
ARTIFICIAL INTELLIGENCE IN HEALTHCARE WITH REFERENCE TO INDIAN LEGAL PERSPECTIVE

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ABSTRACT

Artificial Intelligence (AI) is a rapidly advancing technology that enables machines to perform tasks requiring human intelligence. AI has the potential to fundamentally transform the practice of medicine and the delivery of healthcare. The integration of Artificial Intelligence (AI) in healthcare has reshaped the landscape of medical practice, diagnosis, and patient care. AI technologies, including machine learning, natural language processing, and computer vision, have demonstrated significant potential in improving healthcare outcomes, enhancing diagnostic accuracy, personalizing treatment plans, and optimizing administrative processes. AI-driven tools facilitate early disease detection, predictive analytics, and decision support systems, empowering healthcare providers to make more informed decisions. Additionally, AI holds the potential in the development of personalized medicine. However, challenges such as data privacy concerns, ethical considerations, and the need for robust regulatory frameworks must be addressed for the widespread adoption of AI in healthcare. There is no doubt that AI offers a number of possible benefits, but along with that there are also several risks as the technology continues to evolve. The main requirements for these high-risk AI systems under the AI Act are data governance and risk management, which need to be addressed by the manufacturer.

Keywords: Artificial Intelligence (AI), Healthcare, Machine learning, Computer Vision, Disease Detection

INTRODUCTION

Artificial Intelligence (AI) is a fast-developing field that has the capacity to bring significant changes across different sectors including healthcare. AI encompasses a wide range of technologies that enable computers to perform tasks that typically require human intelligence, such as learning, reasoning, and problem-solving. The use of AI in healthcare has already shown improvement in patient outcomes, reducing costs, and enhancing efficiency. The rapid advancements in artificial intelligence (AI) have brought about exciting opportunities for the healthcare industry. AI technologies, including machine learning, natural language processing, and computer vision, have improved many areas of healthcare. These advancements have the potential to significantly improve patient care, enhance diagnostics, streamline administrative processes, and drive medical research and innovation. One of the main applications of AI in healthcare is helping doctors diagnose diseases using medical images. AI algorithms can analyse medical images, such as X-rays, CT scans, and MRIs, to detect abnormalities, tumours, and other conditions with high accuracy. This has the potential to improve early detection and diagnosis, leading to better treatment outcomes

AI-powered virtual assistants and chatbots have become an important part of modern healthcare, enhancing communication and patient support. It facilitates patients with personalized support and information. These intelligent systems can answer medical questions, provide guidance on self-care, and triage patients based on their symptoms. This not only improves accessibility to healthcare but also reduces the burden on healthcare providers. AI has shown promise in predictive analytics and patient monitoring. By analysing large amounts of patient data, AI algorithms can identify patterns and risk factors for diseases, enabling healthcare providers to intervene earlier and prevent adverse events. AI-powered wearable devices and remote monitoring systems help continuous monitoring of patient vital signs, and also provide real-time alerts for critical changes in a patient's health status¹.

Since these systems are trained using sensitive patient information, the data may be at risk of unauthorized access or misuse if it is not properly protected². Moreover Generative AI

¹ Ramalingam, A, et al. "Impact of Artificial Intelligence on Healthcare: A Review of Current Applications and Future Possibilities." 2 *Quing: International Journal of Innovative Research in Science and Engineering* 43 (2023)

² Yen chen, pouyan Esmaeilzadeh "Generative AI in Medical Practice: In-Depth Exploration of Privacy and Security Challenges" 26 *Journal on Medical internet research* (2024)

models can be trained on sensitive, multimodal patient data, which could be exploited by malicious actors. Therefore, the collection and processing of sensitive patient data, along with tasks such as model training, model building, and implementing generative AI systems, present potential security and privacy risks.

EVOLUTION OF ARTIFICIAL INTELLIGENCE

The origins of artificial intelligence can be traced back to early philosophical discussions that pondered the possibility of creating machines with human-like intelligence. The hunt to duplicate human thought processes and problem-fixing skills has been a recurring topic in various intellectual traditions at some point of history. The term “Artificial Intelligence” was officially coined and defined by John Mc Carthy at the time as “the science and engineering of making intelligent machines”³

The emergence of artificial intelligence began with the development of innovative programs designed to imitate human reasoning and problem-solving. In 1955, Allen Newell and Herbert A. Simon introduced the Logic Theorist, widely recognized as the first AI program to successfully demonstrate mathematical theorems. Moreover, the general problem solver (gps), developed by Newell, Simon, and J.C. Shaw in 1957, aimed to solve an extensive range of issues through heuristic search methods. These early endeavours laid the foundation for subsequent improvements in Artificial Intelligence⁴.

MEANING OF ARTIFICIAL INTELLIGENCE

Artificial Intelligence (AI) is the branch of computer science that enables computers to imitate or simulate human intelligence and perform tasks that typically require human cognitive abilities. It Replace human intelligence, solving knowledge-intensive tasks, building

³ N. H. Patil, S. H. Patel, and S. D. Lawand, "Research Paper on Artificial Intelligence and Its Applications," 44 *Journal of Advanced Zoology* 229-238 (2023)

⁴ Sharma, Twinkle, Poonam, and Renuka Arora. "The Evolution of Artificial Intelligence – A Comprehensive Review." 12 *International Journal of Science, Engineering and Technology*. 3, (2024)

machines, which can perform tasks that require human intelligence, creating some system which can learn by itself are the few specific goals of AI. Machine learning and deep learning are two important subsets of artificial intelligence (AI). Machine learning applies high-performance algorithms to solve problems, whereas deep learning relies on multilayer neural networks for the same purpose. In medical diagnosis, machine learning is used to effectively analyze structured data, including genetic data, electrophysiological data, and medical imaging data. Furthermore, AI contributes to healthcare through advanced medical devices, innovative drug design techniques, telemedicine, physician–patient communication via chatbots, and intelligent systems that analyze the causes of diseases and predict their likelihood of occurrence.

IMPLICATION OF AI IN HEALTHCARE

AI applications play a vital role in the healthcare sector. It has the potential to revolutionize how we diagnose diseases, tailor treatments to individual patients, monitor health conditions in real time, and manage the operational aspects of healthcare delivery. For instance, AI-driven diagnostic tools can accurately analyze medical images, often identifying subtleties that may avoid human eyes. This precision translates into earlier and more accurate diagnoses, significantly impacting patient outcomes. Similarly, in treatment personalization, AI algorithms can sift through vast datasets to identify patterns and predict which treatments will be most effective for specific patient profiles, marking a leap towards truly personalized medicine. Moreover, AI applications extend to patient monitoring, where wearable devices and remote monitoring systems offer continuous oversight of patient health, enabling timely interventions and reducing hospital readmissions. In terms of healthcare delivery, AI can streamline operations, from scheduling appointments to optimizing hospital workflows, thereby improving efficiency and patient satisfaction⁵

The integration of Artificial Intelligence into healthcare has opened new avenues for enhancing patient care⁶, optimizing healthcare operations, and advancing public health initiatives. This section comprehensively explores the pivotal applications of AI across

⁵ Udegbe, Francisca Chibugo, et al. "The Role of Artificial Intelligence in Healthcare: A Systematic Review of Applications and Challenges." *International Medical Science Research Journal* 500-508 (2024)

⁶ *Ibid*

various domains within the healthcare sector. The application of AI in Healthcare are as follows-

1.Diagnostic Assistance

AI algorithms have significantly improved the accuracy and efficiency of disease diagnosis, utilizing data from medical imaging, genetic testing, and biometric sensors. In medical imaging, for example, AI-driven tools analyze X-rays, MRI scans, and CT scans to detect anomalies such as tumours, fractures, and signs of neurological disorders with precision, often surpassing human capability. These systems utilize deep learning techniques to identify patterns and abnormalities that may indicate early stages of diseases like cancer, making timely intervention possible⁷.

Genetic data analysis is another area where AI excels, offering insights into a patient's predisposition to certain diseases and conditions. By analyzing genetic markers and variations, AI algorithms can predict the risk of genetic disorders, enabling preventative measures or early treatments tailored to the individual's genetic makeup. Similarly, in biometric data analysis, AI applications process data from wearable devices to monitor vital signs and detect deviations that may signal health issues, facilitating early diagnosis and intervention

2.Treatment Personalization

AI role in personalizing treatment is transformative, It enable the shift towards precision medicine which treats patients based on their unique characteristics. Each person receives treatment that best suits their needs. AI models analyze vast datasets, including genetic information, environmental factors, and patient history, to predict individual patients in a very effective treatment plans. This approach enhances the efficacy of treatments, minimizes side effects, and reduces the trial-and-error process often associated with finding the right medication or therapy.

3.Patient Monitoring and Care

⁷ Ravi Agarwal, Viknesh Sounderajah, Gey Martin, Daniel S.W. Ting, Alan Karthikesalingam, Dominic King,Hutan Ashrafian & Ara darzi , “ Diagnostic accuracy of deep learning in medical imagining a systematic review and meta-analysis (2021) <https://www.nature.com/articles/s41746-021-00438-z?utm> (Last Visited on May 1, 2026)

AI has enhanced patient care through smart wearable devices. These devices monitor health in real time and help detect problems early. It is also useful in remote monitoring systems. These AI-enabled devices continuously collect health data such as heart rate, blood pressure, glucose levels, and sleep patterns, providing real-time insights into the patient's health status. Advanced AI algorithms analyze this data to detect anomalies that may indicate emerging health issues, enabling prompt medical intervention⁸.

Furthermore, AI-driven systems offer personalized health recommendations and alerts, facilitating self-management of chronic conditions and improving patient engagement in their care. This proactive approach to patient monitoring significantly enhances the quality of care, reduces hospital readmissions, and empowers patients to manage their health actively⁹.

4. Healthcare Operations

AI has transformed healthcare operations by increasing efficiency, lowering costs, and improving patient satisfaction. AI-based tools help optimize workflows by automating administrative activities such as appointment scheduling, patient triage, and billing, allowing healthcare professionals to dedicate more time to patient care. AI algorithms also support effective resource management by optimizing the use of medical equipment and hospital beds. Additionally, AI-powered patient flow management systems help provide timely care, minimize waiting times, and enhance overall healthcare delivery.

CHALLENGES

1. Lack of Quality Medical Data

One of the major challenges for AI in India's healthcare system is the lack of accurate and standardized medical data. Many hospitals still use paper records instead of electronic health records, making it difficult for AI systems to access reliable information. Inconsistent data formats and missing patient information reduce the accuracy of AI predictions. Rural healthcare centers often have incomplete medical records. Poor-quality data can lead to incorrect diagnoses and treatment recommendations. Therefore, improving digital record-keeping is essential for successful AI adoption.

⁸ Niyati Deo, Ashish Anjankar, "Artificial Intelligence with Robotics in Healthcare: A Narrative Review of its Viability in India, Cureus, May 2023, <https://pmc.ncbi.nlm.nih.gov/articles/PMC10287569/> (Last visited on May 11, 2026)

⁹ *Ibid*

2. Clinically Irrelevant Performance Metrics

Another challenge is that the way an AI model is tested in the laboratory does not always show how well it will work in real hospitals. An AI model may have very high accuracy in tests, but it might not actually improve patient care when doctors use it. This difference between good test results and real-world clinical performance is called the AI chasm. To reduce this gap, AI developers and healthcare professionals should work together. They need to evaluate whether the AI truly helps doctors make better decisions and improves patient outcomes, not just whether it performs well on technical tests¹⁰.

3. Data Privacy and Security

AI systems require large amounts of patient health data for training and decision-making. This raises concerns about protecting sensitive medical information from unauthorized access or cyberattacks. Data breaches can expose confidential patient records and reduce public trust in healthcare organizations. Healthcare institutions must follow strict privacy laws and use secure data storage methods. Encryption, anonymization, and strong cybersecurity measures are essential. Without proper protection, patients may hesitate to share their medical information. Therefore, maintaining data privacy is one of the biggest challenges in AI-based healthcare

4. Lack of awareness on AI technologies

Another important challenge of AI in health care is building trust with patients. The patients were usually afraid of AI technology as it is a new concept for them. Doctors and policy makers acknowledge that patients are not ready to rely on AI technology they are afraid of that AI will replace the Doctors or can make incorrect decisions of their treatment¹¹. To complicate matters, there is often a lack of understanding among the general population about

¹⁰ Kelkar, Gauri. "Top Challenges of AI in Healthcare: What Businesses Need to Resolve." *Emeritus*, available at <https://emeritus.org/blog/healthcare-challenges-of-ai-in-healthcare/> (Last Visited on May 22, 2026)

¹¹ Wubineh, Betelhem Zewdu, et al. "Exploring the Opportunities and Challenges of Implementing Artificial Intelligence in Healthcare: A Systematic Literature Review." *42 Urologic Oncology: Seminars and Original Investigations* 48-56 (2024)

the potential benefits and limitations of AI in healthcare, Thus lack of awareness among the general public create a challenge to adopt AI in treatment

5. Legal issues arising in AI

Another challenge of AI in healthcare is lack of clear laws and regulations. Doctors, nurses, and other healthcare professionals must follow strict medical rules and ethical guidelines before they can treat patients. But there are still no universal laws that clearly explain how AI should be used in healthcare or who is responsible if something goes wrong¹². AI can also be misused by criminals, They can steal patient data, create fake medical records, or commit fraud. Therefore, governments need comprehensive laws to regulate AI in healthcare and prevent misuse. These laws should be developed with the help of doctors, legal experts, AI developers, and other stakeholders. They should also clearly define the responsibilities of each party when AI-related errors occur. Since AI technology is evolving rapidly, legal regulations must be updated regularly to address new challenges. Strong legal frameworks and proper regulatory authorities are essential to ensure that AI is used safely, ethically, and responsibly in healthcare¹³.

6. Societal Acceptance and Ethical Adoption of AI¹⁴

The successful use of AI in healthcare depends on both public trust and ethical practices. Although many patients are willing to accept AI-assisted diagnosis, they usually trust a doctor's opinion more when the AI and doctor disagree. Many medical students and healthcare professionals want training in AI, but only a small number have opportunities to learn about AI and machine learning. Some healthcare workers, especially in less developed regions, are also concerned that AI could replace their jobs. To address these concerns, ethical guidelines are needed to protect patient data, ensure fairness, and prevent discrimination. Independent ethics committees should oversee the development and use of AI so that it benefits all patients while respecting privacy, transparency, and human values.

¹² World Health Organization, Ethics and governance of artificial intelligence for health
Available at <https://www.who.int/publications/i/item/9789240029200> (Last visited on June 4, 2026)

¹³ *Ibid*

¹⁴ Unesco "Recommendation on the Ethics of Artificial Intelligence" available at
<https://www.unesco.org/en/artificial-intelligence/recommendation-ethics>, (Last Visited on June 4, 2026)

LEGAL FRAMEWORK

International Framework

At the international level, there is presently no single legally binding treaty exclusively regulating the use of artificial intelligence in healthcare. Instead, the governance of AI is based upon a combination of international ethical principles, policy recommendations, regional legislation, and human rights instruments. These frameworks emphasize the responsible development and deployment of AI while protecting fundamental rights such as privacy, equality, autonomy, and access to healthcare. International organizations including UNESCO, the World Health Organization (WHO), the Organisation for Economic Co-operation and Development (OECD), and the European Union have played a significant role in establishing standards for ethical and responsible AI governance. Although many of these instruments are categorized as "soft law"¹⁵ and lack binding legal force, they have substantially influenced domestic legislation and regulatory policies across numerous jurisdictions. Collectively, these frameworks seek to ensure that AI technologies operate in a manner that promotes patient safety, transparency, accountability, and public trust.

1. Framework Convention on Artificial Intelligence

Framework Convention on Artificial Intelligence was adopted under the auspices of the Council of Europe in September 2024, this international treaty aims to ensure that AI development and use align with human rights, democracy, and the rule of law. It establishes principles for AI governance, including transparency, accountability, and non-discrimination¹⁶.

2. Global Partnership on Artificial Intelligence (GPAI)

¹⁵ Shambhavi Naik Bharath Reddy "A framework for the governance of AI in healthcare for India: An exploratory model" *ijme Indian Journal of Medical Ethics* (2025)

¹⁶ Van Kolschooten, Hannah. "The AI cycle of health inequity and digital ageism: mitigating biases through the EU regulatory framework on medical devices 10" *Journal of Law and the Biosciences* 7 (2023).

GPAI was Launched in June 2020, GPAI is an international initiative that brings together experts from industry, civil society, governments, and academia to guide the responsible development and use of AI. It focuses on bridging the gap between theory and practice by supporting research and applied activities in areas directly relevant to policymakers¹⁷.

3.Spanish Agency for the Supervision of Artificial Intelligence

The Spanish Agency for the Supervision of Artificial Intelligence was established in 2023, this autonomous agency is responsible for overseeing, counseling, and training regarding the proper use and development of AI systems in Spain. It aims to minimize the risks associated with AI technology and ensure its adequate development¹⁸

4.World Health Organization (WHO)

Recognizing the growing use of AI in medical practice, the World Health Organization (WHO) has published important guidance documents titled *Ethics and Governance of Artificial Intelligence for Health* (2021) and *Regulatory Considerations on Artificial Intelligence for Health* (2023)¹⁹. These documents outline six guiding principles for AI governance, namely protection of human autonomy, promotion of human well-being and patient safety, transparency, accountability, inclusiveness, and sustainability. WHO emphasizes that AI systems should undergo rigorous clinical validation before implementation and must remain subject to continuous human supervision throughout their operation. It further recommends that governments establish regulatory mechanisms capable of evaluating the safety, effectiveness, and reliability of AI-based medical technologies before their commercial deployment. Although WHO's recommendations are advisory rather than legally enforceable, they have significantly influenced healthcare regulation worldwide and serve as an important reference for national policymakers²⁰.

5.European Union AI Act

¹⁷Van Kolfschooten, Hannah. "EU regulation of artificial intelligence: Challenges for patients' rights" 59 *Journal of Law and the Biosciences* 81- 112(2022)

¹⁸ *Ibid*

¹⁹ *Ibid*

²⁰ World Health Organization " Ethics and governance of artificial intelligence for health" *available at* <https://www.who.int/publications/i/item/9789240029200>, (Last visited on July 4,2026)

The European Union AI Act (Regulation (EU) 2024/1689) represents the world's first comprehensive and legally binding legislation regulating artificial intelligence²¹. The Act adopts a risk-based approach whereby AI systems are categorized according to the level of risk they pose to society. AI applications used in healthcare, including diagnostic software, clinical decision-support systems, medical imaging, and AI-enabled medical devices, are generally classified as "high-risk" systems. Developers and providers of such systems must comply with stringent legal obligations relating to risk management, transparency, cybersecurity, quality of datasets, technical documentation, human oversight, and post-market monitoring. Significant financial penalties may be imposed for non-compliance, making the legislation one of the strongest AI regulatory regimes globally. The EU AI Act has become an influential model for countries considering comprehensive AI legislation because it balances innovation with the protection of patient rights and public safety²².

Indian Framework

Unlike the European Union, India does not currently possess a dedicated statute regulating artificial intelligence or its application in healthcare. Instead, AI governance is derived from a combination of existing legislation, regulatory guidelines, and policy documents that indirectly govern various aspects of AI deployment. The principal legal instruments include the Digital Personal Data Protection Act, 2023, the Information Technology Act, 2000, the Medical Devices Rules, 2017, the National Medical Commission Act, 2019, and the Clinical Establishments (Registration and Regulation) Act, 2010. In addition, institutions such as the Indian Council of Medical Research (ICMR) and NITI Aayog have issued ethical guidelines and policy recommendations specifically addressing AI in healthcare. Although these measures collectively provide a foundational regulatory framework, they do not comprehensively address issues such as algorithmic accountability, explainability, liability for AI-assisted medical errors, or independent regulatory oversight.

1. Digital Personal Data Protection Act, 2023

²¹European Commission "AI ACT" available at <https://digital-strategy.ec.europa.eu/en/policies/regulatory-framework-ai> (last Visited July 7, 2026)

²² *Ibid*

The Digital Personal Data Protection Act, 2023, governs the collection, processing, storage, and transfer of personal data in India²³. Since AI systems in healthcare process large volumes of patients' personal and health-related information, the Act plays a significant role in protecting patient privacy and ensuring lawful processing of data. It requires data fiduciaries to obtain consent where applicable, implement security safeguards, and comply with obligations relating to data processing and protection. The Act therefore establishes a legal framework for protecting personal data used by AI systems in healthcare²⁴.

However, this Act is not adequate to comprehensively regulate AI in healthcare because it is primarily a data protection legislation and not an AI-specific law. It does not address issues such as algorithmic transparency, explainability, accountability for AI-generated medical decisions, algorithmic bias, or liability arising from AI-related errors. Therefore, while it protects patient data, it does not adequately regulate the functioning of AI systems themselves.

2. Medical Devices Rules, 2017

The Medical Devices Rules, 2017, framed under the Drugs and Cosmetics Act, 1940. It regulates the manufacture, import, sale, and distribution of medical devices in India. Certain AI enabled diagnostic software and Software as a Medical Device (SaMD) fall within the scope of these Rules²⁵ where they perform medical functions such as diagnosis, monitoring, or treatment support. Manufacturers are required to demonstrate compliance with prescribed standards relating to quality, safety, clinical evaluation, and regulatory approval before such devices may be marketed. However, the Rules primarily regulate the medical device itself and do not establish comprehensive governance mechanisms for AI algorithms, machine learning updates, explainability, or post-deployment accountability. Therefore, while they contribute to ensuring the safety of AI-enabled medical technologies, they do not comprehensively regulate the broader legal implications associated with artificial intelligence in healthcare.

3. ICMR Ethical Guidelines for Artificial Intelligence in Healthcare

²³ Digital Personal Data Protection Act, 2023 (Act 22 of 2023) Sec 4

²⁴ Digital Personal Data Protection Act, 2023 (Act 22 of 2023) Sec 8

²⁵ Medical Devices Rules, 2017 Rule 2(zb)

In 2023, the Indian Council of Medical Research (ICMR) issued the *Ethical Guidelines for Application of Artificial Intelligence in Biomedical Research and Healthcare* to promote the responsible development and deployment of AI technologies within India's healthcare system. The Guidelines emphasize core ethical principles including transparency, fairness, accountability, privacy, informed consent, explainability, patient safety, and continuous human oversight. They recommend rigorous validation of AI systems before clinical implementation and encourage healthcare institutions to establish mechanisms for monitoring algorithmic performance and mitigating bias. However, these Guidelines are advisory in nature and do not possess statutory force. Consequently, non-compliance does not attract legal sanctions, limiting their effectiveness as a regulatory mechanism. While the Guidelines provide valuable ethical direction, they cannot substitute for comprehensive legislation specifically governing AI in healthcare²⁶.

Case study and Real world implications

1. Kapadia Hospital leads India's first AI robotic system for knee replacement surgery²⁷.

On 4th December 2025, Kapadia Hospital has enhanced its orthopaedic care by installing MISSO, an advanced robotic system designed in India for knee replacement surgeries. This being the first installation in Mumbai, MISSO combines smart technology with surgical expertise to deliver high precision and faster recovery, making quality healthcare more accessible. MISSO, designed and made in India, uses advanced computing and real-time data to map surgeries in 3D, guiding surgeons for precise cuts and implant placement. Its six-joint robotic arm, tracking camera, and safety features enable real-time adjustments, ensuring stable, natural joint movement. With a minimally invasive approach, it reduces tissue damage, bleeding, and recovery time, helping patients return to daily life faster. Aligned with Aatmanirbhar Bharat, MISSO showcases India's innovation in medical technology, making world-class robotic surgery more accessible²⁸.

²⁶ Indian council of medical research "Ethical guidelines for application of Artificial Intelligence in Biomedical Research and Healthcare" available at <https://www.icmr.gov.in/ethical-guidelines-for-application-of-artificial-intelligence-in-biomedical-research-and-healthcare?q=Research+s&utm> (Last Visited on July 17, 2026)

²⁷ Kapadia Hospital Joins India's First AI Surgery Revolution with MISSO, Hailed by PM Modi." *PharmaBiz.com*, available at <https://www.pharmabiz.com/Default.aspx> (Last Visited on July 27, 2026)

²⁸ Kapadia Hospital Joins India's First AI Surgery Revolution with MISSO, Hailed by PM Modi." *PharmaBiz.com* available at <https://www.pharmabiz.com/Default.aspx> (Last visited on July 28, 2026)

2. Robotic Surgery Machine “SSI Mantra 3” installed at Noble Hospital, Pune²⁹

Noble Hospitals in Pune installed Maharashtra's first indigenous robotic surgical system, named as “SSI Mantra 3”, This system features five robotic arms and immersive 3D HD visualization, enabling precise surgeries in general, urology, gynecology, and cardiothoracic disciplines. The system aims to improve surgical precision and efficiency.

3. Northeast’s first robotic surgery facility unveiled in Assam

In Northeast’s first-ever onco-robotic surgery facility at the Guwahati Medical College and Hospital, Assam³⁰The Chief Minister of Assam Dr. Himanta Biswa Sarma on Sunday (April 13, 2025) inaugurated the first robotic surgery facility of the northeast at the State Cancer Institute of Gauhati Medical College and Hospital. The Chief Minister has also said that similar facilities were coming up in Silchar and Dibrugarh. He said government hospitals in the state would now offer low-cost, highly precise, and least invasive oncological surgical procedures through “Made in India” in machinery³¹.

4. In Tezpur Assam, Baptist Christian Hospital has implemented Qure.ai’s AI technology to rapidly analyze brain CT scans.

This advancement has been particularly beneficial for diagnosing strokes among tea plantation workers, a group highly susceptible to such conditions. The AI system processes scans in seconds, enabling timely interventions that are critical for patient outcomes.

Findings

1. AI helps doctors detect diseases quickly and accurately. It analyzes medical images and patients. AI also supports doctors by analyzing large amounts of health data. It recommends personalized treatment plans for patients. This improves the quality of medical care.

²⁹Thevar, Steffy. "Maharashtra's First Made-in-India Robotic Surgery Machine Installed in Pune's Noble Hospital." *The Times of India*, December 4 2024

³⁰ TNIE Digital, Assam Gets Northeast’s First Onco-Robotic Surgery Facility, *The New Indian Express*, 13 Apr. 2025.

³¹ *Ibid*

2. AI supports doctors by analyzing large amounts of health data. It recommends personalized treatment plans for patients. This improves the quality of medical care records efficiently. This leads to earlier treatment and better outcomes.

3. When using AI in healthcare, it's crucial to approach AI suggestions with a blend of trust and critical thinking. AI can provide valuable insights, but it's important to remember that it's not a replacement for human judgement and expertise.

4. To effectively manage AI suggestions in healthcare, it's crucial to adopt a human centered approach, Prioritize safety and ethical considerations, and implement robust monitoring and evaluation systems. AI should be viewed as a tool to augment, not replace, human judgment, and its output should always be reviewed and validated by healthcare professionals

5. It is evident that many hospitals are bringing AI equipment for better performance in healthcare but along with that risks of patient privacy are also arising. Thus, AI must protect patient privacy and data security. It should be used fairly without bias or discrimination. Thus, proper regulations are needed for safe and responsible use.

CONCLUSION AND SUGGESTION

The use of AI in healthcare has the potential to revolutionize patient care by improving outcomes, reducing costs, and enhancing efficiency. It helps the doctors diagnose diseases more quickly and accurately. AI also supports personalized treatment plans for patients. It improves hospital management and reduces medical errors. Patients can receive faster care through AI-powered tools and virtual assistants. However, AI cannot replace the compassion and directions of experienced medical practitioners. Along with that ethical and regulatory concerns must be addressed to ensure the safe and effective use of AI in healthcare. Thus by developing a robust regulatory framework and addressing ethical concerns, we can harness the power of AI to improve patient care and advance medical research while ensuring that the technology is used in a responsible and an equitable manner. Some suggestions to deal with AI in health sector are-

1. Healthcare system should focus on Promoting population-representative data with accessibility, standardization and quality is imperative. This is the way to ensure accuracy for all populations. While there is a lot of data now, there are issues with data quality, appropriate consent, interoperability and scale of data transfers.
2. AI should be ethical, fair, and inclusive, with explicit and implicit biases carefully identified and addressed before deployment so that AI reduces, rather than increases, existing healthcare inequalities
3. It should emphasise that trust in medical AI requires context-specific transparency, where developers, healthcare providers, users, and regulators jointly establish guidelines and clearly distinguish between data transparency, performance transparency, and algorithmic transparency. This is because people will trust medical AI only if they understand how it works to the extent they need to.
4. At the current stage of AI development, healthcare should prioritize augmented intelligence AI that supports doctors and patients rather than fully autonomous AI systems. This approach improves decision-making while maintaining human oversight, addressing public trust, technical limitations, and regulatory concerns.
5. Healthcare system should emphasise on successful use of AI in healthcare, as it requires comprehensive, multidisciplinary education and training. All stakeholders from AI developers and healthcare professionals to ethicists, patients, and caregivers should be involved so AI is developed, implemented, and used responsibly, ethically, and effectively. .
6. Another suggestion is that healthcare organizations implement AI using proven frameworks, learning healthcare principles, human-centered design, and implementation science, while ensuring strong IT governance is in place before large-scale AI deployment and integration.
7. A comprehensive legal and regulatory framework should be established to govern the development, approval, deployment, and monitoring of AI in healthcare. Such a framework should set standards for safety, effectiveness, accountability, patient privacy, and ethical use while allowing innovation to continue. It should also require continuous post-deployment evaluation of AI systems using real-world clinical data by AI developers, healthcare

providers, health system leaders, and health IT experts. This ensures that AI remains safe, reliable, and trustworthy throughout its lifecycle.