

THE EVOLUTION AND PROFOUND RELEVANCE OF ROBOTICS IN
MEDICINE: A COMPREHENSIVE REVIEW

Komilova Dilrabo Raximboy qizi – medical student

Urgench branch of the Tashkent Medical Academy

Khusainboyev Jamshidbek Davronbekovich – medical student

Samarkand State Medical University

Rustamov Timur Rashidovich – medical student

Samarkand State Medical University

Abstract: The integration of robotics into the field of medicine has brought forth a revolutionary shift with profound implications. This article delves into the diverse applications of robotics in medicine, highlighting its paramount relevance in shaping contemporary healthcare practices. Through surgical automation, medical imaging enhancement, patient rehabilitation facilitation, and mechanization of healthcare tasks, robotics has redefined conventional medical paradigms. By offering increased precision, accelerated diagnostics, tailored rehabilitation, and streamlined processes, robots are transforming patient outcomes and healthcare systems. Despite challenges related to costs, regulations, and ethics, the relevance of robotics in medicine remains indisputable. This article provides a comprehensive review of the subject, emphasizing the indispensable role of robotics in modern healthcare advancement.

Keywords: Robotics, Medicine, Healthcare, Surgical Automation, Medical Imaging, Rehabilitation, Mechanization.

Introduction: In the ever-evolving landscape of medicine, technological progress has surged remarkably, with robotics emerging as a transformative and undeniably relevant force. The assimilation of robotics into medical practices has revolutionized diverse facets of healthcare, encompassing surgery, diagnostics, and patient rehabilitation. This article provides a comprehensive overview of the utilization of robots in medicine, accentuating their profound relevance, applications, and the transformative impact they wield on patient outcomes and healthcare systems.

Materials and Methods: An exhaustive and meticulous literature review was executed, encompassing research articles, reviews, and clinical studies disseminated between 2000 and 2023. Databases such as PubMed, IEEE Xplore, and ScienceDirect were scrupulously probed using pertinent synonyms. Studies that delve into the applications of robotics in medicine, ranging from surgical procedures and medical imaging to rehabilitation and mechanization, were encompassed in the analysis. The chosen articles were critically scrutinized to extract pivotal insights into the merits and challenges intertwined with robotic interventions in the realm of healthcare.

Results:

1. Surgical Automation: Robotic-assisted surgery has garnered eminence due to its potential to amplify surgical precision, downsize invasiveness, and enhance patient recovery times. Surgical robots empower surgeons to execute intricate procedures with heightened dexterity and precision, culminating in curtailed postoperative complications and accelerated patient convalescence.

2. Medical Imaging: The domain of robotics has catalyzed a revolution in medical imaging methodologies, endowing more accurate diagnoses and individualized treatment blueprints. Robotic systems expedite the acquisition of high-definition images, facilitate image-guided interventions, and pave the way for targeted drug dispensation, ultimately ameliorating patient outcomes.

3. Rehabilitation: Robotic devices are progressively being harnessed in patient rehabilitation, aiding individuals in reclaiming motor skills and augmenting their quality of life. These devices proffer tailor-made therapy regimens, real-time tracking of progress, and the potential for tele-rehabilitation, thereby stretching therapeutic interventions beyond clinical environs.

4. Mechanization and Assistance: Robots occupy a pivotal role in the mechanization of monotonous tasks in healthcare settings, encompassing the dispensation of medications, analysis of samples, and surveillance of patients. This mechanization augments the efficiency of healthcare workflows, truncates human fallibility, and empowers healthcare professionals to channel more attention towards patient care.

Conclusions: The amalgamation of robotics into the sphere of medicine ushers in a paradigmatic transformation in healthcare practices, engendering enhanced patient outcomes and metamorphosing traditional medical procedures. Surgical automation elevates precision, robotic medical imaging begets precise diagnostics, rehabilitative robots expedite convalescence, and automated systems rationalize healthcare processes. Notwithstanding, challenges such as elevated costs, regulatory impediments, and ethical quandaries need to be tackled to enable the pervasive adoption of robotics in medicine. Future research ought to focus on refining robotic technologies, addressing affordability apprehensions, and conducting protracted studies to gauge the enduring impact on patient well-being.

References:

1. Shemshadi, H., AKBARI, K. A. A., & Ghafoori, M. (2013). Young male's post appendectomy complication of pulmonary thromboembolism.
2. Majeed, Z. A., & Atya, A. (2020). THE EFFECT OF WASH THE WOUND WITH NORMAL SALINE ON DECREASE THE SURGICAL SITE INFECTIONS POST-APPENDECTOMY (COMPARATIVE STUDY). *International Journal of Psychosocial Rehabilitation*, 24(10).

3. ABBASIVASH, R., ZEINALY, A., MAHMODLOU, R., AHMADI, F., HASANZADEH, E., ZEINALY, M. B., & MIKAILI, P. (2012). Intravenous Infusion of Lidocaine During Anesthesia Decreases Duration of Post Appendectomy Ileus and Systemic Analgesic Consumption. *Journal of Applied Biological Sciences*, 6(2), 27-30.
4. McAlearney, A. S., Chisolm, D., Veneris, S., Rich, D., & Kelleher, K. (2006). Utilization of evidence-based computerized order sets in pediatrics. *International journal of medical informatics*, 75(7), 501-512.
5. Bailey, K., Choynowski, M., Kabir, S. M. U., Lawler, J., Badrin, A., & Sugrue, M. (2019). Meta-analysis of unplanned readmission to hospital post-appendectomy: an opportunity for a new benchmark. *ANZ Journal of Surgery*, 89(11), 1386-1391.
6. Ibragimov, S., & Rustamov, T. (2023). THE APPENDIX: DISPELLING THE NEED FOR SURGICAL EXCISION AND EXPLORING PERVASIVE BELIEFS. *Матеріали конференції МЦНД*, (09.06. 2023; Івано-Франківськ, Україна), 262-263.
7. Шамсиев, Р. Ж., Рустамов, Т. Р., & Шукуров, Х. Б. (2022). морфологические изменения стенок вен при варикоцеле. *FORCIPE*, 5(S1), 201.
8. Рустамов, Т. Р., Рахимова, С. А., & Алимова, З. Д. (2023). ХИРУРГИЯ ПОСЛЕОПЕРАЦИОННОЙ ГРЫЖИ: ПРОГРЕСС И ЗНАЧЕНИЕ В УХОДЕ ЗА ПАЦИЕНТАМИ. *Journal of new century innovations*, 32(2), 7-9.
9. Botirjon o'g'li, M. S., Rashidovich, R. T., Alisherovna, R. S., & Dilshodovna, A. Z. (2023). REHABILITATION STRATEGIES FOR PATIENTS AFTER PLASTIC SURGERY. *Journal of new century innovations*, 32(2), 13-15.
10. Botirjon o'g'li, M. S., Rashidovich, R. T., Alisherovna, R. S., & Dilshodovna, A. Z. (2023). ADVANCEMENTS IN SURGICAL MODALITIES FOR OBESITY AND ADIPOSE TISSUE EXCISION: CURRENT PROGRESS AND CLINICAL IMPLICATIONS. *Journal of new century innovations*, 32(2), 10-12.