

# World view



By Benjamin Lipp

## What many digital tools for chronic pain get wrong

**To address the chronic-pain crisis, digital health technologies must break out of their silos and become integrative and multimodal.**

**C**hronic pain is a health crisis of enormous proportions. In the United States and Europe, about 20% of adults experience chronic pain, defined as pain lasting more than three months. Incidence is likely to rise in the coming decades, owing in part to ageing populations.

The past few years have witnessed an explosion in the number of digital tools, some powered by machine learning and big data, that promise to help people living with pain. Digital-therapeutics companies, such as Hinge Health in San Francisco, California, offer remote physical therapy, monitored by computer vision, to correct posture. In 2022, the device company Neurometrix in Woburn, Massachusetts, received authorization from the US Food and Drug Administration to market Quell, a wearable smart device for nerve stimulation, as the first non-pharmacological treatment for fibromyalgia, a disorder characterized by widespread body pain and fatigue. Virtual-reality (VR) platforms for neurofeedback therapy, which helps users train their brains to cope better with pain over time, promise to provide relief similar to that offered by opioid medications.

In my sociological research, I have spoken to dozens of entrepreneurs, physicians and people with chronic pain about the promise of digital technology for pain management. Our conversations are full of examples showing that data-driven alternatives to addictive drugs can help to fight chronic pain. Indeed, the companies spearheading this trend have produced good evidence that their tools work, such as Hinge Health's longitudinal cohort study (J. F. Bailey *et al.* *J. Med. Internet Res.* **22**, e18250; 2020).

But there are caveats. A 2022 review of research from 12 countries, including the United States, found that digital health technologies could create health disparities or exacerbate existing ones (R. Yao *et al.* *J. Med. Internet Res.* **24**, e34144; 2022). For example, rural areas often don't have broadband Internet access, and older adults might lack digital literacy. Disabled people can be left behind if digital tools are not designed to be accessible. If digital health equity concerns are not taken into account, these technologies will be inadequate in tackling the pain crisis.

Although digital therapies that use a single approach, such as online physical therapy, can benefit some people, they can promote a view of pain as easily fixable and ignore co-occurring conditions that require other solutions. Chronic pain is complex and often involves several overlapping pain conditions, depression, anxiety, sleep disorders and social factors. That's why the International

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**Benjamin Lipp** is an assistant professor at the Technical University of Denmark in Copenhagen. e-mail: [bmili@dtu.dk](mailto:bmili@dtu.dk)

Association for the Study of Pain affirms that the gold standard for treating chronic pain is integrative care, which centres on an individual's needs, involves collaboration between pain physicians and other health professionals and can combine several therapies. This approach requires time, resources and infrastructure enabling seamless, real-time coordination among specialists and with the patient.

Digital technology has huge potential to improve access to integrative care, but it falls short on delivery. The competitive mentality of Silicon Valley does not mesh with the continuity of care and inter-professional communication and organization that are needed to manage this condition. If simply added alongside existing systems – instead of being integrated thoughtfully – digital technology might lead to sub-optimal care and contribute to burnout of providers, who will have to spend more time on electronic health records and coordinate the use of yet another tool.

One solution is focusing on strategic partnerships between digital-health companies that have technological know-how and hospitals and health systems that provide quality pain care. For example, Fern Health, based in New York City, is co-developing and scaling its multimodal education and lifestyle-intervention programme with the MetroHealth System, a non-profit public health-care system based in Cleveland, Ohio. Fern also merged with VR company BehaVR, based in Nashville, Tennessee, which offers neurofeedback therapy at home. New digital health solutions should be designed as add-ons or plug-ins for broader collaborative platforms, rather than as standalone solutions.

Other examples of digital technologies that are addressing the divide and making care accessible to more people can be seen in some newer companies, including US firm Override Health and Upside Health in New York City. These platforms do not promote one specific therapy; rather, they digitally connect several providers to discuss a person's progress in a coordinated way, and provide patients with access to networks of people with similar conditions.

This leaves the challenge of access. Beyond broader societal issues, such as broadband access, digital technology must be understood as a two-way medium not only between health-care provider and patient, but also between platform designers and users. The digital transformation of chronic-pain care cannot succeed without design input from those who should benefit from these tools.

Everyone affected by pain misses out on a massive opportunity when digital technology is seen merely as an upgrade of existing, singular solutions, instead of as a transformative connector.

Technological fixes to medical problems should be viewed with caution. But digital health technology – if used to integrate care and focused on equitable access – might change the course of the current pain crisis.