

The Role of Technology in Reinventing Medical Practice

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Technology has had a significant impact on the healthcare industry, and it is now an integral part of the regular medical practice. One of the most promising opportunities presented by these technological advancements is the potential to empower patients and help them positively impact their health status and that of their communities. We must recognize that these technologies are not just gimmicks or inevitable forces, but tools to improve patient outcomes and ultimately benefit the patients themselves.

To achieve this goal, we must have a clear long-term vision of the benefits we want to bring to patients. This includes improved treatment outcomes, faster diagnosis, easier monitoring, and patient education. Patients must engage in self-monitoring as it promotes a sense of responsibility and empowerment, leading to better adherence to treatment¹ and improved understanding of their conditions². Biometric sensors and wearables are examples of technologies that facilitate self-monitoring and aid in the patient's overall care plan³.

However, we must also consider the societal and economic impacts of these technologies. Although healthcare costs can potentially be reduced by governments or citizens, data on healthcare expenditure does not necessarily support this claim. In fact, the introduction of technology and incremental improvements in diagnostic or treatment methods have been significant drivers of increasing health expenditure in recent years⁴. Nonetheless, these costs may be due to the novel nature of these technologies and, as we continue to study their highest efficiency applications, we may see reduced costs over time⁵.

In spite of the potential benefits, there are several barriers to the adoption of these technologies. Factors such as distance, literacy, and reliability of these technologies must be considered⁶. However, we must strive to close these gaps and reinvent traditional medical practices. Interoperability is essential⁷, and all stakeholders, from patients to governments,

¹ Lupton, D. (2013). The digitally engaged patient: Self-monitoring and self-care in the digital health era. *Social Theory & Health*, 11, 256-270.

² McIlhenny, C. V., Guzik, B. L., Knee, D. R., & Roberts, J. B. (2011). Using technology to deliver healthcare education to rural patients. *Rural and remote health*, 11(4), 72-82.

³ Metcalf, D., Milliard, S. T., Gomez, M., & Schwartz, M. (2016). Wearables and the internet of things for health: Wearable, interconnected devices promise more efficient and comprehensive health care. *IEEE pulse*, 7(5), 35-39.

⁴ Chandra, A., & Skinner, J. (2012). Technology growth and expenditure growth in health care. *Journal of Economic Literature*, 50(3), 645-680.

⁵ Chaudhry, B., Wang, J., Wu, S., Maglione, M., Mojica, W., Roth, E., ... & Shekelle, P. G. (2006). Systematic review: impact of health information technology on quality, efficiency, and costs of medical care. *Annals of internal medicine*, 144(10), 742-752.

⁶ Baker, S. B., Xiang, W., & Atkinson, I. (2017). Internet of things for smart healthcare: Technologies, challenges, and opportunities. *Ieee Access*, 5, 26521-26544.

⁷ Dinh-Le, C., Chuang, R., Chokshi, S., & Mann, D. (2019). Wearable health technology and electronic health record integration: scoping review and future directions. *JMIR mHealth and uHealth*, 7(9), e12861.

healthcare professionals to facility administrators, must be accountable in this process. By working together, we can ensure that technology is being utilized to its fullest potential for the benefit of patients.

One of the areas where technology has had a significant impact is in the field of robotics. One of the potential use cases is the field of robotic surgery, offers several advantages over traditional surgery: this has led to minimally invasive procedures, reducing pain, scarring, and blood loss⁸, and also improved surgical outcomes, including increased accuracy, faster recovery times, and reduced risk of infections⁹.

However, as with any technology applied to healthcare, while we have a long history of case proving for robotic surgery and other IoT medical devices, we must carefully measure their value. We must consider efficiency, not just efficacy, and determine the resources required, interoperability of systems, and what can be done with the data collected.

The patient must be at the centre of all these questions, and regulatory bodies and companies must focus on developing regulations and products that address the patient's needs. Only by doing so can we ensure that technology is being used to improve patient outcomes and make healthcare more accessible.

Parallely, one area where IoT technology can improve healthcare accessibility is through predictive analytics¹⁰. By combining IoT with predictive analytics, we can take an efficient approach to medical technology. This allows for appropriate triage of patient needs that occurs either live or on demand¹¹. However, we must be mindful of the risks involved in data governance and privacy concerns. On his note, standardization among devices and accountability must also be addressed. It is crucial to implement data governance frameworks to ensure that sensitive data is protected and that all stakeholders are accountable for their roles in the process.

In a rapidly changing world, technology will continue to play a crucial role in shaping the future of healthcare. As we look ahead, it is essential to embrace innovation while staying true to the human-centred values of healthcare. By leveraging technology to enhance patient care and streamline operations, we can create a healthcare system that is not only more efficient but also more compassionate. So let us continue to push the boundaries of what's possible, and harness the power of technology to build a better, healthier future for all.

⁸ Dai, J. S. (2010). Surgical robotics and its development and progress. *Robotica*, 28(2), 161-161.

⁹ Feizi, N., Tavakoli, M., Patel, R. V., & Atashzar, S. F. (2021). Robotics and ai for teleoperation, tele-assessment, and tele-training for surgery in the era of covid-19: existing challenges, and future vision. *Frontiers in Robotics and AI*, 8, 610677.

¹⁰ Kankanhalli, A., Hahn, J., Tan, S., & Gao, G. (2016). Big data and analytics in healthcare: Introduction to the special section. *Information Systems Frontiers*, 18, 233-235.

¹¹ Bates, D. W., Saria, S., Ohno-Machado, L., Shah, A., & Escobar, G. (2014). Big data in health care: using analytics to identify and manage high-risk and high-cost patients. *Health affairs*, 33(7), 1123-1131.