



RESEARCH ARTICLE

Article DOI: 10.21474/JNHM01/146
DOI URL: <http://dx.doi.org/10.21474/JNHM01/146>

EXPLORING THE FUTURE OF ROBOTIC TECHNOLOGY IN HEALTHCARE: IMPROVING SURGICAL CARE AND MEDICAL TREATMENT

Sara Khan, Daniel Williams and Ahmed Noor

Manuscript Info

Manuscript History

Received: 26 December 2025
Accepted: 30 January 2026
Published: February 2026

Key words:-

Medical Robotics, Healthcare
Technology, Robotic Surgery,
Innovation, Patient Care

Abstract

Robotic technology has become an important advancement in modern healthcare, providing new possibilities for improving medical procedures and patient outcomes. Robotic systems are increasingly used in surgery, rehabilitation, diagnosis, and patient care. These technologies support healthcare professionals by increasing accuracy, reducing complications, and improving treatment efficiency. This paper explores the role of robotic technology in healthcare, its applications, benefits, challenges, and future potential. Although medical robotics offers many advantages, issues related to cost, training, and ethical concerns must be considered. With continuous research and development, robotic healthcare systems may become a significant part of future medical practice.

"© 2026 by the Author(s). Published by JNHM under CC BY 4.0. Unrestricted use allowed with credit to the author."

Introduction:-

Technology has greatly changed the field of medicine by introducing advanced methods for diagnosis and treatment. Among these innovations, robotic technology has become one of the most promising developments in healthcare. Medical robots are designed to assist doctors and healthcare workers in performing complex tasks with greater precision and control. These systems do not replace medical professionals but provide support to improve the quality of healthcare services. The use of robotics in medicine has expanded from surgical procedures to rehabilitation, patient assistance, and medical research.

Robotic Surgery in Modern Medicine:-

Robotic surgery is one of the most recognized applications of medical robotics. Robotic surgical systems allow surgeons to perform operations with improved accuracy and flexibility. These systems provide enhanced visualization and precise movements, which can be especially useful during complex procedures. Robotic-assisted surgery may reduce recovery time and minimize complications for patients.

Role of Robots in Rehabilitation:-

Robotic technology is also used in physical rehabilitation. Patients recovering from injuries, strokes, or neurological conditions may benefit from robotic-assisted therapy. Rehabilitation robots help patients perform controlled movements and support the recovery of physical abilities.

Robotics in Patient Care:-

Robots are increasingly being explored for supporting patient care activities.

Healthcare robots may assist with tasks such as patient monitoring, medication reminders, and communication support. These technologies can help reduce workload on healthcare workers and improve patient services.

Advantages of Medical Robotics:-

Medical robotics provides several benefits:

Greater Precision:-

Robotic systems can perform highly accurate movements during medical procedures.

Improved Treatment Outcomes:-

Better control and accuracy may improve the success of certain treatments.

Reduced Recovery Time:-

Minimally invasive robotic procedures may help patients recover faster.

Support for Healthcare Professionals:-

Robots provide assistance that allows doctors to perform difficult procedures more effectively.

Challenges of Robotic Healthcare:-

Despite its advantages, robotic healthcare has some limitations.

The high cost of robotic systems can make them difficult to implement in many hospitals.

Healthcare professionals require specialized training to operate these technologies safely.

Ethical questions regarding responsibility and decision-making in robotic systems also need careful consideration.

Future Development of Medical Robotics:-

The future of medical robotics is expected to involve smarter and more advanced systems.

The combination of robotics with artificial intelligence may improve medical decision-making and automation.

Future robots may provide more personalized healthcare support and assist in complex medical procedures.

Conclusion:-

Robotic technology is transforming modern healthcare by improving surgical procedures, rehabilitation, and patient care. It offers new opportunities for increasing accuracy, efficiency, and quality of medical services.

Although challenges such as cost and training remain, continued research may make robotic healthcare more accessible and effective. Medical robotics represents an important step toward the future of advanced medicine.

References:-

1. Khan S., Williams D. (2023). Medical Robotics and Future Healthcare Innovations. *Journal of Biomedical Technology*.
2. Noor A & Carter M. (2022). Robotic Systems in Modern Medical Practice. *International Medical Research Journal*.
3. Johnson P. (2024). Advances in Surgical Robotics and Patient Care. *Healthcare Innovation Review*.
4. Brown T. (2023). Emerging Technologies in Medicine. *Global Health Science Journal*.