not result in increased nursing time at the bedside but rather an increased number of patients. Figure 2 outlines the spectrum of adoption as it relates to workflow and concerns that drive their resistance to AI.

In academia, some are concerned that their ideas and copyrighted works are being picked up and incorporated into LLMs. This concern is also evident on the practice side, with nurses concerned that patient data is being used to train AI models in violation of HIPAA and against patients' wishes.

Shared Decision-Making Standards for Interprofessional Teams Using AI

Participants emphasized that shared decision-making standards are currently lacking, with or without AI. Strong governance frameworks are needed with nurse input and oversight into decisions that impact nursing workflows with AI. Understanding must be fostered so that all team members should speak up regarding concerns. A comparison was drawn from the aerospace industry, which has long relied on technology and machines, that anyone must have the ability to share concerns about technology to foster safety for the entire team. This mindset is not currently broadly accepted in health care, which should be addressed. Additionally, there is a need for common data practices with respect to collection, storage, quality, and equity standards.

FIGURE 2. SPECTRUM OF NURSES' ATTITUDES TOWARD AI ADOPTION



Attitudes shift along this spectrum depending on how and why an AI tool is implemented.

Concerns Driving Resistance

Complexity
Concern more tasks will be involved in an already complex workflow

Trust
Concerns pertaining to the accuracy of information, potential bias in outputs, and hallucinations

Representation
Concerns of continued exclusion from AI design and implementation decisions

Risk
Concerns related to job security, legal risk to their licensure, and fear of institutional surveillance

Barriers, Opportunities, and Academia/Practice Alignment

It was emphasized that academia and practice are not on the same page and recent nurse graduates are not sufficiently equipped to practice with AI. However, the effort for alignment is higher now than previously. Key barriers in academia were noted as lack of access to capital for new technological innovations, as well as faculty already being overstretched due to shortages. Opportunities include clearer regulatory guidance, addressing trust and mistrust, and the potential for greater shared decision-making as AI advances in new ways across patient care.

Survey Findings

The American Academy of Nursing also deployed a short survey— open for one week— to obtain additional information from experts within the profession to cross walk the findings of the published literature and focus groups. In total, 41 respondents completed the full survey. Respondents were from the following professional affiliations: Dean (n = 3), Professor (n = 15), Chief Nursing Officer (n = 1), Chief Nursing Informatics Officer / Nurse Executive Other (n = 2), Ethicist (n = 1), and Other (n = 19).

The survey was branched depending on professional affiliation, with respondents who selected Dean or Professor responding to academia-focused questions, while Chief Nursing Officer, Chief Nursing Informatics Officer / Nurse Executive Other, Ethicist, and Other responded to clinical practice-focused questions. Across both question sets, questions aimed to capture sentiments regarding current use and adoption; readiness and confidence; barriers to integration; education and curriculum; and oversight, governance, and trust.

Academic Representation

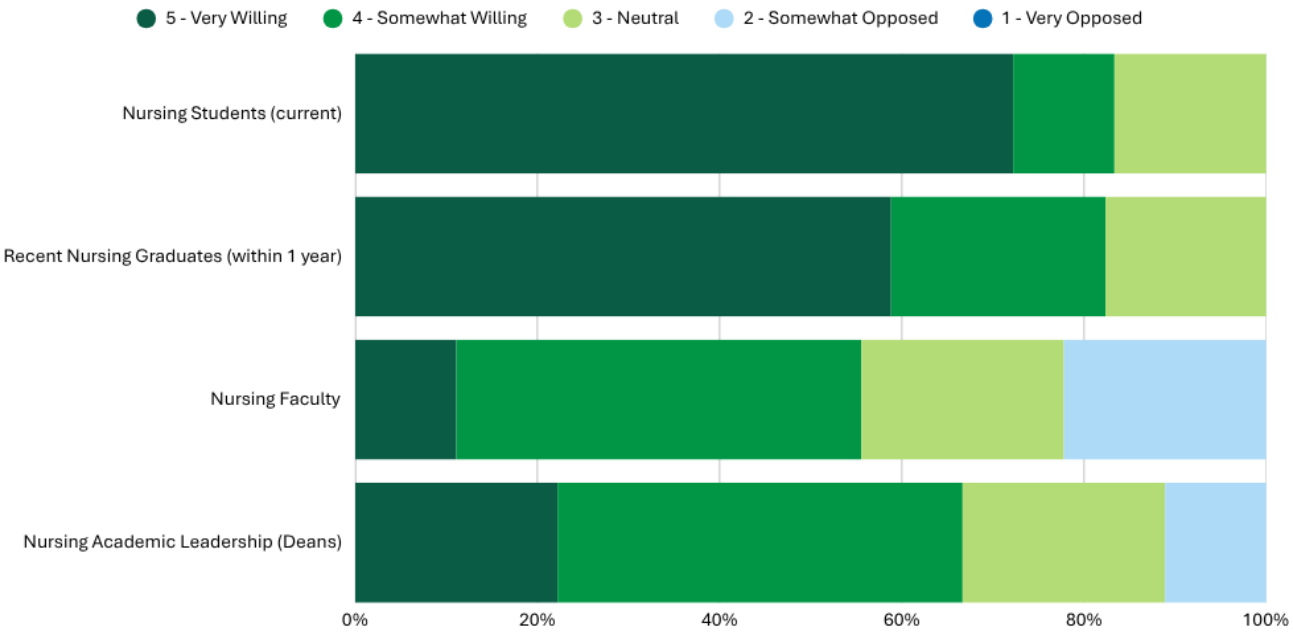
Of the 18 respondents in academia, 50% reported that their organization is located in the South, 22% in the Northeast, 17% in the West, 5.5% in the Midwest, and 5.5% international. Respondents were primarily located in urban settings: 67% reported their organization's locale classification as city, 17% as suburban, and 17% as town.

The majority (61%) of respondents indicated that AI is currently incorporated into their organization's curricula. Seventeen percent indicated that AI is not incorporated into their organization's curricula, while 22% were unsure. For those who indicated that AI is incorporated into their curricula, incorporation varied from threaded throughout courses to only in simulations and other small-scale incorporations.

Across nursing roles, respondents characterized nurses' readiness for AI adoption at their organization primarily as minimally to moderately prepared. Fifty percent characterized nursing students, recent nursing graduates (within 1 year), and nursing academic leadership as minimally prepared for AI adoption. Twenty-eight to 38% of respondents characterized these nursing roles as moderately prepared. No respondent characterized nursing students, recent nursing graduates (within 1 year), or nursing academic leadership as fully prepared for AI adoption. One respondent characterized nursing academic leadership as fully prepared.

FIGURE 3. NURSE READINESS FOR AI ADOPTION (ACADEMIA)

At your organization, how would you characterize nurses' readiness for AI adoption within each of the following roles?

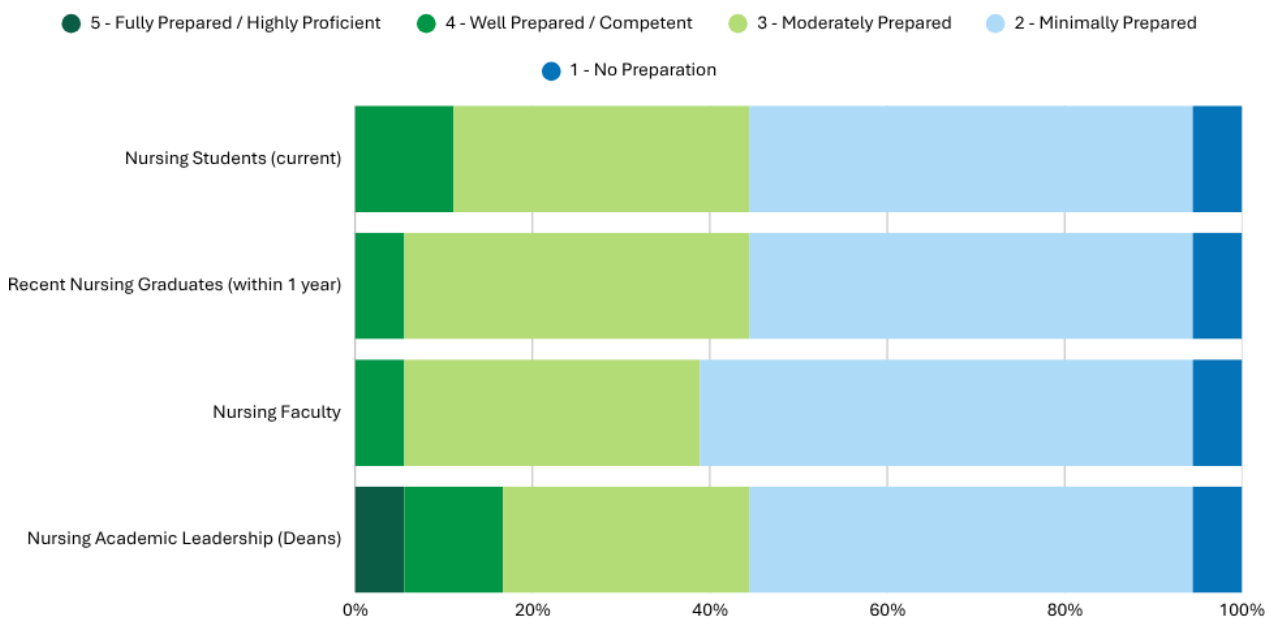


By contrast, respondents characterized nurses' willingness for AI adoption at their organization as primarily very willing across nursing students (72% very willing) and recent nursing graduates (59% very willing). For nursing faculty and nursing academic leadership, however, respondents characterized willingness primarily as only somewhat willing (44% somewhat willing across both faculty and academic leadership).

No respondents selected that nursing students or recent nursing graduates are somewhat opposed, whereas a proportion characterized nursing faculty (22%) and nursing academic leadership (11%) as somewhat opposed to AI implementation. No respondents indicated that any role is very opposed to AI adoption.

FIGURE 4. NURSE WILLINGNESS FOR AI ADOPTION (ACADEMIA)

At your organization, how would you characterize nurses' willingness for AI adoption within each of the following roles?



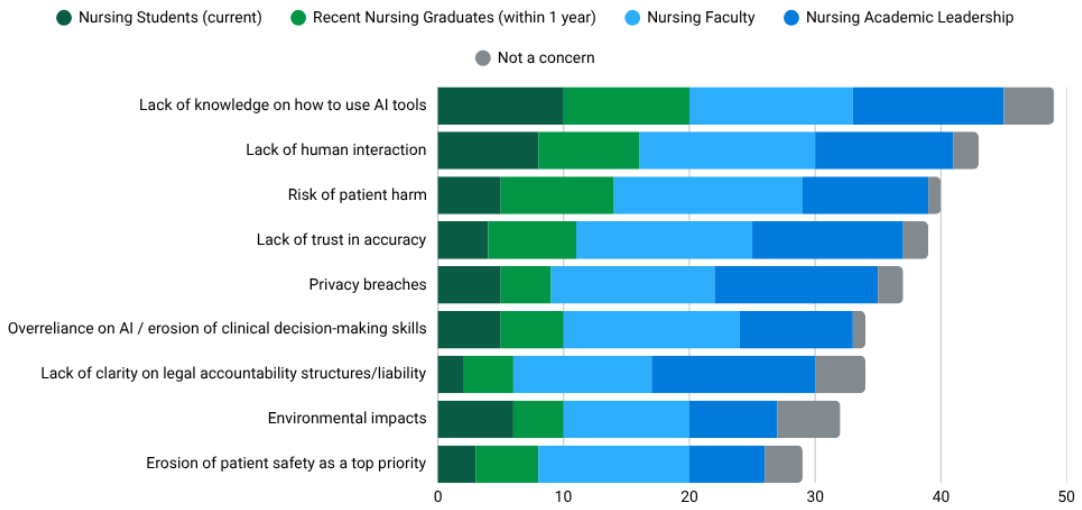
Regarding the nursing profession overall, the majority (61%) of respondents said that the nursing profession is minimally prepared for AI adoption; 22% responded that the nursing profession is moderately prepared; 11% no preparation; and 6% well-prepared/competent. No respondent characterized the nursing profession as fully prepared/highly proficient. For willingness, most respondents (56%) said that the nursing profession is somewhat willing for AI adoption; 28% responded that the nursing profession is neutral; and 17% said somewhat opposed. No respondent selected that the nursing profession overall is very willing nor very opposed.

With respect to concerns and hesitations with respect to AI adoption across nursing levels, respondents reported the most prevalent concerns and hesitations are lack of knowledge on how to use AI tools, lack of human interaction, risk of patient harm, and lack of trust in accuracy. Erosion of patient safety as a top priority and environmental concerns were noted the least.

Across all areas of concern and hesitation, respondents indicated that nursing students and recent nursing graduates have a lower share of concerns compared to nursing faculty and academic leadership.

FIGURE 5. NURSE AI CONCERNS & HESITATIONS (ACADEMIA)

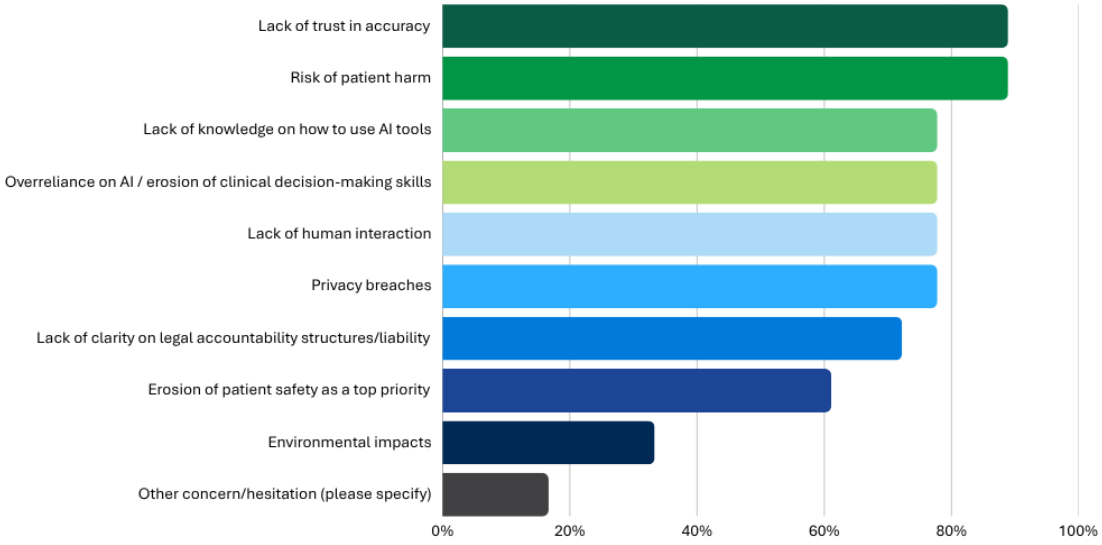
Please indicate whether nurses across levels at your organization have reported the following concerns and hesitations with respect to AI adoption.



For the nursing profession overall, the top concerns and hesitations were risk of patient harm and lack of trust in accuracy, followed by privacy breaches, lack of human interaction, overreliance on AI erosion of clinical decision-making skills, and lack of knowledge on how to use AI tools.

FIGURE 6. NURSING PROFESSION AI CONCERNS & HESITATIONS (ACADEMIA)

Please indicate whether you believe the nursing profession has the following concerns and hesitations with respect to AI adoption.



In relation to interprofessional preparation for AI use, respondents reported that their organization is offering courses and professional development programs that are instructing nurses how to privately, safely, and ethically use AI, taught by AI-focused faculty. Other strategies specified include creating AI taskforces and research committees in which the concerns regarding AI adoption are explored.

Finally, those offering additional reflections on nursing AI readiness noted that nurses should be involved in its development and governance, not only as users of the technology; discussed concern about current and future nursing strikes where their position suggest that AI or AI chatbots cannot replace their roles; emphasized the importance of reproducibility; and suggested that the profession slow the pace of adoption.

Clinical Practice/Other Representation

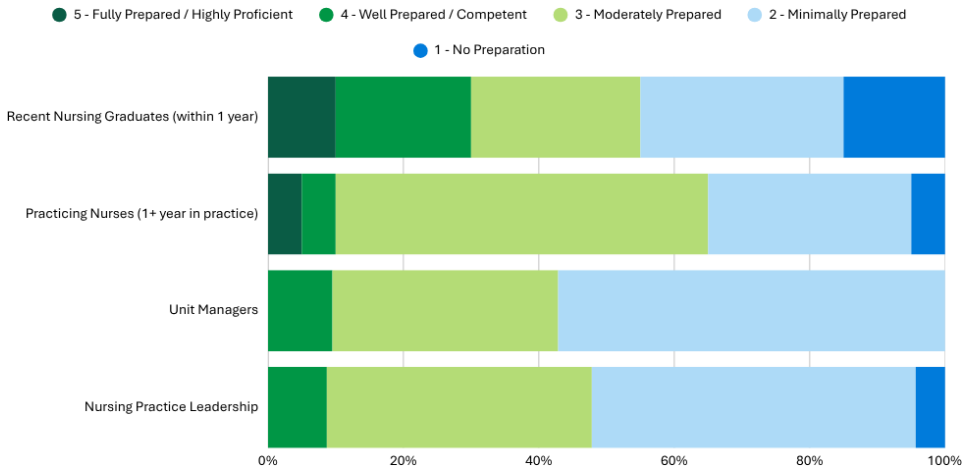
Of the 23 respondents on the clinical practice side, 30% reported their organization is located in the Midwest, 30% in the Northeast, 22% in the South, 14% in the West, and 4% international (Europe). Respondents were primarily located in urban settings: 78% reported their organization's locale classification as city, 9% as suburban, 4% as town, and 9% as other (regional or national health system).

The majority (74%) of respondents indicated that practicing nurses at their organization are currently using AI in their workflows. Twenty-two percent indicated that AI is not incorporated into their organization's nursing workflows, while 4% were unsure. The majority of respondents noted that nurses at their organization had received employer-led training on AI usage (57%). For other avenues of AI training, respondents noted that 30% engaged in peer-to-peer collaboration; 26% vendor-led training; 22% on-the-job trying tools out; 13% other (specified as simulation experiences, continuing professional education); 13% no training; and 4% unsure.

Across nursing roles, respondents characterized nurses' readiness for AI adoption at their organization primarily as minimally to moderately prepared. Ten percent of respondents characterized recent nursing graduates as fully prepared/highly proficient, and 5% characterized practicing nurses as fully prepared/highly proficient. No respondent characterized unit managers or nursing practice leadership as fully prepared/highly proficient, although no respondent characterized unit managers as having no preparation compared to 4% who characterized nursing practice leadership as having no preparation.

FIGURE 7. NURSE READINESS FOR AI ADOPTION (CLINICAL PRACTICE)

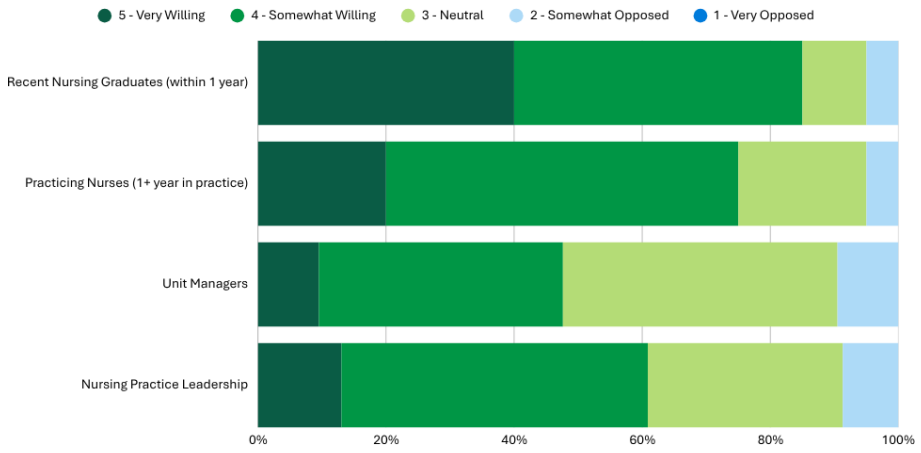
At your organization, how would you characterize nurses' readiness for AI adoption within each of the following roles?



Respondents characterized nurses' willingness for AI adoption at their organization as primarily somewhat willing across all nursing roles (recent nursing graduates 45% somewhat willing; practicing nurses 55%; unit managers 38%; and nursing practice leadership 48%). Recent nursing graduates and practicing nurses had higher shares characterized as very willing for AI adoption (40% and 20%, respectively) compared to unit managers and nursing practice leadership. At all levels, respondents indicated that the role is somewhat opposed to AI adoption (10% for unit managers somewhat opposed; 9% for nursing practice leadership, and 5% across practicing nurses and recent nursing graduates). No respondents indicated that any role is very opposed to AI adoption.

FIGURE 8. NURSE WILLINGNESS FOR AI ADOPTION (CLINICAL PRACTICE)

At your organization, how would you characterize nurses' willingness for AI adoption within each of the following roles?



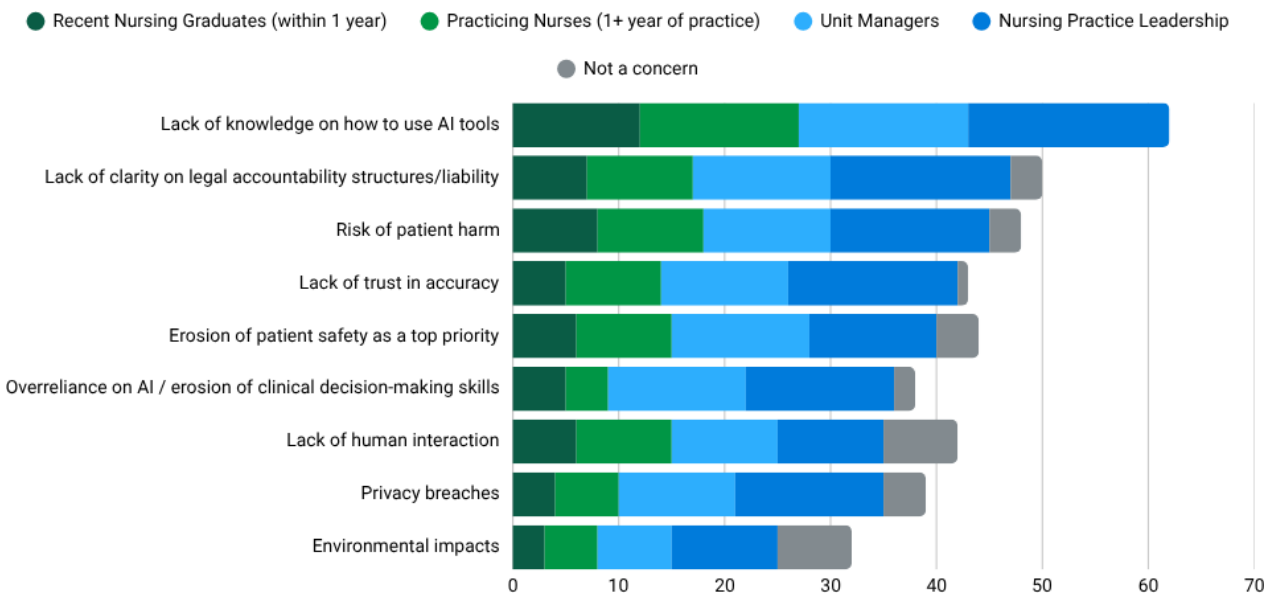
In relation to the nursing profession overall, the majority (74%) of respondents said that the nursing profession is minimally prepared for AI adoption; 26% responded that the nursing profession is moderately prepared. No respondent characterized the nursing profession as fully prepared/highly proficient, well prepared/competent, or not prepared at all. For willingness, the majority of respondents (57%) said that the nursing profession is somewhat willing for AI adoption; 21.5% responded that the nursing profession is neutral; and 21.5% said somewhat opposed. No respondent selected that the nursing profession overall is very willing nor very opposed.

Regarding concerns and hesitations with respect to AI adoption across nursing levels, respondents reported the most prevalent concerns and hesitations are lack of knowledge on how to use AI tools, lack of clarity on legal accountability structures/liability, risk of patient harm, and lack of trust in accuracy. Environmental concerns, privacy breaches, and lack of human interaction were the least endorsed concerns. This is an area of discordance with the respondents from academia: while lack of human interaction as a top priority is a top concern (2 out of 9) across academia respondents, this is the among the least cited concerns across clinical practice respondents. Across nearly all areas of concern and hesitation, respondents indicated that nursing practice

leadership have a higher share of concerns compared to other roles, especially compared to recent nursing graduates.

FIGURE 9. NURSE AI CONCERNS & HESITATIONS (CLINICAL PRACTICE)

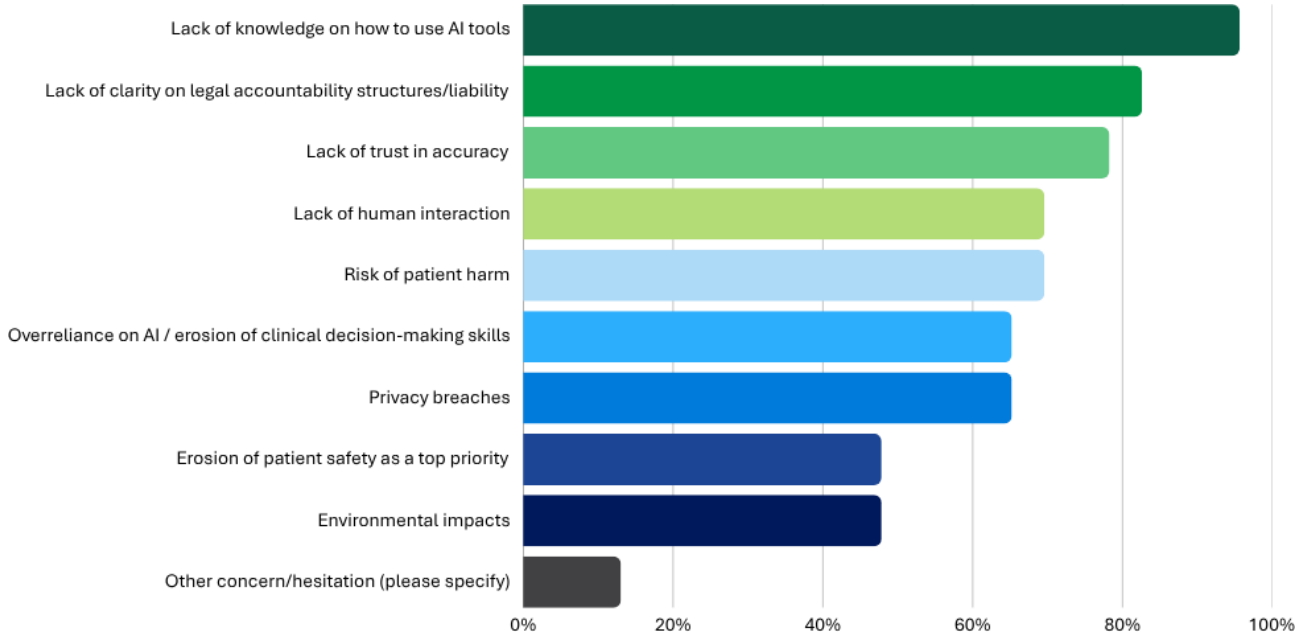
Please indicate whether nurses across levels at your organization have reported the following concerns and hesitations with respect to AI adoption.



For the nursing profession overall, the top concerns and hesitations were lack of knowledge on how to use AI tools (96%), lack of clarity on legal accountability structures/liability (83%), lack of trust in accuracy (78%), risk of patient harm (70%), and lack of human interaction (70%).

FIGURE 10. NURSING PROFESSION AI CONCERNS & HESITATIONS (CLINICAL PRACTICE)

Please indicate whether you believe the nursing profession has the following concerns and hesitations with respect to AI adoption.



Considering interprofessional preparation for AI use, respondents reported that their organization is offering educational resources, including basic training to achieve a foundational understanding of AI policy and approved AI tools and methods. Additional strategies specified include changes to governance structures, organizational AI position statements, and evidence-based guidelines.

Those offering additional reflections on nursing AI readiness noted that collaboration across professional organizations, nursing boards and schools, and industry is vitally important. Some expressed concern over the lack of nursing representation in designing AI literacy programs and curricula. One respondent pointed out that clinical practice is moving more rapidly than academic nursing, which means that recent graduates will likely not be prepared to navigate the realities of the changing work environment. One respondent noted that nurses should understand the impact of data centers on the environment.

FIGURE 11. RANKED AI CONCERNS & HESITATIONS OF RESPONDENTS (ACADEMIA AND CLINICAL PRACTICE, ORGANIZATIONAL)

Top Concerns & Hesitations *(Academia)*	**Top Concerns & Hesitations *(Clinical Practice)***
1. Lack of knowledge on how to use AI tools	Lack of knowledge on how to use AI tools
2. Lack of human interaction	Lack of clarity on legal accountability structures/liability
3. Risk of patient harm	Risk of patient harm
4. Lack of trust in accuracy	Lack of trust in accuracy
Least Cited Concerns & Hesitations *(Academia)*	**Least Cited Concerns & Hesitations *(Clinical Practice)***
1. Erosion of patient safety as a top priority	Environmental impacts
2. Environmental impacts	Privacy breaches & lack of human interaction (tied)

FIGURE 12. RANKED AI CONCERNS & HESITATIONS FOR THE OF NURSING PROFESSION OVERALL, (ACADEMIA AND CLINICAL PRACTICE)

Top Concerns & Hesitations *(Academia)*	**Top Concerns & Hesitations *(Clinical Practice)***
1. Risk of patient harm	Lack of knowledge on how to use AI tools
2. Lack of trust in accuracy	Lack of clarity on legal accountability structures/liability
3. Privacy breaches	Lack of trust in accuracy
4. Lack of human interaction	Risk of patient harm
Least Cited Concerns & Hesitations *(Academia)*	**Least Cited Concerns & Hesitations *(Clinical Practice)***
1. Environmental impacts	Erosion of patient safety as a top priority
2. Erosion of patient safety as a top priority	Environmental impacts

Limitations

This report was meant to be a scan of the environment as it stands at the time of its writing. The vast amount of literature across practice, education, as well as regulatory and legislative spaces in nursing, represents a proliferation of resources that could not be captured in a single report.

Moreover, the frontline assessment, while bringing voices from national leaders in nursing across the country was an effective opportunity to obtain a pulse; it is by no means the full heartbeat of the largest health care workforce. The same is true for the results of the survey data. Specifically, related to the focus groups, the perspectives do not represent the full picture as the participants were from universities within AHCs, large health systems, industry, and research. This does not capture other types of nursing schools, such as small schools, private colleges, or large schools without an academic health center. Additionally, the participants representing practice settings were from large health systems that focus on in-patient and acute care. Other health settings such as ambulatory care, long term care, rural and urban health clinics are not represented, leaving an opportunity for a more in-depth evaluation of nurses' perceptions and attitudes of AI readiness in other areas.

However, this report provides context to be further explored and expanded upon to fully support the nursing profession's engagement in AI governance, leadership, and implementation.

Conclusion

The findings of this landscape analysis demonstrate that the nursing profession is at an inflection point with respect to artificial intelligence. Nurses are engaging with AI tools at an accelerating pace, bringing optimism about its potential to reduce burden, improve patient outcomes, and strengthen care delivery. At the same time, the infrastructure needed to support responsible adoption, which includes institutional policy, formal training, governance frameworks, and regulatory guidance, has not kept pace with the speed of integration. The result is a workforce navigating a rapidly evolving technology largely without the institutional scaffolding required to do so safely, ethically, and equitably. AI use among nurses has climbed to roughly 70%, while published organizational policy sits closer to 36% and formal training before an AI tool is deployed around 22%. Adoption is outrunning governance.

Concurrent to the work of this report, news in early July of 2026 highlighted concerns that AI tools were allegedly replacing task previously performed by nurses, specifically reviewing charts and coordinating insurance claims. However, these reports are not consistent, and the findings of this report suggest that nurses, on the whole, are willing to integrate AI into their workflow to support better patient care. That is not to say that concerns around changes to how a nurse will practice clinically or administratively in an AI-enabled health care environment are not valid and certainly need to be addressed by the profession.

The report also denotes a consistent theme over time and technology: nurses remain underrepresented in the design, governance, and implementation of the AI tools that will shape

their practice. For AI to be implemented responsibly, nurses must be engaged not merely as end-users but as co-creators.

The path forward requires coordinated action across education, practice, policy, and professional governance. Nursing education must systematically integrate AI as a foundational thread woven through every level of preparation. Institutions must establish and enforce clear policies, governance structures, and training requirements that match the pace of adoption. Regulatory bodies must develop consistent standards for AI competency in licensure and continuing education.

AI will not resolve the longstanding challenges facing the health care system: affordability, access, workforce shortages, and persistent health disparities. However, when nurses and their expertise are deployed as a central part of AI, health care can better address these persistent challenges with greater precision and efficiency.

To return to the opening question, is today's nursing workforce prepared for the ethical and responsible use of AI, the current picture is incomplete. The evidence reviewed and the results of the frontline assessment clearly show that the urgency of completing the picture is vital. Strengthening nursing's readiness for AI is not a technical challenge to be solved. It is a professional imperative.

Appendix A – Focus Group Questions

1. How is your organization currently using AI/how are nurses using AI in your system?

2. What are the aims for AI tool implementation (i.e. what problems are you looking to deploy AI to solve for) in the next 1-2 years? In the next 5 years?

3. What are nurses' attitudes related to readiness/willingness for AI adoption?

4. What are the concerns and hesitations nurses have reported in adopting AI?

5. What attitudes would need to be in place for interprofessional standards and shared decision-making for teams using AI?

6. What are the barriers and opportunities you see for academia and practice? Do you think the infrastructure is in place for practice and academia to be on the same page on AI/readiness for practice?

Appendix B – Survey Questions

1. Please select your professional affiliation.
    a. Dean
    b. Professor
    c. Chief Nursing Officer
    d. Chief Nursing Informatics Officer / Nurse Executive Other
    e. Ethicist
    f. Accreditor
    g. Other (please specify)
2. Please indicate the U.S. region in which your organization is located.
    a. Northeast
    b. Midwest
    c. South
    d. West
    e. Territory or International – Outside Continental US (please specify)
3. Please indicate your organization's locale classification.
    a. City
    b. Suburban
    c. Town
    d. Rural
    e. Other (please specify)

Academia (Dean & Professor response):

1. Is AI currently incorporated into your organization's curricula?
    a. Yes
    b. No
    c. Unsure
2. If yes, to what extent and how? (e.g., threaded; simulation only)
3. At your organization, how would you characterize nurses' readiness for AI adoption within each of the following roles?

    Roles: Nursing Students (current); Recent Nursing Graduates (within 1 year); Nursing Faculty; Nursing Academic Leadership (Deans)

    Scale: 5- Fully Prepared / Highly Proficient; 4 - Well Prepared / Competent; 3- Moderately Prepared; 2 - Minimally Prepared; 1 - No Preparation
4. At your organization, how would you characterize nurses' willingness for AI adoption within each of the following roles?

    Roles: Nursing Students (current); Recent Nursing Graduates (within 1 year); Nursing Faculty; Nursing Academic Leadership (Deans)

    Scale: 5 – Very Willing; 4– Somewhat Willing; 3 – Neutral; 2 – Somewhat Opposed; 1 – Very Opposed

5. How would you characterize the nursing profession's readiness for AI adoption?
   Scale: 5- Fully Prepared / Highly Proficient; 4 - Well Prepared / Competent; 3 Moderately Prepared 2; - Minimally Prepared; 1 - No Preparation
6. How would you characterize the nursing profession's willingness for AI adoption?
   Scale: 5 – Very Willing; 4 – Somewhat Willing; 3 – Neutral; 2 – Somewhat Opposed; 1 – Very Opposed
7. Please indicate whether nurses across levels at your organization have reported the following concerns and hesitations with respect to AI adoption.
   Roles: Nursing Students (current); Recent Nursing Graduates (within 1 year); Nursing Faculty; Nursing Academic Leadership (Deans)
   Concerns/Hesitations:
      i. Lack of knowledge on how to use AI tools
      ii. Overreliance on AI / erosion of clinical decision-making skills
      iii. Erosion of patient safety as a top priority
      iv. Lack of trust in accuracy
      v. Lack of human interaction
      vi. Risk of patient harm
      vii. Privacy breaches
      viii. Lack of clarity on legal accountability structures/liability
      ix. Environmental impacts
      x. Other concern/hesitation (please specify)
8. Please indicate whether you believe the nursing profession has the following concerns and hesitations with respect to AI adoption.
      a. *Same concerns/hesitations as above*
9. What strategies, if any, is your organization employing to prepare practicing nurses to use AI interprofessionally?
10. Do you have additional reflections to share with respect to nursing readiness for AI?

Practice/Other (Chief Nursing Officer, Chief Nursing Informatics Officer / Nurse Executive Other, Ethicist, and other response):

1. Are practicing nurses at your organization currently using AI in their workflows?
   a. Yes
   b. No
   c. Unsure
2. What type of training, if any, have practicing nurses at your organization received on AI usage?
   a. Employer-led
   b. Vendor-led
   c. On-the-job trying tools out
   d. Peer-to-peer collaboration
   e. None
   f. Unsure

3. Other (please specify)At your organization, how would you characterize nurses' readiness for AI adoption within each of the following roles?
   Roles: Recent Nursing Graduates (within 1 year); Practicing Nurses (1+ year in practice); Unit Managers; Nursing Practice Leadership
   Scale: 5 - Fully Prepared / Highly Proficient; 4 - Well Prepared / Competent; 3 - Moderately Prepared; 2 - Minimally Prepared; 1 - No Preparation
4. At your organization, how would you characterize nurses' willingness for AI adoption within each of the following roles?
   Roles: Recent Nursing Graduates (within 1 year); Practicing Nurses (1+ year in practice); Unit Managers; Nursing Practice Leadership
   Scale: 5 – Very Willing; 4 – Somewhat Willing; 3 – Neutral; 2 – Somewhat Opposed; 1 – Very Opposed
5. How would you characterize the nursing profession's readiness for AI adoption?
   Scale: 5 - Fully Prepared / Highly Proficient; 4 - Well Prepared / Competent; 3 - Moderately Prepared; 2 - Minimally Prepared; 1 - No Preparation
6. How would you characterize the nursing profession's willingness for AI adoption?
   Scale: 5 – Very Willing; 4 – Somewhat Willing 3 – Neutral; 2 – Somewhat Opposed; 1 –Very Opposed
7. Please indicate whether nurses across levels at your organization have reported the following concerns and hesitations with respect to AI adoption.
   Roles: Recent Nursing Graduates (within 1 year); Practicing Nurses (1+ year in practice); Unit Managers; Nursing Practice Leadership
   Concerns/Hesitations:
      i. Lack of knowledge on how to use AI tools
      ii. Overreliance on AI / erosion of clinical decision-making skills
      iii. Erosion of patient safety as a top priority
      iv. Lack of trust in accuracy
      v. Lack of human interaction
      vi. Risk of patient harm
      vii. Privacy breaches
      viii. Lack of clarity on legal accountability structures/liability
      ix. Environmental impacts
      x. Other concern/hesitation (please specify)
8. Please indicate whether you believe the nursing profession has the following concerns and hesitations with respect to AI adoption.
   Same concerns/hesitations as above
9. What strategies, if any, is your organization employing to prepare practicing nurses to use AI interprofessionally?
10. Do you have additional reflections to share with respect to nursing readiness for AI?

Appendix C – Glossary of Key Terms, Abbreviations, and Organizations

Accreditation, certification, licensing, and professional organizations

AACN — the American Association of Colleges of Nursing, the organization which establishes core educational standards and competencies (the AACN Essentials) for baccalaureate and graduate nursing programs.

AHC — Academic Health Centers, comprehensive networks combining medical schools, teaching hospitals, and health professional programs to drive patient care, scientific research, and clinical education.

ACEN — Accreditation Commission for Education in Nursing, a nonprofit, non-governmental organization that provides specialized accreditation for all levels of nursing education programs.

ANA — the American Nurses Association, the national membership organization representing the interests of U.S. registered nurses, aiming to advance the nursing profession, improve health standards, and support the professional development of nurses; also publishes the Code of Ethics for Nurses.

CCNE — Commission on Collegiate Nursing Education, a autonomous accrediting agency of AACN, contributing to the improvement of the public's health. CCNE ensures the quality and integrity of baccalaureate, graduate, and residency/fellowship programs in nursing.

CNEA — Commission for Nursing Education Accreditation, the National League for Nursing's autonomous accreditation division that accredits programs across the nursing academic spectrum, including practical/vocational, diploma (RN), associate, bachelor, master's, post-graduate certificate, practice doctorate, and distance learning programs.

CHEA — Council for Higher Education Accreditation, a non-profit higher education organization that examines the quality, effectiveness, and ability of accrediting organizations to accredit degree-granting higher education institutions and/or the programs that these institutions offer.

NAM — National Academy of Medicine; an independent health-and-medicine advisory body within the National Academies (formerly the Institute of Medicine).

NASEM — the National Academies of Sciences, Engineering, and Medicine, the umbrella body which includes the NAM.

NIH — the National Institutes of Health, the primary U.S. agency for public health and biomedical research, currently strategizing AI research.

NCSBN — the National Council of State Boards of Nursing, the organization through which nursing regulatory bodies act and counsel together on matters of common interest and concern.

WHO — World Health Organization; the United Nations public-health agency.

Artificial-intelligence and data terms

Agentic or workflow-executing AI systems — AI systems that go beyond producing recommendations to autonomously execute multi-step tasks in clinical workflows (e.g., scheduling, ordering, drafting communications, coordinating referrals), typically with defined human-in-the-loop checkpoints.

Ambient documentation / AI scribes — AI tools that passively capture the audio of a clinical encounter and generate a draft clinical note, order set, or after-visit summary for physician review and editing.

AI — Artificial Intelligence; computer systems that perform tasks ordinarily requiring human intelligence.

CDS — Clinical decision support; software that presents evidence-based recommendations, alerts, or contextual information to clinicians at the point of care to inform diagnosis, treatment, or monitoring decisions; may or may not incorporate machine learning.

EHR — Electronic Health Record; the digital record of a patient's health information used in clinical care.

Generative AI — a class of AI systems, typically built on large machine-learning models, that produce new content (text, images, audio, or code) in response to prompts rather than only classifying or predicting from existing data.

LLM — Large Language Model; an AI model trained on large text corpora to interpret and generate natural language, and the basis of many generative-AI and consumer chatbot tools.

ML — Machine Learning; a branch of AI in which systems learn patterns from data rather than following explicitly programmed rules.

Predictive analytics / risk models — algorithms trained on clinical data to estimate the likelihood of a future event (e.g., hospital readmission, sepsis, deterioration) and support prioritization and triage.

References

Abuadas, M., Albikawi, Z., & Rayani, A. (2025). The impact of an AI-focused ethics education program on nursing students' ethical awareness, moral sensitivity, attitudes, and generative AI adoption intention: A quasi-experimental study. *BMC Nursing*, *24*, 720. https://doi.org/10.1186/s12912-025-03458-2

Asgari, E., Montaña-Brown, N., Dubois, M.,Khalil, S., Balloch, J., Yeung, J. A., & Pimenta, D. (2025). A framework to assess clinical safety and hallucination rates of LLMs for medical text summarisation. *NPJ Digital Medicine, 8*(1), 274. https://doi.org/10.1038/s41746-025-01670-7

American Academy of Nursing. (2026). *American Academy of Nursing Position Statement on Artificial Intelligence in Health Care. Washington, DC.*

American Association of Colleges of Nursing. (2021). *The essentials: Core competencies for professional nursing education*. https://www.aacnnursing.org/Portals/0/PDFs/Publications/Essentials-2021-Version.pdf

American Association of Colleges of Nursing. (2026). *The essentials: Core competencies for professional nursing education*. https://www.aacnnursing.org/Portals/0/PDFs/Publications/Essentials-2021.pdf

Accreditation Commission for Education in Nursing. (2025). *2023 accreditation manual for nursing education programs* (Revised July 2025). https://cdn.prod.website-files.com/64cd4590606a797c63f00e8e/68cdd224df7b04e58e7d5c08_ACENAccredManual25.pdf

American Nurses Association. (2025). *Code of Ethics for Nurses*. https://codeofethics.ana.org/home

American Nurses Association. (2022). *The Ethical Use of Artificial Intelligence in Nursing Practice*. https://www.nursingworld.org/globalassets/practiceandpolicy/nursing-excellence/ana-position-statements/the-ethicaluse-of-artificial-intelligence-in-nursing-practice_bod-approved-12_20_22.pdf

Arkansas State University. (2026, January 5). *Nurses and the AI Policy Gap: How Education Can Bridge Safety and Innovation*. https://degree.astate.edu/online-programs/healthcare/rn-to-bsn/ai-ethics-nurse-educator-guide/

Ball Dunlap, P., Marquard, J., Delaney, C., Aliferis, C., Chappell, K., Coleman, T.M., Klein, P., Yakusheva, O., Wolfe, I., & Michalowski, M. (2026). Artificial intelligence can replace nursing tasks, but not nurses: Examining artificial intelligence's supports and threats to nursing practice through the lens of the 2025 Nursing Code of Ethics. *Nursing Outlook 74*(4), 1-11. 10.1016/j.outlook.2026.102808

Bienstock, J., & Heuer, A. (2022). A review on the evolution of simulation-based training to help build a safer future. *Medicine*, *101*(25), e29503. https://doi.org/10.1097/MD.0000000000029503

Birkholz, L., Martin, M., Barnum, B., Breslin, L., & Kalevor, S. (2025). Navigating artificial intelligence in nursing: An ethical exploration of benefits, risks, and educational shifts. *Nursing Outlook*, *73*(5), 102520. https://doi.org/10.1016/j.outlook.2025.102520

Blomquist, J., Llewellyn, S., Alderden, J., & Connor, K. (2025). Empowering faculty to incorporate large language models in nursing education using a delegation framework. *Nursing Education Perspectives*, *46*(2), 126–128. https://doi.org/10.1097/01.NEP.0000000000001246

Cary, M. P., Zink, A., Wei, S., Olson, A., Yan, M., Senior, R., Bessias, S., Gadhoumi, K., Jean-Pierre, G., Wang, D., Ledbetter, L. S., Economou-Zavlanos, N. J., Obermeyer, Z., & Pencina, M. J. (2023). Mitigating racial and ethnic bias and advancing health equity in clinical algorithms: A scoping review. *Health Affairs*, 42(10), 1359–1368. https://doi.org/10.1377/hlthaW.2023.00553

Cary, M. P., Bessias, S., McCall, J., Pencina, M. J., Grady, S. D., Lytle, K., & Economou-Zavlanos, N. J. (2025a). Empowering nurses to champion Health equity & BE FAIR: Bias elimination for fair and responsible AI in healthcare. *Journal of Nursing Scholarship*, 57(1), 130–139. https://doi.org/10.1111/jnu.13007

Cary, M. P., Grady, S. D., McMillian-Bohler, J., Bessias, S., Silcox, C., Silva, S., Guilamo-Ramos, V., McCall, J., Sperling, J., & Goldstein, B. A. (2025b). Building competency in artificial intelligence and bias mitigation for nurse scientists and aligned health researchers. *Nursing Outlook*, *73*(3), Article 102395. https://doi.org/10.1016/j.outlook.2025.102395

Cato, K. D., McGrow, K., & Collins Rossetti, S. (2020). Transforming clinical data into wisdom. *Nursing Management*, *51*(11), 24–30. https://doi.org/10.1097/01.NUMA.0000719396.83518.d6

Cato, K., & Tiase, V. (2025, February 4). Can AI relieve nursing documentation burden? *American Nurse*. https://www.myamericannurse.com/can-ai-relieve-nursing-documentation-burden/

Choi, R. Y., Coyner, A. S., Kalpathy-Cramer, J., Chiang, M. F., & Campbell, J. P. (2020). Introduction to machine learning, neural networks, and deep learning. *Translational Vision Science & Technology*, *9*(2)14. doi: 10.1167/tvst.9.2.14.

Commission on Collegiate Nursing Education. (2026). *Standards for accreditation of baccalaureate and graduate nursing programs* (Amended 2026). https://www.aacnnursing.org/Portals/0/PDFs/CCNE/CCNE-Education-Standards-Updated-2026.pdf

Council for Higher Education Accreditation. (2025, February). *Guiding principles for artificial intelligence in accreditation and recognition*. https://www.chea.org/sites/default/files/other-

content/Guiding%20Principles%20for%20Artificial%20Intelligence%20in%20Accreditation%20and%20Recognition---Feb%2013%202025.pdf

Cross, J. L., Choma, M. A., & Onofrey, J. A. (2024). Bias in medical AI: Implications for clinical decision-making. *PLOS Digital Health, 3*(11), https://doi.org/10.1371/journal.pdig.0000651
De Gagne, J. C. (2023). The State of Artificial Intelligence in Nursing Education: Past, Present, and Future Directions. *International Journal of Environmental Research and Public Health*, 20(6), 4884. https://doi.org/10.3390/ijerph20064884

AN ACT TO AMEND TITLE 24 OF THE DELAWARE CODE RELATING TO MEDICAL PROFESSIONALS, TITLES, AND NONHUMAN ENTITIES, House Bill 191. 153rd General Assembly. (DE, 2026). https://legis.delaware.gov/BillDetail/142752

Delaney, C.W., Weaver, C.A., Warren, J.J., Clancy, T.R., & Simpson, R.L. (2017). *Big data enabled nursing education, research, and practice*. Springer.

DeLoach, C., Ard, N., & Nunn-Ellison, K. (2026). Balancing innovation and integrity: AI integration in ACEN-accredited nursing programs. *Teaching and Learning in Nursing*, *21*(2), 124–126. https://doi.org/10.1016/j.teln.2026.01.001

Demiris, G., Oh, O., Ulrich, C. M., Bin You, S., Cho, H., & Villarruel, A. M. (2026). Artificial intelligence and nursing science: Opportunities, challenges, implications, and guidelines. *Nursing Outlook 74(*3), 102770. https://doi.org/10.1016/j.outlook.2026.102770

Dodson, T.M., Thompson-Hairston, K., & Reed, J.M. (2025). Nursing students' AI literacy and ethical understanding of AI in nursing education. *Teaching and Learning in Nursing 20*(4), 390-394. https://www.sciencedirect.com/science/article/pii/S1557308725002033?via%3Dihub

Dornan, M. (2025). Every nurse an AI nurse: A framework for integrating artificial intelligence across nursing practice, education, research and policy. *Digital Health,* 11, 20552076251377939. https://doi.org/10.1177/20552076251377939

Doston, T., Fontenot, J., Morris, D., & Hebert, M. (2025). The use of artificial intelligence in nursing education: A scoping review. *Journal of Nursing Education*, *64*(8), 479–488. https://doi.org/10.3928/01484834-20250313-03

Dzikowicz, D. J., Aktas, M., Wang, J., & Dreisbach, C. (2025). An evaluation of funded National Institutes of Health grants in nursing science and artificial intelligence. *Nursing Outlook*, *73*(5), Article 102529. https://doi.org/10.1016/j.outlook.2025.102529

Eliot, L. (2024). Exposing the brittleness of generative AI as exemplified by the recent gibberish meltdown of ChatGPT. *Forbes*. https://www.forbes.com/sites/lanceeliot/2024/02/25/exposing-the-brittleness-of-generative-ai-as-exemplified-by-the-recent-gibberish-meltdown-of-chatgpt/

Elsevier. (2026). *Clinician of the Future 2026: Nurses Edition*. https://www.elsevier.com/insights/clinician-of-the-future/2026/nurses

Farquhar, S., Kossen, J, Kuhn, K, and Gal, Y. (2024). Detecting hallucinations in large language models using semantic entropy. *Nature (630)*625–630. https://doi.org/10.1038/s41586-024-07421-0.

George, A., & Griswold Pierce, A. (2025). "Artificial Intelligence in Critical Care Nursing: Benefits, Risks, and Ethical Considerations." *Critical Care Nurse*, *45*(5), 46–52. https://doi.org/10.4037/ccn2025746

Glauberman, G., Ito-Fujita, A., Katz, S., & Callahan, J. (2023). Artificial intelligence in nursing education: Opportunities and challenges. *Hawai'i Journal of Health & Social Welfare*, *82*(12), 302–305. https://pubmed.ncbi.nlm.nih.gov/38093763/

Green, C. (2025). Ethics, Artificial Intelligence, and Critical Care Nursing. *American Journal of Critical Care*, 34(5), 404–406. https://doi.org/10.4037/ajcc2025758

Harrington, L. (2018). Nurse robots. *AACN Advanced Critical Care*, *29*(2), 107–110. https://doi.org/10.4037/aacnacc2018248

Hassanein, S., El Arab, R. A., Abdrbo, A., Abu-Mahfouz, M. S., Gaballah, M. K. F., Seweid, M. M., Almari, M., & Alzghoul, H. (2025). Artificial intelligence in nursing: An integrative review of clinical and operational impacts. *Frontiers in Digital Health*, *7*, 1552372. https://doi.org/10.3389/fdgth.2025.1552372

Hirani, R., Noruzi, K., Khuram, H., Hussaini, A. S., Aifuwa, E. I., Ely, K. E., Lewis, J. M., Gabr, A. E., Smiley, A., Tiwari, R. K., & Etienne, M. (2024). Artificial intelligence and healthcare: A journey through history, present innovations, and future possibilities. *Life*, 14(5), 557. https://doi.org/10.3390/life14050557

Health Management Academy. (2024, November 11). *What RNs Think about AI—And How Health System Leaders Should Communicate About AI in Care Delivery.* https://hmacademy.com/insights/all-access/health-technology/what-rns-think-about-ai-and-how-health-system-leaders-should-communicate

Joo, J. Y., Liu, M. F., & Ho, M.-H. (2025). Nurses' perceptions of artificial intelligence adoption in healthcare: A qualitative systematic review. *Nurse Education in Practice, 88*, 104542. https://doi.org/10.1016/j.nepr.2025.104542

Kaul, V., Enslin, S., & Gross, S.A. (2020). History of artificial intelligence in medicine. *Gastrointestinal Endoscopy*, 92(4), 807–812.https://doi.org/10.1016/j.gie.2020.06.040

Lee, S. Y., & Jeffery, A. D. (2026). From the Iron Lung to Artificial Intelligence: Integrating New Technology into Critical Care. *American Journal of Critical Care, 35*(1), 70–76. https://doi.org/10.4037/ajcc2026154

Lifshits, I., & Rosenberg, D. (2024). Artificial intelligence in nursing education: A scoping review. *Nurse Education in Practice*, *80*, 104148. https://doi.org/10.1016/j.nepr.2024.104148

McKinsey & Company & American Nurses Foundation. (2024, October 1). *The pulse of nurses' perspectives on AI in healthcare delivery*. https://www.mckinsey.com/industries/healthcare/our-insights/the-pulse-of-nurses-perspectives-on-ai-in-healthcare-delivery

National Academy of Medicine. (2025). *Generative Artificial Intelligence in Health and Medicine: Opportunities and Responsibilities for Transformative Innovation*. Washington, DC: The National Academies Press. https://doi.org/10.17226/28907.

National Conference of State Legislatures. (2025, July 10). Artificial Intelligence 2025 Legislation. https://www.ncsl.org/technology-and-communication/artificial-intelligence-2025-legislation

National Conference of State Legislatures. (2026, July 10). Artificial Intelligence 2026 Legislation. https://www.ncsl.org/financial-services/artificial-intelligence-legislation-database

National Council of State Boards of Nursing. (2024). Leader to Leader Spring 2024. https://www.ncsbn.org/magazines/leader-to-leader-spring-2024

National Council of State Boards of Nursing (2021, August). NCSBN Model Rules Revised August 2021. www.ncsbn.org/public-files/21_Model_Rules.pdf

National Institutes of Health. (2025, June 3). NOT-OD-25-117: Request for Information (RFI): Inviting Comments on the NIH Artificial Intelligence (AI) Strategy. https://grants.nih.gov/grants/guide/notice-files/NOT-OD-25-117.html

National League for Nursing. (2025, September). *NLN vision statement: Artificial intelligence (AI) in nursing education*. https://www.nln.org/docs/default-source/default-document-library/nln_ai_vision_statement.pdf

National League for Nursing Commission for Nursing Education Accreditation. (2026, June). *NLN CNEA standards of accreditation*. https://irp.cdnwebsite.com/cc12ee87/files/uploaded/NLN+CNEA+Standards+of+Accreditation_June+2026.pdf

Office of Science and Technology Policy (2023). National artificial intelligence research and development strategic plan: 2023 update. https://bidenwhitehouse.archives.gov/wp-content/uploads/2023/05/National-Artificial-Intelligence-Research-and-Development-Strategic-Plan-2023-Update.pdf

Olawade, D. B., Plabon, S. B., Ojo, A., Ogunbona, M. A., Makanjuola, B. D., & Olasilola, O. R. (2026). Human in the loop artificial intelligence in healthcare: Applications, outcomes, and implementation challenges. *International Journal of Medical Informatics*, 213, 106362. https://doi.org/10.1016/j.ijmedinf.2026.106362

Ostick, M., Mariani, B., Lovecchio, C., & Moriarty, H. (2025). Nursing student and faculty attitudes, perceptions, and behavioral intentions of artificial intelligence use in nursing

education: An integrative review. *Nursing Education Perspectives*, *46*(2), E7–E11. https://doi.org/10.1097/01.NEP.0000000000001372

Porter, A., & Foronda, C. (2024). Enhancing artificial intelligence literacy in nursing education to combat embedded biases. *Nursing Education Perspectives*, *45*(2), 131–132. https://doi.org/10.1097/01.NEP.0000000000001245

Robert, N. (2019). How artificial intelligence is changing nursing. *Nursing Management, 50*(9), 30–39. https://doi.org/10.1097/01.numa.0000578988.56622.21

Ronquillo, C. E., Peltonen, L., Pruinelli, L., Chu, C. H., Bakken, S., Beduschi, A., Cato, K., Hardiker, N., Junger, A., Michalowski, M., Nyrup, R., Rahimi, S., Reed, D. N., Salakoski, T.,

Salanterä, S., Walton, N., Weber, P., Wiegand, T., & Topaz, M. (2021). Artificial intelligence in nursing: Priorities and opportunities from an international invitational think-tank of the Nursing and Artificial Intelligence Leadership Collaborative. *Journal of Advanced Nursing*, *77*(9), 3707–3717. https://doi.org/10.1111/jan.14855

Seigel, R., Augenstein, J., Shashoua, M., Slater, C., Livingston, S., & Irlbeck, C. (2026, April 9). *Manatt Health: Health AI policy tracker*. Manatt, Phelps & Phillips, LLP. https://www.manatt.com/insights/newsletters/health-highlights/manatt-health-health-ai-policy-tracker

Sengstack, P.P., Adrian, B., Boyd, D.L., Davis, A., Hook, M., Hulett, S.L., Karp, E., Kennedy, R., Heermann Langford, L., & Niblett, T.A. (2020, June 23). The six domains of burden: A conceptual framework to address the burden of documentation in the electronic health record. *American Nursing Informatics Association*. https://www.ania.org/assets/documents/position/ehrBurdenPosition.pdf

Shepherd, J., & McCarthy, A. (2025). Advancing nursing practice through artificial intelligence: Unlocking its transformative impact. *OJIN: The Online Journal of Issues in Nursing*, *30*(2). https://doi.org/10.3912/OJIN.Vol30No02Man01

Simpson, R. L. (2024). How nurses can conquer their fear of AI. *American Nurse Journal*, 19(1), 68. https://doi.org/10.51256/anj012468

Singleton, M. (31 July, 2020). University of Virginia School of Nursing Flashback Friday - Practice Makes Perfect: The History of Simulation. https://nursing.virginia.edu/news/flashback-history-of-simulation/

Stanford Institute for Human-Centered Artificial Intelligence (HAI). (2025). The 2025 AI Index Report. https://hai.stanford.edu/ai-index/2025-ai-index-report

Topaz, M. (2025). Invisible scribes: Can nurses trust ambient AI for clinical documentation? *Journal of Continuing Education in Nursing*, *56*(9), 358–359. https://doi.org/10.3928/00220124-20250814-03

Topaz, M., Peltonen, L.-M., Michalowski, M., Stiglic, G., Ronquillo, C., Pruinelli, L., Song, J., O'Connor, S., Miyagawa, S., & Fukahori, H. (2025). The ChatGPT effect: Nursing education and generative artificial intelligence. *Journal of Nursing Education, 64*(6). https://doi.org/10.3928/01484834-20240126-01

Twenter, P. (2026, April 28). Can ambient AI work for nurses? Jefferson Health is finding out. *Becker's Hospital Review*. https://www.beckershospitalreview.com/quality/nursing/can-ambient-ai-work-for-nurses-jeWerson-health-is-finding-out/

Von Gerich, H., Moen, H., Block, L. J., Chu, C. H., DeForest, H., Hobensack, M., Michalowski, M., Mitchell, J., Nibber, R., Olalia, M. A., Pruinelli, L., Ronquillo, C. E., Topaz, M., & Peltonen, L.-M. (2022). Artificial Intelligence-based technologies in nursing: A scoping literature review of the evidence. *International Journal of Nursing Studies*, *127*, 104153. https://doi.org/10.1016/j.ijnurstu.2021.104153

AN ACT Relating to the use of nursing titles; amending RCW 118.79.030 and 18.79.030; providing an effective date; and providing an expiration date, HB 2155. 2025-26. (WA, 2026). https://app.leg.wa.gov/BillSummary/?BillNumber=2155&Year=2026

Webb, J. (2024). Machine learning, healthcare resource allocation, and patient consent. *The New Bioethics, 30*(3), 206227. https://doi.org/10.1080/20502877.2024.2416858.

Weirich, B., Martin, L., Corbin, A. (2026). Minutes That Matter. *Nurse Leader*, 24(4), 102763. https://doi.org/10.1016/j.mnl.2026.102763

The White House. (2025, July). Winning the AI Race: America's AI Action Plan. https://www.whitehouse.gov/articles/2025/07/white-house-unveils-americas-ai-action-plan/

The White House. (2026, March). *National policy framework for artificial intelligence: Legislative recommendations*. https://www.whitehouse.gov/wp-content/uploads/2026/03/03.20.26-National-Policy-Framework-for-Artificial-Intelligence-Legislative-Recommendations.pdf

Wolters Kluwer. (2025a). *Nursing Insights: Redefining nursing practice for an AI-driven future*. https://assets.contenthub.wolterskluwer.com/api/public/content/3096468-nursing-insights-redefining-nursing-practice-for-an-ai-driven-future37c4d695cc?v=de018f3c&_gl=1*1nz2n1r*_gcl_au*MjA5NTQ4Nzg3LjE3ODAwODA2NTk.*_ga*MTEwNjUwNTI0NC4xNzgwMDgwNjYw*_ga_7DJGBC7BG3*czE3ODUyNTcwNTAkbzExJGcxJHQxNzg1MjU3MT Q5JGo1OSRsMCRoNTQ4Mzg0MzQ3

Wolters Kluwer. (2025b, June 3). *2025 Future Ready Healthcare Survey Report: Generative AI: Balancing today's needs and tomorrow's vision*. https://assets.contenthub.wolterskluwer.com/api/public/content/future-ready-healthcare-2025

Wolters Kluwer. (2026). *2026 Future Ready Healthcare Survey Report: Patients, doctors, and nurses on AI: Similar tools, different pathways, one destination*.

https://assets.contenthub.wolterskluwer.com/api/public/content/3333130-2026-future-ready-healthcare-survey-report-pdf--774e854545?v=e4d07570

World Health Organization. (2025). State of the world's nursing 2025: investing in education, jobs, leadership and service delivery. https://www.who.int/publications/i/item/9789240110236

Xavier, T., Pei, Q., & Carrington, J. M. (2025). Leveraging artificial intelligence to detect stigmatizing language in electronic health records to advance health equity. *Nursing Outlook, 73*(5), 102493. https://doi.org/10.1016/j.outlook.2025.102493

Yakusheva, O., Bouvier, M. J., & Hagopian, C. O. P. (2025). How Artificial Intelligence is altering the nursing workforce. *Nursing Outlook, 73*(1), 102300. https://doi.org/10.1016/j.outlook.2024.102300

Zhong, E. H., Spector, N., O'Hara, C., Livanos, N., & Castillo, J. D. (2025). Advancing nursing regulation in the digital era: Harnessing AI to bridge workforce gaps and strengthen practice competency and safety. *Journal of Nursing Regulation*, 16(3), 150–164. https://doi.org/10.1016/j.jnr.2025.08.015