

The Ethical Use of Artificial Intelligence in Nursing Practice

Effective Date: 2022
Status: Position Statement
Written by: ANA Center for Ethics and Human Rights
Adopted by: ANA Board of Directors

Purpose

The purpose of this position statement is to provide nurses with ethical guidance on the use of artificial intelligence (AI) in health care. AI is a broad category that involves using algorithms to drive the behavior of agents such as software programs, machines, robotics, games, and other hardware devices (Clipper, Batcheller, Thomaz, & Rozga, 2018). AI in health care encompasses a wide range of existing, emerging, and future technologies intended to assist nurses in caring for their patients. Data, including big data, is an important aspect of AI because its ethical use influences how AI functions and thus how it affects patients. As new AI technologies continue to emerge, nurses must have guidance on the ethical, caring, compassionate, and safe use of AI in health care. This position statement provides practical examples of AI in nursing and addresses ethical considerations by using a systematic approach based on core tenets in the literature to analyze the appropriateness of AI's application in practice.

Statement of ANA Position

Nursing values and ethics, described in the Code of Ethics for Nurses with Interpretive Statements, place caring and compassion as central elements in the nurse-patient relationship. ANA believes the appropriate use of AI in nursing practice supports and enhances the core values and ethical obligations of the profession. AI that appears to impede or diminish these core values and obligations must be avoided or incorporated only in such way that these values and obligations are protected. Nurses must ensure that advanced technologies do not compromise the nature of human interactions and relationships central to the nursing profession. It is crucial that nurses anticipate and evaluate the impact of AI on health care through a proactive approach that emphasizes agency, caring, and influence over how technology is developed and applied (Archibald & Barnard, 2018). Nurses must be informed about AI so they can provide appropriate education to patients and families to dispel myths and alleviate fears and thereby support the use of AI for optimal health outcomes.

Recommendations

According to the Code of Ethics for Nurses with Interpretive Statements (ANA, 2015), advanced technologies, including AI, do not replace nursing skills or judgment. The Code of Ethics for Nurses Interpretive Statement 4.2 clarifies that “nurses in all roles are accountable for decisions made and actions taken in the course of nursing practice. Systems and technologies that assist in clinical practice are adjunct to, not replacements for, the nurse’s knowledge and skill” (ANA, 2015, p. 15). AI does not replace a nurse’s decision-making, judgment, critical thinking, or assessment skills. Interpretative Statement 1.1 holds that “nurses consider the needs and respect the values of each person in every professional relationship and setting; they provide leadership in the development and implementation of changes in public and health policies that support this duty” (ANA, 2015, p. 1). Nurses are responsible for being informed about and ensuring the appropriate use of AI to optimize the health and well-being of those in their care. The code specifically references concepts related to AI in the following excerpts:

- “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” (ANA, 2015, p. 16).
- “Advances in technology, genetics, and environmental science require robust responses from nurses working together with other health professionals for creative solutions and innovative approaches that are ethical, respectful of human rights, and equitable in reducing health disparities. Nurses collaborate with others to change unjust structures and processes that affect both individuals and communities. Structural, social, and institutional inequalities and disparities exacerbate the incidence and burden of illness, trauma, suffering, and premature death” (ANA, 2015, p. 32).
- “Because of rapidly evolving communication technology and the porous nature of social media, nurses must maintain vigilance regarding postings, images, recordings, or commentary that intentionally or unintentionally breaches their obligation to maintain and protect patients’ rights to privacy and confidentiality” (ANA, 2015, p. 9).

Background

What Is AI and How Is It Applied in Nursing Practice?

AI is a broad category that involves using algorithms to drive the behavior of different agents such as software programs, machines, robotics, games, and other hardware devices (Clipper, Batcheller, Thomaz, & Rozga, 2018). AI is particularly useful in health care with respect to assisting or taking over mechanical tasks such as feeding, attending to patient hygiene, fetching, and dispensing or titrating medication, as well as conducting diagnostics. In such cases, nurses must safeguard patients so that efficiency gains are directed at activities that support or enhance caring for patients’ physical, emotional, and cognitive needs. Nurses should also consider how technology shapes the nurse-patient relationship with respect to patient expectations and perceptions of caring. For example, while AI might replace a nurse’s need to feed or administer medication, it could also diminish the frequency of physical touch and nurturing behaviors. The absence of touch and nurturing can in turn diminish the patient’s perception of a caring relationship. It is critical for nurses to support AI technology that creates, maintains, and/or enhances caring interactions with patients. AI integration may manifest as prompts in the electronic health record or the implementation of nomograms as decision-support tools. Decision-making at the systems and population health levels is informed by acquired population data and can negatively impact nursing processes and intuition. Population- and system-level data mined from domains with significant systemic racism and bias will likely carry this same bias into implementation, which is contrary to ethical nursing practice.

The integration of AI in health care requires the consideration of intention, moral agency, and fundamental beliefs about nursing care in the 21st century. This consideration extends to related definitions of AI including the American Medical Association's (AMA, 2018; AMA Council on Long Range Planning and Development, 2018) reference to augmented intelligence. AI does not replace good nursing care or the care provided by other members of the interprofessional team. AI augments, supports, and streamlines expert clinical practice. An exploration of AI requires moral/ethical consideration of four key aspects of AI: methodological elements; justice, fairness, and equity; data and informatics; and regulatory principles.

Each nurse will interact with AI in specific ways depending on their scope of practice, role, responsibilities, and area of practice. This impacts and informs individual and population care decisions and navigation within complex health care systems.

Methodological Considerations

Ethical concerns about AI exist because the technology not only may impact an individual patient's end result but also may affect its use in health care throughout the development, design, and testing processes, and in its integration and ongoing use. The methodology used in development, design, and testing has critical importance in the ethical application and use of AI.

- Development, design, and testing (Jobin et al., 2020)
 - The performance of AI is only as good as the data used to develop and design it and the testing that verifies it.
- Reliability
 - Recognition of a pattern does not necessarily mean it is meaningful. Reproducibility and external validity must be significant (Morley & Floridi, 2020).
- Integration
 - Responsibility to ensure appropriate use and outcome requires traceability to ensure ongoing evaluation.

Application/Examples

- Nurses involved in the development of AI have a responsibility to be knowledgeable about the data being used and provide transparency throughout the process.
- Nurses who participate in research or evidence-based practice initiatives have a responsibility to use scientific rigor in ensuring reliability.
- Nurses integrating AI into their practice have a responsibility to ensure the validity of the AI, the appropriate application and use of AI, transparency in the process, and ongoing evaluation for reliability.

Justice, Fairness, and Equity Considerations

Justice, fairness, and equity are interrelated concepts in the AI literature (AMA, 2018). AI has the potential to improve health for many but without proper oversight can also perpetuate and cause injustices and inequities.

- Justice encompasses respect for diversity, inclusion, and equity. Promoting justice requires identification and mitigation of bias, balance between individual and collective interests, recognition of and intervention to address exacerbation of health disparities, prevention of the financial exploitation of data, and elimination of exploitation of vulnerable populations.
- Fairness is defined as minimizing or preventing unwanted bias and discrimination (Berendt, 2019; Rogers et al., 2020). This applies to:
 - Fair access to AI

- Fairness-aware data mining procedures that take the broadest view and consider neutrality and independence
- Fair access to redress and remedy (Kamishima et al., 2012; Rogers et al., 2020).
- Unfair outcomes resulting from profiling algorithms or those rooted in prioritizing that affect minorities disproportionately and can lead to discrimination and transformative effects on society (Middelstadt et al., 2016)
- Justice and fairness require transparency to promote responsibility and accountability (Jobin et al., 2019; Rogers et al., 2020).

Application/Examples

- As nurses, we need to recognize and call out disparities in AI programming and outputs and consider those disparities in our creation of guidelines and protocols based on AI data.
- Nurses routinely work to eliminate health disparities and must intentionally engage in work that promotes diversity, equity, and inclusion in emerging technology and their associated systems—we cannot forget the people we serve.
- Mitigating bias occurs at the individual level but must be extrapolated to encompass the larger reach of technologies associated with AI.

Data and Informatics Considerations

Consumer/patient applications have taken a data-driven approach. Social media platforms, including online health communities, have become popular destinations where patients can connect and exchange support. Due to the relative ease of accessing publicly available data, many researchers mine social media as a way to get a better understanding of consumer/patient experiences (Lau et al., 2019). Big data refers to large volumes of data that are from varied data sources and received at ever-increasing rates (termed velocity)—often referred to as the three Vs (Oracle, 2021).

- Social media collects varied data in massive amounts; this data is attractive to “traditional” researchers at academic institutions but is also attractive to assorted commercial entities such as advertisers (Staccini et al., 2020).
- Patient users may expect that their data are protected because the data are health-related. This misconception could be compounded if a health care provider recommends or encourages patients to use a device to log and track symptoms or health behaviors (Staccini et al., 2020).

Application/Examples

- Nurses must understand the specific devices and applications that they encourage their patients to utilize for health improvement and help their patients protect their personal data.
- Nurses may educate patients on instances where patients are asked to provide private health and demographic information. Health literacy affects an individual’s ability to provide consent to end-user permissions through a notice-and-consent approach. The end-user agreement is often challenging to understand and written in legal jargon. The consent for use is not always transparent about who can use the data and for what purpose. This is problematic, and nurses can help bridge the gap through education.
- Nurses need to consider the complexities inherent in completing forms and providing other information in myriad health care situations. Many health record/health information systems utilize complex software and algorithms that are considered trade secrets and are protected under intellectual property laws. This makes expectations of transparency unrealistic.
- Nurse informaticists need to intentionally engage in system design that protects patients. Nurse informaticists must be aware of firewalls and other barriers when evaluating a system. Even if the software and algorithms are disclosed for the purposes of transparency, many are so intricate and convoluted that the average person may not be able to understand whether

the system is protecting the privacy of the end user according to the agreement. This situation makes it difficult to evaluate the ethical considerations of a health record/health information system or site.

Regulatory Considerations

It is essential for nurses to be part of the interdisciplinary effort to advocate for an AI governance framework and develop regulatory guidelines that hold AI and advanced technology developers morally accountable. Producing ethical AI helps to achieve the nurse's duty to minimize or avoid harm (Baig et al., 2020; Morely & Floridi, 2020).

- Consistent, ongoing, and rigorous nursing research in the area of AI can slow the ever-growing gap between fast-paced technological advancement and outpaced regulatory measures (Baig et al., 2020; Morely & Floridi, 2020).
- "Any ethical analysis of an AI system by healthcare governing bodies must consider how potential ethical harms arise at different levels of analysis and at different stages of an algorithm's lifecycle" (Morely & Floridi, 2020, p. 255). Nurse researchers, nurse informaticists, and nurse ethicists can be valuable contributors to these governing bodies (Baig et al., 2020; Morely & Floridi, 2020).

Application/Examples

- Nurses should be a part of the drafting and implementation of policy, legislation, and accountability systems for ethical design and practical use of AI and advanced technologies.
- Nurses must continue to contribute research to develop best practices, identify negative implications, and prove the benefits of AI.
- Nurse leaders implementing AI in health care organizations must put forth measures that ensure responsibility and accountability for the safe and sustainable use of AI and advanced technologies.

Summary

Integration of AI in practice must not alter the goals of patient care. Compassion, trust, and caring are foundational principles in the nurse-patient relationship. The continually evolving of advanced digital technologies such as AI must be adopted or integrated into nursing practice within these nursing and ethical care elements so that nursing practice remains relevant in the changing landscape (Fronczek, 2019).

Nurses within their respective domains need to be aware of how AI impacts their nursing processes and their patient outcomes. Within public health, research, and informatic nursing, an awareness of how population data or big data can easily overshadow minority health needs and perpetuate disparities is necessary. Each nurse must consider how AI is integrated into their practice and be cognizant of ways it can help and hurt both individual and population health outcomes.

References

American Nurses Association. (2015). Code of Ethics for Nurses with Interpretive Statements. Retrieved from <https://www.nursingworld.org/coe-view-only>

American Association of Colleges of Nursing (AACN). (2021, April 6). *The essentials: Core competencies for professional nursing education*. <https://www.aacnnursing.org/Portals/42/AcademicNursing/pdf/Essentials-2021.pdf>

American Medical Association (AMA) (2018). *Augmented intelligence in health care*. <https://www.ama-assn.org/system/files/2019-08/ai-2018-board-policy-summary.pdf>

American Medical Association (AMA) Council on Long Range Planning and Development. (2018, June). *Report of the council on long range planning and development: A primer on artificial and augmented intelligence*. 2018 AMA Annual Meeting. <https://www.ama-assn.org/system/files/2018-11/a18-clrpd-reports.pdf>

Baig, M. A., Almuhaizea, M. A., Alshehri, J., Bazarbashi, M. S., & Al-Shagathrh, F. (2020). Urgent need for developing a framework for the governance of AI in healthcare. *Studies in Health Technology and Informatics*, 272, 253–256. <https://doi.org/10.3233/SHTI200542>

Goldstein, C. A., Berry, R. B., Kent, D. T., Kristo, D. A., Seixas, A. A., Redline, S., Westover, M. B., Abbasi-Feinberg, F., Aurora, R. N., Carden, K. A., Kirsch, D. B., Malhotra, R. K., Martin, J. L., Olson, E. J., Ramar, K., Rosen, C. L., Rowley, J. A., & Shelgikar, A. V. (2020). Artificial intelligence in sleep medicine: An American Academy of Sleep Medicine position statement. *Journal of Clinical Sleep Medicine*, 16(4), 605–607. <https://doi.org/10.5664/jcsm.8288>

Jobin, A., Ienca, M., & Vayena, E. (2019). The global landscape of AI ethics guidelines. *Nature Machine Intelligence* 1, 389–399. <https://doi.org/10.1038/s42256-019-0088-2>

Kaplan, B. (2020). Seeing through health information technology: The need for transparency in software, algorithms, data privacy, and regulation, *Journal of Law and the Biosciences*, 7(1), 1–18. <https://doi.org/10.1093/jlb/ljaa062>

Lau, A., Staccini, P., & Section Editors for the IMIA Yearbook Section on Education and Consumer Health Informatics (2019). Artificial intelligence in health: New opportunities, challenges, and practical implications. *Yearbook of Medical Informatics*, 28(1), 174–178. <https://doi.org/10.1055/s-0039-1677935>

McCarthy, M. K. (2019, June 17). *Artificial intelligence in health: Ethical considerations for research and practice*. Healthcare Information and Management Systems Society, Inc. (HIMSS). <https://www.himss.org/resources/artificial-intelligence-health-ethical-considerations-research-and-practice>

Meijer, A. (2013). Understanding the complex dynamics of transparency. *Public Administration Review*, 73(3), 429–439. <https://doi.org/10.1111/puar.12032>

Morley, J., & Floridi, L. (2020). An ethically mindful approach to AI for health care. *Lancet*, 395(10220), 254–255. [https://doi.org/10.1016/S0140-6736\(19\)32975-7](https://doi.org/10.1016/S0140-6736(19)32975-7)

Oracle. (2021). *What is big data?* Retrieved December 21, 2021, from <https://www.oracle.com/big-data/what-is-big-data/>

Richardson, L. (2021, August 5). *How FDA regulates artificial intelligence in medical products*. The PEW Charitable Trusts. <https://www.pewtrusts.org/en/research-and-analysis/issue-briefs/2021/08/how-fda-regulates-artificial-intelligence-in-medical-products>

Staccini, P., Lau, A., & Section Editors for the IMIA Yearbook Section on Consumer Health Informatics and Education (2020). Social media, research, and ethics: Does participant willingness matter? *Yearbook of Medical Informatics*, 29(1), 176–183. <https://doi.org/10.1055/s-0040-1702022>

United Nations. (2021, September 11). *Frequently asked questions: AI and IP policy*. World Intellectual Property Organization. <https://www.wipo.int/about-wipo/en/>

ANA acknowledges Ethics Advisory Board members Ian Wolfe, PhD, MA, RN, HEC-C, Jennifer Bartlett, PhD, RN-BC, CNE, CHSE, and Elizabeth Swanson, DNP, MPH, APRN-BC; Center for Ethics and Human Rights Senior Policy and Ethics Advisor Kara Curry, MA, RN, HEC-C, Center for Ethics and Human Rights Director Liz Stokes, PhD, JD, RN, and Center for Ethics and Human Rights intern Amitabha Palmer, PhD who contributed to the drafting of this document on behalf of the ANA Ethics Advisory Board.