DIGITAL HEALTH

Physician centricity in the deployment of digital solutions for neurological conditions

Graham B Jones[1,2] (iD), Jason Freeman[1], Allison Mann[1] and Amit Khanna[3]

Abstract

The widespread deployment of telemedical approaches to managed care during the CoV2 pandemic has provided an opportunity for clinicians to engage in the development and refinement of this mode of delivery. This also represents a pivotal moment to help effect a paradigm shift in how new and more sophisticated digital health services are designed and delivered with the caregiver playing a guiding role. Building on momentum this way can allow the fuller potential of digital health to be realized by focusing on "end user pull" which balances the omnipresent "technology push" of the consumer product and medical device industries. Perhaps nowhere is this more critical than in the care of neurological illnesses where patient–provider interactions must be managed frequently and rely on a complex battery of data measures. The emergent role of the physician-entrepreneur can be envisioned, complimenting established physician-scientist career paths and represents a timely and opportune moment to refine medical education curricula.

Despite widespread deployment of digital technologies for diagnosis and management of patients with complex illness over the past decade, adoption in standard care has been somewhat limited.[1] The recent SARS-CoV-2 pandemic provided an opportunity for real-world evaluation of this model, with routine checkups delivered by telemedicine platforms at large scale globally. Appetite exists within the Health Care Professional (HCP) and patient community to continue use of telemedicine post-pandemic and payers who recognize it as resource-effective means to deliver quality care have developed new reimbursement mechanisms.[2] This said, the utility of telemedicine remains limited to routine maintenance of the HCP-patient relationship and currently appears less suited to more rigorous applications including complex diagnoses that initially require technical protocols and assessments. Nowhere is this more evident than in the management of complex neurological disorders. In order to capitalize on the momentum post-pandemic, it is essential we begin to address some of the limitations and encourage active dialog between the key stakeholders who can help enable development. In this regard, Spina et al.[3] offer some pointers for the path

forward by reflecting on observations reported by clinicians during the pandemic. Focusing on neuromuscular diseases, they survey the application of telemedicine in four main categories viz. (a) clinician–patient interaction, (b) remote clinical assessment, (c) remote monitoring, and (d) digital therapeutics. They report the routine benefits of telemedicine have been widely appreciated, though scalability across all neurological categories is tempered by the range of cognitive abilities encountered. Some specific technologic limitations are highlighted, for example, the need for remote electrodiagnostic testing and the need for calibration and validation of remotely conducted actions (e.g. repetitive maneuvers). However, there is appetite among the clinical community for aggregate and

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[1]Novartis Pharmaceuticals, USA
[2]Tufts University Medical Center, USA
[3]Neuroscience Global Drug Development, Novartis Pharma AG, Switzerland

Corresponding author:
Graham B Jones, Novartis Pharmaceuticals, 1 Health Plaza, East Hanover, NJ, 07936, USA.
Emails: graham.jones@novartis.com, graham.jones@tufts.edu

longitudinal passive data capture from devices and apps and also some notable successes in terms of patient compliance for use of devices to perform specific activity tests.[4] How and when these emerging technologies will be utilized is a more complex undertaking and must have HCP's engaged in all aspects of design and deployment. The range of skills deployed when a neurologist assesses a patient are myriad, combining norms of care practice with insights gleaned from years of observation and not always recorded in publicly available documents. These observations, which represent components of personalized medicine are sometimes recalled in clinical notes in the medical literature and form key elements of the corpus of learning we must distill from the bedside to EMR and general medical practice. Accordingly, though new technologies will emerge, the decision on when and how to gather and interpret the information will rest with the physician. Ideally this so called digital "toolbox" will consist of composite data streams which are contextualized based on the patient's unique environment (personalized), and data capture is achieved passively (reducing patient bias and increasing adherence). For example, the transitions from Clinically Isolated to Relapsing Remitting through Secondary Progressive and ultimately Primary Progressive each bear signatures in Multiple Sclerosis, and the ability to detect transitions with early warning could be of great benefit to patients, caregivers and providers. Equally importantly, such technologies might provide data on disability level as a function of patients' daily activities[5,6] and help remotely manage complex diseases that currently require multiple patient visits within short time periods.[7] Designing the software, firmware and hardware which might enable these decision points requires input from end users. Though considerable effort is devoted to patient user experience (UX) in the design of consumer devices and interfaces, the clinician community must be equally involved in this instance. Though some physicians have actively engaged with technology startups there is need for an aggregated forum to advance such tools and devices, bringing key insights to managed care into the process. Failure to do this will result in products with diminished utility. For example, in the case of health-related apps (which now total over 300,000), most consumers stop using them soon after initial use.[8] A contributing factor is likely the lack of personalization which can only be truly achieved through integration with the persons/patients unique medical attributes. Thus, although there exists the real potential to effect a step change in use of remote devices in care, without these critical inputs the conundrum of "technology push" versus "end user pull" will continue to hold back development and adoption. This is a unique time to create an ecosystem which provides more meaningful medical assessment data. Granted, there will be additional challenges to overcome including legal considerations and data privacy concerns but the benefits could be transformative. It is incumbent on the clinical community to embrace this opportunity and encourage physician entrepreneurs to guide the debate and in parallel to advance medical education to prepare the next generation of leaders in the field. We advocate that clinician communities, medical societies, and scholarly journals such as this join forces in a global effort to help develop these solutions.

ORCID iD: Graham B Jones ⓘD https://orcid.org/0000-0003-2195-3567

References

1. Moulin T, Dobson J, Hixson JD, et al. Digital health: the journal's pioneering journey 6 years on. *Digit Health* January 2021; 7: 1–4. doi:10.1177/20552076211034034

2. Khanna A and Jones GB. Envisioning post-pandemic digital neurological, psychiatric and mental health care. *Fronts Digit Health* 2021; 3: 803315.

3. Spina E, Trojsi F, Tozza S, et al. How to manage with telemedicine people with neuromuscular diseases? *Neurol Sci* 2021; 42: 3553–3559. doi:10.1007/s10072-021-05396-8

4. Rockette-Wagner B, Saygin D, Moghadam-Kia S, et al. Reliability, validity and responsiveness of physical activity monitors in patients with inflammatory myopathy. *Rheumatology* 2021; 60: 5713–5723. doi:10.1093/rheumatology/keab236

5. Abbadessa G, Lavorgna L. Miele G, et al. Assessment of multiple sclerosis disability progression using a wearable biosensor: a pilot study. *J Clin Med* 2021 Mar 10; 10: 1160.

6. Block VJ, Lizée A, Crabtree-Hartman E, et al. Continuous daily assessment of multiple sclerosis disability using remote step count monitoring. *J Neurol* 2017 Feb; 264: 316–326.

7. Bombaci A, Abbadessa G, Trojsi F, et al. Digital technologies, web and social media study group of the Italian Society of Neurology. Telemedicine for management of patients with amyotrophic lateral sclerosis through COVID-19 tail. *Neurol Sci* 2021 Jan; 42: 9–13.

8. Vaghefi I and Tulu B. The continued use of mobile health apps: insights from a longitudinal study. *JMIR Mhealth Uhealth* 2019; 7: e12983.