

## The Future of Wearables in Healthcare

Examining the challenges for a wearables revolution in healthcare

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**Wearable technology has the capacity to unlock broad, far-reaching possibilities in the healthcare industry. Wearables can help continuously collect invaluable, individualized real-world data to support innovation in care delivery and clinical research. Leveraging wearables to gather comprehensive physical and behavioral user metrics can help identify those at risk of disease, improve adherence to treatment regimens, and enhance the overall patient experience. Digital data can also be used to measure patient-centered endpoints in clinical trials and observational studies to determine the factors driving patient outcomes, enabling a true “digital transformation” in healthcare.**

While some healthcare spaces are starting to employ wearables, specific considerations around standards, policy, and design integration must be addressed for them to reach their full potential across the healthcare sector.

### Standards

For the pharmaceutical industry to make informed investment decisions about co-developing wearable technologies in concert with their drugs and vaccines, standards need to be set for digital device development and usage across all disciplines. Standards allow for the assessment of quality, validity, reliability, and other critical product attributes. To promote the development of high-quality products, it's important for the pharmaceutical industry to implement digital health wearables and technological processes in a highly informed way.

Fitness trackers and smartwatches already gather personal health data like hours of standing time and heart rate, but the transition from personal health data to clinical use requires a different set of standards. The [IEEE P360](#) and [Consumer Technology Association](#) (CTA) have already begun qualifying the capabilities of wearable devices; however, there has been slow progress to incorporate this type of data into clinical practice. Capturing everyday behaviors to help inform a medical professional's ability to provide care while also protecting patient privacy is a challenge yet to be addressed across the healthcare system. Setting the precedent for the next wave of health technology and its use is a big responsibility, one that is needed now more than ever in the midst of an ongoing pandemic.

Establishing clear and comprehensive standards is step one in achieving that goal.

### Policy

Wearables offer opportunities to “mass customize” user experience with adaptable technology companions. Healthcare consumers increasingly expect their needs to be anticipated with personalized solutions tailored to their circumstances, especially when it comes to issues like quickly addressing symptoms and use of medications. Since this requires a deep level of insight into users' lives, issues around privacy, security, fair use, public health, and other related matters need to be given serious consideration to protect users of wearable technology and those around them.

Patient confidentiality can be a major concern when it comes to protecting the data of those using wearable devices. Collecting patient information that is not required by a provider or pharmaceutical company can have serious ethical implications. A 2017 University of Illinois-Chicago [study](#) discussed a few of these challenges. For example, the study found that methodologies for mobile technology data collection and data conceptualization and interpretation for specific populations like low-income, racial/ethnic minority youth can potentially lead to a type of “monitoring” system that strays from the original intent of the health-risk data collection. Industries need to prioritize implementing strong cybersecurity protections around their devices' data, in compliance with [HIPAA regulations](#), to protect users and the integrity of the information collected.

Companies must also ensure that their wearable

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technologies have regulatory grade hardware. A recent [article](#) detailing regulatory aspects of smart devices for cardiac monitoring highlighted the safety and regulatory assessments conducted by entities like the U.S. Food and Drug Administration and the European CE Mark. The strict guidelines that wearable devices must meet to be disseminated in the market are important for the pharmaceutical industry to consider as they invest in durable, reliable hardware for their wearables. Leading organizations will have to expand their scope to include the latest innovations of smart wearables and their medical uses that meet the highest standards for safety and performance.

## Integrated Design

The pharmaceutical industry faces additional unique challenges to optimizing wearables integration with their products that will require the expertise of individuals across a range of disciplines such as physical design, human factors, data transfer, epidemiology, and more. Creating and deploying wearable technology will require a multidisciplinary approach to help traverse specialties and translate research into impact. Such an approach that employs the expertise of professionals across disciplines, from technology experts to engineers and data scientists, will better equip the pharmaceutical industry to prioritize patient health and security and to transform healthcare as we know it.

Consumers demand a more integrated digital healthcare experience comparable to their retail interactions—and we need to answer the call. It is of the utmost importance that pharmaceutical companies address emerging standards and policy considerations when developing their wearables strategy. This can open doors to groundbreaking products to improve the patient experience.

## How Exponent Can Help

Exponent's multidisciplinary engineers and scientists are at the forefront of rapid development in wearable technologies, including improved performance, safety margins, and usability. We help clients achieve their innovation goals by supporting the wearables product life cycle from early-stage R&D to post-market quality control and monitoring. Exponent's services include identifying, testing, and implementing optimal wearable technologies that can provide powerful indices to a variety of behavioral and performance-based metrics and distilling the ensuing high-volume data into actionable outcomes for a broad range of use case requirements.



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