

## TASKS IN ARTIFICIAL INTELLIGENCE THAT REQUIRE HUMAN INTELLIGENCE

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Healthcare systems around the world face significant challenges in achieving the ‘quadruple aim’ for healthcare: improve population health, improve the patient's experience of care, enhance caregiver experience and reduce the rising cost of care.<sup>1–3</sup> Ageing populations, growing burden of chronic diseases and rising costs of healthcare globally are challenging governments, payers, regulators and providers to innovate and transform models of healthcare delivery.

Moreover, against a backdrop now catalyzed by the global pandemic, healthcare systems find themselves challenged to ‘perform’ (deliver effective, high-quality care) and ‘transform’ care at scale by leveraging real-world data driven insights directly into patient care. The pandemic has also highlighted the shortages in healthcare workforce and inequities in the access to care, previously articulated by The King's Fund and the World Health Organization.

Artificial Intelligence (AI) is a field of computer science that focuses on creating systems capable of performing tasks that typically require human intelligence. Such tasks include learning, reasoning, speech and image recognition, problem-solving, and decision-making.

AI works through algorithms, mathematical models, and large volumes of data, allowing machines to “think,” “learn,” and adapt. This field includes many technologies such as machine learning and neural networks and is already widely used in chatbots, autopilots, medicine, and other areas, with further development expected in generative models for content creation.

Artificial Intelligence (AI) is a revolutionary technology that enables machines to perform tasks instead of humans. AI allows companies to make more informed decisions at scale, ranging from image recognition and creative content generation to data-driven forecasting.

In the modern digital world, organizations generate enormous amounts of data through sensors, user interactions, and system logs. AI uses this data to optimize operations by automating customer support, improving marketing strategies, and providing valuable insights through advanced analytics. Evaluate and validate

Next, we must iteratively evaluate and validate the predictions made by the AI tool to test how well it is functioning. This is critical, and evaluation is based on three dimensions: statistical validity, clinical utility and economic utility.

Statistical validity is understanding the performance of AI on metrics of accuracy, reliability, robustness, stability and calibration. High model performance on retrospective, in silico settings is not sufficient to demonstrate clinical utility or impact.

To determine clinical utility, evaluate the algorithm in a real-time environment on a hold-out and temporal validation set (eg longitudinal and external geographic datasets) to demonstrate clinical effectiveness and generalisability.

Economic utility quantifies the net benefit relative to the cost from the investment in the AI system.

Today, Artificial Intelligence is increasingly applied in medicine. The ability of AI to radically transform diagnostic processes, accelerate drug development, and improve the quality of healthcare opens up vast opportunities for optimizing the healthcare system. Before exploring the various aspects of these technologies, it is important to understand what artificial intelligence is.

Artificial Intelligence has a significant impact on medicine by improving physicians' work and increasing clinical efficiency. Neural networks are actively used to process medical images and assist doctors in diagnosis and treatment decisions. AI helps interpret X-rays, MRI scans, and other medical images, enabling accurate and rapid diagnosis of diseases such as various types of cancer or fractures. Machine learning technologies can detect details that may be invisible to the human eye.

AI is also increasingly used for disease prevention and treatment, providing healthcare professionals and patients with new tools for decision-making. Other AI-based solutions in medicine cover a wide range of applications, from data analysis to education and drug development. Like any technology, artificial intelligence has both advantages and disadvantages.

#### Advantages:

One of the main advantages of AI is its ability to analyze large volumes of data, as well as MRI and X-ray images, faster and sometimes more accurately than physicians. This is especially important in medical fields with limited time and staff. Personalized treatment: AI helps develop personalized treatment plans by analyzing patients' medical history, genetic characteristics, and current health conditions. Optimization of workflows and resource management: AI can automate many routine and administrative tasks, such as maintaining medical records, scheduling appointments, and managing supplies, freeing up staff time for more critical tasks.

#### Disadvantages:

Data privacy and security issues: The use of AI requires collecting and analyzing large amounts of medical data, which poses risks to patient confidentiality.

Lack of human interaction: Despite its effectiveness in analytical and diagnostic tasks, AI cannot fully replace human empathy and personal contact, which are essential in clinical practice. Cost and accessibility of technology: The development and implementation of AI require significant financial investments that not all healthcare institutions can afford, especially in developing countries.

Areas of AI application in medicine: Artificial intelligence is widely used in clinical medicine, covering nearly all aspects of healthcare activities, including diagnosis, treatment, resource management, disease prevention, and health monitoring.

In conclusion, artificial intelligence represents a powerful tool in medicine with great potential, and its continued development is expected to further improve the quality and efficiency of healthcare services.

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