

Iranian Pediatric Surgery and Big Data in The Era of Artificial Intelligence

Manoochehr Ebrahimian¹ 

¹ Pediatric Surgery Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran

***Address for Corresponder:** Dr Manoochehr Ebrahimian, Pediatric Surgery Research Center, Research Institute for Children's Health, Shahid Beheshti University of Medical Sciences, Tehran, Iran (email: manoochehrebahimian@gmail.com)

How to cite this article:

Ebrahimian M. Iranian pediatric surgery and big data in the era of artificial intelligence. Iranian Journal of Pediatric Surgery 2023; 10 (1):10 - 12.

DOI: <https://doi.org/10.22037/irjps.v10i1.44196>

Dear Editor-In-Chief

Despite the widespread implementation of Artificial Intelligence (AI) in the medical field over the past few decades, its application has largely been confined to specific areas such as designing nomograms, predicting risks, and image processing until recent years.¹⁻² However, the emergence of Large Language Models (LLMs) and sophisticated neural networks has ushered in a transformative era in natural language processing. Notably, the

introduction of Generative Pre-trained Transformers (GPTs) has marked a significant breakthrough across various scientific disciplines, particularly in social and medical sciences.³ LLMs demonstrate the capability to generate responses that are relatively accurate when prompted. Within the medical field, GPTs have found application in various areas, including diagnostic evaluation, decision-making processes, prognosis estimation, and even

scholarly writing.⁴ In addition to the remarkable strides made in AI, achieving a reliable predictive capability poses a significant challenge. Each AI model employs its unique learning algorithm, necessitating researchers to conduct thorough training for optimal outcomes. Whether through supervised or unsupervised training methods, the sorting of extensive information, commonly referred to as big data, is crucial for deep learning. Regrettably, the medical field, particularly in surgery, grapples with a significant challenge – the scarcity of big data. The primary sources of big data in surgical practice are often confined to confidential and incomplete databases held by insurance companies. Consequently, many surgical centers worldwide are actively developing integrated data collection systems to cultivate a comprehensive form of big

data. Notably, there has been a substantial increase in large-data studies within surgical practice over the past decade, especially in low- and middle-income countries.⁵ On the contrary, establishing an integrated big data system in the pediatric surgery field poses a considerable challenge due to its nature as a subspecialty. Unfortunately, there appears to be a neglect of big data collection in the surgical domain in Iran, and there is a noticeable absence of reliable large-data-based studies in recent times. In light of these observations, it is recommended to consider the establishment of an international or countywide big data infrastructure. Such a system would facilitate the training of advanced models, addressing the current gap in comprehensive data collection within the surgical field.

References

1. Kaul V, Enslin S, Gross SA: History of artificial intelligence in medicine. *Gastrointestinal endoscopy*. 2020;92(4):807-12.
2. Healy DA, Murphy SP, Burke JP, et al: Artificial interfaces (“AI”) in surgery: historic development, current status and program implementation in the public health sector. *Surgical oncology*. 2013;22(2):77-85.
3. Wilcox EG, Gauthier J, Hu J, et al: On the predictive power of neural language models for human real-time comprehension behavior. *arXiv preprint arXiv:200601912*. 2020.
4. Ebrahimian M, Behnam B, Ghayebi N, et al: ChatGPT in Iranian medical licensing examination: evaluating the diagnostic accuracy and decision-making capabilities of an AI-based model. *BMJ Health Care Inform*. 2023;30(1).
5. Knight SR, Ots R, Maimbo M, et al: Systematic review of the use of big data to improve surgery in low- and middle-income countries. *British Journal of Surgery*. 2019;106(2):e62-e72.