

Artificial Intelligence in Nurse Anesthesia Practice

Position Statement

Introduction

Patient safety is paramount and must be the guiding principle for Certified Registered Nurse Anesthetists (CRNAs), also referred to as nurse anesthesiologists or nurse anesthetists, when evaluating, implementing, and use of artificial intelligence (AI) in anesthesia and perioperative care. CRNAs provide anesthesia, analgesia, sedation, and pain management services to patients of all ages and complexities across diverse healthcare settings. CRNAs remain responsible and accountable for the professional judgments they make and the care they provide.¹

AI encompasses technologies that can perform or support tasks traditionally associated with human cognitive effort, including prediction, pattern recognition, image interpretation, language processing, and decision support. AI has already influenced anesthesia care through rule-based automation and advanced monitoring technologies, and newer approaches such as machine learning, computer vision, predictive analytics, and generative AI are expanding potential applications across the perioperative continuum.^{3,4}

AI may improve access to information, support clinical decision-making, enhance monitoring and risk prediction, reduce administrative burden, and improve healthcare operations. At the same time, AI may introduce risks related to inaccurate or unreliable outputs, automation bias, algorithmic bias, privacy and cybersecurity, loss of situational awareness, and over-reliance on technology. Responsible implementation requires a balance between innovation and clinician expertise necessary for safe anesthesia care.^{4,5,6}

Purpose

To describe the American Association of Nurse Anesthesiology (AANA) position on the responsible use of AI in nurse anesthesia practice and to promote patient safety, professional accountability, human oversight, transparency, equity, privacy and security, appropriate education, and CRNA participation in AI governance.

Audience

This position statement is intended for CRNAs, resident registered nurse anesthetists, members of the interdisciplinary healthcare team, healthcare organizations, administrators, educators, researchers, technology developers, regulators, policymakers, and other stakeholders involved in the development, evaluation, implementation, oversight, or use of AI technologies affecting anesthesia and perioperative care.

Position

The AANA supports the responsible, ethical, and evidence-based development and integration of AI technologies into nurse anesthesia practice when their use enhances patient care and augments the knowledge, skills, clinical judgment, and capabilities of CRNAs. AI should contribute to safe, high-quality, equitable, evidence-based, and patient-centered anesthesia care while complementing, rather than replacing, the clinical judgment, critical thinking, vigilance, professional accountability, and hands-on expertise of CRNAs.²⁻⁵

AI must serve as a supportive tool and not as a replacement for the CRNA's knowledge and expertise, critical thinking, clinical judgment, vigilance, professional accountability, or direct interaction with patients. CRNAs should remain actively engaged in clinical decision-making and retain the ability to independently evaluate, question, modify, disregard, or override AI-generated recommendations when clinically appropriate. The use of AI does not diminish or transfer the professional responsibility of the CRNA.^{1,3,6}

Patient Safety and Clinical Judgment

AI must be developed and used with patient safety as the primary consideration. AI-generated predictions, alerts, recommendations, or other information should support, rather than supplant, the CRNA's independent assessment and evaluation of the patient and clinical situation.^{1,3,4}

AI may assist CRNAs by identifying clinically meaningful patterns within large volumes of data, synthesizing information from multiple sources, and supporting recognition of patient-specific risks. However, anesthesia is a dynamic practice in which patient conditions may change rapidly and require immediate assessment, intervention, and application of professional judgment.^{4,7}

CRNAs should critically evaluate AI-generated clinical information and determine whether its use is appropriate based on the individual patient, the clinical context, and the plan of care.^{3,4,6}

Human Oversight and Professional Accountability

AI technologies that influence anesthesia care must incorporate meaningful human oversight. CRNAs and other qualified healthcare professionals should retain the ability to evaluate, question, modify, disregard, or override AI-generated recommendations when clinically appropriate.^{4,5,7}

CRNAs should remain actively engaged in clinical decision-making and avoid over-reliance on AI-generated recommendations. AI should support, rather than substitute for, clinical judgement. Maintaining meaningful human oversight is essential to reduce automation bias and support decisions that remain patient-centered, ethically sound, and clinically appropriate. Numerous healthcare organizations, similarly, caution against overreliance on AI-enabled technologies and emphasize that they are intended to support clinicians rather than replace clinical judgement.

A human-in-the-loop approach, in which a qualified healthcare professional actively reviews, interprets, and retains responsibility for decisions informed by AI, is particularly important when AI may influence clinical decisions or patient outcomes. The degree of human oversight should be proportionate to the potential risk to the patient.^{4,7}

CRNAs must remain alert to automation bias and over-reliance on AI. Technology can be used to enhance situational awareness and clinical capability rather than diminish vigilance, independent decision-making, or professional accountability.^{3,5}

Safety, Validation, and Transparency

AI technologies intended to influence anesthesia or perioperative care must be appropriately validated and evaluated for trustworthiness, including transparency, reliability and validity, accountability, fairness, utility, and fitness for purpose. Evaluation should consider the technology's intended use, patient population, and clinical environment before implementation and should undergo continued evaluation after deployment. CRNAs can participate in interdisciplinary governance processes that develop facility policies and procedures and oversee the selection, implementation, and ongoing use of AI technology.

Clinicians must have access to sufficient information to understand an AI system's intended purpose, limitations, performance, and appropriate use. Greater transparency and explainability

are warranted as the potential influence of an AI system on clinical decision-making and patient outcomes increases.^{5,7}

Generative AI and large language models may support documentation, information retrieval, education, and other professional activities, but they may also produce inaccurate, misleading, fabricated, or inconsistent information. Clinically significant outputs should be independently reviewed and verified before use.^{4,6}

Ethical, Equitable, and Patient-Centered Use

AI should support equitable, patient-centered anesthesia care and should not create or exacerbate existing healthcare disparities. Developers and healthcare organizations should evaluate AI technologies for potential bias in training data, model performance, and real-world use.^{4,5,7}

Evaluate AI technologies across diverse patient populations and clinical environments whenever appropriate. Attention should be given to populations and settings that may be underrepresented in development or validation data, including rural and resource-limited environments.^{4,5}

AI should strengthen rather than diminish communication, shared decision-making, and meaningful human interaction. Patients must remain active participants in decisions regarding their care.^{5,6}

Privacy, Confidentiality, and Security

CRNAs and healthcare organizations must safeguard patient privacy and confidentiality when using AI technologies and comply with applicable laws, regulations, professional standards, and organizational policies.^{2,5,7}

Protected health information and other confidential information should only be entered into AI technologies that have been appropriately approved for that purpose and that provide suitable privacy, security, and data-protection safeguards.^{2,7,8}

Healthcare organizations should evaluate cybersecurity, data governance, access controls, and vendor practices when selecting and implementing AI technologies that affect patient care.^{5,7,8}

CRNA Leadership, Education, and Governance

CRNAs should develop sufficient AI literacy to understand the capabilities, limitations, risks, and appropriate uses of AI technologies relevant to anesthesia practice. Education must support the ability to critically evaluate AI outputs and recognize concerns related to validation, bias, privacy, security, and human oversight.^{4,5,6}

CRNAs can be meaningfully involved in the evaluation, selection, implementation, governance, monitoring, and quality improvement of AI technologies that affect anesthesia and perioperative care. Their clinical expertise and knowledge of anesthesia workflows are important to ensuring that AI technologies address real-world patient and practice needs.^{4,5,8}

Healthcare organizations must establish governance structures and policies that define accountability for AI use, support clinician participation, and promote ongoing monitoring of safety, effectiveness, equity, and performance.^{5,8}

Conclusion

AI has the potential to enhance anesthesia and perioperative care by supporting clinical decision-making, monitoring, risk assessment, information management, and other innovations. Its value depends on responsible implementation that preserves the central role of human expertise in safe anesthesia care.^{3,4,5}

The AANA supports innovation that improves patient care while preserving CRNA clinical judgment, vigilance, professional accountability, patient-centered decision-making, and meaningful human interaction. CRNAs should be active participants and leaders in shaping how AI is evaluated, implemented, governed, and monitored within anesthesia and perioperative practice.^{1,2,4,5}

AI should augment the CRNA's ability to deliver safe, high-quality anesthesia care - not replace the clinical judgment, vigilance, expertise, accountability, and human interaction that remain fundamental to nurse anesthesiology practice.^{3,6}

AANA Resources

- [Standards for Nurse Anesthesia Practice](#)

- 144 • [Scope of Nurse Anesthesia Practice](#)
- 145 • [Code of Ethics for the Certified Registered Nurse Anesthetist](#)
- 146 • [Mobile Information Technology](#)
- 147 • [Patient-Driven Interdisciplinary Practice](#)
- 148 • [Documenting Anesthesia Care](#)
- 149 • [Patient-Centered Perianesthesia Communication](#)
- 150 • [Promoting a Culture of Safety and Healthy Work Environment](#)

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