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Cover Story:

The Future is Digital

Artificial Intelligence – Putting Patients First

A recent MIT Technology Review Insights survey looked at the current and potential future applications of artificial intelligence (AI) in the healthcare environment. This article discusses the survey's findings, and looks at how these technologies are 're-humanizing' healthcare, by aiding the transition from target- to value-based care models.

Not long ago, no one would have dreamed that a machine could be a partner in guiding a medical procedure, but recent advancements have transformed AI technologies into powerful tools for enhancing clinical and operational efficiency.

Today, AI is allowing everyone involved in the healthcare ecosystem—doctors, nurses, administrators, and patients—to benefit from enhanced efficiency and better diagnoses. It extends and augments professional capabilities and provides the foundation for better, more cost-effective outcomes. Crucially, it is an enabling technology for a more personalized approach to patient care, focusing on patient outcomes rather than just system efficiency.

During the next 10 years, AI is expected to radically streamline healthcare delivery by providing immensely powerful insights to enhance the patient management pathway, yet there are hurdles to overcome before AI transforms healthcare provision. For example, at present, too much patient consultation time is spent entering data, rather than drawing inferences from it. However, these transitional issues should quickly be resolved as AI is more broadly adopted across the sector, and the outlook among

healthcare professionals is positive; almost half of medical staff expect AI will enable more robust diagnoses, and 57% believe its improved predictive capabilities will allow them to focus more on preventive medicine. Rather than eliminating the human element from the system, AI allows those individuals to make smarter decisions, with fewer errors.

AI is already here

Numerous technologies are in play today to allow healthcare professionals to deliver the best care, increasingly customized to patients, and at lower costs. For instance, in medical imaging analysis applications, the combination of AI-based imaging technologies and radiologists has been shown to outperform either AI or the radiologist in isolation. So, far from replacing radiologists, the technology supports decisions and amplifies the performance of existing staff.

Radiologists don't just look at images. That would be a complete misunderstanding of what radiologists do. In my view, AI will enhance the value radiologists provide to patients, not replace them. While AI has been shown to augment the care radiologists provide, AI does not yet have the capacity to do what radiologists accomplish every day. It does, however, offer the tremendous opportunity to bring radiologists back into daylight by empowering them to become more 'doctor' than ever before. AI will help to re-establish the human connection between the radiologist and the patient. As such, I'm not the least worried that radiology as a medical specialty might eventually be at risk if we responsibly embrace AI.

To give just one example—GE Healthcare recently gained FDA clearance for first AI algorithms embedded on-device to prioritize critical chest X-ray review. These help radiologists prioritize critical cases with a suspected pneumothorax—a type of collapsed lung—by immediately flagging critical cases to radiologists for triage, which could drastically cut the average review time from up to eight hours[1]. They offer the first-of-its-kind automated AI quality check features that detect acquisition errors, flagging images for technologist review and allowing them to make corrections before they go to radiologists for review, and were built in collaboration with UC San Francisco (UCSF), using GE Healthcare's Edison platform. It's just one example of how an AI algorithm can help busy practitioners—reducing the turnaround time it can take for radiologists to review a suspected pneumothorax.

The industry is slowly realizing that AI is an enabling tool that represents the extension, not extinction, of professional capabilities. The survey found that seven out of 10 healthcare institutions have either adopted or are considering AI, with 10% using it for one or more applications, 17% conducting pilot projects, 11% in the process of acquiring at least one AI application, and more than a third planning to increase their spending on AI in the next two years. For those institutions that have already adopted AI, 86% of respondents believe that it has helped them analyse and make better use of data, while 79% indicate that it has helped avert healthcare worker burnout. Healthcare administrators and leaders also see AI as an agent for positive change, with 80% of business-facing and administrative healthcare workers expecting it to help them improve revenue opportunities, and 81% believing it will make them more competitive healthcare providers. In addition, more than 82% of healthcare business leaders report that adoption of AI has led to workflow improvements in both their operational and administrative activities, with nearly three out of four institutions planning to develop their own AI algorithms in the next two years.

Untangling complexity

Across the entire healthcare ecosystem—from patient management, operations and administration to diagnosis and treatment—medical professionals are confronted with growing complexity. Regulatory concerns, expanding treatment alternatives, and the onslaught of data and information are all exceedingly challenging to navigate.

The true value of AI is in reducing this complexity, automating and streamlining workflows to allow healthcare professionals to harness the insights available, without being overwhelmed by the sheer volume of data. Handling growing workload volumes—and managing the backlog and staff fatigue that accompanies it—was cited as the top challenge that they were looking to mitigate through the use of AI. These technologies can be used to assume many of a physician's more mundane administrative responsibilities, such as taking notes or updating electronic health records, which can take up to 10% of a typical medical professional's working week. Almost 80% of AI adopters surveyed indicate that AI has already automated many of these time-consuming tasks, and 45% believe this frees up additional time for patient consultations, procedures and other higher value tasks.

Expect the unexpected

Integrating AI applications into existing systems is obviously a major challenge for any healthcare system, with 60% of respondents concerned about

Health-care professionals are ready for AI

The health-care industry is eager to capitalize on the benefits of artificial intelligence, including improved quality of care and lower costs.

28% No plans

15% Considering deploying AI in the next two years

19% Considering deploying AI in the next 12 months

11% In the process of obtaining AI

17% Have deployed one AI pilot project or more

10% Have deployed one AI application or more
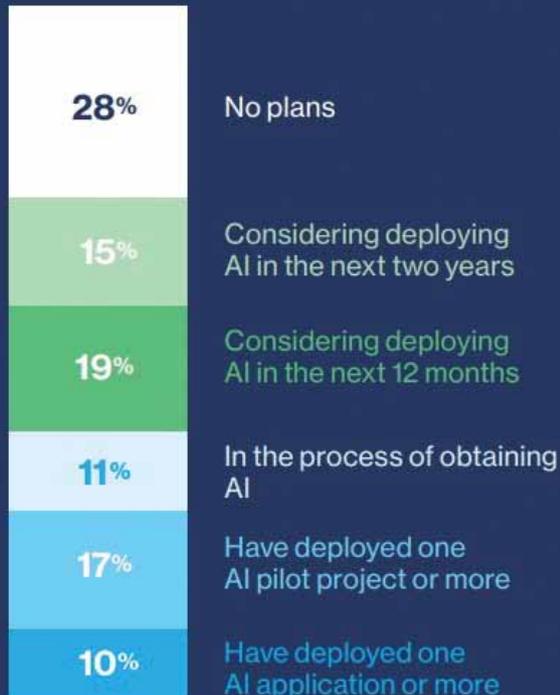
7 out of 10

health-care institutions have adopted or are considering AI.

Infographic from the MIT Technology Review Insights report: The AI effect: How artificial intelligence is making health care more human

the disruptive impact on established processes. Interestingly, there are four issues that less than half of current AI adopters consider obstacles to more widespread adoption: cybersecurity; lack of compelling adoption rationale; reluctance of staff to adopt the new technology; and lack of senior leadership support. Despite this, overcoming these 'traditional' adoption difficulties isn't easily done for most institutions, as a willingness to change and adopt AI is a perpetual challenge for even the most tech-forward organizations. The key to success is for medical professionals to see these technologies as something positive, rather than a threat, and evolve their practices to embrace these developments. AI can extend the resources and capabilities of over-worked healthcare professionals and vastly improve processes, leading to better patient outcomes.

Conclusion

AI needs to work for healthcare professionals as part of a robust, integrated ecosystem, and success relies on more than simply deploying a new technology. The more 'humanized' the application of AI is, the faster and more widely it will be adopted, and the better the return on the initial investment. Ultimately, this will improve results and patient care and, in healthcare, the priority should always be the patient.

About the survey

In October 2019, MIT Technology Review Insights surveyed 908 healthcare professionals involved in the purchase or selection of AI, big data analytics, or medical technologies. With respondents from both sides of the Atlantic - 70% USA and 30% UK - this mixed cohort included:

- 17% medical doctors and specialists
- 5% nurses or nurse practitioners
- 26% senior managers
- 16% information technology professionals
- 16% research and development staff
- 9% legal or regulatory professionals
- 9% finance or accounting personnel
- 2% other healthcare workers ■

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