Artificial intelligence and the future of anesthesiology: Qualitative findings from a national survey of physician anesthesiologists

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Context

Thanks to recent advancements in computer processing power and cloud computing, artificial intelligence (AI) is poised to have a major effect on healthcare delivery and access. (Karras et al., 2019) The acceptance and adoption of AI applications in clinical practice, particularly in specialties that have traditionally supported innovation such as anesthesiology, is of significant academic interest. (CL & CJ, 2012) Despite the multiple studies in literature discussing physicians' beliefs and attitudes about the use of technologies such as AI in medicine, the perspectives of physician anesthesiologists have been overlooked. (Jungmann et al., 2020; Scheetz et al., 2021; Truong et al., 2019; Wadhwa et al., 2020) The purpose of this study was to explore whether physician anesthesiologists' attitudes, motivators and perceived barriers towards using AI in clinical practice were associated with physician-level and practice characteristics.

Methods

In this cross-sectional study, we surveyed physician anesthesiologists of the American Society of Anesthesiology (ASA) using a web-based survey distributed via e-mail. Associations between physician level of training and experience, practice characteristics and physician attitudes, motivators and perceived barriers to using AI in clinical practice were estimated.

Results

Survey invitations were emailed to 27,056 physician anesthesiologists practicing in the United States. Between May 2021 and June 2021, 1,086 physicians (4%) completed the survey. Only 7% of respondents indicated they were well educated on AI. Thirty-seven percent of respondents reported they had heard of but didn't know much about AI and less than 2% reported they didn't know and hadn't heard about AI. In total, 47% of physicians describe their feelings regarding using AI in clinical practice as positive or very positive (4-5 on a 5-step Likert-type scale). As benefits of AI, anesthesiologists collectively identified enhanced efficiency (79%), timeliness (75%) and effectiveness of health-care delivery (69%). The pre-hospital (69%), continued quality improvement (61%) and intra-operative (58%) domains of anesthetic care were selected as most likely to benefit from AI in the next 10 years. When it comes to anticipating the future role of AI in the field, anesthesiologists anticipate that AI will likely outperform them in predicting adverse peri-op events (83%), formulating pain management plans (67%) and performing airway examinations (45%). A majority of respondents doubt AI will ever outperform them in providing empathetic care to patients (81%), performing endotracheal intubation (65%) and performing regional anesthetic blocks (64%). The primary motivators of using AI in clinical practice were improving healthcare outcomes (81%), remaining in charge of final clinical decision-making (55%) and reducing healthcare costs (54%). Leading barriers to using AI in clinical practice were a lack of algorithmic transparency (60%), malpractice and legal liability concerns (47%) and the potential for medical errors (41%). Concerns about job replacement (46%) and income loss (45%) where also identified.

Conclusions

Overall, physician anesthesiologists' attitudes toward using artificial intelligence in clinical practice were positive. Though nearly half of respondents were pessimistic about how AI will impact both patient safety and labor market dynamics, respondents nonetheless identified motivating factors that, if true, would encourage them to use AI in practice. It remains unclear whether these motivating factors would, overall, outweigh the negative impact of perceived risks and barriers of using AI in anesthesiology. Despite the limitations of a cross-sectional survey design and the possibility of non-response bias, our results have implications for perioperative leaders charged with integrating AI into modern anesthetic practice. Given the scope and complexity of the subject, further discussions and research are required.