

Recognizing Safety Concerns With Nonoperating Room Anesthesia

Question

What safety concerns should healthcare providers recognize as procedures involving nonoperating room anesthesia (NORA) increase? What are the risks outside the traditional operating room (OR)?

Answer

NORA refers to anesthesia administered in locations other than a traditional OR, and an increased number of NORA cases does present safety concerns that involve both anesthesia and nonanesthesia providers.¹ Some specific complications found in a closed claims analysis from one study included airway compromise, aspiration pneumonia, and dental injuries. Oversedation and subsequent oxygenation/ventilation accounted for most of the claims.² Airway management during procedures that require a shared airway is an additional concern.

Another study showed an upward trend in the age of patients receiving NORA care.³ That study found that NORA cases took half the time of OR cases and were more likely to start after normal working hours. Anesthesia for colonoscopy was the most common procedure-specific type of NORA.⁴

NORA has expanded into many fields of medicine, and numerous factors have driven the growth of NORA cases, including the development of less invasive procedures, the increasing comorbidities of the aging population, new technologies that have widened the scope for NORA cases, and the pursuit to improve value while decreasing costs.⁵

Unlike traditional ORs, NORA procedure rooms often are customized for specific medical interventions rather than general surgical needs. Thus, anesthesia providers might find these settings challenging if they are unfamiliar with the setup or if the location is suboptimal. Among the risk concerns of NORA include limited access to anesthesia equipment, inadequate lighting, poor power

supply, issues with temperature regulation, and challenges in patient monitoring, and potential unexpected negative outcomes.⁶

Anesthesia providers should work with procedural teams to ensure a safe NORA environment. They should conduct a thorough preprocedure evaluation to assess patient safety and procedural feasibility as well as maintain open and real-time communication among the team members throughout the procedure and into the recovery area.

As NORA cases increase and the patient population receiving these procedures becomes older and has more complex medical conditions, a focus on patient safety and quality of care is imperative. Part of decreasing risk involves the anesthesia team being adequately prepared for NORA cases and becoming familiar with the location, equipment, and available staff. Safety measures include regular maintenance of anesthesia-related equipment, adequate rescue medications, and up-to-date protocols. Additionally, [intraoperative neurophysiological monitoring](#) in the NORA setting should be held to the same standards and qualities as in the OR.⁷

Another risk element of NORA involves the expanding role of imaging in surgical practice, specifically exposure to ionizing radiation in an increasing number of NORA cases. Healthcare organizations should ensure that NORA teams are informed and educated about this kind of exposure. They should be encouraged to use personal shielding (i.e., lead aprons and thyroid shields) and eye protection, and they should maintain distance from the radiation sources.⁸

Success in dealing with the risks of NORA were examined in a recent study. Portable monitoring devices, streamlined sedation techniques, and anesthesia technology advancements were shown to enhance patient safety. Researchers emphasized the significance of healthcare organizations following protocols designed for the specific requirements of each procedural setting.⁹

Additionally, healthcare organizations should implement the American Society of Anesthesiologists (ASA) standards titled [Statement on Nonoperating Room Anesthesia Services](#) as well as consider other safety measures, such as:

- Using checklists in NORA cases to ensure the availability of personnel and equipment.
- Providing ongoing NORA-specific education and training to appropriate healthcare providers and staff members.

- Being aware of technological advances and how providers can use them to improve preoperative assessment, monitor patients during and after procedures, and provide the most appropriate anesthetics for increasingly complex cases.
- Defining safe practices for NORA cases and sharing them among the surgical team.
- Establishing protocols and guidelines for emergency procedures and conducting drills to ensure providers are prepared to respond to an emergency.
- Tracking risk-related data associated with NORA cases and using the data to help support education efforts and develop safety interventions.
- Maintaining a proactive (rather than a reactive) system to examine potential errors and near misses and prevent future occurrences of adverse events.
- Creating quality improvement programs that are supported by debriefings, root cause analysis, and continuing education programs.¹⁰

Endnotes

¹ Yeh, T., Beutler, S. S., & Urman, R. D. (2020, August). What we can learn from nonoperating room anesthesia registries: Analysis of clinical outcomes and closed claims data. *Current Opinions in Anaesthesiology*, 33(4):527–532. doi:

<https://doi.org/10.1097/ACO.0000000000000844>

² Ibid.

³ Alexander, N., Gabriel, R. A., Dutton, R. P., & Urman, R. D. (2017, April). Growth of nonoperating room anesthesia care in the United States: A contemporary trends analysis. *Anesthesia & Analgesia*, 124(4):1261–1267. doi:

<https://doi.org/10.1213/ANE.0000000000001734>

⁴ Ibid.

⁵ Walls, J. D., & Weiss, M. S. (2019, June). Safety in non-operating room anesthesia (NORA). *APSF Newsletter*, 34(1).

Retrieved from www.apsf.org/article/safety-in-non-operating-room-anesthesia-nora/

⁶ Ibid.; Enhance Healthcare Consulting. (2024, October 8). *Ensuring safety in non-operating room anesthesia (NORA)*.

Retrieved from <https://enhancehc.com/ensuring-safety-in-non-operating-room-anesthesia-nora/>

⁷ Walls, et al., Safety in non-operating room anesthesia (NORA); Wong, T., Georgiadis, P. L., Urman, R. D., & Tsai, M. H. (2020, January 8). Non-operating room anesthesia: Patient selection and special considerations. *Local and Regional Anesthesia*, 13:1–9. doi: <https://doi.org/10.2147/LRA.S181458>

⁸ Wong, et al., Non-operating room anesthesia: Patient selection and special considerations.

⁹ Kaye, A. D., Rogers, B. N., Mashaw, S., Mosieri, C. N., Urman, R. D., & Shekoochi, S. (2025, August). Safety of nonoperating room anesthesia: A narrative review. *Current Opinion in Anesthesiology*, 38(4), 425–435. Retrieved from https://journals.lww.com/co-anesthesiology/abstract/2025/08000/safety_of_nonoperating_room_anesthesia__a.17.aspx

¹⁰ Walls, et al., Safety in non-operating room anesthesia (NORA).

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