# AI applications in anaesthesia show promise but face limitations



A recent study published in BMC Anesthesiology has examined the effectiveness of AI applications in determining appropriate anesthesia methods based on patient information. Conducted at a single centre over a one-month period, the research focused on two AI applications—Gemini and CoPilot—and their ability to align with the decisions made by human anesthesiologists.

The results of the study revealed a notable level of concordance between the AI systems and the anesthesiologists. Specifically, both applications selected general anesthesia in 100% of cases where anesthesiologists did the same. Furthermore, the Gemini application showed a significant concordance rate of 85.7% regarding preferences for patients on medication. These findings suggest that AI has the potential to replicate expert human decisions in specialised areas of medical practice.

The authors of the study highlighted that clinicians’ confidence in AI is expected to grow as successful real-world applications are demonstrated. As noted by researchers Singh and Nath, adopting robotic assistance in routine procedures could afford anesthesiologists valuable time, which can then be allocated to critical decision-making. They outlined that although there are developments in areas such as drug infusion systems and pain management, concrete studies targeting AI technologies for effective anesthesia management have been limited.

The study not only positioned AI as a tool that could play an integral role in anesthesiologists' routines but also indicated the necessity for further research. The authors underscored a pressing need for more comprehensive studies that explore direct applications of AI in clinical settings. This aligns with the findings of Lopes et al., who pointed out that despite rapid advancements in AI, clinical applications within anesthesia are still sparse.

In the context of surgery for upper extremity procedures, the AI analysis provided various alternatives—including general anesthesia and regional blocks—yielding an 80% agreement with the decisions of anesthesiologists. This highlights AI's growing ability to support critical choices in anesthetic management.

AI technologies are already being utilised for monitoring anesthesia depth, pain management, and predicting potential complications. The study illustrated that AI applications can rapidly process large volumes of patient data, allowing them to recommend suitable anesthesia methods within seconds. However, it was noted that the AI systems did not fully adhere to current guidelines for regional anesthesia in patients with anticoagulants, indicating a need for further development in this area.

Research highlighted by Singh and Nath shows that AI can be particularly advantageous in special patient cases, such as those with rare diseases, where traditional methods might be less effective. Moreover, findings from Joosten et al. pointed to improved cognitive outcomes for patients who underwent drug infusion through computer-assisted systems.

Despite the promising capabilities of AI applications, the study also acknowledged limitations, including the study's single-centre design and the exclusion of broader patient demographics, such as children. The reliance on free versions of AI software may also imply that more sophisticated applications could potentially yield different results.

Overall, while the study demonstrates that AI can assist anesthesiologists in decision-making processes, its current limitations suggest that it may function best as a supplementary tool rather than a replacement for skilled medical professionals. As the understanding and implementation of AI technology in anaesthesia continue to evolve, its role in enhancing the efficiency and safety of procedures is likely to expand, reshaping future practices within the field.

Source: [Noah Wire Services](https://www.noahwire.com)

## Bibliography

1. <https://www.researchgate.net/publication/387697704_Comparison_of_AI_applications_and_anesthesiologist's_anesthesia_method_choices> - This link corroborates the study published in BMC Anesthesiology that examined the effectiveness of AI applications in determining appropriate anesthesia methods and the concordance between AI systems and anesthesiologists.
2. <https://www.researchgate.net/publication/387697704_Comparison_of_AI_applications_and_anesthesiologist's_anesthesia_method_choices> - This study highlights the specific AI applications—Gemini and CoPilot—and their ability to align with the decisions made by human anesthesiologists.
3. <https://www.researchgate.net/publication/387697704_Comparison_of_AI_applications_and_anesthesiologist's_anesthesia_method_choices> - The study results showing a notable level of concordance between the AI systems and the anesthesiologists, including the 100% concordance for general anesthesia and the 85.7% concordance rate for patients on medication.
4. <https://springernature.figshare.com/collections/Artificial_intelligence_in_anesthesiology_a_bibliometric_analysis/7598430> - This bibliometric analysis supports the growing confidence in AI among clinicians and the potential for AI to replicate expert human decisions in specialized areas of medical practice.
5. <https://www.researchgate.net/publication/383752781_Artificial_intelligence-assisted_interventions_for_perioperative_anesthetic_management_a_systematic_review_and_meta-analysis> - This systematic review and meta-analysis underscores the necessity for further research on the direct applications of AI in clinical settings and the sparse clinical applications within anesthesia despite rapid advancements in AI.
6. <https://www.researchgate.net/publication/383752781_Artificial_intelligence-assisted_interventions_for_perioperative_anesthetic_management_a_systematic_review_and_meta-analysis> - The review highlights AI's growing ability to support critical choices in anesthetic management, including alternatives such as general anesthesia and regional blocks.
7. <https://www.researchgate.net/publication/387697704_Comparison_of_AI_applications_and_anesthesiologist's_anesthesia_method_choices> - The study illustrates AI's capability to rapidly process large volumes of patient data and recommend suitable anesthesia methods within seconds.
8. <https://www.researchgate.net/publication/383752781_Artificial_intelligence-assisted_interventions_for_perioperative_anesthetic_management_a_systematic_review_and_meta-analysis> - The review notes the limitations of AI systems, including the non-adherence to current guidelines for regional anesthesia in patients with anticoagulants and the need for further development in this area.
9. <https://www.researchgate.net/publication/383752781_Artificial_intelligence-assisted_interventions_for_perioperative_anesthetic_management_a_systematic_review_and_meta-analysis> - The study highlights AI's advantages in special patient cases, such as those with rare diseases, where traditional methods might be less effective.
10. <https://www.researchgate.net/publication/383752781_Artificial_intelligence-assisted_interventions_for_perioperative_anesthetic_management_a_systematic_review_and_meta-analysis> - Findings from Joosten et al. are mentioned, pointing to improved cognitive outcomes for patients who underwent drug infusion through computer-assisted systems.
11. <https://www.researchgate.net/publication/387697704_Comparison_of_AI_applications_and_anesthesiologist's_anesthesia_method_choices> - The study acknowledges the limitations, including the single-centre design and the exclusion of broader patient demographics, such as children, and the reliance on free versions of AI software.
12. <https://bmcanesthesiol.biomedcentral.com/articles/10.1186/s12871-024-02882-2> - Please view link - unable to able to access data