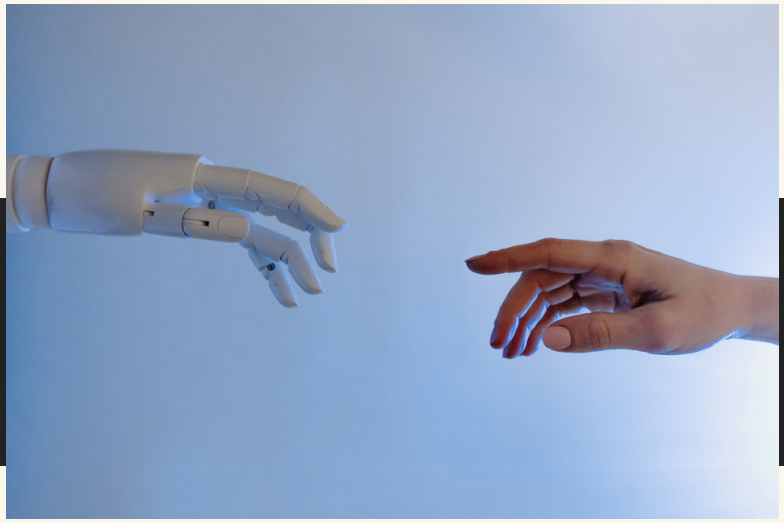
How AI is transforming healthcare in Australia

Artificial intelligence (AI) is the use of computer systems to perform tasks that normally require human intelligence, such as perception, reasoning, learning, decision making and problem solving. AI is already being used in many aspects of our daily lives, from online maps and navigation to facial recognition and social media recommendations. But what does AI mean for healthcare in Australia?

AI has the potential to revolutionize healthcare by supporting clinicians and consumers to make more precise and personalized healthcare decisions using data on genetics, environment and lifestyle. AI can also help improve the efficiency, quality and safety of healthcare services by automating tasks, optimizing workflows and enhancing communication. In this blog post, we will explore some of the current and future applications of AI in healthcare in Australia, as well as some of the challenges and opportunities that lie ahead.

AI for diagnosis and treatment

One of the most promising areas of AI in healthcare is diagnosis and treatment. AI can help clinicians to detect, classify and monitor diseases using various types of data, such as images, scans, tests, records and symptoms.



For example, AI can help diagnose skin cancer by analyzing images of skin lesions and comparing them with a database of dermatological cases. AI can also help predict the risk of coronary artery disease from scans or guide minimally-invasive surgery using data-driven robots.

AI can also help personalize treatment choices by analyzing patients' genomic and molecular data, as well as their preferences and outcomes. For instance, AI can help select the best antidepressant medication for patients with major depression or explain a diagnosis to a concerned relative using natural language generation. AI can also help monitor patients' conditions and responses to treatment using sensors, wearables and apps.

*Examples of AI tools already being used for **diagnosis and treatment** in Australia:*

- **SkinVision:** an app that uses AI to analyze photos of skin spots and moles and provide a risk assessment of skin cancer.
- **HeartCare:** a platform that uses AI to analyze cardiac MRI scans and provide insights into heart function and structure.
- **iKnife:** a surgical knife that uses AI to analyze the smoke produced during surgery and identify the type of tissue being cut.
- **Genie:** a platform that uses AI to analyze genomic data and provide personalised recommendations for cancer treatment.
- **ChatGPT:** an AI chatbot that can answer medical questions, take notes or explain diagnoses using natural language.

AI for diagnosis and treatment

Another area where AI can have a significant impact is health service delivery. AI can help improve the accessibility, affordability and quality of health services by streamlining processes, reducing costs and enhancing outcomes. For example, AI can help triage patients by assessing their symptoms and urgency and directing them to the most appropriate level of care. AI can also help schedule appointments, manage waiting lists, allocate resources and coordinate care across different providers.

AI can also help empower consumers to take more control over their own health by providing them with information, education and support.

*Examples of AI tools already being used for **health service delivery** in Australia:*

- **Healthdirect:** a website that uses AI to provide consumers with health information, symptom checkers, service finders and online consultations.
- **Coviu:** a platform that uses AI to enable telehealth services between clinicians and consumers using video calls, chatbots and digital tools.
- **HealthEngine:** a platform that uses AI to help consumers book appointments with health providers online.
- **ResApp:** an app that uses AI to diagnose respiratory diseases from cough sounds.

Hello Sunday Morning: an app that uses AI to help consumers reduce their alcohol consumption and improve their wellbeing.

Challenges and opportunities for AI in healthcare

Data quality and availability:

AI relies on large amounts of high-quality data to learn from and apply to new situations. However, data may be incomplete, inaccurate, biased or outdated, which may affect the performance and reliability of AI tools.

Data may also be fragmented across different sources, systems and formats, which may limit the interoperability and integration of AI tools. Data may also be sensitive or confidential, which may raise ethical and legal issues around data ownership, consent, privacy and security.

Regulation and governance:

AI involves complex algorithms that may be difficult to understand, explain or verify. This may create challenges for ensuring the safety, efficacy and accountability of AI tools. There may also be gaps or inconsistencies in the existing regulatory frameworks for approving, monitoring and evaluating AI tools. There may also be a need for new governance

mechanisms for overseeing the development, deployment and use of AI tools, such as standards, guidelines, audits and reviews.

Workforce and education:
AI may change the roles, skills and competencies of the healthcare workforce. Some tasks may be automated or augmented by AI, while new tasks may emerge or require human oversight. This may require retraining, reskilling and upskilling of the existing workforce, as well as attracting and retaining new talent. There may also be a need for educating the workforce and the consumers on how to critically assess, use and trust AI tools, as well as how to collaborate and communicate with them.

Ethics and society:
AI may have social, cultural and ethical implications for healthcare in Australia. AI may affect the values, norms and expectations of the healthcare system, such as quality, equity, autonomy and dignity. AI may also affect the relationships, interactions and behaviors of the healthcare stakeholders, such as clinicians, consumers, providers and policymakers. AI may also raise ethical dilemmas or conflicts, such as fairness, transparency, accountability and responsibility.

To address these challenges and harness the opportunities of AI in healthcare, Australia needs a coordinated and collaborative approach that involves multiple stakeholders from different sectors and disciplines. Some of the initiatives that are already underway or planned to support this approach are:

- The Australian Alliance for Artificial Intelligence in Healthcare: a network of researchers, clinicians, industry partners and policymakers that aims to advance the development, translation and adoption of AI in healthcare in Australia.
- The AI in Health Grand Challenge: a national research program that aims to solve major health problems using AI in collaboration with industry and government partners.
- The National Artificial Intelligence Health Ethics Framework: a set of principles and guidelines that aims to ensure the ethical use of AI in health in Australia.
- The Medical Software Assurance Framework: a set of standards and processes that aims to ensure the safety and quality of medical software, including AI tools.

Conclusion
AI is transforming healthcare in Australia by enabling more precise, personalized and efficient diagnosis, treatment and service delivery. AI has the potential to improve the health outcomes and experiences of consumers and clinicians, as

well as the performance and sustainability of the health system. However, AI also poses some challenges and risks that need to be addressed by ensuring the data quality and availability, regulation and governance, workforce and education, and ethics and society of AI in healthcare. To achieve this, Australia needs a coordinated and collaborative approach that involves multiple stakeholders from different sectors and disciplines.