## Efficiency Meets Excellence: The Impact of Merging High-Performance Organizations with Anesthesia Units

Papiroon Noitasaeng, BNS<sup>1</sup>, Araya Ongiem, MEd<sup>1</sup>, Phongthara Vichitvejpaisal, MD, PhD<sup>1</sup>

The present study explored the transformative potential of merging high-performance organizational principles with anesthesia units in healthcare. The current landscape of anesthesia services faces challenges in resource allocation, patient satisfaction, and operational efficiency. Shortages of anesthesia providers and outdated equipment hinder optimal patient care, while communication gaps and workflow inefficiencies contribute to patient dissatisfaction. Recognizing the critical role of anesthesia units in ensuring patient safety during medical procedures, the present article proposed a paradigm shift through the integration of high-performance organization principles from Public Administration.

High-performance organizations, known for efficiency, adaptability, innovation, and sustained excellence, offer a strategic framework to address anesthesia service challenges. By streamlining administrative processes, optimizing resource allocation, and fostering a culture of continuous improvement, the merger of high-performance organization principles with anesthesia units aimed to enhance efficiency, elevate patient care, and empower anesthesia providers for professional development. The present article provided a comprehensive overview of successful high-performance organization integrations in other sectors, drew parallels to healthcare, and presented real-world case studies illustrating the positive outcomes of such mergers. Through a step-by-step guide, the article outlined the implementation of high-performance organization principles in anesthesia units, addressing challenges, gaining stakeholder buy-in, and projecting future implications. This exploration into the convergence of efficiency and excellence offered valuable insights for healthcare leaders, administrators, and anesthesia providers seeking to revolutionize anesthesia services in pursuit of higher performance and superior patient outcomes.

Keywords: Anesthesia services; Healthcare transformation; High-performance organizations; Operational efficiency; Professional development

Received 22 January 2025 | Revised 16 September 2025 | Accepted 25 September 2025

J Med Assoc Thai 2025; 108(10):851-60

Website: http://www.jmatonline.com

Anesthesia services are integral to healthcare, ensuring patient comfort and safety during surgical procedures<sup>(1,2)</sup>. However, the field faces challenges impacting operational efficiency and patient outcomes. Shortages of anesthesia providers, including anesthesiologists and nurse anesthetists, strain teams, and compromise care. Ongoing investment in modern equipment is vital, with implications for optimal care delivery<sup>(3,4)</sup>. The significance of continuous professional development for anesthesia providers is a pressing concern<sup>(5,6)</sup>.

Communication gaps between providers and patients contribute to pre-procedure anxiety<sup>(7)</sup>. Patient satisfaction hinges on pain management

#### Correspondence to:

Vichitvejpaisal P.

Department of Anesthesiology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok 10700, Thailand.

Phone: +66-81-8384393

Email: phongthara@gmail.com

#### How to cite this article:

Noitasaeng P, Ongiem A, Vichitvejpaisal P. Efficiency Meets Excellence: The Impact of Merging High-Performance Organizations with Anesthesia Units. J Med Assoc Thai 2025;108:851-60.

DOI: 10.35755/jmedassocthai.2025.10.851-860-02607

and postoperative effects, necessitating transparent communication about procedures, risks, and recovery expectations<sup>(8)</sup>. Addressing bottlenecks in the anesthesia workflow, from preoperative assessment to postoperative care, involves coordination challenges with surgical teams, nursing staff, and healthcare professionals<sup>(8)</sup>. The impact of inefficient record-keeping on patient care and operational efficiency is noteworthy.

Anesthesia providers play a crucial role in ensuring patient safety during surgical procedures, thereby influencing postoperative outcomes<sup>(1,2)</sup>. Collaboration with various medical specialties contributes to overall healthcare success<sup>(8)</sup>. However, the financial aspect, emphasizing revenue generation and its role in sustaining hospital operations, is vital<sup>(9)</sup>. Through the lens of Public Administration, integrating high-performance organization (HPO) principles with anesthesia units can unlock benefits for both organizational efficiency and patient care.

## Understanding high-performance organizations

**Definition and characteristics of HPOs** 

High-level efficiency and effectiveness: HPOs

<sup>&</sup>lt;sup>1</sup> Department of Anesthesiology, Faculty of Medicine Siriraj Hospital, Mahidol University, Bangkok, Thailand

are characterized by streamlined and optimized processes that minimize waste and maximize output. This efficiency extends to all facets of the organization, including administrative tasks and core operational functions. HPOs excel in the judicious use of resources, ensuring that personnel, time, and materials are allocated with precision to achieve optimal outcomes. This commitment to efficiency contributes to overall organizational effectiveness<sup>(10,11)</sup>.

Continuous improvement and adaptability: HPOs embrace a culture of continuous improvement, drawing inspiration from the Kaizen philosophy. This involves the ongoing pursuit of small, incremental changes to enhance processes, operations, and outcomes<sup>(12)</sup>. HPOs demonstrate a high degree of adaptability, responding swiftly to changes in the external environment. This adaptability is reflected in their ability to innovate, reorganize, and evolve in response to emerging challenges and opportunities<sup>(10,13,14)</sup>.

Focus on innovation and excellence: HPOs foster a culture that encourages and rewards innovation. These include promoting creativity among employees, investing in research and development, and adopting cutting-edge technologies to stay ahead of the curve. The pursuit of excellence is a central tenet of HPOs. This commitment extends beyond meeting basic standards to consistently delivering high-quality outcomes. HPOs set and maintain ambitious performance benchmarks, driving a culture of excellence at all levels<sup>(13-15)</sup>.

## HPOs in the medical and industrial sectors

HPOs are entities that consistently surpass their counterparts in various aspects, including innovation, efficiency, and overall effectiveness. Here are examples from both the medical and industrial fields, along with highlights of their successful outcomes and valuable lessons learned<sup>(2,4)</sup>.

Mayo Clinic: Renowned for providing highquality patient care through a collaborative and patient-centered approach, Mayo Clinic stands out for achieving positive health outcomes and maintaining high patient satisfaction. Success stems from collaborative teamwork, patient-centered care, and an unwavering commitment to excellence in medical practice. The sharing of knowledge among healthcare professionals and a focus on continuous learning play pivotal roles in Mayo Clinic's achievements<sup>(16)</sup>.

Johns Hopkins Hospital: A leader in medical research and education, Johns Hopkins has made

groundbreaking contributions to various fields, including medicine, public health, and biomedical research. Success is attributed to investments in cutting-edge research, fostering interdisciplinary collaboration, and maintaining a strong commitment to education. Johns Hopkins has effectively demonstrated the importance of integrating research with clinical practice<sup>(17)</sup>.

Singapore General Hospital: Known for its efficiency, high-quality patient care, and innovative practices, Singapore General Hospital has earned recognition in medical tourism and patient outcomes. Success is driven by efficient healthcare delivery, leveraging technology for patient care, and an unwavering focus on continuous improvement. Leadership and employee engagement are also emphasized as critical factors contributing to Singapore General Hospital's achievements<sup>(18)</sup>.

Toyota: Renowned in the automotive industry for its efficient production system, the Toyota Production System (TPS), Toyota has achieved high-quality manufacturing, reduced lead times, and minimized waste. Success is underpinned by an emphasis on continuous improvement, waste reduction, and active employee involvement. The concept of Kaizen, or continuous improvement, pioneered by Toyota, has been widely adopted by other organizations<sup>(12,19)</sup>.

Apple: Consistently producing innovative and high-quality products that dominate markets, Apple's success lies in its focus on design, user experience, and seamless integration across devices. Prioritizing innovation, design excellence, and maintaining a closed ecosystem provides a competitive edge. Apple's ability to create a strong brand identity and foster customer loyalty is also noteworthy<sup>(20)</sup>.

### Common lessons learned across industries

Continuous improvement: HPOs prioritize continuous improvement and learning at all levels of the organization<sup>(10,13,14)</sup>.

Employee engagement: Engaged and empowered employees play a crucial role in the success of organizations<sup>(21)</sup>.

Innovation: A culture that fosters innovation and embraces change is a common trait among HPOs<sup>(22,23)</sup>.

Customer/patient-centric approach: Organizations that prioritize the needs and satisfaction of their customers or patients tend to outperform their peers<sup>(8)</sup>.

Strong leadership: Effective leadership, with a clear vision and the ability to inspire and guide the organization, is a common factor<sup>(21)</sup>.

## Challenges in anesthesia services

Current issues in anesthesia delivery

Anesthesia units often face challenges related to shortages of qualified personnel, including anesthesiologists and nurse anesthetists. This shortage can lead to overworked teams, potential burnouts, and compromises in patient care. Additionally, the reliance on outdated anesthesia equipment poses a risk to patient safety and may hinder the ability to provide state-of-the-art care. Upgrading equipment to modern standards is crucial for optimal service delivery. Inadequate communication between anesthesia providers and patients can result in heightened anxiety and uncertainty before procedures. Improving communication strategies is essential for enhancing the overall patient experience<sup>(24)</sup>. Moreover, challenges in postoperative care, including issues such as pain management and nausea, can impact patient satisfaction and recovery. Addressing these complications is crucial for holistic patient care<sup>(1,8)</sup>.

## Opportunities for improvement

Investing in workforce development programs, continuing education, and training opportunities can address personnel shortages and enhance the skills of anesthesia providers, contributing to improved patient care<sup>(25)</sup>. Embracing modern technologies, such as advanced monitoring systems and anesthesia delivery platforms, presents an opportunity to enhance efficiency, accuracy, and patient safety within anesthesia units(26,27). Developing and implementing effective communication protocols between anesthesia providers and patients can mitigate anxiety, improve informed consent processes, and enhance the overall patient experience<sup>(28)</sup>. Furthermore, identifying and streamlining workflow inefficiencies within anesthesia units can optimize resource utilization, reduce delays, and contribute to overall operational efficiency.

## Recognizing the necessity for change in anesthesia practices

The healthcare landscape is continually evolving with advancements in medical science, technology, and patient expectations. Anesthesia practices must adapt to these changes to meet the demands of a dynamic and complex healthcare environment. The shift towards patient-centered care necessitates innovations in anesthesia practices to ensure a more personalized and satisfactory experience for patients. Recognizing the importance of patient preferences

and expectations is paramount<sup>(22)</sup>.

## Linking challenges to HPO principles

HPO principles emphasize high-level efficiency and effectiveness. Linking this to anesthesia challenges involves identifying inefficient processes, such as outdated workflows or resource allocation, and implementing changes aligned with HPO principles for optimal performance. Recognizing the necessity for change requires a commitment to continuous improvement<sup>(10,11)</sup>. HPOs thrive on a culture of ongoing enhancement, encouraging anesthesia units to systematically identify, address, and learn from challenges, fostering a mindset of continuous improvement<sup>(2,3)</sup>.

The dynamic nature of healthcare demands adaptability. HPO principles underscore the importance of being agile and responsive to change<sup>(23)</sup>. Anesthesia practices can benefit from adopting this principle to navigate evolving medical technologies, protocols, and patient expectations. HPOs focus on innovation and excellence, aligning with the need for creative solutions in anesthesia practices. This involves embracing innovative technologies, procedures, and communication strategies to elevate the standard of care and patient outcomes<sup>(2,3,8)</sup>.

# The synergy of merging HPOs (Figure 1) Improved efficiency

Streamlining administrative processes: Integrate digital solutions to automate administrative tasks such as scheduling, record-keeping, and billing. This minimizes paperwork, reduces errors, and enhances overall efficiency<sup>(11)</sup>. Conduct a thorough analysis of administrative workflows to identify bottlenecks and redundant processes. Streamlining these workflows ensures a more seamless and time-effective operation. Implement efficient communication platforms to enhance collaboration among anesthesia providers, surgical teams, and other stakeholders. Real-time communication can prevent delays and improve coordination<sup>(29)</sup>.

Optimizing resource allocation: Utilize data analytics to inform resource allocation decisions. Analyzing patient demand, procedure complexity, and historical data can guide the optimal deployment of personnel and equipment. Implement crosstraining programs to enhance the versatility of anesthesia providers<sup>(30)</sup>. This allows for more flexible resource allocation, ensuring that personnel can adapt to changing demands within the unit. Implement dynamic scheduling systems that adapt to fluctuations

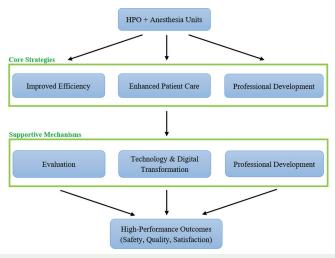


Figure 1. Concept map: the synergy of merging HPOs with anesthesia units.

in case volumes and urgency. This allows for better utilization of staff and resources, preventing overallocation or underutilization<sup>(4,11)</sup>.

#### Enhanced patient care

Focus on safety and quality: Implement standardized safety protocols derived from HPO principles to enhance patient safety during anesthesia administration<sup>(1,2)</sup>. This includes rigorous preoperative assessments, standardized checklists, and realtime monitoring during procedures<sup>(27)</sup>. Establish comprehensive quality assurance programs that continuously monitor and evaluate anesthesia services. Regular audits, peer reviews, and benchmarking against industry standards contribute to a culture of excellence and safety. Prioritize ongoing training and certification programs for anesthesia providers to ensure they stay abreast of the latest safety protocols and best practices. This commitment to professional development enhances the overall quality of care(15,30).

Patient satisfaction and outcomes: Develop and implement clear and transparent communication strategies between anesthesia providers and patients. This involves explaining procedures, addressing concerns, and setting realistic expectations to enhance patient understanding and satisfaction<sup>(28,31)</sup>. Introduce innovative postoperative care initiatives aimed at minimizing discomfort, managing pain effectively, and ensuring a smooth recovery process. Enhanced postoperative care contributes significantly to positive patient outcomes and satisfaction<sup>(32)</sup>. Establish robust systems for collecting and analyzing patient feedback. This information provides valuable

insights into the patient's experience, enabling continuous improvement and a patient-centered approach to anesthesia services<sup>(33)</sup>.

#### **Professional development**

Training and education initiatives: Implement continuous learning programs that focus on the latest advancements in anesthesia practices, technology, and patient care. Regular training sessions, workshops, and conferences keep anesthesia providers abreast of evolving industry standards<sup>(5,34)</sup>. Introduce simulation training programs that replicate real-world scenarios. This immersive training enhances the skills and decision-making abilities of anesthesia providers, ensuring preparedness for diverse and challenging situations. Facilitate cross-disciplinary training to foster collaboration between anesthesia providers and other healthcare professionals. This interdisciplinary approach improves communication and coordination during surgical procedures<sup>(35)</sup>.

Empowering anesthesia providers for excellence: Establish recognition programs that acknowledge and celebrate excellence in anesthesia service delivery. This recognition not only motivates anesthesia providers but also creates a culture that values and rewards outstanding contributions. Provide opportunities for leadership development within the anesthesia team. Empowering anesthesia providers with leadership skills enhances their ability to contribute to decision-making processes, fostering a sense of ownership and responsibility<sup>(21,36)</sup>. Implement mentorship programs that pair experienced anesthesia providers with those in the early stages of their careers. Mentorship fosters knowledge transfer, skill

development, and a sense of community within the anesthesia unit<sup>(37)</sup>.

#### **Evaluation**

Strong evaluation mechanisms are central to sustaining HPOs. The integration of anesthesia units should include measurement through key performance indicators (KPIs) such as case throughput, efficiency of resource utilization, and workforce productivity<sup>(6,9,11)</sup>. Equally important are patient-centered outcomes, including complication rates, morbidity and mortality, and patient satisfaction<sup>(1,2,7,8)</sup>. Embedding these evaluation metrics ensures transparency, accountability, and evidence-driven continuous improvement<sup>(15,30)</sup>.

## Technology and digital transformation

Technology serves as a catalyst for HPOs efficiency and innovation in anesthesia. Advanced data analytics and artificial intelligence (AI) support clinical decision-making and predictive modeling for patient care<sup>(3,22,26,38,39)</sup>. The use of electronic anesthesia records (EAR) enhances documentation accuracy and integration with hospital information systems<sup>(27,40-42)</sup>. Furthermore, simulation training and virtual reality (VR) platforms provide immersive learning opportunities for anesthesia providers, strengthening preparedness for high-risk scenarios and complex procedures<sup>(3,38,43)</sup>.

## Risk management and compliance.

Patient safety and adherence to professional standards form the foundation of HPO principles in healthcare. Anesthesia units should embed structured risk management frameworks, including incident response protocols and root cause analysis (RCA) for adverse events<sup>(4,17,30)</sup>. Proactive monitoring, early identification of risks, and adherence to national and international accreditation standards ensure compliance, safeguard patient welfare, and reinforce organizational resilience<sup>(1,18,24)</sup>.

# Real-world examples of HPO integration in anesthesia units

In the anesthesia field, successful outcomes often result from a combination of evidence-based practices, continuous quality improvement, and commitment to patient safety. These examples demonstrate the importance of embracing innovative approaches, leveraging data, and fostering a culture of excellence within anesthesia departments to achieve high performance<sup>(1,22)</sup>.

#### Cleveland Clinic Anesthesia Institute

Successful outcomes: The Cleveland Clinic's Anesthesia Institute is known for its commitment to patient safety, efficiency, and innovation. They have implemented protocols to reduce complications, improve patient outcomes, and enhance overall perioperative experience<sup>(1,7,8,22)</sup>.

Lessons learned: Emphasizing a multidisciplinary approach to perioperative care, implementing standardized protocols, and leveraging technology for data-driven decision-making contribute to success. Continuous training and education for anesthesia providers are also crucial<sup>(40)</sup>.

## Virginia Mason Medical Center

Successful outcomes: Virginia Mason is recognized for its dedication to the principles of Lean Healthcare, which includes the anesthesia department. Lean methodologies have led to improved efficiency, reduced waste, and enhanced patient safety in the perioperative setting<sup>(41)</sup>.

Lessons learned: Applying Lean principles, such as process optimization and waste reduction, can lead to improved performance in anesthesia services. Virginia Mason's success highlights the importance of a culture of continuous improvement and the involvement of frontline staff in identifying and addressing inefficiencies<sup>(34)</sup>.

#### **Anesthesia Quality Institute (AQI)**

Successful outcomes: AQI is a non-profit, national organization focused on collecting and analyzing anesthesia-related data to improve the quality of care. It was established by the American Society of Anesthesiologists (ASA) in 2008. Their efforts have led to the development of quality indicators, benchmarking tools, and initiatives to enhance patient safety and outcomes<sup>(6,15)</sup>.

Lessons learned: Systematic data collection, analysis, and benchmarking can drive improvements in anesthesia care. The establishment of standardized quality indicators helps anesthesia providers identify areas for improvement and track progress over time<sup>(6)</sup>.

## Australian and New Zealand College of Anaesthetists (ANZCA)

Successful outcomes: ANZCA has been proactive in promoting safety and quality in anesthesia care. Their initiatives include the development of guidelines, training programs, and research to advance the practice of anesthesia in the region<sup>(2)</sup>.

Lessons learned: Collaboration among

anesthesia professionals, ongoing education, and the development of evidence-based guidelines contribute to improved patient outcomes<sup>(35)</sup>. ANZCA's emphasis on research and innovation underscores the importance of staying abreast of advancements in the field.

## Penn Medicine's Department of Anesthesiology and Critical Care

Successful outcomes: Penn Medicine (the University of Pennsylvania Health System) has a comprehensive approach to anesthesia care, focusing on patient safety, quality improvement, and research. They have implemented initiatives to enhance communication, reduce perioperative complications, and improve patient satisfaction<sup>(2)</sup>.

Lessons learned: Prioritizing patient safety through effective communication, implementing quality improvement projects, and fostering a culture of accountability contribute to success. Penn Medicine's commitment to research helps drive advancements in anesthesia practice<sup>(42,44)</sup>.

## **Implementing HPO principles**

#### Steps for integration

Assessing current practices: This involves conducting a comprehensive assessment of current anesthesia practices, including administrative processes, resource allocation, communication protocols, and patient care workflows. Identify areas of strength and weakness within the anesthesia unit. This includes evaluating personnel skills, equipment efficacy, and overall operational efficiency. Involve key stakeholders, including anesthesia providers, administrators, and supportive staff, in the assessment process to gain diverse perspectives and insights<sup>(4,11)</sup>.

Establishing a framework for change: To encompass the improvement of efficiency, the enhancement of patient care, and the fostering of a culture of continuous improvement, a strategic plan should be developed that outlines specific initiatives, milestones, and timelines for integration. This plan should align with the overall goals of the healthcare institution and reflect the unique needs of the anesthesia unit. Allocate resources, both human and financial, to support the integration process. This may involve training programs, technology investments, and organizational restructuring (34,38).

Building a culture of continuous improvement: Leaders should actively support and participate in the integration process to inspire confidence among anesthesia providers and staff. Implement robust communication strategies to keep all stakeholders informed and engaged. Training programs should be designed to equip anesthesia providers with the skills and knowledge needed for the changes ahead. Establish feedback mechanisms to gather input from anesthesia providers and other staff throughout the integration process. This feedback loop enables real-time adjustments and ensures that the integration aligns with the evolving needs of the unit (36,38,44).

#### Overcoming resistance

Addressing common concerns and objections: Establish open and transparent communication channels to address concerns and objections. Conduct town hall meetings, Q&A sessions, and one-on-one discussions to create platforms for expressing apprehensions. Encourage anesthesia providers and stakeholders to document their concerns and objections. This allows for a systematic review of recurring themes and provides a basis for targeted solutions. Develop educational materials and workshops to address misconceptions and to provide in-depth information about the benefits of HPO integration. Clear communication on how integration addresses specific concerns fosters a better understanding<sup>(21,27,28,35)</sup>.

Gaining buy-in from anesthesia providers and stakeholders: Involve anesthesia providers and stakeholders in the decision-making process. Seek their input on key aspects of the integration, ensuring that their perspectives shape the overall strategy. Clearly articulate the benefits of HPO integration for anesthesia providers and stakeholders. Emphasize how integration will improve working conditions, enhance patient care, and contribute to professional development. Share success stories from other healthcare institutions that have successfully integrated HPO principles into anesthesia services. Testimonials from anesthesia providers who have experienced positive outcomes can be particularly persuasive<sup>(4,6,13,24)</sup>.

Team-building initiatives: Implement team-building initiatives to foster a sense of unity and collaboration among anesthesia providers. This includes workshops, team-building exercises, and collaborative projects that promote a shared vision. Provide opportunities for anesthesia providers to take on leadership roles within the integration process. Empowering them to be active participants in decision-making and implementation fosters a sense of ownership and commitment. Maintain continuous communication throughout the integration process.

Regular updates, progress reports, and forums for feedback ensure that anesthesia providers and stakeholders feel engaged and informed<sup>(13,27,28,31,35)</sup>.

## Future implications and innovations

## Projecting the future impact of HPO integration

Organizational sustainability: Anticipate sustained efficiency gains resulting from HPO integration. Project how streamlined processes, optimized resource allocation, and a culture of continuous improvement will contribute to long-term organizational sustainability. Consider how the integration of HPO principles prepares the anesthesia unit to adapt to future changes in healthcare regulations, technology, and patient expectations<sup>(14,40)</sup>.

Enhanced patient outcomes: Project a continuous trajectory of quality improvement in patient care. Expect positive impacts on patient satisfaction, reduced postoperative complications, and improved overall health outcomes. Envision the development and implementation of innovative patient-centric practices that prioritize individualized care, preventive measures, and holistic well-being<sup>(8,28,44)</sup>.

#### Potential innovations in anesthesia services

Technology integration: Envision the integration of smart monitoring systems that provide real-time data on patient vital signs, allowing for more precise anesthesia administration and early detection of potential complications. Explore the incorporation of telemedicine for preoperative assessments, enabling remote consultations and streamlined communication between anesthesia providers and patients<sup>(38,39)</sup>.

Advancements in anesthesia delivery: Anticipate the application of precision medicine approaches in anesthesia, tailoring dosage and administration based on individual patient characteristics and genetic factors. Envision the development of automated anesthesia administration systems that use AI to adjust dosage in real-time, enhancing safety and efficiency<sup>(3)</sup>.

Professional development and training: Introduce VR training modules for anesthesia providers, offering realistic simulations of complex scenarios to enhance skills and decision-making. Develop advanced cross-disciplinary training platforms that facilitate collaboration between anesthesia providers and other healthcare professionals, fostering a more integrated and cohesive healthcare team<sup>(5,34,43)</sup>.

#### Conclusion

By leveraging Public Administration principles

and conducting a thorough assessment of existing practices, healthcare institutions can pinpoint areas for enhancement in administrative processes, resource allocation, and patient care. The integration process encompasses establishing a framework for change and nurturing a culture of continuous improvement.

Real-world case studies have illustrated successful HPO integrations in anesthesia units, showcasing improved efficiency, patient-centric care, and positive outcomes. Overcoming resistance by addressing concerns and gaining buy-in from anesthesia providers and stakeholders is critical for the success of the integration process.

The potential for transformative change in anesthesia units through HPO integration is immense. By streamlining administrative processes, optimizing resource allocation, and enhancing patient care, anesthesia services can position themselves as high-performing contributors to overall healthcare excellence. The emphasis on continuous improvement and professional development ensures that anesthesia providers are equipped to adapt to evolving healthcare landscapes and deliver exceptional care.

As healthcare institutions project future implications and innovations resulting from HPO integration, the focus shifts towards long-term sustainability, enhanced patient outcomes, and the integration of cutting-edge technologies. The conclusion emphasizes that by embracing the principles of HPOs, anesthesia units have the opportunity not only to address existing challenges but also to pioneer innovative practices that shape the future of anesthesia services. This transformative journey towards efficiency, excellence, and patient-centered care holds the promise of redefining the role of anesthesia units within the broader healthcare ecosystem.

## What is already known about this topic?

In the domain of healthcare management and anesthesia services, extensive research has explored strategies aimed at bolstering operational efficiency within healthcare organizations. These initiatives encompass the streamlining of administrative processes, optimization of resource allocation, and enhancements in communication protocols. Furthermore, the existing body of literature has thoroughly examined diverse approaches to quality improvement within anesthesia units. These endeavors span a spectrum of initiatives, including augmenting patient safety measures, optimizing the delivery of anesthesia, and improving overall clinical outcomes.

Additionally, the challenges and opportunities linked with organizational mergers have been scrutinized across a multitude of industries. In the specific context of healthcare, comprehending the intricacies of merging HPOs with anesthesia units necessitates considerations of organizational culture, alignment of communication strategies, and integration of resources. Moreover, an essential focus of research involves exploring avenues to enhance the patient experience, ensuring safety, and optimizing outcomes through progressive advancements in anesthesia practices.

#### What does this article add?

This article presents a comprehensive synthesis of HPO principles and anesthesia practices, exploring the potential synergistic effects arising from the merger of these two components. This integration holds the promise of enhancing overall performance. The article conducts a rigorous assessment of the impact of this merger on operational efficiency within the specific context of anesthesia services. Its objective is to quantify improvements in processes, resource utilization, and communication protocols resulting from the incorporation of HPO strategies.

Furthermore, the article extends its scope beyond organizational efficiency to scrutinize the impact on patient care outcomes. This broader evaluation encompasses an in-depth examination of safety measures, the quality of anesthesia delivery, and overall patient satisfaction within the merged environment.

Drawing insights from case studies and empirical evidence, the article goes on to identify best practices for the successful merger of HPOs with anesthesia units. It offers practical recommendations for navigating challenges, fostering cultural alignment, and optimizing resource utilization. This multifaceted approach contributes valuable insights to the existing knowledge base and provides actionable guidance for organizations contemplating or undergoing such mergers.

#### Conflicts of interest

The authors declare no conflict of interest.

## References

- Warner MA, Arnal D, Cole DJ, Hammoud R, Haylock-Loor C, Ibarra P, et al. Anesthesia patient safety: Next steps to improve worldwide perioperative safety by 2030. Anesth Analg 2022;135:6-19.
- 2. Wacker J. Quality indicators for anesthesia and

- perioperative medicine. Curr Opin Anaesthesiol 2023;36:208-15.
- Bignami E, Lanza R, Cussigh G, Bellini V. New technologies in anesthesia and intensive care: take your ticket for the future. J Anesth Analg Crit Care 2023;3:16. doi: 10.1186/s44158-023-00098-3.
- Yinusa A, Faezipour M. Optimizing healthcare delivery: a model for staffing, patient assignment, and resource allocation. Appl Syst Innov 2023;6:78. doi: https://doi.org/10.3390/asi6050078.
- Petersen JA, Bray L, Østergaard D. Continuing professional development (CPD) for anesthetists: A systematic review. Acta Anaesthesiol Scand 2024;68:2-15.
- Yee MS, Tarshis J. Anesthesia quality indicators to measure and improve your practice: a modified delphi study. BMC Anesthesiol 2023;23:256. doi: 10.1186/ s12871-023-02195-w.
- Peng F, Peng T, Yang Q, Liu M, Chen G, Wang M. Preoperative communication with anesthetists via anesthesia service platform (ASP) helps alleviate patients' preoperative anxiety. Sci Rep 2020;10:18708. doi: 10.1038/s41598-020-74697-3.
- Teshome D, Mulat Y, Fenta E, Hunie M, Kibret S, Tamire T, et al. Patient satisfaction and its associated factors towards perioperative anesthesia service among surgical patients: A cross-sectional study. Heliyon 2022;8:e09063.
- Evans J, Leggat SG, Samson D. A systematic review of the evidence of how hospitals capture financial benefits of process improvement and the impact on hospital financial performance. BMC Health Serv Res 2023;23:237. doi: 10.1186/s12913-023-09258-1.
- Do TT, Mai NK. A systematic review on high performance organization. Manag Res Rev 2021;44:181-208.
- 11. Ebugosi QA, Olaboye JD. Optimizing healthcare resource allocation through data-driven demographic and psychographic analysis. Comput Sci IT Res J 2024;5:1488-504.
- Abdulmouti H. Benefits of kaizen to business excellence: Evidence from a case study. Ind Eng Manage 2018;7:251. doi:10.4172/2169-0316.1000251.
- Salcinovic B, Drew M, Dijkstra P, Waddington G, Serpell BG. Factors influencing team performance: What can support teams in high-performance sport learn from other industries? A systematic scoping review. Sports Med Open 2022;8:25. doi: 10.1186/ s40798-021-00406-7.
- 14. de Waal A, Linthorst J. Future-proofing the high-performance organization. Sustainability 2020;12:8507. doi: 10.3390/su12208507..
- Willmington C, Belardi P, Murante AM, Vainieri M. The contribution of benchmarking to quality improvement in healthcare. A systematic literature review. BMC Health Serv Res 2022;22:139. doi: 10.1186/s12913-022-07467-8.
- 16. Caine NA, Ebbert JO, Raffals LE, Philpot LM,

- Sundsted KK, Mikhail AE, et al. A 2030 Vision for the Mayo Clinic Department of Medicine. Mayo Clin Proc 2022;97:1232-6.
- 17. Pronovost PJ, Armstrong CM, Demski R, Callender T, Winner L, Miller MR, et al. Creating a high-reliability health care system: improving performance on core processes of care at Johns Hopkins Medicine. Acad Med 2015;90:165-72.
- Tan CC, Lam CSP, Matchar DB, Zee YK, Wong JEL. Singapore's health-care system: key features, challenges, and shifts. Lancet 2021;398:1091-104.
- 19. Croft D. Guide: Toyota Production System (TPS) Learn Lean Sigma [Internet]. 2024 [cited 2024 Nov 5]. Available from: https://www.learnleansigma.com/guides/toyota-production-system-tps/.
- Zou Y. Apple's brand marketing strategy: A case study on brand image and customer engagement. Highlights in Business, Economics and Management 2023;23:712-5.
- Gun L, Imamoglu S, Turkcan H, Ince H. Effect of digital transformation on firm performance in the uncertain environment: Transformational leadership and employee self-efficacy as antecedents of digital transformation. Sustainability 2024;16:1200. doi: 10.3390/su16031200.
- 22. Thacharodi A, Singh P, Meenatchi R, Tawfeeq Ahmed ZH, Kumar RRS, V N, et al. Revolutionizing healthcare and medicine: The impact of modern technologies for a healthier future-A comprehensive review. Health Care Sci 2024;3:329-49.
- Holden RJ, Boustani MA, Azar J. Agile Innovation to transform healthcare: innovating in complex adaptive systems is an everyday process, not a light bulb event. BMJ Innovations 2021;7:499-505.
- 24. Abouleish AE, Pomerantz P, Peterson MD, Cannesson M, Akeju O, Miller TR, et al. Closing the chasm: Understanding and addressing the anesthesia workforce supply and demand imbalance. Anesthesiology 2024;141:238-49.
- Al-Worafi YM. Healthcare workforce issues in developing countries: public health and others. In: Al-Worafi YM, editor. Handbook of medical and health sciences in developing countries. Cham: Springer; 2023. p. 1-25.
- Hashimoto DA, Witkowski E, Gao L, Meireles O, Rosman G. Artificial intelligence in anesthesiology: Current techniques, clinical applications, and limitations. Anesthesiology 2020;132:379-94.
- 27. Paganelli AI, Mondéjar AG, da Silva AC, Silva-Calpa G, Teixeira MF, Carvalho F, et al. Realtime data analysis in health monitoring systems: A comprehensive systematic literature review. J Biomed Inform 2022;127:104009. doi: 10.1016/j. jbi.2022.104009.
- 28. Sharkiya SH. Quality communication can improve patient-centred health outcomes among older patients: a rapid review. BMC Health Serv Res 2023;23:886. doi: 10.1186/s12913-023-09869-8.

- Kumar D. AI-Driven automation in administrative processes: Enhancing efficiency and accuracy. Int J Eng Sci Humanit 2024;14:256-65.
- Falade I, Gyampoh G, Akpamgbo E, Chika O, Obodo O, Okobi O, et al. A comprehensive review of effective patient safety and quality improvement programs in healthcare facilities. Med Res Arch 2024;12:1-15. doi: https://doi.org/0.18103/mra.v12i7.5649.
- 31. Smith KL, Martini J. Patient-provider communication and interactions. In: Daaleman TP, Helton MR, editors. Chronic illness care: principles and practice. Cham: Springer; 2023. p. 195-207.
- 32. Admiraal M, Hermanides J, Meinsma SL, Wartenberg HCH, Rutten MVH, Ward-van der Stam VMC, et al. Current multidisciplinary approaches to preventing chronic postoperative pain. Br J Anaesth 2021;127:331-5.
- 33. Han S, Xu M, Lao J, Liang Z. Collecting patient feedback as a means of monitoring patient experience and hospital service quality learning from a government-led initiative. Patient Prefer Adherence 2023;17:385-400.
- Al-Omary H, Soltani A, Stewart D, Nazar Z. Implementing learning into practice from continuous professional development activities: a scoping review of health professionals' views and experiences. BMC Med Educ 2024;24:1031. doi: 10.1186/s12909-024-06016-7.
- 35. McLaney E, Morassaei S, Hughes L, Davies R, Campbell M, Di Prospero L. A framework for interprofessional team collaboration in a hospital setting: Advancing team competencies and behaviours. Healthc Manage Forum 2022;35:112-7.
- Nathan N. The path to leadership in anesthesiology. Anesth Analg 2022;134:241. doi: 10.1213/ ANE.0000000000005863.
- Plyley T. The impact of mentorship in anesthesiology.
  ASA Monitor 2021;85:42. doi: 10.1097/01.
  ASM.0000742736.48901.85.
- 38. Langeron O, Castoldi N, Rognon N, Baillard C, Samama CM. How anesthesiology can deal with innovation and new technologies? Minerva Anestesiol 2024;90:68-76.
- Bellini V, Valente M, Gaddi AV, Pelosi P, Bignami E. Artificial intelligence and telemedicine in anesthesia: potential and problems. Minerva Anestesiol 2022;88:729-34.
- Malik S. Data-driven decision-making: Leveraging the IoT for real-time sustainability in organizational behavior. Sustainability 2024;16:6302. doi: https:// doi.org/10.3390/su16156302.
- Plsek PE. Accelerating health care transformation with lean and innovation [Internet]. New York: Productivity Press; 2013 [cited 2024 Dec 5]. Available from: https:// doi.org/10.1201/b15817.
- Penn Medicine. Penn nursing and clinical quality improvement [Internet]. 2024 [cited 2024 Nov 18]. Available from: https://www.pennmedicine.org/for-

- health-care-professionals/for-nurses-and-advanced-practice/nursing-at-penn/our-vision/new-knowledge-and-innovation/clinical-quality-improvement.
- 43. Manolakis K, Papagiannakis G. Virtual Reality simulation streamlines medical training for healthcare professionals. J Dent 2022;121:103987. doi: https://
- doi.org/10.1016/j.jdent.2022.103987.
- 44. Ahmed Z, Ellahham S, Soomro M, Shams S, Latif K. Exploring the impact of compassion and leadership on patient safety and quality in healthcare systems: a narrative review. BMJ Open Qual 2024;13(Suppl 2):e002651.