INDIAN JOURNAL OF LEGAL REVIEW [IJLR – IF SCORE – 7.58]

VOLUME 5 AND ISSUE 13 OF 2025

APIS – 3920 - 0001 *(and)* ISSN - 2583-2344

Published by

Institute of Legal Education

https://iledu.in

THE FUTURE OF MEDICAL TECHNOLOGY IN INDIA: NAVIGATING THE ETHICAL LANDSCAPE OF AI AND ROBOTICS IN HEALTHCARE

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BEST CITATION - ADV. SHRADDHA SATYAWAN JAGTAP, THE FUTURE OF MEDICAL TECHNOLOGY IN INDIA: NAVIGATING THE ETHICAL LANDSCAPE OF AI AND ROBOTICS IN HEALTHCARE, *INDIAN JOURNAL OF LEGAL REVIEW (IJLR)*, 5 (13) OF 2025, PG. 465-468, APIS – 3920 – 0001 & ISSN - 2583-2344

Abstract

The rise of artificial intelligence (AI) and robotics is poised to redefine numerous sectors and healthcare stands at forefront of this revolution. From sophisticated diagnostic tools and robotic surgical assistants to AI-powered drug discovery and personalized treatment plans, the integration of these technologies promises unprecedented advancements in efficiency, precision and accessibility. However, this transformative potential is intrinsically linked with a complex web of ethical dilemmas. The "Doctors vs. Device" paradigm encapsulates the profound considerations necessary to ensure that these technological leaps genuinely benefit humanity, particularly within the diverse and complex healthcare landscape of a nation like India. This essay seeks to advocate for a human-centered, ethical and equitably accessible future for medical technology. Achieving this vision, however demand a robust ethical foundation, deeply rooted in established international guidelines and declarations. These global frameworks provide essential principles to ensure that advancements in medical technology are not only innovative but also responsibly developed and deployed for the benefit of all.

In accordance with the precautionary approach undertaken in principle 15 of Rio Declaration, the Cartagena protocol mentions potential risks associated with modern biotechnology and the need for adequate level of protection[760]. Declaration on bioethics and Human Rights recognize the importance of freedom of scientific research and the benefits derived from scientific technological developments, while stressing the need that such research and developments occur within the framework of ethical principles set out in this declaration[761]. However, this progress must be carefully balanced with the imperative that all such research and development occur within a robust framework of ethical principles. This framework becomes even more critical when considering the direct impact of AI and robots on patient care, autonomy, non-maleficence, beneficence justice and the very definition of a healing relationship.

Crucially, the Right to Health, though not explicitly enumerated, is recognized as an intrinsic part of Right to Life under Article 21 of the Indian Constitution. The fundamental human right to health means that everyone has the right to the highest attainable standard of physical, mental health which includes access to all medical services, sanitation, adequate food, decent housing, healthy working conditions and clean environment[762]. As AI and robotic devices become integral to diagnostics, surgical procedures, patient monitoring and even elderly care, their design, implementation and oversight must meticulously uphold this

[760] Sreenivasulu N. S., Law Relating to Biotechnology, Oxford University press, New Delhi, 2016

[761] Article 2 (4) Declaration of bioethics and Human Rights

[762] Dr. Jyoti Bhakare, An Introduction to Health law, edition 2015

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right. Questions arise regarding accountability of AI system in medical errors, the potential for algorithmic bias to exacerbate health inequalities and the impact of reduced human interaction on patient well-being and trust.

Moreover, the foundational principle that society should have access to primary healthcare remains paramount. This aligns with the Directive Principle of State Policy (DPSP) which mandates that the state shall regard the raising of the level of nutrition and standard of living of its people and improvement of public health as among its primary duties. In Mahendra Pratap Singh vs. State of Orissa and others case High court laid down that, the people should have access to primary healthcare[763]. The government should have necessary arrangement for adequate healthcare for the public at large. The government is required to assist people to get treatment and healthy life[764].

The impetus for integrating AI and Robotics into healthcare is compelling. India, with its vast population and significant healthcare disparities stands to gain immensely from solutions that can augment medical capacity, reduce diagnostic errors and streamline administrative processes; AI's ability to analyze massive datasets can lead to earlier and more accurate disease detection, predict patient outcomes and identify optimal treatment pathways. Robotic systems can enhance surgical precision, assist in rehabilitation and even automate routine hospital tasks, freeing up human healthcare professionals for more critical patient interactions. The potential to overcome geographical barriers through AI-powered telemedicine and remote robotic assistance is particularly appealing in a country where access to specialist care remains a challenge.

'Any policy framework today has to contribute to sustainable development that is development that meets the needs the present without compromising the ability of future generations to meet their own needs[765].'However, the rapid deployment of these technologies without robust ethical and legal frameworks poses significant risks. One of the most pressing concerns revolves around patient safety and clinical validation. While AI and robots promise increased accuracy but their infallibility cannot be assumed. There is need for rigorous clinical validation and performance standards for all AI Healthcare Systems and Medical Robotics Devices. This includes comprehensive testing to demonstrate efficacy, safety and reliability in real-world clinical settings ensuring that these tools are not merely innovative but also demonstrably beneficial and non-maleficent. Post-market surveillance and reporting mechanisms are crucial for continuous monitoring, enabling the identification and mitigation of unforeseen adverse events or performance degradation over time.

Another paramount of ethical consideration is patient autonomy, data privacy and security. 'Personal Data[766]' means any information relating to an identified or identifiable natural person; who can be identified directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, psychological, genetic, mental, economic, cultural or social identity of that natural person. Healthcare data is inherently sensitive, containing deeply personal information. AI systems by their very nature thrive on vast datasets raising critical questions about how this data is collected, stored, used and shared. Data collection and use, emphasizes that only data necessary for specific medical purpose should be collected and only with explicit informed consent. Encryption robust cybersecurity measures and strict access controls are vital to protect this sensitive

[763] Article 47 of Indian constitution

[764] Mahendra pratap singh vs. State of Orissa and others, 1996

[765] Report of the World Commission on Environment and Development, 'Our Common Future', Brutland Report, UN Doc. A/42/427(1987)

[766] Article 4 of GDPR

information from unauthorized access, breaches and misuse. Furthermore, the concept of data ownership is crucial, stating that patients retain ownership of their data and have rights to access, rectify and erase their personal health information. This empowers patients and reinforces their control over their digital health footprint. The Digital Data Protection Act, 2023 enacted in India, undoubtedly serve as a foundational legal pillar for these provisions. This landmark legislation provides a comprehensive framework for the processing of digital personal data, acknowledging both the individual's right to privacy and necessity of data processing for lawful purposes. Critically, the DPDP Act mandates explicit and informed consent for health data processing, a principle central to patient autonomy. Safeguarding Right to Privacy[767] in healthcare means getting explicit, informed consent for health data use, implementing strong data security and actively tackling algorithmic bias.

The evolving relationship between doctors and devices is central to the ethical discourse. While AI and robots can significantly augment human capabilities, they must not dilute the essential human element of healthcare. Ultimately, healthcare must remain accountable for patient outcomes, a responsibility that highlights vital role of human oversight. This principle is vital to prevent a "Black box" scenario where medical decisions are made solely by opaque algorithms without human understanding or invention. The concept of "Explainable AI" becomes critical here which allowing clinicians to comprehend the reasoning behind an AI's recommendations, fostering trust and enabling informed decision-making. Moreover, mandatory training and certification programs for healthcare professionals are essential to ensure their competency in operating and interpreting these advanced systems, thereby bridging the knowledge gap between human expertise and technological capability.

Algorithmic bias is a silent yet pervasive ethical threat. AI systems learn from the data they are fed and if this data reflects existing societal biases or lacks representation from diverse populations, the AI can perpetuate or even amplify these biases. This can lead to discriminatory outcomes in diagnosis or treatment recommendations, exacerbating existing health inequities. For instance, an AI trained predominantly on data from one demographic group might misdiagnose or provide suboptimal care for individuals from underrepresented populations. The manufacturers and deployers of AI healthcare systems must actively identify, mitigate and monitor for algorithmic bias ensuring fairness and non-discrimination in healthcare delivery. This commitment to equitable outcome is paramount, especially in a diverse nation like India, where socioeconomic and cultural variations can influence health data.

Accountability and liability in the event of malfunction or harm caused by AI or robotic systems present complex legal challenges. When a human doctor makes a mistake the lines of accountability are relatively clear. However, in an AI-powered system pinpointing responsibility become intricate: is it the developer, the manufacturer, the deploying hospital, the supervising clinician or the AI itself? This will necessitate robust legal frameworks that can assign responsibility appropriately, ensuring that patients who suffer harm have avenues for redressal. Finally, the ethical imperative of equitable access and socioeconomic impact cannot be overlooked. While AI and Robots hold the promise of improving healthcare, there is a significant risk that these advanced technologies could exacerbate existing health disparities if not managed carefully. High costs associated with AI and robotic systems could lead to their adoption primarily in urban, well-funded private healthcare facilities. Promoting open standards and interoperability can also help reduce costs

[767] Article 21 of Constitution of India

and foster wider adoption. The aim is to ensure that the benefits of technological advancement are realized across all sections of society which aligning with India's broader goals of universal health coverage.

The establishment of the National Healthcare AI and Robotics Regulatory Agency is a crucial step towards addressing these multifaceted challenges. Such an agency, composed of medical experts, AI/Robotics specialists, bioethicists, legal experts and patient advocates is essential to develop comprehensive regulations, conduct assessments, enforce standards and provide guidance. Its power to issue licenses, conduct inspections and imposed penalties are vital for effective oversight and ensuring compliance. The appellate body and advisory committee further strengthen the regulatory framework by providing avenues for redressal and incorporating diverse perspectives.

In conclusion, the integration of AI and robots into healthcare in India presents a profound opportunity to enhance medical care, improve patient outcomes and address systematic inefficiencies. However, this opportunity must be seized with a deep understanding of the inherent ethical complexities A forward-thinking blueprint must prioritize patient safety, data privacy, human oversight, equitable access and clear accountability. And it should aim to foster a human-centered approach to technological advancement. The "Doctors vs. Device" debate is not about choosing one over the other, but rather about synergizing human empathy and clinical judgment with technological precision and efficiency. The goal is to ensure that AI and robots serve as powerful allies to healthcare professionals, empowering them to deliver higher quality, more accessible and ethically sound care to every citizens and ultimately strengthening the nation's healthcare resilience.

References:

1. National Medical Commission (NMC) regulations and ethical guidelines for medical practitioners.
2. Digital Personal Data Protection Act, 2023.
3. Information Technology Act, 2000
4. WHO publications on AI in health and digital health strategies.
5. IEEE publications on AI ethics and Autonomous system
6. Articles, Research journals, books on medical ethics, health technology, bioethics and data protection, cyber law.
7. European Union AI Act (relevant provisions for high-risk AI systems in healthcare).
8. OECD principles on AI
9. UN Sustainable Development Goals (SDGs) related to health and well-being.

Websites:

1. https://shodhganga.inflibnet.ac.in
2. https://jstor.org
3. https://pib.gov.in
4. https://www.who.int
5. https://www.nmc.org.in
6. https://www.fda.gov