



# Is HEALTHCARE ready for the RISE OF AI?

**Kate Preston** and **Mark Sujan** discuss how organisations can be better prepared to take advantage of the opportunities of AI

**A**rtificial intelligence (AI) is increasingly prominent across all sectors and there's much discussion about it in the public domain, including *The Ergonomist* where, for example, articles have been written about ChatGPT, a new triaging system for accident and emergency and the future ethical issues around sentient AI. The increasing popularity of AI shows people's interest in these new technologies, which have the potential to change – or disrupt – everyday life.

Specifically in healthcare, the possibilities for its use are endless, from automating management systems to providing remote monitoring and predicting and diagnosing patient illness. There are currently several examples of how AI has been applied in healthcare, with some of them having presented guest talks at meetings of the CIEHF Digital Health & AI Special Interest Group. These include MIA, an AI-based breast cancer screening tool created by Kheiron Medical Technologies, and an AI-guided clinical coaching service developed by Health Navigator.

Despite the increased technical development of these new technologies, introducing AI

into the healthcare sector may result in new challenges that must be overcome before it can be used safely and effectively. These challenges include technical aspects such as data availability and validation of new AI technology. However, as highlighted in the CIEHF's *Human Factors and Ergonomics of Healthcare AI* white paper, while these technical aspects are important, new AI technologies should be approached from a systems perspective. This systems perspective will help to understand any human factors challenges that should be addressed before integrating this new technology into everyday practice.

A key challenge that's been highlighted and is often overlooked is related to the organisational readiness of healthcare systems to integrate and use AI technology.

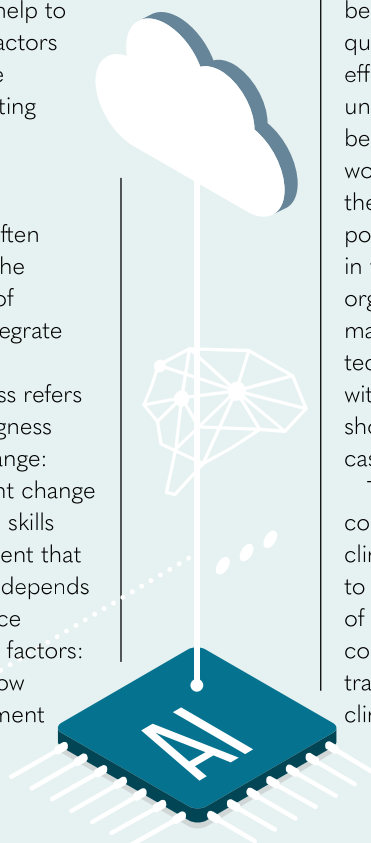
Organisational readiness refers to an organisation's willingness and ability to adopt a change: organisations have to want change and need the knowledge, skills and resources to implement that change. Change efficacy depends on task demands, resource availability and situational factors: does the organisation know what it will take to implement



the change? Does it have the resources available? Given its current situation, can it do it?

From this perspective, one might argue that healthcare organisations might certainly be very willing to adopt AI. Still, questions remain about change efficacy in terms of a lack of understanding of how AI might be adopted, what resources would be required and whether the organisations are in a good position to adopt AI at this point in time. Without the appropriate organisational readiness, there may be barriers to using AI technology in healthcare, with some of these barriers shown in the following example case studies.

The Welsh Ambulance Service considered using an AI-powered clinical decision support system to improve the recognition of cardiac arrest calls in their contact centres. The system is trained on past patient calls and clinical guidelines to learn salient





features indicative of critical illness. It alerts call centre operators when critical episodes, such as cardiac arrest, are detected. The AI system also adds important cues from the conversation to the call history together with notes from the operator. This information is then flagged up to the call centre operator, who bears responsibility for making a final decision.

A Systems Engineering Initiative for Patient Safety (SEIPS) analysis was undertaken. This showed there was a desire for the adoption of new technologies, but the organisation and the wider healthcare system lacked the experience and knowledge base to assure and adopt such AI technologies within their systems and processes.

For example, a crucial activity is sharing of clinical and patient data to train and validate AI models. It became apparent early on that this wasn't simply a matter of looking up relevant legislation, but that the information governance processes would need to be actively negotiated and defined between the different parties. From a human factors perspective, we can regard this as a form of less visible articulation work, i.e. activities that are required to make something work in practice but which aren't explicitly recognised as part of the innovation process. The ambulance service was neither sufficiently prepared nor possessed suitable technical expertise to foresee the technical nuances and complexities of the data sharing requirements and their legal and ethical implications.

A further example came from a study done as part of PhD research, which focused on an AI clinical decision for sepsis in



critical care. The study aimed to understand user needs for the new sepsis AI tool using a human factors approach. The output from the study suggested several challenges related to organisational readiness.

One of these challenges was the need for increased collaboration across different regional areas and sometimes between hospital locations and departments. This lack of cooperation resulted in work and decisions being completed in silos, little communication and different technology brands being used for the same application.

For example, other electronic prescribing technologies were found to be used within the same hospital. It was also found that some departments may still use a paper-based system for their patient notes or prescribing, resulting in clinicians having to transcribe patient notes or not having access to the information.

This lack of cohesion with technology causes issues with patient care, including tasks such as patient transfer between regional locations, hospitals and even departments. It may also result in errors as it's unclear if a patient has received a drug, for example.

These two examples show a need for more mature organisational readiness for the adoption of new AI within healthcare. Based on previous work, some suggestions for how to do this are as follows:

- Promote the use of systems approaches to understand the operational environment in socio-technical systems and consider the eight principles set out in the CIEHF AI in Healthcare white paper.
- Create an education and training infrastructure to enable healthcare stakeholders and healthcare organisations to develop AI literacy and capacity. The CIEHF could collaborate with national bodies, such as NHS England and the

Healthcare Safety Investigation Branch, as well as specialists in AI in the development of and provision of such training programmes.

- Frame the adoption of healthcare AI as a socio-technical process and focus on the necessary and often implicit articulation work by considering building of relationships and trust among stakeholders, negotiation of priorities, and the repair of social and organisational structures potentially disrupted by AI technologies.
- Before AI technology can be used in healthcare, work may need to be done to streamline, change or even overhaul the current technology. Without this, AI technologies potential may not be reached within this sector.

Overall, there is a need and significant opportunities for human factors specialists to contribute to the understanding of the practical implications of adopting AI in healthcare and to overcome barriers, such as organisational readiness, to realise its full benefit. ■

#### FURTHER READING

Sujan M, Baber C, Salmon P, Pool R, Chozos N., *Human Factors and Ergonomics in Healthcare AI*, CIEHF, 2021. (<https://ergonomics.org.uk/resource/human-factors-in-healthcare-ai.html>)

## About the authors

**Kate Preston** is a PhD researcher at the University of Strathclyde in Glasgow, focusing on human factors and hospital AI technology. She co-chairs the CIEHF Digital Health & AI Special Interest Group.

**Mark Sujan** is founder of Human Factors Everywhere Ltd and also works part-time at the Healthcare Safety Investigation Branch. He chairs the CIEHF Digital Health & AI Special Interest Group.

