



MALAYSIAN SOCIETY OF ANAESTHESIOLOGISTS

YEAR BOOK 2025/2026
Future-ready Anaesthesia

MALAYSIAN SOCIETY OF ANAESTHESIOLOGISTS



Yearbook 2025/2026

Published by
Malaysian Society of Anaesthesiologists
Unit 3.3, Level 3
Medical Academies Malaysia Building
No. 5, Jalan Kepimpinan P8H
Presint 8, 62250 Putrajaya Malaysia.
Tel: (603) 8996 0700
Email: secretariat@msa.net.my

Copyright ©2026 Malaysian Society of Anaesthesiologists

All rights reserved. No part of this book may be reproduced in any form or by any means without prior permission from the publisher.

Pusat Kebangsaan ISBN/ISSN Malaysia
ISSN 2462 - 1307

Contents

Foreword	iii
Preface	v
Acknowledgements	vii
I Perioperative Management and Patient Safety	1
1 Robotic Anaesthesia: Replacing or Refining the Anaesthesiologist?	3
<i>Low Ren Geng; Izzuddin Azaharuddin; Azarinah Izaham</i>	
2 Protein, Energy, and Outcomes in Critically Ill Patients: What Anaesthesiologists Need to Know	14
<i>Zheng-Yii Lee; Carolyn Tze Ing Loh; Muhamad Hafizzi Mohd; Mohd Shahnaz Hasan</i>	
3 Surgeon Perspective on Patient Safety: Views from the Other Side of the Divide	26
<i>Chik Ian</i>	
4 Awake Deep Brain Stimulation Surgery: Anaesthetic Considerations and Clinical Practice	29
<i>Jeyaganesh Veerakumaran; Yeap Chun Hong</i>	
5 Building a Future-Ready Vascular Anaesthesia Service in Malaysia	33
<i>Nor Hidayah Zainool Abidin</i>	
6 Same Day Admission for Elective Lower Segment Caesarean Section: A Quality Improvement Initiative in Obstetric Anaesthesia at Universiti Malaya Medical Centre (UMMC)	39
<i>Nur Azreen Hussain; Nabilah Abdul Ghani; Chuah Pea Ching</i>	
7 Optimising Coagulation in Cardiac Surgery	44
<i>Mohd Fitry Zainal Abidin</i>	

II	Supportive Teamwork	51
8	Supportive Teamwork: The Anaesthesiology Avengers Team	53
	<i>Ainina Zulkeplee</i>	
9	Teamwork in Futuristic Anaesthesia: The Human Foundation for Future-Ready Practice	57
	<i>Mohd Hafiz Abd Razak</i>	
10	Effective Team Leadership in Anaesthesia and Perioperative Care	61
	<i>Izzuddin Azaharuddin; Azarinah Izaham; Low Ren Geng; Mohd Wafiq Irfan Zawawi</i>	
11	Collaborative Practice in Anaesthesia: Strengthening Teamwork Through Leadership and Simulation	68
	<i>Chong Shwen Nee; Phang Ti Ping</i>	
12	Prehabilitation in Major Surgical & Oncological Surgeries — A Reflection on Current Practices	73
	<i>Wong Wei Jin; Siti Nadzrah binti Yunus</i>	
III	Smart Technology	79
13	Future-Ready Anaesthesia Training: Integrating Digital Technologies Into Programme Governance	81
	<i>Nur Fariza Ramly</i>	
14	Future-Ready Anaesthesia: Negotiating the Intersection of Smart Technology, AI, and Clinical Decision Support	86
	<i>Wong Wai Kit</i>	
IV	Sustainability in Anaesthesia and Intensive Care	93
15	Eco-Conscious Anaesthesia: Healing Patients, Healing the Planet	95
	<i>Yeap Chun Hong; Jeyaganesh Veerakumaran</i>	
16	Sustainable Pain Medicine in Anaesthesia Practice	100
	<i>Johnny Toh Sing Kiu; Ken-Yi Lui</i>	

Foreword

Dear Colleagues and Esteemed Readers,

It is both a privilege and an honour to welcome you to the latest edition of the Malaysian Society of Anaesthesiologists (MSA) Year Book.

This year's theme, **“The Future-Ready Anaesthesia”** comes at a pivotal moment for our specialty. As the medical landscape evolves through technological breakthroughs, shifting demographic demands, and rapid developments in perioperative medicine, our role extends far beyond the traditional boundaries of the operating theatre. We are transforming into holistic perioperative physicians, clinical leaders, and innovators who drive patient safety and excellence in outcomes.

Being future-ready is not merely about adopting state-of-the-art technology or modern pharmacological advancements; it is a mindset. It requires us to cultivate resilience, embrace continuous learning, and integrate data-driven insights into our daily clinical practice. From artificial intelligence and advanced haemodynamic monitoring to sustainable, eco-friendly anaesthetic practices, the future calls on us to adapt proactively while remaining steadfast in our commitment to compassionate, high-quality patient care.

This Year Book stands as a testament to the dedication, intellectual vigour, and collective accomplishments of our vibrant community over the past year. Within these pages, you will find a celebration of our milestones, critical reflections on emerging trends, and inspiring contributions from colleagues across the nation who are actively shaping the trajectory of Malaysian anaesthesiology.

I extend my deepest gratitude to the Editorial Board Of the Year Book for their tireless efforts in bringing this volume to fruition. My heartfelt thanks also go to every member of the MSA whose commitment to excellence keeps our Society strong, progressive, and globally competitive.

As you read through this edition, I hope it sparks meaningful conversations, inspires new ideas, and renews your passion for our extraordinary profession. Together, let us step boldly into the future, united in our mission to elevate the standards of anaesthesiology, critical care, and pain medicine in Malaysia.

Wishing you all an inspiring and reflective read.

Dr Hasmizy Muhammad

President,
Malaysian Society of Anaesthesiologists

Preface

It has been a great privilege to assemble the MSA Year Book 2025/2026. While considering potential topics, we felt strongly drawn to the theme of sustainability, safety, and future-readiness, which closely align with the current needs of our practice.

We were delighted that so many of the authors we approached were eager to share their fresh insights and perspectives on this theme. This enthusiastic response demonstrates that our fellow anaesthesiologists are highly adaptable to the evolving changes in our field. Our role was simply to weave these ideas together, a task made possible by the invaluable support of fraternity members who served as independent reviewers.

In this Year Book, we explore the changing landscape of sustainable practices. Given that green anaesthesia has been a recurrent theme over the past three years, we felt it vital to examine the safe use of medications and resources as core components of sustainability. Furthermore, we invite the fraternity to consider evolving practices such as robotic surgery and point-of-care testing like ROTEM. It is time to embrace these advancements rather than dismissing them as costly or restricted to major tertiary centres. A future-ready anaesthesiologist understands that keeping the broader picture in view benefits everyone in the long term. Finally, we address the nuances of artificial intelligence (AI). While it is a subject some may tiptoe around, AI is not a competitor to be feared, but rather a complementary partner in our practice.

We hope you enjoy this edition. Traditionally, the publication has been “by the anaesthetist, and for the anaesthetist”. In line with collaborative practices, we are pleased to have the voice of the surgeons too.

Associate Professor Dr Chaw Sook Hui
Dr Priscilla A/P Manymuthu
Dr Ahmad Fariz bin Elias

Editors
MSA Year Book 2025/2026

Acknowledgements

The Malaysian Society of Anaesthesiologists (MSA) Year Book 2026 would not have reached completion without the valuable contributions of our reviewers from various institutions across Malaysia.

We would like to express our sincere gratitude to the following reviewers:

Dr Farah Syaza binti Rahman

Anaesthesiologist

Department of Anaesthesiology & Critical Care

Hospital Sultanah Nur Zahirah, Kuala Terengganu, Terengganu

Dr Teoh Tsyx Xiang

Anaesthesiologist & Lecturer

Department of Anaesthesiology

Faculty of Medicine, Universiti Malaya, Kuala Lumpur

Dr Vinod Laxmikanth A/L Balasundra

Anaesthesiologist

Department of Anaesthesiology

Universiti Malaya Medical Centre, Kuala Lumpur

Dr Ajayan Nair G Prabhakaran

Anaesthesiologist

Department of Anaesthesia & Intensive Care

Hospital Queen Elizabeth, Kota Kinabalu, Sabah

Dr Noreen Lynette Louis

Clinical Fellow

Department of Anaesthesiology and Intensive Care

Institut Jantung Negara, Kuala Lumpur

Dr Mohd Azizan Ghazali

Consultant Anaesthesiologist

Department of Anaesthesiology & Intensive Care

Hospital Putrajaya, Putrajaya

Dr Wong Gin Leong Justin

Consultant Anaesthesiologist & Senior Lecturer

Department of Anaesthesiology

Faculty of Medicine, Universiti Malaya, Kuala Lumpur

Dr Suki Bin Ismet

Anaesthesiologist & Lecturer

Department of Anaesthesiology & Intensive Care

School of Medical Sciences, Universiti Sains Malaysia, Kubang Kerian, Kelantan

Dr Afifah binti Samsudin

Anaesthesiologist & Lecturer

Department of Anaesthesiology & Intensive Care

Faculty of Medicine, UiTM Sungai Buloh Campus, Selangor

Dr Mohd Khazrul Nizar bin Abd Kader

Anaesthesiologist

Department of Anaesthesiology & Intensive Care

Hospital Canselor Tuanku Muhriz, Universiti Kebangsaan Malaysia, Selangor

Part I

Perioperative Management and Patient Safety

Future-Ready Anaesthesia: Negotiating the Intersection of Smart Technology, AI, and Clinical Decision Support

Wong Wai Kit¹

¹Senior Lecturer and Consultant Anaesthetist, Department of Anaesthesiology and Intensive Care, Faculty of Medicine and Health Science, Universiti Malaysia Sarawak (UNIMAS), Sarawak, Malaysia

KEY POINTS

- Artificial intelligence (AI) is increasingly integrated into perioperative and critical care medicine.
- AI should be viewed as a form of augmented intelligence that complements, rather than replaces, clinician expertise.
- Current applications span the entire perioperative continuum, including preoperative risk stratification, intraoperative haemodynamic prediction, automated drug delivery and critical care analytics.
- Despite promising results, AI systems require rigorous external validation, ongoing monitoring and careful assessment of generalizability across different patient populations.
- Challenges include algorithm bias, AI hallucinations, alert fatigue, workflow integration, cybersecurity concerns and medico-legal uncertainty.
- Most regulatory authorities continue to emphasise that AI systems should function as decision support tools, rather than autonomous decision makers.
- In Malaysia, cost remains one of the most significant challenges in the implementation of AI systems.
- Education and research represent two areas in which AI may profoundly reshape the future of anaesthesiology.
- Future-ready anaesthetists will require competencies in AI literacy, data interpretation and critical appraisal to ensure safe and effective implementation.

Keywords: Artificial Intelligence, Anaesthesia, Clinical Decision Support Systems, Machine Learning, Perioperative Medicine, Smart Technology, Future-Ready Healthcare

14.1 Introduction

The modern practice of anaesthesiology and critical care is experiencing a significant paradigm shift. As we embrace the theme of “Future-Ready Anaesthesia” for 2026, the focus has progressed beyond basic digitization of electronic health records (EHRs) and traditional monitoring. We are now entering the era of augmented intelligence. In environments characterized by large volumes of high-velocity physiological data, Artificial Intelligence (AI) and advanced Clinical Decision Support Systems (CDSS) are fundamentally transforming how we predict risk, deliver intraoperative care, and manage critical illness.

Within perioperative medicine and intensive care, AI applications now extend across the entire patient journey, from preoperative risk stratification to intraoperative drug titration and postoperative outcome prediction. These technologies constitute an essential part of a “future-ready” anaesthesia practice, enhancing clinician expertise while addressing the growing complexity of modern healthcare systems.

14.2 Understanding AI: Capabilities and Limitations

Artificial intelligence broadly encompasses computational systems capable of performing tasks that typically require human cognitive functions, including pattern recognition, prediction, and decision making. Machine learning (ML), a principal subset of AI, enables algorithms to identify patterns within large datasets and generate predictive models without predefined programming.[1] However, AI should never be viewed as a substitute for clinical judgement. Contemporary AI systems do not possess consciousness, empathy, intuition, moral reasoning, or independent decision making capabilities. Rather, they generate outputs based on patterns learned from training data. They cannot independently assume professional responsibility for patient care decisions.

AI systems are fundamentally dependent on the quality, completeness, and representativeness of the data used during development. Hence, inaccurate, incomplete, or biased datasets may result in unreliable predictions. Furthermore, generative AI systems may occasionally produce plausible but incorrect outputs, a phenomenon commonly referred to as “AI hallucination”. In healthcare, such errors have potential significant consequences and underscore the importance of maintaining human oversight in all AI-assisted clinical decision making.[2]

In anaesthesia, AI applications are commonly integrated into clinical decision support systems that analyse patient data in real time and provide recommendations, alerts, or predictions to support clinical judgement.

14.3 The Preoperative Paradigm: Precision Risk Stratification

Historically, preoperative assessment has relied on generalized scoring systems such as the ASA physical status classification. Although these tools are clinically foundational, they lack the precision of individualized care. Currently, machine learning (ML) algorithms leverage comprehensive electronic health records (EHRs), laboratory data, and physiological parameters to generate highly personalised risk stratifications.[3, 5]

Recent AI-based platforms, such as the MySurgeryRisk calculator, have demonstrated superior accuracy in predicting postoperative complications including acute kidney injury, delirium, and mortality, compared to traditional risk calculators. Despite being validated in a large multicentre cohort, it is unlikely that MySurgeryRisk will perform to the exact same degree in Malaysia without local recalibration, as the populations in the US or Europe (where the AI was largely developed) have different baseline risks for cardiorespiratory complications compared to Malaysia’s multi-ethnic demographic.[4] Deep learning and computer vision are revolutionizing airway assessment. Image-based AI that analyses ultrasound scans and facial phenotypes can now predict difficult intubation with remarkable accuracy, allowing clinicians to formulate proactive airway management strategies and facilitate resource allocation.[3, 6]

While thousands of AI and machine learning models boast excellent technical metrics, many fail to translate into tangible bedside benefits or are quickly abandoned by clinicians. Herein lies the problem of the AI chasm in medicine. The experience of the Epic Sepsis Model shows that AI systems are not infallible. Although designed to facilitate early sepsis detection, subsequent evaluations demonstrated lower than expected sensitivity and a substantial number of false positive alerts in real world clinical environments. Such findings highlight the importance of independent validation, continuous monitoring, and cautious interpretation of AI generated recommendations.[7]

14.4 Intraoperative Smart Technologies and Autonomous Care

In the operating room, AI applications are advancing from passive monitoring toward active predictive analytics and closed-loop systems.

- **Predictive Haemodynamics:** Traditional monitoring is reactive, with clinicians intervening only after a parameter breaches a threshold. Advanced ML algorithms, utilizing arterial waveform analysis (such as the Hypotension

Prediction Index), can now predict intraoperative hypotensive events up to 15 minutes in advance. This provides the anaesthetist with a crucial window for preventative intervention, thereby minimizing end organ hypoperfusion.[3, 6] However, the clinical impact of predictive monitoring remains an area of ongoing investigation. While several studies have demonstrated reductions in hypotension burden, evidence regarding improvements in major patient centred outcomes remains less definitive. Furthermore, concerns have been raised regarding alarm fatigue, false positive alerts and the need for clinicians to interpret algorithm generated predictions within broader clinical context.[8]

- Closed-Loop and Autonomous Systems:** The holy grail of “smart” anaesthesia is automated drug delivery. Closed-loop target-controlled infusion (TCI) systems that utilize continuous electroencephalogram (EEG) feedback are being refined to automatically titrate propofol and remifentanyl. By continuously interpreting the depth of anaesthesia through complex neural network analysis, these systems maintain hemodynamic stability and reduce the risk of accidental awareness or burst suppression, thereby optimizing both safety and medication use.[3] Despite these promising developments, fully autonomous anaesthesia remains unlikely in the foreseeable future. Anaesthetic management involves numerous contextual factors, including surgical complexity, patient preferences, ethical considerations and unexpected intraoperative events that cannot currently be managed reliably by automated systems alone. Contemporary expert opinion increasingly favours a model of supervised autonomy, in which clinicians remain actively involved in oversight and decision making.[9]

14.5 Critical Care: Predicting the Unpredictable

The intensive care unit (ICU) generates terabytes of data each day, representing a volume that is impossible for any human to synthesize in real time. In this context, AI excels as a continuous background processor.[6]

This is notably evident in sepsis management. Sepsis remains a leading cause of ICU mortality, primarily due to delayed recognition. State-of-the-art predictive models utilizing gradient boosting algorithms (such as XGBoost) can analyse subtle, multi-granular trends in vital signs and laboratory results to predict the onset of sepsis and septic shock hours before clinical symptoms appear. Additionally, unsupervised ML clustering is facilitating the classification of sepsis into distinct clinical phenotypes, guiding tailored resuscitation strategies for fluid administration and

vasopressor selection.[6, 10, 11, 12]

14.6 The Human-AI Synergy in Decision Support

Modern Clinical Decision Support Systems (CDSS) are designed to reduce, rather than increase, cognitive load. A notable limitation of early CDSS was “alert fatigue”, resulting from an overwhelming number of threshold-based alarms. Future-ready CDSS employ context-aware AI to filter irrelevant information, providing actionable and highly specific alerts. Whether recommending optimal sedation weaning protocols or cross-referencing patient comorbidities for precise drug dosing, these systems integrate seamlessly into clinical workflows.[13]

Anaesthetists frequently manage multiple data streams simultaneously. AI-assisted monitoring can reduce information overload and support more efficient decision making. In addition to that, clinical decision support tools can prompt clinicians to adhere to evidence based protocols, thereby improving consistency of care.

14.7 Implementation and Workforce Development

The successful integration of AI into routine practice depends not only on technology performance but also on clinical acceptance and workflow compatibility. AI tools often fail to blend seamlessly with existing, often old, hospital IT infrastructure. These may contribute to alert fatigue, increase workload, and disrupt established clinical processes. Implementation in routine practice remains limited by usability barriers, workflow misalignment, trust concerns, and financial and ethical constraints.[14]

Future-ready anaesthetists will therefore require competencies extending beyond traditional clinical skills, including data literacy, critical appraisal of AI outputs, and an understanding of algorithmic limitations. If junior anaesthetists become overly reliant on AI, there is a distinct risk that foundational clinical skills and independent troubleshooting capabilities may degrade. Training programmes must therefore evolve to teach not only how to use these systems, but how to safely override them. Positioning clinicians to be able to support AI integration into clinical care will require focused educational initiatives to provide clinicians with sufficient understanding of AI to propose and evaluate clinical AI applications to solve clinical needs. Collaborative initiatives by major academic institutions like UNIMAS, which include hosting the “AI Tools for Teaching, Research, and Productivity” workshop with Google for Education, have received widespread acclaim from clinicians alike as an excellent entry point into the world of AI.[14]

14.8 Challenges, Ethics, and the “Black Box”

Despite considerable potential, the transition to AI-integrated care presents significant challenges. Clinicians must approach these technologies with both enthusiasm and critical evaluation.

A primary barrier to clinical trust is the “black box” phenomenon, in which an algorithm provides a highly accurate prediction without explaining its reasoning. In critical care, where decisions are often life or death, interpretability is essential. As a result, the field is rapidly shifting toward XAI (Explainable AI), utilizing frameworks such as SHAP (Shapley Additive Explanations) to deliver transparent, biomarker-driven rationales for AI predictions.[3, 12]

We must navigate ethical considerations regarding algorithmic bias, often resulting from non-representative training data, and automation bias, in which a clinician may inappropriately defer to a machine’s judgment over their own clinical expertise.[6] Historically, clinical decision making has been the responsibility of healthcare professionals, with legal accountability resting primarily upon individual practitioners. The introduction of AI complicates this framework because recommendations may be generated by algorithms developed by third party vendors using proprietary methodologies that are not fully transparent to end users. Consequently, determining responsibility when adverse outcomes occur may become increasingly challenging. Another equally important question concerns situations in which clinicians choose not to follow AI recommendations and an adverse outcome subsequently occurs. As AI systems become widely adopted and evidence supporting their use accumulates, future medicolegal frameworks may need to address whether failure to utilise available decision support tools could itself constitute a deviation from accepted standards of care.

At present, most regulatory authorities continue to emphasise that AI systems should function as decision support tools rather than autonomous decision makers. Professional accountability therefore remains with the treating clinician, despite issues relating to the failure of AI software itself. The clinician must critically evaluate algorithm generated recommendations within the broader clinical context and exercise independent judgement when determining appropriate management.[15]

Especially in Malaysia, cost remains one of the most significant challenges. Implementation of AI systems requires not only substantial investment in digital infrastructure, data storage, and cybersecurity, but also a concerted effort to address the shortage of specialised technical expertise. Furthermore, ongoing maintenance and regular training for clinical staff add to the financial burden, potentially widening the gap in healthcare quality between higher and lower resourced institutions. This concept aligns closely with the

principles of value-based care. Something may be perfect, but if it costs hundreds or thousands more, we probably are not in a financial position to implement or to put in practice on a large scale as it does not bring value. These contextual factors highlight the need for tailored policy frameworks and strategic partnerships to ensure equitable and sustainable integration of AI across the Malaysian healthcare system. The question remains, do we have enough expertise in our country to produce similar technology, or will we have to spend millions to bring it in from overseas? Relying exclusively on expensive, imported platforms (which incur substantial ongoing maintenance and licensing costs) is financially unsustainable and risks widening the technological divide between well resourced urban centres and district hospitals.

14.9 AI in Education and Research

Although discussions surrounding AI frequently focus on clinical applications, its influence extends far beyond direct patient care. Education and research represent two areas in which AI may profoundly reshape the future of anaesthesiology.

Medical education has traditionally relied upon lectures, textbooks, bedside teaching and simulation based training. AI technologies now offer opportunities to personalise learning experiences and support competency based education. In anaesthesia, where the development of procedural expertise and situational awareness is critical, AI enhanced simulation may become an increasingly valuable educational tool. However, educators must also remain mindful of its potential limitations. Excessive reliance on AI generated content may risk reducing opportunities for independent critical thinking. Hence, AI should complement rather than replace traditional educational approaches.[16]

Research is another domain undergoing significant transformation through AI. In perioperative medicine, AI has been applied to outcomes based research, biomarker discovery, precision medicine and predictive modelling. Beyond healthcare analytics, AI is also accelerating pharmaceutical development. Drug discovery has traditionally been a lengthy and expensive process involving extensive laboratory experimentation. AI assisted approaches can rapidly screen large numbers of molecular candidates, identify promising therapeutic targets and optimise drug development pipelines.[17]

14.10 Conclusion

The future of anaesthesia is not one of machine replacement, but of a hybrid decision-making model. Rather than replacing clinicians, the future of AI in anaesthesia is increasingly conceptualised as

augmented intelligence, in which human expertise and machine learning capabilities complement each other. By delegating data synthesis and pattern recognition to smart technology, a future-ready anaesthetist is freed to focus on aspects that machines cannot replicate: clinical intuition, nuanced ethical judgment, and compassionate patient care. Those who can effectively integrate technological innovation with patient centred care will be best positioned to lead the next generation of perioperative medicine.

References

- [1] A. Thakkar, A. Gupta, and A. De Sousa. “Artificial intelligence in positive mental health: a narrative review”. In: *Frontiers in Digital Health* 6 (2024), p. 1280235. doi: 10.3389/fdgth.2024.1280235.
- [2] M. P. Singh and Y. N. Keche. “Ethical integration of artificial intelligence in healthcare: narrative review of global challenges and strategic solutions”. In: *Cureus* 17.5 (2025), e84804. doi: 10.7759/cureus.84804.
- [3] G. Duarte-Medrano et al. “Advancing a hybrid decision-making model in anesthesiology: applications of artificial intelligence in the perioperative setting”. In: *Healthcare (Basel)* 14.1 (2025), p. 97. doi: 10.3390/healthcare14010097.
- [4] Y. Ren, E. Adiyek, Z. Guan, et al. “MySurgeryRisk model predictions of postoperative complications and mortality”. In: *JAMA Surgery* (2026). Published online April 29, 2026. doi: 10.1001/jamasurg.2026.1112.
- [5] Y. Cao et al. “Artificial intelligence revolutionizing anesthesia management: advances and prospects in intelligent anesthesia technology”. In: *Frontiers in Medicine* 12 (2025), p. 1571725. doi: 10.3389/fmed.2025.1571725.
- [6] R. Giri, S. H. Firdhos, and T. A. Vida. “Artificial intelligence in anesthesia: enhancing precision, safety, and global access through data-driven systems”. In: *Journal of Clinical Medicine* 14.19 (2025), p. 6900. doi: 10.3390/jcm14196900.
- [7] A. Wong, E. Otles, J. P. Donnelly, et al. “External validation of a widely implemented proprietary sepsis prediction model in hospitalized patients”. In: *JAMA Internal Medicine* 181.8 (2021), pp. 1065–1070. doi: 10.1001/jamainternmed.2021.2626.
- [8] K. Maheshwari et al. “Hypotension prediction index for prevention of hypotension during moderate- to high-risk noncardiac surgery: a pilot randomized trial”. In: *Anesthesiology* 133.6 (2020), pp. 1214–1222. doi: 10.1097/ALN.0000000000003557.
- [9] H. J. Paiste et al. “Strengths-weaknesses-opportunities-t analysis of artificial intelligence in anesthesiology and perioperative medicine”. In: *Frontiers in Digital Health* 6 (2024), p. 1316931. doi: 10.3389/fdgth.2024.1316931.
- [10] T. Q. Oliveira et al. “Responsible AI for sepsis prediction: bridging the gap between machine learning performance and clinical trust”. In: *Journal of Clinical Medicine* 15.6 (2026), p. 2251. doi: 10.3390/jcm15062251.
- [11] J. Lee and J. H. Yoon. “Current perspectives on the artificial intelligence in critical care medicine”. In: *Anesthesiology Clinics* 43.3 (2025), pp. 507–525. doi: 10.1016/j.anclin.2025.05.005.
- [12] D. Kanzin et al. “Artificial intelligence in sepsis management: balancing survival gain and nurse workload”. In: *Advanced Research Journal* 13.1 (2025), pp. 57–76.
- [13] I. Jankovic and J. H. Chen. “Clinical decision support and implications for the clinician burnout crisis”. In: *Yearbook of Medical Informatics* 29.1 (2020), pp. 145–154. doi: 10.1055/s-0040-1701986.
- [14] L. Han et al. “Artificial intelligence in perioperative care: opportunities and challenges”. In: *Anesthesiology* 141.2 (2024), pp. 379–387. doi: 10.1097/ALN.0000000000005013.
- [15] Medical Protection Society. *Common medico-legal dilemmas healthcare professionals are facing with the use of AI*. London: MPS. 2024.
- [16] K. S. Chan and N. Zary. “Applications and challenges of implementing artificial intelligence in medical education: integrative review”. In: *JMIR Medical Education* 5.1 (2019), e13930. doi: 10.2196/13930.

- [17] D. Paul et al. “Artificial intelligence in drug discovery and development”. In: *Drug Discovery Today* 26.1 (2021), pp. 80–93. doi: 10.1016/j.drudis.2020.10.010.

Part IV

Sustainability in Anaesthesia and Intensive Care

