

2024 INDUSTRY TRENDS: **WEARABLE DEVICES**



The proliferation of [Internet-of-Things \(IoT\)](#) [applications in healthcare](#) – driven by innovations in remote care, real-time monitoring, and preventive measures – is revolutionizing how patients use wearable devices. Healthcare providers are now empowered to improve efficiency and patient benefit, such as reducing medical costs, streamlining record-keeping, and more specifically targeting individual intervention needs. Further, new wearable device developments are encouraging heavy patient involvement in their own health. These advancements have broadened the definition of wearables beyond traditional consumer devices like smartwatches and smart rings, paving the way for clinically driven solutions with significant healthcare impact.

In this report, we dive into wearable device trends and their impact on the industry for 2024 and beyond.

1

**WEARABLE DEVICE
INFLUENCE ON
HEALTH PROVIDERS
AND INSURERS**

2

**STANDARDIZATION
OF WEARABLE
DATA-AS-A-SERVICE**

3

**RISE OF IMPLEMENTATION
OF WEARABLES INTO
TELEMEDICINE**

4

**DISEASE
MANAGEMENT AT HOME
AND IN CLINIC**

5

**WEARABLES TO AID
PREVENTATIVE
EARLY DISEASE DETECTION**

6

**USE OF WEARABLES
IN MENTAL HEALTH**

1 WEARABLE DEVICE INFLUENCE ON HEALTH PROVIDERS AND INSURERS

The COVID-19 pandemic sparked [dramatic growth in the use of health and fitness apps](#), reflecting a growing desire for the integration of the traditional healthcare system and the growing virtual landscape, such as telemedicine. In fact, [one CVS survey](#) showed that U.S. adults most value convenient care, privacy, personalized plans, and positive healthcare factors such as proximity, low cost, and the ability to monitor health through apps and wearables.

These trends emphasize the potential of wearable devices for remote patient health monitoring. Take, for example, the Apple Watch. Its [FDA-cleared* EKG monitoring](#) can send notifications, providing valuable data for remote care for healthcare providers and insurance companies. Another example is glucose monitoring. In one survey, [71% of participants](#) said that “using remote patient monitoring would help them better manage their condition between office visits.”

There is certainly potential for healthcare providers to incorporate wearables into health improvement programs and patient care. However, to successfully integrate the use of wearable data, clinicians must possess the skills, knowledge, and training to ensure ethical and competent practice.



*** FDA clearance is typically given to Class I and Class II products that are low to moderate risk products and obtained through the 510(k) process. Clearance is by the manufacturer's ability to demonstrate substantial equivalence to a legally marketed predicate device.**

2 STANDARDIZATION OF WEARABLE DATA-AS-A-SERVICE

As the direct-to-consumer wearable market grows, medical device retailers see an opportunity in remote health monitoring to standardize data from health monitoring wearables. However, the lack of interoperability and data integration across platforms presents a challenge to organized clinical implementation. The data extraction, transformation, and load (ETL) process of wearable data-as-a-service provides the solution for standardization that enables the aggregation of wearable data into universally usable data analytics in a clinical setting.

The [global healthcare interoperability solutions market](#) is estimated to value at \$3.4 billion and to grow at [12.9% CAGR](#) from 2022 to 2027. For medical device sellers and providers, data interoperability can become a value-adding service in navigating the complex data aggregation process in clinical settings. Other value-adding areas include data compliance and security to navigate the changing landscape of consumer privacy and data regulations. Offering wearable data standardization as a service enables all users to safely transport and analyze patient data for use in telemedical and clinical cases. The ETL process of wearable data-as-a-service will continue to grow in demand as healthcare and insurers move toward the convenient nature of telemedicine.



3 RISE OF IMPLEMENTATION OF WEARABLES INTO TELEMEDICINE

Telemedicine grew in popularity during the COVID-19 pandemic, as it provided patients with an alternative to in-person clinical visits. However, many patients and providers have gravitated toward telemedicine even post-pandemic. This growing use of virtual healthcare is driving the need for wearables as remote patient monitoring tools. [Key features in the successful implementation of wearables](#) include clearly defining problem and disease state, integrated system of healthcare delivery, technology support bar and service, personalized experience, enhanced end-user experience, aligned payment and reimbursement models, and clinician champions and stakeholder support. Each category represents a crucial factor when deriving value from wearables into telemedicine.

Wearables can track EKG, exercise patterns, sleep, ovulation cycle, and other data to enable personalized telemedicinal care. Some devices on the rise include optoelectronic sensors that can wirelessly detect oxygen saturation, heart rate, and other metrics using light. Other offerings include flexible, skin-like sensors for greater wearability, as well as low-cost nanomaterial sensors. These additional offerings all contribute to building the foundation of wearable accessibility for all types of patients.

Wearables also collect valuable passive health data, which provides a comprehensive view of a patient to a greater degree than possible with sporadic office visits. Healthcare providers will be able to create “[digital twins](#),” or virtual models of patients and their health, through the aggregation of individual, personalized data collected by wearable technology. This encourages informed care that is specifically tailored to each patient. With a successful transition to telehealth applications, all data will be efficiently and safely managed and transmitted through the cloud as IoT solutions.



4 DISEASE MANAGEMENT AT HOME AND IN CLINIC

The dissemination of wearables into both at-home and clinical settings has pushed the development of [novel product categories](#), such as biosensor patches, exoskeletons, and wearable injectables.

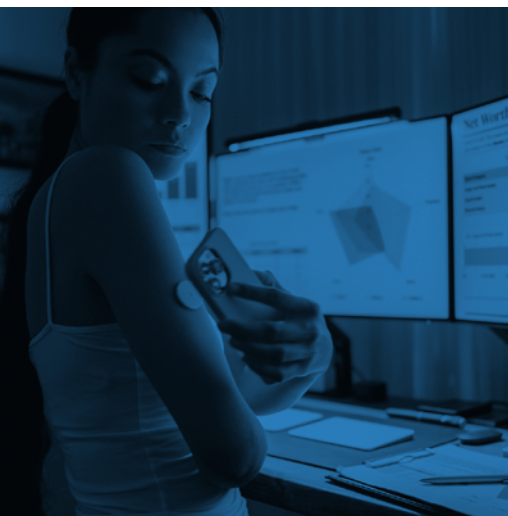
[Biosensors](#) combine biological and physicochemical transducers to provide comprehensive analyses for accurate clinical diagnoses. The biosensors can be electrochemical, optical, or mass-based.

Biosensors that specifically target cancer biomarkers are in development, intending to provide simpler, faster, and lower-cost alternatives to existing techniques, such as polymerase chain reactions and immunohistochemistry. Biosensor patches have the potential to further transform the global point-of-care diagnostics market, which is expected to [surpass \\$159.01 billion by 2032](#).

[Exoskeletons](#) are wearable robotic devices that augment patient movement for rehabilitation purposes.

The two main types include rigid weight-based exoskeletons and joint targeting, which focuses on specific joints. In a clinical setting, exoskeletons can restore mobility after neurological or muscular impairment, and they are currently used as a supplement to conventional therapy.

[Wearable injectables](#) are biological agents that are formulated for large volume injections (>1mL) and are becoming prevalent, driven by the push towards at-home use, increased convenience, and focus on patient-centricity drug delivery. Benefits of wearable injectables include the delivery of larger volumes, the reduced need for permeation, and the closing of the injection gap between the mediums of syringes, autoinjectors, and pumps. The evolution of wearables enables innovative at-home and clinical applications like biosensors, exoskeletons, and injectables that are transforming disease management. By bridging the gap between emerging technologies and patient needs, these wearable devices have enormous potential to improve healthcare delivery and outcomes.



5

WEARABLES TO AID PREVENTATIVE EARLY DISEASE DETECTION

Over-the-counter wearables' ability to capture personalized health data enables early detection of medical conditions such as AFib, sleeping disorders, and respiratory issues. Studies have shown [The Oura Ring](#), for example, detected changes in body temperature, heart rate, breathing rate, and sleep efficiency up to 2.5 days before wearers reported signs of COVID-19-positive symptoms. However, smartwatch technology is not limited to COVID-19; wearables have the potential to [detect early signs of progression in Parkinson's Disease](#) as much as seven years earlier than other methods.

Clinical wearables also have the [potential to detect breast cancer](#). Wearable devices can now attach to clothing and use ultrasound technologies to check for abnormal breast development. This technology provides a lower-cost, at-home option for patients who cannot afford the often-costly traditional prevention practices. By leveraging predictive analytics, wearable technology can [aid in and advance preventative disease detection](#).



6 USE OF WEARABLES IN MENTAL HEALTH

The digital mental health market is projected to [grow up to \\$71.1 billion by 2030, with a 20.3% CAGR between 2023-2030](#). Much of the growth can be attributed to the growing availability of both wearables and biosensors in the mental health market. The clinical design of wearables results in the development of machine-learning models that can use biosensor data to measure mental well-being.

According to the Society for Human Resource Management (SHRM), 40% of remote workers surveyed have experienced [an increase in the likelihood of anxiety and depression](#) symptoms, as compared to 35% of in-person workers. It's also mentioned that 64% of executives said remote work has negatively affected employee mental health in 2022, as compared to 55% in 2021.

Wearable devices offer the opportunity for cost-effective, convenient, real-time monitoring of mental health issues. [A study conducted on the potential effectiveness of wearables](#) in the mental health field found that their sensors can gather real-time information on anxiety and stress levels through analysis of heart rate, as well as record habits such as sleep that can indicate the presence of depression or other mental illnesses. Wearables will also be able to lead to more personalized treatment options, as the recorded data can provide insights into effective sleep habits, medication regimens, and physical activity needs. It's very apparent that wearables offer a significant opportunity to influence the mental illness landscape by creating pathways to more effective and individualized treatment.





The wearable industry has and will continue to exert significant influence on health providers and insurers. The healthcare industry must consider the standardization of wearable data-as-a-service, the implementation of wearables into telemedicine, the use of wearables in early-disease detection, and the technology's unique ability to tap into the digital mental health market. We expect these key trends to continue to impact the wearable device industry in 2024 and in the years to come.

ABOUT CLARKSTON CONSULTING

Businesses across life sciences industries partner with Clarkston Consulting to enhance strategic decision-making, improve operational efficiencies, implement new technologies, and promote business growth and market diversification. Leveraging deep functional and industry expertise, our people discover, design, and deliver solutions that fit your business, your goals, and your future. At Clarkston, your purpose is our purpose.

For more information about how we can help your company, [please contact us](#).

