AORN Position Statement on Artificial Intelligence (AI) in Perioperative Nursing

POSITION STATEMENT

AORN believes:

- **AI cannot and must never be a replacement for the perioperative RN.** The human expertise, empathy, and accountability required for clinical decision-making and practice cannot be replicated.[1,2]

- **Perioperative RNs should be full participants in preparing for the future of AI-enabled technology that intersects with the perioperative practice setting.**
  - Health care professionals (eg, perioperative nurses, informatics nurses, surgeons, anesthesia professionals, surgical technologists, sterile processing personnel) should lead interdisciplinary collaboration among professional organizations and developers and manufacturers of AI-enabled technologies through their lifecycle, including the co-design, implementation, and evaluation of AI systems to reduce cognitive burden, streamline processes, and enhance clinical outcomes and performance.
  - The unique attributes of perioperative RNs position them to be effective leaders for interdisciplinary collaboration through seamless communication and shared decision-making among clinical care teams and AI developers.

- **Artificial Intelligence (AI) integration methods matter.**[1,2] When integrated ethically and responsibly, AI has the potential to improve health care, including patient outcomes, patient experience, workflow efficiencies, and health care worker experience. When ineffectively integrated, AI has the potential to do harm. Essential elements of responsible AI integration include:
  - Proactive, structured governance and thoughtful operationalization
  - Transparency, explainability (ie, understanding *how* the AI system works), and interpretability (ie, understanding *what* an AI system's output means in context) for AI systems to foster trust, accountability, and safe integration
  - Data security and privacy protections
  - Equity, fairness, and trustworthiness that is prioritized through robust safeguards, ensuring inclusiveness, mitigating bias, and democratizing access across all socioeconomic groups and protected classes
  - Practices that support patient self-determination (ie, either informed consent or disclosure) depending on the situation.

- **Risk mitigation should be prioritized.**[1,2] Complying with privacy and security regulations and adopting policies to monitor and address ever-evolving risks are essential. The use of agentic AI in health care introduces high risk due to its autonomous decision-making.

- **AI education is essential.**[1,2]
  - Academic curricula for all health professions should prepare learners for competent and safe use of AI and include AI competency domains (ie, AI literacy,[3] social and ethical implications of AI, AI-enhanced clinical encounters, evidence-based evaluation of AI-based tools, workflow analysis for AI-based tools, and practice-based learning and improvement of AI-based tools).[4] Health care organizations that implement AI-enabled technology should provide targeted education to health care professionals whose roles intersect with the AI systems adopted by the organization.
  - Health care professionals whose roles intersect with AI-enabled technology have the responsibility to engage in continuous learning strategies for the AI system they use.

- **AI research is a priority.**[1] Ongoing research into the role of AI in nursing and perioperative practice is imperative. Research priorities should include perioperative practice setting-focused clinical effectiveness studies; implementation science investigations; and evaluations of AI's impact on nursing workflow, patient outcomes, and professional satisfaction.[3]

The integration of AI in perioperative nursing practice presents both unprecedented opportunities and significant challenges. AORN holds that AI has a complementary (rather than replacement) role in perioperative care, emphasizing the irreplaceable value of human expertise while establishing frameworks for responsible integration.[1] Advancements in and implementation of AI is transforming health care, including perioperative practice, at an ever-increasing pace. AI-enabled technology, including machine learning, predictive analytics, natural language processing, robotic systems, and clinical decision support, is intended to optimize workflows, support decision-making, and enhance patient outcomes in the perioperative practice setting.[5,6]

The accelerating advancement of these technologies brings anticipated improvements in care efficiencies, but significant opportunity for improvement remains in these areas:

Ethics & Equity: Without monitoring and vigilance, AI can reinforce systemic biases and worsen disparities.[7,8] Ensuring equity in the development and application of AI tools is an absolute imperative.

Transparency & Trust: Black-box algorithms, which are neither transparent nor explainable, can reduce clinician confidence and limit performance-based monitoring and accountability.[9] Transparent and explainable AI is a prerequisite to safe decision-making.

Privacy & Security: The use of AI in health care depends on access to large volumes of clinical data, which heightens risks related to data privacy, cybersecurity, and secondary data use.[10] AI systems may introduce new vulnerabilities across the data lifecycle, including data aggregation, model training, deployment, and ongoing optimization, increasing the potential for breaches, unauthorized access, and misuse of sensitive patient information. Robust data governance, strong security controls, and adherence to applicable privacy and regulatory standards are essential to maintaining patient trust and ensuring safe and ethical use of AI-enabled technologies.[10]

Workforce Preparedness: Most perioperative nurses lack formal training in AI. A coordinated strategy and standards for education and continuing professional development are required.[1,11] Advocating for incorporation of AI education into nursing school curricula is essential for the safe and ethical integration of AI into clinical practice. As AI becomes increasingly relevant to perioperative nursing, health care professionals must proactively pursue learning opportunities to remain current and competent in delivering high-quality care.[4,12,13]

Clear Governance, Policies, & Evaluation Measures: These are necessary to balance innovation with patient safety and ethical practice.[1] Some structured security regulations are in place (eg, HIPAA, FDA, NIST AI Risk Management Framework[14]), but the regulatory landscape is evolving.

Regulatory Oversight: Regulatory oversight of agentic AI in US health care is currently fragmented, with federal and state agencies working to adapt existing frameworks to address the unique risks posed by autonomous systems.[15] Agentic AI is reshaping health care operations, but its autonomy demands new regulatory paradigms.[15] While some federal agencies like the FDA and NIST are adapting, state laws and industry-led initiatives are currently filling the gaps. The future of oversight will likely depend on a hybrid model combining statutory regulation, technical standards, and ethical governance.

The **AORN Guideline for Integration of Artificial Intelligence**[1] provides evidence-based practice recommendations for perioperative teams, and these recommendations should be used as the basis for organizational policies and procedures for the use of AI in the perioperative practice setting. Other professional organizations should follow AORN's lead and develop AI-specific practice standards and guidelines, including patient safety protocols, quality metrics, and professional accountability frameworks, that address the considerations of AI integration in their unique practice settings. By taking a leadership role in AI integration across the perioperative environment, perioperative nurses can advocate for responsible, transparent, and patient-centered adoption of these technologies, ensuring alignment with nursing values and the safety of patients and communities.

Glossary

Agentic AI: Artificial intelligence systems capable of autonomous planning, execution, and interaction. Unlike traditional AI, which responds to specific prompts, agentic AI can define actions needed to achieve specified goals (autonomous planning), interact directly with external systems and application programming interfaces (tool integration), and complete multi-step tasks without continuous human intervention (independent execution).

AI literacy: The ability to understand, critically evaluate, and responsibly use artificial intelligence systems, recognizing their capabilities and limitations, while applying them ethically to support human judgment, safety, and accountability.

Artificial intelligence: The theory and development of systems able to complete tasks that typically require human intelligence, such as visual perception, speech recognition, decision-making, or language translation. It can include computer systems designed to perform tasks that typically require human intelligence (eg, recognition, reasoning, decision-making).

Black-box algorithm: A computational model, often developed using machine learning techniques, in which the internal logic and decision-making processes are not transparent or readily interpretable by end users. As a result, clinicians cannot clearly understand how input data produce specific outputs (eg, predictions, recommendations, or classifications), which may limit trust, impede performance monitoring, hinder identification of error or bias, and weaken accountability in clinical use.

Machine learning: A branch of artificial intelligence focused on building applications that learn from data and improve their accuracy over time without being programmed to do so; algorithms learn patterns from data to make predictions or recommendations.

Predictive analytics: Statistical and computational techniques that analyze historical data to forecast outcomes.

Clinical decision support: Digital tools that provide clinicians with patient-specific information and recommendations to aid decision-making.

Robotic systems: Mechanically assisted surgical or procedural systems that may incorporate AI for enhanced precision, safety, and workflow efficiency.

Explainable AI (XAI): AI systems designed to provide human-understandable reasoning for outputs, supporting clinician trust and accountability.

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ADDITIONAL RESOURCES

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