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10 ways AI can boost life sciences and health care

1 Diagnose smarter (and faster)

AI can uncover hidden patterns and disease characteristics in patient data, with potential to diagnose uncommon medical conditions at a faster rate than human doctors.

AI can automate the diagnostic process while potentially reducing operational costs, allocating medical practitioners more time to focus on activities such as patient interaction and support.

In conjunction with computer-aided detection (CAD) systems, AI can enhance and analyse radiological images where abnormalities are not visible to the human eye. AI can also be helpful in situations where human radiologists are not available, or where their case load is overwhelming.[1]

FACT An Australian prostate cancer testing group is using AI to create an easily accessible and streamlined approach to screening. The AI analyses the patient's results, and the clinicians review what the AI recommends so they may determine the next best step. Read more.

2 Push scientific discovery to new limits

AI can simulate the chemical interactions used to assess a drug's efficacy. This enables rapid and accurate identification of vaccines for viral infections.[2]

AI enables scientists to collect enormous data sets that are helping to uncover the complexity of fields like neuroscience. These data sets for example, can help researchers analyse the workings of neurons in an effort to understand cognition.[3]

3 Create more time for care

Changes to AI-based compliance processes can be implemented at the push of a button, instead of requiring extensive communication and retraining for human operators.[4]

AI-enabled chatbots can complete a wide range of tasks, such as addressing patient questions, scheduling appointments and calls and referring patients to other departments. Automating administrative processes increases efficiency and lessens the pressure on our health system.

AI can assess health records, understand the potential actions given certain criteria and completely automate review processes—eliminating many overhead costs and repetitive labour.[5]

FACT In a proof-of-concept trial, Deloitte's Referral and Intelligent Triage Analytics software (RITA) analysed over 21,500 incoming referrals, using natural language processing to identify patterns between referral letter language and triage pathway. RITA was 96 percent accurate in triaging patients with suspicion of cancer (versus previous clinical decisions). Read more.

4 Respond to complex health events rapidly

AI enables for complex, real time monitoring based on low latency, high precision, and more prompt contact tracing.[6]

AI-enabled predictive analytics can provide indications of future resource needs for different scenarios. This can help determine the optimal inventory to satisfy an update in hospital re-admission, or what new machinery/supplies are needed to meet seasonal demand.[7]

FACT AI has proved effective in real-time location systems. This technology enables a highly precise and socially fair approach to contact tracing in healthcare settings. Read more.

5 Optimise hospital workflows

Predictive AI can forecast peaks and valleys in patient volume and adjust hospital resource demand levels. Increased efficiency and accuracy in supply chains can minimise waste and promote sustainability efforts.

Leveraging AI analytics in Command Centres can optimise patient movement and staffing coordination from the moment emergency services are called. This can minimise events such as ambulance ramping due to emergency department overcrowding.

AI can augment long term demand planning forecasts which can be used for infrastructure planning as well as the identification of medical skills shortages.

6 Enhance smart medical devices

Captured by wearable devices, AI can analyse and identify anomalies in patient vitals. This enables patients to receive elevated levels of monitoring and care without being stuck in a hospital bed wired to machines.

AI driven technology can remotely monitor outpatient behaviour, such as nutrition, sleep patterns and medication routine. These insights can be extremely valuable in clinical trials or other events where the behaviour of outpatients can vary widely.

Wearable devices can alert wearers when they are experiencing abnormal physiological patterns, such as heart murmurs or an accelerated heart rate. Some devices can also call Emergency Services if sudden impact (i.e. a car crash or a fall) is detected.

FACT AI and augmented-reality solutions can be used for real-time surgical guidance. By integrating physiological information that cannot be seen with the naked eye into surgical imaging systems, the technology aims to reduce surgical complication rates, improving patient care and safety. Read more.

7 Complete more health trials with less error

Digital twins of potential new drugs can make it easier for biopharmaceutical companies to pick the best candidates for clinical studies. This can accelerate the R&D process and reduce the amount of failed experimentation.

AI can accelerate the drug approval process by analysing insights from past and current trials that can be used to inform and improve future trials.

8 Personalise health plans with precision medicine

AI can be used to proactively diagnose, prevent and treat a future illness based on an individual's lifestyle, real-world environment, biometric data and genomics.

Machine learning models can predict the best ways to engage with patients and health care practitioners based on past behaviour. This includes when and with what message platform to best engage with.

FACT Data Integration Partnership Australia (DIPA) & Connected Health Data Program (CHD) Data held by Health is a valuable national asset. The use, re-use and sharing of health data can help us explore the health journeys of Australian citizens. This helps researchers and policy makers to provide better health and wellbeing for all Australians, now and for future generations. Read more.

9 Prioritise prevention

AI can tap into social media, online forums and medical queries to generate insights that can improve educational materials in health campaigns. By understanding and anticipating the needs of patients, AI can help spur them into action.[8]

Precision medicine has emerged as an effective and cost-efficient form of disease treatment and prevention because it is more precise in addressing a patient's needs and assigning actions specifically suited to that individual's predisposed health risks.

FACT Deloitte's CARDEA solution provides a dynamic data analytics model to quickly and easily identify high-risk patients and the key factors impacting readmission. High-risk patients are connected to clinicians daily via a secure user interface which provides clinicians with information that enables them to take appropriate clinical action based on a patient's risk profile. Read more.

10 Ensure compliance in the most complex situations

AI can enable real-time risk assessments and monitoring of regulatory compliance, providing immediate notifications and information about detected issues.

AI can enable proactive compliance efforts through data analysis and machine learning. This can minimise errors and related consequences such as regulatory fines and reputation damage.
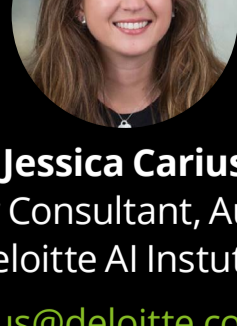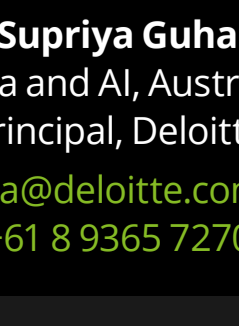
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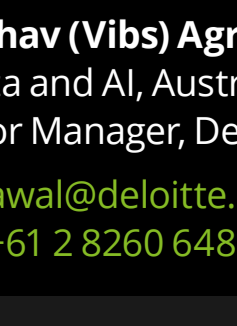knuttall@deloitte.com.au
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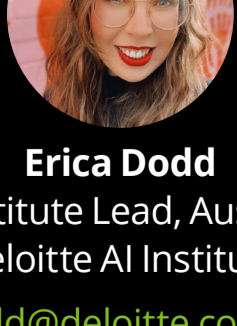
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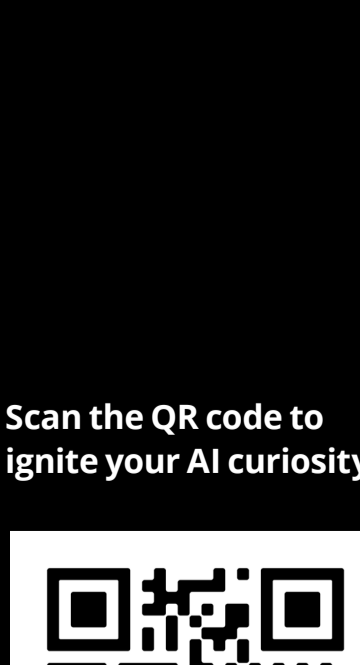jcarius@deloitte.com.au
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