

## Artificial Intelligence: Transforming Future Healthcare System

**Type:** Editorial

**Received:** October 28, 2024

**Published:** December 13, 2024

**Citation:**

Sukhpal Kaur. "Artificial Intelligence: Transforming Future Healthcare System". PriMera Scientific Surgical Research and Practice 5.1 (2025): 01-03.

**Copyright:**

© 2025 Sukhpal Kaur. This is an open-access article distributed under the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original work is properly cited.

**Sukhpal Kaur\***

*Professor, Department of Orthodontics & Dentofacial Orthopaedics, Desh Bhagat Dental College & Hospital, Mandi Gobindgarh*

**\*Corresponding Author:** Sukhpal Kaur, Professor, Department of Orthodontics & Dentofacial Orthopaedics, Desh Bhagat Dental College & Hospital, Mandi Gobindgarh.

Artificial Intelligence (AI) is a subfield of computer science concerned with developing systems and programs that have the ability to perceive information and convert this information into intelligent actions to achieve desired goals. They do this by receiving innumerable data and processing this data. Also they learn from their past to do task in well organized manner and to improve in future. Thus, AI describes computer models and programs which simulate human-level intelligence to perform cognitive functions, including solving complex problems and experience gathering.

AI is a broad science, encompassing various fields including reasoning, natural language processing, planning and machine learning. Machine learning is most commonly used AI application in medical and dental fields.

Artificial Intelligence is not a novel word or technology for researchers. The idea of this technology originated thousands of years back, when ancient philosophers had considered questions of life and death. In ancient times, mechanical things were created which moved independently of human intervention, these were called "automatons". The word "automaton" means "acting of one's own will." The earliest automaton from 400 BCE was a mechanical pigeon created by a friend of the philosopher Plato. After that around year 1495, the most famous automaton was generated by Leonardo da Vinci. In early 1900s, the focus was centered on idea of artificial humans. Some inventors even made some versions now called 'Robots.' The proliferation in the technology continued leading to development of its more and more versions.

The term "artificial intelligence" was given by John McCarthy in 1955 at Dartmouth College conference. The application of AI in healthcare field set foot in the early 1970s when research created MYCIN, an AI program which helps in identification of variety of blood infections and management. In 1979 the American Association for Artificial Intelligence was introduced.

From 1980s to 1990s, the AI technology helped medical sector by generating faster data collection and processing of data, helps in performing precise surgeries, also assisted in research and mapping and more thorough execution of health records.

Artificial intelligence is not a single technology, but rather a collection of them which are increasingly prevalent in healthcare system. These technologies are capable to modify patient care, as well as administrative procedures within provider, payer and pharmaceutical organizations in variety of ways.

There are number of challenges healthcare sector faces all around the world in fulfilling the healthcare system aims such as upgrading health of people, making the patient's experience of health care more better, amplify caregiver experience and decreasing cost of care. The increasing burden of chronic diseases and rising costs of healthcare globally are challenging governments, payers, regulators and healthcare providers to make certain changes in health care sector to provide services. The application of new technology and artificial intelligence in healthcare system can address some of these challenges.

**Diagnosis:** Artificial Intelligence has diverse applications in the healthcare system. It is used to build sophisticated machines that have ability to detect various diseases and can also identify cancer cells. According to American Cancer Society, more of mammograms generate false results. But the emergence of AI enables review and translation of mammograms thirty times faster with precise accuracy upto 99% decreasing the need of biopsy. Artificial Intelligence can help in analyzing chronic health related conditions with lab and other medical data to ensure early diagnosis of these conditions. It is used in various medical specialties including radiology, screening, psychiatry, primary care and telemedicine.

**Decision making and treatment:** The application artificial intelligence in healthcare system has been altering the approach to diagnose diseases, to treat and to regularly monitor the patients. Also, AI helps in achieving more precise diagnoses and allowing more personalized treatments for patients. By using AI, healthcare professionals can analyze vast amounts of clinical documentation in a short duration to identify disease markers and trends that would otherwise be overlooked. Robots are used for simple laboratory task to highly complicated surgical procedures where they assist health care professionals or perform the procedures themselves. Also they are used in hospitals and laboratories for repetitive tasks, in rehabilitation and physical therapy.

**Research:** AI greatly brushing up the research work related to healthcare and can create new drugs by using historical data and medical intelligence. Application of AI in the field of drug research and discovery significantly reduces the cost for production and time to market the new drug.

**Keeping well:** Another potential benefit of AI is to help people to stay healthy. Smart technology applications and apps motivate people for healthier behaviour and manage their healthy lifestyle. It also allows healthcare professionals to understand day to day changing patterns and needs of patients in better way so that they can guide and support them for living healthy life.

**End of life care:** Robots also have capability to transform the end of life care by helping individuals to stay independent for longer, decreasing the need for hospitalization and nursing homes. Recent advances empowering the robots even to have conversations and social interactions to keep minds of older people sharp and active.

In dentistry also AI is valuable in diagnosis and treatment planning, estimating dental age from panoramic radiographs, diagnosing cyst and tumor from Orthopantomograms, classifying growth patterns of patients and Machine learning is used for automatic landmark identification on lateral cephalograms with better accuracy.

By making use of this smart technology in hospital settings and clinics, healthcare centers can become smarter, faster, and more efficient in providing care to millions of people worldwide. Artificial intelligence in healthcare system can be truly turning point for future where patients receive quality of health services with reduced cost.

### **Limitations of AI**

Although AI technology is beneficial for healthcare system in many ways, there are also some challenges. The major concerns are related to ethics and privacy. As the AI applications are mainly based on patient data including their medical information. So maintaining patient privacy, data confidentiality and keep check for unauthorized access to data are critical issues.

AI may overlook some variables of patients such as social and economical factors that can play prime role in recommendations for a patient. AI application may allocate a patient to a specific hospital or care center on the basis of his/her diagnosis but this system may not consider patient's economical conditions and personal preferences.

Application of AI in medical field depends on data available from millions of catalogued cases. If very less data available on any specific disease and demographics there is possibility of false diagnosis. Therefore, one should have proper knowledge of AI to assist in clinical decisions and not to replace the knowledge and expertise of humans and final decisions should be clinicians' responsibility

Using AI in marketing faces difficulty in replicating the human behaviour such as emotions, intuition and creativity. AI algorithms completely depend on data and patterns, and lacks innovative approaches that need human creative thinking and intuition. AI helps in reducing cost and health professional's pressure but it may render some jobs unnecessary.

Doubtlessly AI has great potential to refine healthcare system. Automating various tasks with AI, makes healthcare provider's schedules more relaxable and allow them to interact with more number of patients. Implementation of AI in healthcare system is increasing along with its limitations and challenges. It still needs some human surveillance, may not consider social factors, experiences data gaps and prone to cyber attacks. Researchers are continuously working hard to overcome the shortcomings of AI and to make them boon to human beings. Despite of its limitations this smart technology promises incredible benefits to healthcare system.

***The machine does not control us. We control the machine and it is our duty to use it wisely.***

***Max Tegmark***

## References

1. No longer are science fiction, AI and robotics transforming healthcare. <https://www.pwc.com/gx/en/industries/healthcare/publications/ai-robotics-new-health/transforming-healthcare.html>
2. What is the history of artificial intelligence (AI)?. <https://www.tableau.com/data-insights/ai/history>
3. Pros & Cons of Artificial Intelligence in Medicine. <https://drexel.edu/cci/stories/artificial-intelligence-in-medicine-pros-and-cons/>
4. Khan B., et al. "Drawbacks of Artificial Intelligence and their potential solutions in healthcare sector". Biomed Mater Devices 8 (2023): 1-8.
5. Palanivel J., et al. "Artificial intelligence - creating the future in orthodontics - a review". J Evolution Med Dent Sci 10.28 (2021): 2108-2113.