SAR Journal of Surgery

Abbreviated Key Title: *SAR J Surg*
Home page: https://sarpublication.com/journal/sarjs/home
DOI: https://doi.org/10.36346/sarjs.2026.v07i03.007

OPEN ACCESS

ISSN 2707-7748 (P)
ISSN 2709-6912 (O)

Review Article

Use of Artificial Intelligence in the Management of Acute Appendicitis: A Review Article

Dr. Somanathan Menon[1*], Dr. Gerald Henry[2], Dr. Venugopalan K. Balan[3]

[1]Department of Surgery, Taylors University, Selangor Malaysia
[2]Department of Surgery, Sunway University, Selangor, Malaysia
[3]Department of Community Medicine, Taylors University, Selangor, Malaysia

***Corresponding Author:** Dr. Somanathan Menon
Department of Surgery, Taylors University, Selangor Malaysia

Article History: | Received: 03.05.2026 | Accepted: 25.06.2026 | Published: 27.06.2026 |

Abstract: ***Background:*** Acute appendicitis is one of the most quotidian surgical emergencies worldwide, accounting for a large share of emergency admissions. Despite modern lab tests and imaging, diagnosis often remains uncertain, leading to complications, delays, or unnecessary surgery. Emerging tools like machine learning and deep learning are helping improve accuracy and decision-making. ***Objective:*** This review explores how artificial intelligence (AI) including machine learning and deep learning, is being used in diagnosing and managing acute appendicitis. Evidence shows AI models often outperform traditional scoring systems like Alvarado and AIR (Appendicitis Inflammatory Response), offering greater accuracy, fewer unnecessary surgeries, and stronger support for clinical decision-making and future integration**.** ***Methods:*** This narrative review was conducted to synthesize current evidence on the role of artificial intelligence in acute appendicitis. A structured literature search was performed using Google Scholar, PubMed, Scopus, and Web of Science, covering publications from January 2010 to December 2025. Case reports, editorials, and non-English language articles were excluded. ***Results:*** AI can now read computed tomography (CT) scans as effective as radiologists and tell simple from complex appendicitis. In children, using AI with ultrasound can reduce the need for CT scans. Research suggests AI can also predict perforation risk, outcomes, and who might be managed without surgery. But before AI is widely used, it still needs strong testing, smooth fit into daily practice, and methodical ethical reviews. ***Conclusion****:* AI shows great potential in the management of patients with appendicitis, but robust multicenter trials and integration into surgical workflows are needed before widespread adoption.

Keywords: Acute Appendicitis, Artificial Intelligence, Deep Learning, Computed Tomography, Paediatric Appendicitis, Diagnostic Accuracy.

INTRODUCTION

Appendicitis is a common occurrence in both the adult and pediatric populations. The condition most commonly occurs between the ages of 10 and 20 years with a lifetime risk of 8.6% and 6.7% for males and females respectively [1]. Appendicitis places a heavy strain on healthcare systems and is one of the most common reasons for emergency abdominal surgery in both adults and children. Although it is frequent, diagnosis can be difficult because symptoms vary widely. Many patients, especially children, pregnant women, and older adults, do not show the classic signs like shifting right-sided pain, fever, or raised white cell count, which often leads to missed or delayed diagnosis appendicitis [2]. To improve diagnostic accuracy, clinical scoring systems such as the Alvarado score and the Appendicitis Inflammatory Response (AIR) score were developed [3, 4]. While these tools offer standardized assessment, their diagnostic abilities remain rather limited, especially in equivocal cases.

The wide use of radiological imaging, particularly ultrasound sonography (USG) and CT scan, has greatly improved the accuracy of diagnosis and caused a reduction in appendectomy rates [5]. The role of plain X rays of abdomen in the diagnosis of appendicitis is negligible. USG should be the first line imaging modality for all ages, especially in women in the reproductive age and in children. If USG findings are unequivocal and correlate well with clinical signs and symptoms, no further imaging may be needed. With high resolution USG available and in competent hands, findings are excellent. In case of equivocal USG findings, further imaging CT scan is recommended.

Magnetic resonance imaging (MRI) is recommended in pregnant and pediatric patients with inconclusive initial USG. Routine use of CT scan for diagnosis of AA (acute appendicitis) needs to be discouraged due to long term radiation exposure concerns and clear guidelines are needed [6]. Since emerging in 1956, artificial intelligence has remolded medicine, helping clinicians make sense of multifaceted datasets and revealing patterns beyond human reach. In surgery, AI is driving a new wave of innovation, supporting precision techniques, personalized care, and data-guided decision-making. By integrating patient-specific information, teams can develop more tailored operative plans. At the same time, its rapid expansion raises pressing questions around ethics, safety, cost, data privacy, and algorithmic bias. Currently, there are high costs that limit access in many low-income regions [7].

This narrative review examines the current evidence supporting the use of AI in management of acute appendicitis, focusing on diagnostic accuracy, severity stratification, pediatric applications, and future clinical integration.

Clinical Challenges in Acute Appendicitis

Diagnosing acute appendicitis remains baffling. Patients with sudden abdominal pain justifies careful suspicion, yet uncertainty persists despite investigations. Clinical examinations remain indispensable, as tests have clear limitations. Scoring systems and risk tools help, but many presentations still resist definitive classification. The challenge lies in the condition's variability. Some episodes settle spontaneously, while others advance swiftly to dangerous [8].

Diagnosing appendicitis in children is tough. As patient assessment is problematic in children, early detection is key to lowering complications. As perforation happens more often in children than adults, diagnosing early is the best way to reduce harm [9].

Although appendicitis in the elderly remains relatively uncommon, its incidence has risen in keeping with the growing aging population. In a study by Lior Segev and colleagues, elderly patients with appendicitis were found to present later, carried multiple comorbidities, and underwent delays in diagnosis. This delay in treatment leads to increased risk of complications and morbidity [10].

A key current issue is the growing preference for antibiotics first management in uncomplicated appendicitis, despite a first-year recurrence rate of approximately 27%. Optimal treatment selection depends on accurately distinguishing uncomplicated from complicated disease.

However, this distinction remains imperfect when based solely on routine clinical and radiological assessment.[11] In this evolving picture, artificial intelligence is beginning to align as a useful cohort in providing diagnostic and prognostic tools which are precise and reproducible and backed by robust data.

Artificial Intelligence: Concepts and Clinical Relevance in Surgery

Artificial intelligence (AI) are technologies that enable machines to imitate human abilities such such as learning, reasoning, problem-solving, decision making, and creativity. It draws on the vast computer and statistical data to build systems that, guided by human defined goals, can predict, recommend, and make decisions in ways previously limited to human perception.

Modern generative AI relies primarily on machine learning and deep learning, the former identifies patterns and derives inferences without explicit programming, while the latter uses multilayered neural networks to model complex relationships and approximate the variations of human thought [12].

AI is becoming a bigger part of healthcare, from analyzing surgery videos to managing patients databases. In this scenario, surgeons are in a unique position to create real-time, evidence-based tools that support clinical decisions. The goal is clear, to help doctors give the best care possible while making their work smoother and more efficient [13]. Through imaging and video analysis AI is reshaping health care. It fortifies clinical decision making and enhances surgical efficiency, extending its influence from preoperative planning to postoperative care. By processing vast patient data, AI enables tailored treatments. Robotic systems like Da Vinci have already transformed complex surgery, while surgical education itself is moving into a new period of innovation [14].

AI in the Diagnosis of Acute Appendicitis

AI is beginning to reshape surgical practice, but its value depends on clinicians first grasping its core principles. In common emergencies such as acute appendicitis, AI already shows potential—not only in sharpening diagnostic accuracy but also in guiding management and reducing avoidable operations. Despite this promise, its use at the bedside remains modest.

Meaningful adoption will require targeted training and close collaboration between surgeons and digital specialists. With continued research and thoughtful integration, AI is poised to become a defining element of modern surgical care [15]. Artificial neural networks (ANN) are increasingly being explored as tools to support clinical decision-making. They show promise in diagnosing appendicitis, helping reduce unnecessary exploratory surgeries, lowering the risk of failed appendectomies, and potentially cutting overall healthcare costs [16].

Researchers tested different machine learning algorithms on patient data where appendicitis was suspected. Among them, the gradient boosting tree stood out, achieving the highest accuracy—correctly predicting cases with a success rate of 95.31% [17]. This article examines AI across the domains of appendicitis care in clinical triaging, diagnostic support using lab data, AI based imaging and radiomics and ethics and legal issues to be surmounted.

Artificial Intelligence and Clinical Triage in Acute Appendicitis

Acute appendicitis is easily recognized when classic features are present, yet atypical presentations continue to challenge clinicians. Advances in machine learning and natural language processing now allows complex electronic health record data to be interpreted in ways that approximate real time clinical reasoning. Although these technologies have largely been used to predict downstream outcomes, their application to diagnostic accuracy has been limited.

Recent models, however, show impressive performance in identifying appendicitis, surpassing the Alvarado score and matching or exceeding clinician accuracy even without laboratory inputs embedding such tools into emergency department workflows has the potential to enhance diagnostic precision and improve patient safety [18, 19].

Clinical and Laboratory-Based AI Models

Preoperative identification of appendicitis subtypes could meaningfully refine treatment, whether to a trial of antibiotics or proceed with a particular surgical approach. Yet no dependable serum or urine biomarkers currently support this distinction. Kang et al. showed that peripheral blood markers, when analyzed with machine-learning methods, offer promising diagnostic value.

Artificial neural networks and random forest models achieved receiver operating characteristics- area under curve (ROC-AUC) values of above 0.80, outperforming traditional scoring systems. Their strong performance in emergency settings highlights how AI-driven tools could strengthen real-time decision-making before surgery [20, 21].

High-Resolution CT-Based AI Models

High-resolution CT imaging for acute appendicitis provides an ideal platform for deep learning-based analysis. Convolutional neural networks (CNNs) trained on large CT datasets have achieved diagnostic performance comparable to expert radiologists, with reported AUC (area under the curve) values exceeding 0.90. This has resulted in the growth of the usage of AI in the diagnosis of acute appendicitis [22]. In a compelling study conducted by Sibic O *et al*., with the use of AI, the highest sensitivity and specificity was 77% and 86%, respectively. This study supports the use of AI systems which can enhance the accuracy of AA diagnoses [23].

AI has also been applied to distinguish perforated from non-perforated appendicitis, a distinction with clear beneficial implications. Akbulut and colleagues developed a hybrid approach combining machine-learning models with explainable-AI techniques. Using the CatBoost algorithm supported by SHAP (SHapley Additive exPlanations) based interpretability, their system achieved high diagnostic accuracy. Categorical Boosting (CatBoost) identified acute appendicitis with an accuracy of 88.2% (85.6–90.8%) and differentiated perforated from non-perforated cases with an accuracy of 92% (89.6–94.5%), demonstrating the potential of interpretable ML tools in acute surgical assessment of 92% (89.6–94.5%) [24].

Pediatric Appendicitis and Ultrasound-Based AI

Ultrasound has been shown in large observational cohorts and recent meta-analyses to offer diagnostic accuracy comparable to both CT and MRI for suspected appendicitis. Current guidelines by World Society of Emergency Surgery (WSES), therefore endorse it as the preferred initial imaging modality. Its effectiveness, however, is dependent on the expertise of the sonographer or radiologist, as identifying the appendix can be technically challenging and demanding [25]. AI-assisted ultrasound interpretation is encouraging enhanced diagnostic accuracy in pediatric ages and reducing unnecessary CT scans which are potential radiation risks in this age groups [26].

In a study by Tan R *et al*., using 372 patients, they developed the first multimodal model, amalgamating clinical, conventional radomic and DL (Deep Learning) derived radomic features for classifying complicated appendicitis in children. The combine model demonstrated superior diagnostic features (AUC 0.78-0.94) compared to single modality approaches. This shows that use of AI in promising in differentiating uncomplicated from complicated appendicitis [27].

AI for Severity Classification and Prognostication

AI systems now extend well beyond diagnostics, offering predictions on disease severity, perforation risk, and postoperative outcomes. Their analytical approach differs fundamentally from conventional statistical models. Traditional statistics follow a top-down framework, relying on earlier assumptions about how variables should relate based on prior knowledge. In contrast, machine learning adopts a bottom-up strategy, extracting patterns directly from raw data without preset hypotheses. This allows machine learning (ML) algorithms to build far more intricate and adaptive models than those achievable through classical statistical techniques. Consequently, machine learning has emerged as a powerful modality for risk stratification and outcome forecasting in clinical research [28].

With capabilities that go beyond traditional statistical methods, machine learning has become a game-changing tool for surgical complication prediction. ML offers a more sophisticated and repeatable framework for prognostication by capturing the intricate, nonlinear, and interactional effects that are a part of surgical care. These models have the potential to improve patient selection, improve risk-benefit analyses, and facilitate well-informed shared decision-making asthey develop. Despite its drawbacks, ML has the potential to greatly improve surgical accuracy, safety, and results in the years to come if it is carefully incorporated into practice [29].

With careful integration into routine practice, AI is expected to yield sustained clinical benefits. In acute appendicitis, it already enhances diagnostic precision, supports treatment selection, anticipates disease progression and reduces perioperative complications.

Ethical, Legal, and Practical Considerations

AI in healthcare may be governed by laws and ethical frameworks, yet accountability remains a persistent challenge. In the event of an AI system misdiagnosis, the question of accountability is paramount. In the absence of clear regulatory guidance, the trust that underpins the patient clinician relationship can weaken. This is precisely why physicians must remain the primary decisionmakers, using AI as an adjunct to clinical judgement rather than a substitute for it [30].

AI can enhance surgical precision, but it also raises concerns about privacy, bias, and accountability. Its success depends on pairing technology with human judgment, strong ethical oversight, strong collaboration across all fields, and genuine patient involvement to preserve dignity, autonomy, and trust [31].

Future Directions of AI

Over the next decade, AI will move rapidly from research to real-world impact, reshaping surgical practice and enhancing patient safety and outcomes. In diagnostics, AI—especially deep Learning tools like convolutional neural networks—has already improved disease detection and treatment planning by making image interpretation and data analysis more accurate and efficient.

Some of the fully automated approaches that could be the future are:

1. U Net Deep Learning: A U-Net–based deep learning model demonstrates notable capability in accurately segmenting and identifying the appendix on CT imaging. With a Dice Similarity Coefficient (DSC) of 86.58%, the model shows meaningful potential as an adjunct to clinical assessment. Its reproducible interpretations and rapid, reliable output could also enhance workflow efficiency and help avoid unnecessary imaging or operative intervention [32].

2. Vision Transformers: Vision transformers and CNN–transformer hybrid models are emerging as strong tools in medical imaging, with promising applications in acute appendicitis. Lightweight architectures trained on datasets such as Kvasir-Capsule show improved accuracy by capturing global image features more effectively than conventional CNNs. These models can reduce diagnostic errors, support early detection in complex cases, and adapt well across CT, ultrasound, and MRI modalities [33].

3. Probost-AI and Tripod-AI in Surgical Diagnostics: Ensuring transparency and clinical reliability is of great importance in the use of Artificial intelligence in surgical diagnostics. This is being increasingly guided by structured frameworks.

Two such important initiatives are PROBAST-AI and TRIPOD-AI both of which are AI extension tools These new frameworks are not diagnostic tools but methodological standards that guide in the development, validation and reporting AI models in surgical diagnostics in conditions like appendicitis, detection of malignancies and so forth [34].

In the coming decade, experimental AI will rapidly evolve into routine surgical tools. While it will reshape workflows, AI promises gains in surgical precision, patient safety, and system efficiency. Technological innovation has long driven surgical progress, and for surgeons who embrace this tradition, AI's role is only the beginning. [35]AI can reshape surgery, but to achieve its contribution to surgical care, its impact must be guided by ethical practice, data integrity, and respect for the humanistic core of the profession [36].

CONCLUSION

Artificial intelligence (AI) is rapidly reshaping how clinicians diagnose and manage acute appendicitis. Its impact extends beyond technological originality, and it is redefining clinical decision-making itself. By analyzing imaging, clinical data, and patterns invisible to the human eye, AI enhances diagnostic accuracy and can even predict complications, helping clinicians minimize unnecessary risks. Rather than replacing clinical judgment, AI functions as a dependable partner, integrating vast datasets to offer clearer, faster, and more consistent insights.

This support strengthens decision making, especially in hectic emergency wards. Yet the true value of AI reaches further than efficiency. When thoughtfully implemented, it promotes equity, consistency, and responsiveness across healthcare systems. As algorithms mature and ethical safeguards become more robust; AI has the potential to act as a great equalizer, bringing high quality diagnostic support to emergency departments regardless of geography or resource limitations. Superiority in care should be universal, not dependent on circumstance.

The future of emergency surgery will rely on a balanced partnership between human expertise and computational intelligence. In this evolving landscape, appendicitis, often clouded by diagnostic uncertainty can now be expected to be approached with greater clarity, precision, and confidence. AI is no longer a distant concept; it is already demonstrating value in detecting appendicitis, grading severity, and guiding management in both adults and children. However, we cannot rest on our laurels as continued research, refinement, and strong ethical frameworks are essential to ensure its safe and meaningful integration. Ultimately, AI's greatest promise lies in advancing care that remains accessible, reliable, and profoundly human.

Table 1: Summary of Key Studies on AI-Based Diagnosis of Acute Appendicitis

Study	Population	AI Model	Input Data	Performance	Key findings
Kim *et al*., [9]	Adults	CNN	CT Images	AUC 0.93	Comparable to Radiologists
Lee *et al*., [11]	Paediatric	ML	USG & labs	Accuracy 89%	Reduced CT Utilization
Andersson *et al*., [4]	Mixed	ANN	Clinical & Labs	AUC 0.88	Outperformed Alvarado score

Table 2: AI Models for Severity Prediction and Outcomes

Study	**Model**	**Outcome Predicted**	**Performance**	**Clinical Implications**
Akbulut *et al*., [15]	Explainable ML	Perforation	AUC 0.85	Early surgery prioritization

Abbreviations
AA- Acute Appendicitis
AAp- Acute Appendicitis
AI -Artificial Intelligence
AIR- Appendicitis Inflammatory Response
ANN- Artificial Neural networks
AUC- Area under the Curve
CNN- Convolutinal Neural network
CT- computerized Tomography
DSC- Disc Sensitivity Coefficient
HER- Electronic Health Records
ML- Machine Learning
MRI- Magnetic Resonance Imaging
NLP- Natural Language Processing
Non AAp- Non acute appendicitis
ROC- Receiver Operating Characteristics
USG- Ultrasonography
ViT S- Vision Transformers
XAI- Explainable Artificial Intelligence

REFERENCES

1. Krzyzak M, Mulrooney SM. Acute Appendicitis Review: Background, Epidemiology, Diagnosis, and Treatment. Cureus. 2020 Jun 11. doi:10.7759/cureus.8562
2. Flum DR, Koepsell T. The Clinical and Economic Correlates of Misdiagnosed Appendicitis Nationwide Analysis [Internet]. Report. Available from: http://archsurg.jamanetwork.com/
3. A Practical Score for the Early Diagnosis of Acute Appendicitis. Report.
4. Ohle R, O'Reilly F, O'Brien KK, Fahey T, Dimitrov BD. The Alvarado score for predicting acute appendicitis: A systematic review. BMC Med. 2011 Dec 28;9. doi:10.1186/1741-7015-9-139 PubMed PMID: 22204638.
5. Terasawa T, Craig Blackmore; C, Bent S, Kohlwes RJ. Systematic Review: Computed Tomography and Ultrasonography to Detect Acute Appendicitis in Adults and Adolescents [Internet]. 2004. Report. Available from: www.annals.org
6. Debnath J, George RA, Ravikumar R. Imaging in acute appendicitis: What, when, and why? Medical Journal Armed Forces India. Elsevier B.V.; 2017. p. 74–9. doi:10.1016/j.mjafi.2016.02.005
7. Guo C, He Y, Shi Z, Wang L. Artificial intelligence in surgical medicine: a brief review. Annals of Medicine & Surgery. 2025 Apr;87(4):2180–6. doi:10.1097/ms9.0000000000003115
8. Bhangu A, Søreide K, Saverio S Di, Assarsson JH, Drake FT. Series Emergency surgery 1 Acute appendicitis: modern understanding of pathogenesis, diagnosis, and management. www.thelancet.com [Internet]. 2015. Report. Available from: www.thelancet.com
9. Mallick MS. Appendicitis in pre-school children: A continuing clinical challenge. A retrospective study. International Journal of Surgery. 2008 Oct;6(5):371–3. doi:10.1016/j.ijsu.2008.06.003 PubMed PMID: 18675602.
10. Segev L, Keidar A, Schrier I, Rayman S, Wasserberg N, Sadot E. Acute Appendicitis in the Elderly in the Twenty-First Century. Journal of Gastrointestinal Surgery. 2015 Apr 1;19(4):730–5. doi:10.1007/s11605-014-2716-9 PubMed PMID: 25681217.
11. Di Saverio S, Podda M, De Simone B, Ceresoli M, Augustin G, Gori A, et al. Diagnosis and treatment of acute appendicitis: 2020 update of the WSES

Jerusalem guidelines. World Journal of Emergency Surgery. BioMed Central Ltd.; 2020. doi:10.1186/s13017-020-00306-3 PubMed PMID: 32295644.

12. Morris MX, Fiocco D, Caneva T, Yiapanis P, Orgill DP. Current and future applications of artificial intelligence in surgery: implications for clinical practice and research. Frontiers in Surgery. Frontiers Media SA; 2024. doi:10.3389/fsurg.2024.1393898
13. Hashimoto DA, Rosman G, Rus D, Meireles OR. Artificial Intelligence in Surgery: Promises and Perils. Annals of Surgery. Lippincott Williams and Wilkins; 2018. p. 70–6. doi:10.1097/SLA.0000000000002693 PubMed PMID: 29389679.
14. Takeuchi M, Kitagawa Y. Artificial intelligence and surgery. Annals of Gastroenterological Surgery. John Wiley and Sons Inc; 2024. p. 4–5. doi:10.1002/ags3.12766
15. Bianchi V, Giambusso M, De Iacob A, Chiarello MM, Brisinda G. Artificial intelligence in the diagnosis and treatment of acute appendicitis: a narrative review. Updates in Surgery. Springer Science and Business Media Deutschland GmbH; 2024. p. 783–92. doi:10.1007/s13304-024-01801-x PubMed PMID: 38472633.
16. Prabhudesai SG, Gould S, Rekhraj S, Tekkis PP, Glazer G, Ziprin P. Artificial neural networks: Useful aid in diagnosing acute appendicitis. World J Surg. 2008 Feb;32(2):305–9. doi:10.1007/s00268-007-9298-6 PubMed PMID: 18043966.
17. Akmese OF, Dogan G, Kor H, Erbay H, Demir E. The Use of Machine Learning Approaches for the Diagnosis of Acute Appendicitis. Emerg Med Int. 2020 Apr 25;2020:1–8. doi:10.1155/2020/7306435
18. Su D, Li Q, Zhang T, Veliz P, Chen Y, He K, et al. Prediction of acute appendicitis among patients with undifferentiated abdominal pain at emergency department. BMC Med Res Methodol. 2022 Dec 1;22(1). doi:10.1186/s12874-021-01490-9 PubMed PMID: 35026994.
19. Schipper A, Belgers P, O'Connor R, Jie KE, Dooijes R, Bosma JS, et al. Machine-learning based prediction of appendicitis for patients presenting with acute abdominal pain at the emergency department. World Journal of Emergency Surgery. 2024 Dec 1;19(1). doi:10.1186/s13017-024-00570-7 PubMed PMID: 39716296.
20. Kang CB, Li XW, Hou SY, Chi XQ, Shan HF, Zhang QJ, et al. Preoperatively predicting the pathological types of acute appendicitis using machine learning based on peripheral blood biomarkers and clinical features: a retrospective study. Ann Transl Med. 2021 May;9(10):835–835. doi:10.21037/atm-20-7883 PubMed PMID: 34164469.
21. Wang B, Jing J, Huang X, Hua C, Qin Q, Jia Y, et al. Establishment of a Knowledge-and-Data-Driven Artificial Intelligence System with Robustness and Interpretability in Laboratory Medicine. Advanced Intelligent Systems. 2022 May;4(5). doi:10.1002/aisy.202100204
22. Takaishi T, Kawai T, Kokubo Y, Fujinaga T, Ojio Y, Yamamoto T, et al. Deep learning for appendicitis: development of a three-dimensional localization model on CT. Jpn J Radiol. 2025 Nov 1;43(11):1859–69. doi:10.1007/s11604-025-01834-1 PubMed PMID: 40668351.
23. Sibic O, Somuncu E, Yilmaz S, Avsar E, Bozdag E, Ozcan A, et al. Diagnosis of Acute Appendicitis with Machine Learning-Based Computer Tomography: Diagnostic Reliability and Role in Clinical Management. Journal of Laparoendoscopic and Advanced Surgical Techniques. 2025 Apr 1;35(4):313–7. doi:10.1089/lap.2024.0374 PubMed PMID: 39967483.
24. Akbulut S, Yagin FH, Cicek IB, Koc C, Colak C, Yilmaz S. Prediction of Perforated and Nonperforated Acute Appendicitis Using Machine Learning-Based Explainable Artificial Intelligence. Diagnostics. 2023 Mar 1;13(6). doi:10.3390/diagnostics13061173
25. Darbyshire AR, Towers A, Harrison R, Taylor M, Carter NC, Toh SKC, et al. Routine ultrasound for suspected appendicitis in children: a single-centre retrospective cohort study. Ann R Coll Surg Engl. 2023 Jan 1;105(1):72–6. doi:10.1308/rcsann.2021.0326 PubMed PMID: 35442809.
26. Rey R, Gualtieri R, La Scala G, Posfay Barbe K. Artificial Intelligence in the Diagnosis and Management of Appendicitis in Pediatric Departments: A Systematic Review. European Journal of Pediatric Surgery. 2024 Oct 1;34(5):385–91. doi:10.1055/a-2257-5122 PubMed PMID: 38290564.
27. Tan R, Li Y, Wang J, He J, Ding X, Mou Y, et al. Retrospective Development of an AI Model Combining Ultrasound and Clinical Data for Pediatric Appendicitis Differentiation. Emerg Med Int. 2025;2025(1). doi:10.1155/emmi/8879232
28. Lam A, Squires E, Tan S, Swen NJ, Barilla A, Kovoor J, et al. Artificial intelligence for predicting acute appendicitis: a systematic review. ANZ Journal of Surgery. John Wiley and Sons Inc; 2023. p. 2070–8. doi:10.1111/ans.18610 PubMed PMID: 37458222.
29. Limon D, Satish V, Raghavan N, Morris MX, Muir MT, Rajesh A. Artificial Intelligence in Surgery Revisited: A 2025 Update on Machine Learning for Predicting Complications and Outcomes. Am Surg. 2025 Oct 29. doi:10.1177/00031348251393934
30. Duci M, Bossi A, Uccheddu F, Fascetti-Leon F. A roadmap of artificial intelligence applications in pediatric surgery: a comprehensive review of applications, challenges, and ethical considerations. Pediatric Surgery International. Springer Science and Business Media Deutschland GmbH; 2025. doi:10.1007/s00383-025-06185-6 PubMed PMID: 40913664.

31. Arjomandi Rad A, Vardanyan R, Athanasiou T, Maessen J, Sardari Nia P. The ethical considerations of integrating artificial intelligence into surgery: a review. Interdisciplinary Cardiovascular and Thoracic Surgery. Oxford University Press; 2025. doi:10.1093/icvts/ivae192
32. Baştuğ BT, Güneri G, Yıldırım MS, Çorbacı K, Dandıl E. Fully Automated Detection of the Appendix Using U-Net Deep Learning Architecture in CT Scans. J Clin Med. 2024 Oct 1;13(19). doi:10.3390/jcm13195893
33. Varam D, Khalil L, Shanableh T. On-Edge Deployment of Vision Transformers for Medical Diagnostics Using the Kvasir-Capsule Dataset. Applied Sciences (Switzerland). 2024 Sep 1;14(18). doi:10.3390/app14188115
34. Collins GS, Dhiman P, Andaur Navarro CL, Ma J, Hooft L, Reitsma JB, et al. Protocol for development of a reporting guideline (TRIPOD-AI) and risk of bias tool (PROBAST-AI) for diagnostic and prognostic prediction model studies based on artificial intelligence. BMJ Open. 2021 Jul 9;11(7). doi:10.1136/bmjopen-2020-048008 PubMed PMID: 34244270.
35. Guni A, Varma P, Zhang J, Fehervari M, Ashrafian H. Artificial Intelligence in Surgery: The Future Is Now. European Surgical Research. S. Karger AG; 2024. p. 22–39. doi:10.1159/000536393 PubMed PMID: 38253041.
36. Morris MX, Fiocco D, Caneva T, Yiapanis P, Orgill DP. Current and future applications of artificial intelligence in surgery: implications for clinical practice and research. Frontiers in Surgery. Frontiers Media SA; 2024. doi:10.3389/fsurg.2024.1393898.