

EDITORIAL

Digital Vascular Medicine: The future we cannot ignore

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No other event in recent world history has expedited the advance of digital technologies so much as the COVID-Pandemic has during the past year. The need for fast and reliable internet connection, advanced digital solutions, online conferences, digital patient management and efficient organization of patient care has become more obvious than ever. There is also increasing acknowledgement of the need for partnership between human and digital systems to effect change in healthcare, such as open-source software for reporting, analysis and dissemination of data.¹ For example, after finding improved prediction of influenza-like illness through the use of wearables, Fitbit have announced that they will share their data with research and academic institutes (while upholding privacy regulations) for researchers to use as a tool to help mitigate the spread of COVID-19.²

The big players in digital technologies have recognized the potential of digital medicine and are moving fast in establishing infrastructures that could potentially transform medical practice, just as “Google Maps” changed the way we move around the world. “Amazon Care”, “Google Health”, “Apple Healthcare” are all establishing collaborations with healthcare institutions and investing in healthcare apps, such as the Health App and the Apple Watch, to reinvent our everyday practice.² Logistics in hospitals need a significant update and high-tech companies could facilitate this in the best possible way. Similarly, the Bill and Melinda Gates Foundation has invested huge amounts of resources in promoting the Global Burden of Disease, a program run on a 25,000 CPU super-computer located in Seattle, which identifies world needs and provides a window into the most pressing challenges and commendable achievements of the collective endeavour to transform human health and wellbeing.^{3,4} Our responsibility as healthcare specialists is not only to follow this trend, but to become leaders and innovators, facilitating better care for our

patients without allowing high-tech companies to exploit the vast vacuum without proper medical and ethical guidance.¹

Despite cardiovascular disease being the leading cause of global mortality and a major contributor to disability worldwide,⁵ the application of digital technologies and artificial intelligence remains in its infancy. The effectiveness of wearables and health apps in improving monitoring, diagnosis and management of patients with cardiac insufficiency, arrhythmias, ischemic heart disease, etc. will prove only the beginning.^{6,7}

For vascular diseases, the potential of digital technologies in the diagnosis and monitoring of patients with peripheral arterial disease (PAD) is enormous, allowing for increased adherence to best medical treatment, follow-up visits, and supervised exercise training programs. Specific apps to monitor O₂ saturation and determine the flow status of the lower extremities, as well as submitting wound surveillance to vascular experts, have already been suggested. Similarly, active app-oriented self-monitoring and consultation lies within the realm of possibility for patients suffering from aortic disease. Given the delimited availability of vascular expertise, allied to a geographically dispersed patient population, such digital provision would prove revolutionary. Although the use of smartphones and digital programs may for the time being remain low in the typical population suffering from vascular diseases (mainly older and more comorbid patients), the situation will undoubtedly have changed beyond recognition within a decade.

The use of hybrid operating rooms and sophisticated software to decrease operating times, contrast use and fluoroscopy time have already become a widespread reality.⁸ Similarly, simulation-based training of endovascular procedures has been proven to increase procedure-specific parameters and outcomes. The use of virtual reality and artificial intelligence for preoperative planning, in the operating theatre, and during follow-up are, excitingly, just around the corner.

The pathway to a digital future is already determined and it is important for the vascular community to jump on the train of digital innovation and artificial intelligence, as it will prove essential in the upcoming decades. The potential for vascular medicine to grow through integration of digital workflow is vast and should not be left unexploited.

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