Artificial Intelligence

EXECUTIVE SUMMARY

The Australian College of Nursing (ACN) advocates for the patient-centred, ethical, and safe use of Artificial Intelligence (AI) to support and enhance nursing practice, education, and administration. The safe and ethical application of AI in nursing relies on several principles and needs to be supported by strong governance. AI has developed exponentially and is a key area of growth within digital health and technology (Abuzaid et al., 2022). While AI has many potential benefits in healthcare, appropriate regulations and safeguards must be embedded so that their use does not compromise patient safety, nursing care delivery, or the profession more broadly. This position statement outlines the core principles that apply to using AI in healthcare.

AI is becoming increasingly more advanced, accurate, practical, efficient, and effective (Pailaha, 2023). Nurses are uniquely placed to play a leadership role in developing, testing, implementing, and evaluating AI in healthcare in a nursing context. AI has the potential to significantly reduce the often-repetitive tasks that nurses perform, as well as assist in solving both our current and future workflow challenges. Nurses must understand and consider the implications of AI in clinical and non-clinical settings to ensure patient-centred care is uncompromised. Education should be readily available to the profession to enhance professional understanding of what constitutes an AI product and the role of AI's algorithms in decision-making. To assist the development of professional understanding, the National Nursing and Midwifery Digital Health Capability Framework (Australian Digital Health Agency, 2020) and A National Policy Roadmap for Artificial Intelligence in Healthcare (AAAiH, 2023) are resources that could be embedded into the undergraduate nursing curriculum. It is important that nurses know how to perform the tasks that increasingly AI is executing. Nurses must know when to question results provided by the AI tool and must understand the parameters of safe AI use such as considering when the dataset is not large enough to allow the algorithm to work with safety and accuracy.

This AI position statement is developed in keeping with the ACN mission of *Shaping Health, Advancing Nursing*. It is a starting guide for the nursing profession to ensure nursing remains at the forefront of Australian healthcare and to ensure improved patient outcomes. (Refer to Appendix 1 for definitions)

Purpose

This position statement aims to provide nurses with an understanding of the core principles to safely navigate using AI, recognising the pivotal and important role of AI. It acknowledges the role AI will play in the contemporary healthcare setting in the future.

Principles for safe use of AI by nurses

Nursing informatics must be involved at all stages of generative AI development and intrinsically involved in maintaining Australian nursing standards and practice.

Nurses must:

a. Continue to use their nursing knowledge and critical thinking to ensure that AI is providing accurate and safe solutions (AIDH, 2024). This will ensure patients and the broader community are afforded the best care in line with AHPRA's Shared Code of conduct principles (AHPRA, 2023).

b. Be cognisant when generative AI is used in nursing. Be cognisant of generative AI in digital tools used to provide care, including applications with decision support, predictive tools, and automation.

c. Consider the ethical implications of data and algorithmic bias, which may embed gender, race, and other inequalities and inequities due to the inherent limitations of generative AI across various populations.

d. Engage in learning about different types of AI and how they can impact the provision of care: understand generative AI's safe and ethical applications.

BACKGROUND

What is AI?

The Australian Alliance for Artificial Intelligence in HealthCare (AAAiH) describes artificial intelligence as the simulation of human intelligence processes by machines (AAAiH, 2021). The goal of AI in healthcare is to automate tasks and streamline decision-making, leading to better care delivery and patient outcomes (Abuzaid et al., 2022). Although the concept of AI was developed more than seventy years ago, it has become increasingly well-known since the public arrival of large language models (LLMs) such as ChatGPT, a generative pre-trained transformer (Haug & Drazen, 2023). AI's foundational element is its use of algorithmic processes to automate and simulate intelligent behaviour, including complex pattern recognition and problem-solving. AI learns from inputted data and thus improves its performance over time via repetition, which can result in increasingly independent action.

AI in Healthcare

With the increasingly efficient application of AI across various sectors, AI will become intrinsically embedded in the Australian healthcare system (Reddy, 2020). This includes but is not limited to clinical practice, management, administration, informatics, education, and research for the nursing profession.

AI is widely used in the Australian healthcare sector. Examples include:

Robotics in Care: Robots are being introduced to assist with logistical tasks and provide social interaction for patients, reducing physical demands on nursing staff.

Clinical Decision Support Systems (CDSS): In Australia, nurses increasingly use AI-powered CDSS to assist with evidence-based clinical decisions. These systems analyse large volumes of patient data to provide treatment recommendations, enhancing the precision and efficiency of patient care (Jean, 2023).

Virtual Nursing Assistants: AI-driven virtual assistants are helping with tasks like scheduling patient appointments and medication reminders, freeing up nurses for direct patient care.

Remote Patient Monitoring: With the integration of AI, remote monitoring systems help nurses track patients' health, in remote areas and in metropolitan areas. AI analyses data from wearables, alerting nurses to changes in patients' conditions for early intervention, such as Blood Glucose Level monitoring applications. Virtual hospitals such as Royal Prince Alfred Virtual Hospital (RPA Virtual, 2024) in Sydney are providing expert patient care across virtual care services.

Predictive Analytics: AI-based predictive analytics are employed to anticipate patient flow and potential health issues, helping nurses manage resources and prepare for changes in patient care demands.

Administrative Support: Generative AI tools attached to local healthcare networks can rapidly distil information and develop administrative documents such as memos, letters and briefing papers or clinical documents such as discharge summaries and care plans.

AI's role in healthcare is poised to expand exponentially in the coming years (Jean, 2023). Nurses are faced with systems and tools increasingly reliant on various aspects of AI. As a human-centred profession, it is vital that nursing matches the pace of development and implementation of AI whilst fully understanding the benefits, limitations, and risks of its use. Innovations such as AI-driven surgical robotics, computer vision, and more advanced electronic health records will transform the industry.

Patients can and will expect improved diagnostics, more personalised care, and greater accessibility to healthcare services. Considering these advances, the nursing profession is well placed as the largest, most highly

educated and skilled health workforce to take a leading role in addressing current healthcare challenges and utilising this technology to ensure improved patient outcomes.

AI is becoming more advanced, accurate, practical, effective, efficient, and economical for nursing care. This provides the nursing profession with opportunities but adds pressure to apply AI technology in patient care (Stokes & Palmer, 2020). The requirement to provide ethical care and informed decision-making for patients shapes nurses' roles in considered decision-making for patients. The use of AI is not always inherently visible in systemic clinical or informatics processes; patients must feel confident in all decisions relating to their well-being. The risk of data bias is a reality in the use of AI, and there is evidence that AI models can embed and deploy human and social bias at scale. Therefore, nurses require assurance that the information provided is based on algorithms utilising unbiased real-time data.

The use of AI in health care is now critical to the knowledge base and skill set of the 21st-century nurse, and as such, ACN supports its development as a core curriculum component of undergraduate nursing education, plus a fundamental element of continual professional development. Furthermore, ACN recognises the need to identify the evolving specialised digital and informatics nursing roles that are critical in the development, governance, use, and assurance of patient safety within the current healthcare system. These roles may not be seen as 'traditional' nursing roles but utilise nurses' knowledge and skills in an advanced contemporary nursing environment.

AI's Role in Supporting Nurses

ACN identifies the transformative potential AI brings and notes some of these potential benefits for the nursing profession, including:

Expanding access to high-quality care by reducing time-consuming tasks that do not require specialised nursing skills and knowledge, thus freeing nurses to concentrate on high-quality care and allowing nurses to concentrate on other tasks (Robert, 2019).

Planning and predicting by using knowledge about tasks, resources, goals, and potential trade-offs to create and dynamically update care plans or forecast required care and resources (Pailaha, 2023).

Improving electronic medical records (EMRs) through data organisation and analysis (Pailaha, 2023).

Improving collaboration, coordination, and communication between healthcare disciplines (Pailaha, 2023).

Providing increased levels of direct patient care: Robotics are increasingly used in nursing environments. An example of this is "Moxi", a robot assistant used to give time back to nurses by being programmed to run tasks such as picking up medications from the pharmacy or transferring patients' belongings (Diligent Robotics, 2024).

Streamlining real-time documentation with the use of ambient listening algorithms. These can be programmed to keep clinical-based nursing records at the time of intervention. This can not only provide real-time contemporaneousness documentation but also improve the accuracy of nursing documentation, and reduce the administrative burden (Pailaha, 2023).

Increasing work satisfaction. AI can undertake some professional tasks that do not require a highly skilled nurse to complete, allowing nurses to have more direct time to deliver care to patients, supporting the nursing ability to work to full scope. This can bring an improved level of job satisfaction and well-being to nurses' working life, while positively impacting patients and improving treatment outcomes. AI may also reduce health problems associated with stress and job dissatisfaction for the nurse (Robert, 2021).

Key Issues for Nursing

The key issues for the nursing profession surrounding AI emphasise the delicate balance between the transformative potential of AI to improve patient care and the critical imperatives of data privacy, ethics, managing data bias and equitable access, all of which must be thoughtfully addressed to ensure that AI truly advances healthcare for everyone. As recommended in the AI in Healthcare Roadmap (AAAiH, 2023), there is a need for caution in adopting AI for use in clinical settings.

As the nursing field begins to reap the benefits of AI implementation and advancement, it is crucial to proceed cautiously. Currently, there are no professional practice standards for AI use in nursing although the Australasian Institute of Digital Health supports a shared code of conduct for all healthcare professionals and organisations and promotes profession-specific codes of practice for all health professionals using AI in clinical use (AIDH, 2023). In Australia, only the Therapeutic Goods Administration can approve AI for clinical use, subject to specific guidelines. The nursing workforce lacks a structured, widespread AI education, and higher education is still in the early stages of incorporating digital health and AI into an already dense undergraduate nursing curriculum (AAAiH, 2023).

Research by the Australian Institute of Health Innovation at Macquarie University, Sydney, Australia, has raised additional concerns. Their study of 266 safety reports related to AI-enabled medical devices in real-world settings found that 16% were associated with patient harm, 66% were potential hazards, and 4% were near-miss events where users intervened to prevent harm (Lyell et al., 2023).

This underscores the need for nurses to be fully informed about all aspects of AI development and use and actively participate in incident reporting and review. Safety event reports highlight the need for a comprehensive system approach to ensure the safety of AI-enabled medical devices, which includes understanding how patients and healthcare professionals interact with these systems.

Current considerations are outlined in Appendix 2, but this list is not exhaustive.

Principles of the Ethical and Safe Use of AI for Nurses

Solving ethical dilemmas, advocacy, privacy and data protection, closing social gaps (or inequities) enabling access to treatment, providing empathy and sympathy are but a small sample of the core skills nurses bring to patients and consumers in times of need. However, the nursing profession faces challenges when using AI and must ensure that the human contact or human touch (Pepito et al., 2023) that is so important to nursing care and patient well-being is not lost with the health industry's adoption of AI.

Nurses are often the final safeguard in ensuring treatment decisions are in keeping with an evidence base. To ensure the nursing profession maintains the highest standards of evidence-based care and human-centred individualised care and treatment, ACN outlines the principles identified in Appendix 3 to be considered by nurses when AI is included in their healthcare interventions.

As AI is implemented within the nursing profession, its ethical and safe use in critical decision-making situations is essential. The increasing prevalence of healthcare integrated devices, data analytics, data driven projected outcomes and robotics presents a growing safety challenge.

Incorporating AI into nursing practices, education, and research requires careful planning, training, and ethical considerations. By embracing AI technologies that focus on enhancing patient care and improving nursing workflows, the nursing profession can unlock the full potential of AI to deliver more efficient and intrinsically human-centred healthcare services.

AI's use of algorithms and predictive models to assess data about patient populations will potentially lead to AI-developed personalised care solutions for individuals. These solutions will complement nurses' own nursing knowledge and practice, enriching and improving patient experiences.

ACN Recommendations

ACN recognises the benefits AI represents and the potential to improve further health outcomes for individual patients, their communities and Australia as a whole. ACN recommends that nurses who specialise in informatics be included in those bodies managing AI in healthcare within the healthcare system.

1. The nursing profession asserts its commitment to staying abreast of healthcare advancements, particularly in AI. We advocate for AI education at all levels of nursing, from undergraduate to advanced CPD levels, to ensure a comprehensive understanding of AI products, algorithmic decision-making, and the legal liabilities associated with automated decisions (Reddy et al., 2020). The National Nursing and Midwifery Digital Health Capability Framework (Australian Digital Health Agency, 2020) and A National Policy Roadmap for Artificial Intelligence in Healthcare (AAAiH, 2023) should be integrated into nursing curricula to facilitate this education effectively. The Australian College of Nursing is currently offering a Graduate Certificate in Digital Health (ACN, 2024).
2. Nursing informaticians must be integral to all aspects of AI application, adhering to Australian standards and management protocols. Healthcare organisations must ensure nurses' active involvement in governance models, emphasising principles of fairness, transparency, accountability, and trustworthiness.
3. Nurses must play a central role in the design, implementation, and evaluation of AI applications, ensuring that ethical and practical considerations align with nursing requirements. AI should only be integrated into nursing practice when ratified evidence demonstrates improved patient outcomes. It is imperative to emphasise that AI is a tool to enhance nursing care and treatment, not a replacement for critical thinking.
4. We advocate for the recommendations outlined in A National Policy Roadmap for Artificial Intelligence in Healthcare (AAAiH, 2023). We advocate for AI to be developed within a robust safety framework, for the implementation of accreditation to assess AI safety and quality practice standards and the integration of the national AI ethical framework to support value-based healthcare.
5. Nursing should have a participatory role in the development of data governance models based on principles of integrity, transparency, auditability, accountability, stewardship, checks and balances, standardisation, and change management (The Data Governance Institute, 2023).

APPENDIX 1

Current Definitions of Common Terminology Associated with Artificial Intelligence

- **Artificial Intelligence (AI):** A term coined by Stanford Emeritus Professor John McCarthy in 1955. He defined this as "the science and engineering of making intelligent machines". We have programmed machines to behave cleverly, playing chess for example, but today, we concentrate on machines that can learn, at least somewhat like humans do, (HAI, 2020). AI can also indicate a broad field that includes anything related to the simulation of human cognitive abilities using machines (O'Connor et al., 2022).
- **Automated decision-making:** Technology assisting the judgement of human decision-makers (Commonwealth Ombudsman, 2019).
- **Human-Centered Artificial Intelligence:** AI that seeks to augment the abilities of, address the societal needs, and draw inspiration from human beings. It researches and builds effective partners and tools for people, such as a robot helper and companions for the elderly (Interaction Design Foundation, n.d.).
- **Large language model (LLM):** Also referred to as natural language processing. Branch of AI that uses large data sets to teach machines to understand, interpret and generate responses that mimic human language (Gartner, 2024).
- **Machine learning (ML):** Often referred to as neural networks. Machine learning is a subset of AI that uses algorithms to enable computers to learn from and make predictions or decisions based on data. ML is used in healthcare for tasks like disease prediction and image analysis (Reddy et al., 2019).
- **Deep Learning:** A type of machine learning that uses neural networks with many layers to process and analyse complex data (Jakhar et al., 2020). It is currently the most successful ML approach, usable for all types of ML, with better generalisation from small data and better scaling to big data. It has been applied in healthcare for image recognition and natural language processing. Computer-aided diagnosis is an example of deep learning that assists radiologists and pathologists in interpreting medical images and aiding in detecting diseases.
- **Generative Artificial Intelligence:** Also known as generative pre-trained transformers, training data generates new content in various mediums (for example, text, images, and code) (Massachusetts Institute of Technology, 2023).
- **'Hallucination' effect:** Where a LLM generates false information (IBM, n.d.).
- **Computer vision:** Algorithms developed to analyse specific criteria in images and videos that are used to interpret, predict and assist with decision-making (IBM, n.d.).
- **Predictive Analytics:** AI-driven predictive analytics uses historical data to forecast future health outcomes; this helps healthcare providers identify patients at risk and allocate resources more effectively (Reveal, 2024).
- **Narrow AI:** Intelligent systems specifically designed for one particular thing, e.g., speech or facial recognition (Techopedia, 2023).
- **Data Governance:** Data Governance is a system of decision rights and accountabilities for information-related processes, executed according to agreed-upon models that describe who can take what actions with what information, and when, under what circumstances, using what methods (The Data Governance Institute, n.d.).

APPENDIX 2

Issues for nursing consideration in the use of AI

- **Governance:** Currently, there is no professional practice standard or code of ethics governing the use of AI in Australia's health care system. The Therapeutic Goods Administration must approve AI in Australia for medical use, and it is required to meet specific guidelines.
- **Limited education on the nature and uses of AI within the nursing profession:** The speed of AI adoption has required education providers to continuously change course and education content within very tight timeframes.
- **Data Sharing:** Consent, privacy and security concerns about privacy breaches or unconsented use of patient data need to be addressed.
- **Confidentiality:** How and where personal information is stored and its secondary use in AI, as well as the potential ability to resurface it by AI algorithms.
- **Validity and reliability:** There are still issues with the validity of AI-generated data, as illustrated by the 'hallucination' effect defined above.
- **Biases:** As AI learns from inputted data and uncontrolled datasets (e.g. the Internet), there is potential that AI will perpetuate or systematically embed existing biases into its outputs, which may lead to the potential for suboptimal outcomes (Pailaha, 2023).
- **Legal liability:** Legal liability can become complex when AI facilitates decisions. The legal responsibility is still with the practitioner regardless of AI-recommended actions.
- **Informed consent:** Ensuring patients and consumers are aware of AI and consent to its use in their care.
- **Patient advocacy:** Nurses have a significant professional role as advocates for patients and their families in an increasingly complex healthcare system, now inclusive of AI.
- **Ethical use of AI:** For example, personalisation, loss of privacy, and anthropomorphisms use in healthcare, must be considered to ensure we have the public's trust and acceptance in using intelligent healthcare devices and services (Liu & Tao, 2022).
- **Incident reporting:** All healthcare professionals must contribute to safety monitoring requirements to ensure risk if harms are detected, reported and communicated (AAAiH, 2023).

APPENDIX 3

Principles of the Ethical and Safe Use of AI for Nurses

- **Patient-Centred Care:** AI should be used to enhance patient care and experiences. It is critical to ensure the well-being and preferences of patients is at the forefront of nursing practice.
- **Nursing Autonomy:** AI should support nurses in decision-making without undermining their professional autonomy. Nurses should have the final say in patient care decisions.
- **Human Oversight:** There must always be human oversight of AI systems. Nurses should critically evaluate AI-generated recommendations and decisions, not simply rely on them, intervening when necessary (Poalenlungi et al., 2023).
- **Clinical Expertise and Human Touch:** Nursing care involves a combination of clinical expertise and compassionate human interaction. AI should complement these skills rather than replace them (Aquino et al., 2023).
- **Critical Thinking:** Nurses should always use critical thinking in their roles. This is particularly important when using AI as accountability for all nursing decision-making, which always sits with the nurse (Whende, 2019).
- **Transparency and Accountability:** AI systems used in nursing should be transparent and accountable, and nurses should understand the decisions and recommendations made by AI tools. (Robert N.2019)
- **Education and Continuous Training:** It is recommended that nurses receive undergraduate and postgraduate training and education in AI technologies. They must be prepared to work with AI tools effectively and adapt to evolving best practices (Buchanan et al., 2021; O'Connor et al., 2022).
- **Interdisciplinary Collaboration:** Encourage collaboration between nursing professionals and AI developers, clinicians, and other healthcare stakeholders to ensure that AI tools are integrated effectively into nursing practice (Aquino et al., 2023).
- **Adherence to Standards:** Follow industry and regulatory standards and guidelines for AI use in healthcare to maintain consistency and quality in nursing practice (AAAiH, 2021; AAAiH, 2023).
- **Data Privacy and Security:** Protect patient data and ensure its confidentiality and security when using AI systems. Comply with data protection regulations and educate nurses on data handling best practices (AAAiH, 2021).
- **Data Governance:** Establish strong data governance practices to ensure the quality and integrity of the data used by AI systems in nursing (O'Connor et al., 2023; Australian Digital Health Agency, 2020).
- **Ethical Decision-Making:** Nurses should be trained in ethical considerations related to AI use in healthcare. AI systems should adhere to ethical standards, and nurses should have mechanisms for addressing ethical dilemmas (Prakash et al., 2022).
- **Ethical Frameworks:** Apply ethical frameworks and guidelines to AI in nursing. These frameworks help nurses and healthcare organisations make morally sound decisions using AI (AAAiH, 2021; AAAiH, 2023).
- **Monitoring and Evaluation:** Implement processes for monitoring and evaluating the performance and impact of AI systems in nursing care (O'Connor et al., 2023). Regularly assess their effectiveness and safety. This involves considering the following:
  - **Bias Mitigation:** Address bias in AI algorithms and data. Regularly audit and adjust AI systems to prevent discrimination in patient care. Ensure fairness and equity in the use of AI (Chen et al., 2023).
  - **Resilience and Preparedness:** Nurses should be trained to handle situations when AI technologies fail or make errors, and backup plans should be in place.
  - **Clinical Validation:** AI systems used in nursing must undergo rigorous clinical testing and validation to ensure their accuracy and effectiveness in real-world healthcare settings, particularly in the Australian healthcare context.

- **Feedback Loops:** Encourage feedback from nurses and patients on AI systems. Use this feedback to improve AI tools continually and ensure they align with nursing best practices.
- **Inclusivity and Diversity:** Ensure that AI systems used in nursing are tested for bias and that they consider diverse patient populations to avoid disparities in care.

- **Research and Evidence-Based Practice:** Nurses should engage in research to assess the effectiveness of AI applications in Australian healthcare and use evidence-based practices when incorporating AI into patient care (AAAiH, 2021).

- **Regarding patients**, we recommend the following principles (AAAiH, 2021; Australian Digital Health Agency, 2020; AAAiH, 2023):
  - **Informed Consent:** Patients should be informed about the use of AI in their care and have the option to give informed consent for AI-driven interventions.
  - **Patient Education:** Nurses should educate patients about AI technologies used in their care, address any concerns, and ensure that patients are comfortable with AI-assisted treatments.
  - **Safeguards for Vulnerable Populations:** Be especially cautious when using AI with vulnerable patient populations, such as children or the elderly, and ensure additional safeguards are in place.
  - **Cultural Competency:** Nurses should use AI in culturally sensitive and competent ways to provide care that respects the diversity of patients.

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