The INSIGHT Partners

Wearable Medical Device

Introduction

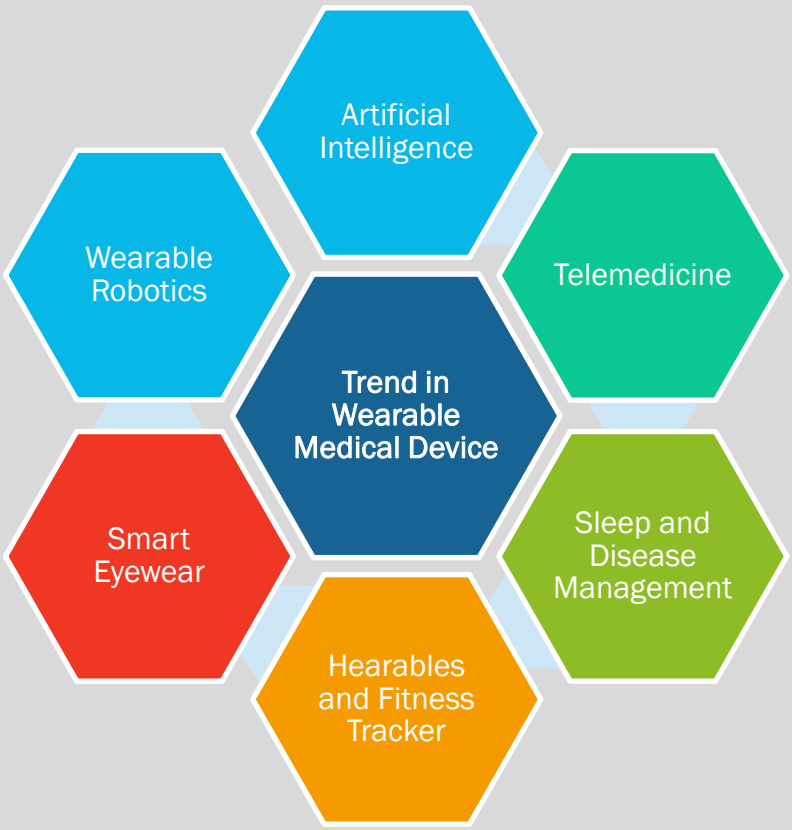
The wearable medical device industry is indispensable in revolutionizing healthcare by promising seamless integration into daily routine. These devices have evolved and adopted various uses, from simple devices assisting surgery to achieving fitness goals. The advancement of embedded systems, wireless communication technologies, sensing technologies, nano-technologies, and miniaturization is making it possible to develop smart medical systems to monitor human activities continuously. Wearable technology in healthcare refers to a variety of wearable medical devices and supportive accessories. A wearable medical device monitors health metrics and assists in delivering treatment based on provided medical information. Examples include smartwatches that monitor blood pressure, heart rate, and insulin pumps. These devices help manage the chronic conditions of an individual and promote awareness. Wearable sensors help detect abnormal and/or unforeseen conditions by monitoring physiological parameters and other symptoms.

This blog presents an overview of wearable medical devices, highlighting the current trends, gaps, major juggernauts, government initiatives, and conclusion based on key opinions of the stakeholders of wearable medical devices.

Notable Trends in Wearable Medical Devices

A notable trend in the wearable medical device market includes personalized health monitoring, integration with telemedicine, an advanced biometric sensor, seamless data connectivity, data security and privacy, chronic disease management, and AI and predictive analytics. Growing demand for wearables in the healthcare ecosystem has proven to be a booming market, and companies are involved in supplying wearable health technology to their consumers and making it beneficial. According to the data retrieved from the National Institutes of Health, approximately 30% of the adult population in the US adopt wearable healthcare devices, and nearly half of this population use wearable devices daily to deal with complex health issues. Several companies are reportedly competing to lead in commercializing wearable blood pressure devices that could replace conventional hospital tests.

The increasing burden of chronic diseases is another factor promoting the overall wearable medical device market. Elderly population is also adopting wearable medical devices owing to the rising prevalence of chronic and acute diseases globally. Wearable medical devices got prominence during the COVID-19 pandemic. The pandemic further boosted the overall demand for wearable medical devices. For instance, smartwatches monitor the oxygen level in the body. Wearable medical devices provide health practitioners and patients a better way to monitor health data.



Source: Expert Interviews, Surveys, Secondary Research, and the Insight Partners Analysis

Artificial intelligence (AI) enables automated data collection and real-time analytics, offering personalized care. Several other smart wearables are focused on precision medicine, telemedicine, and e-health services. Startups and established companies in the healthcare industry also manufacture intelligent wearable devices that improve disease management, sleep management, and physical rehabilitation. Innovative wearable devices, fitness trackers, smart textiles, smart glasses, sub-skin wearable sensors, and hearing aids are also being used rapidly.

Increasing attention to fitness is another rendering driver for the wearable medical devices market expansion in the coming years. Various wearable medical products and software are being developed for weight and fitness management. Devices such as fitness trackers, smart watches, blood pressure monitors, and ECG monitors have witnessed a booming demand over the years. Vital sign monitoring is reportedly one of the fastest-growing segments in all regions. A few years ago, one could check vital signs only in hospitals and ambulances, but now, through wearable devices, vital signs can be monitored in real-time at convenience. Wearable vital signs monitoring also helps physicians monitor their patients remotely. Vital sign monitoring is being used widely in sports and exercise.

Challenges and Unmet Needs

While wearable medical devices hold great promise for improving healthcare, there are still challenges to overcome with unmet needs.

Accuracy: A common challenge for wearable medical devices

Accuracy is the most important feature of any medical device that analyzes, monitors, reports, regulates, and/or treats human health. Factors such as sensor calibration placement and algorithm quality used for data analysis are crucial in achieving accuracy. Wearable medical devices often rely on these sensors to capture physiological signals such as sleep patterns, heart rate, and step count.

Factors such as motion artifacts, signal interference, and device placement can lead to errors or reduce the accuracy of measurements. However, manufacturers of wearable devices must invest in research and development to augment sensor technology, improve signal processing algorithms, and ensure rigorous calibration procedures to address this challenge.

Data Privacy and Security

Wearable medical devices are also associated with issues and risks such as privacy and data sharing. Data privacy and security concerns occur while integrating consumer wearables into research studies. Wearable medical devices collect personal and sensitive data; hence, ensuring data privacy and protection becomes important, necessitating researchers to adopt data anonymization and encryption techniques that protect individual information and adhere to ethical guidelines.

Collaborations between wearable device manufacturers and researchers are vital to counter this challenge. Industry standards for data collection, data sharing, and interoperability are anticipated to enhance the reliability and reproducibility of wearables.

Regulatory bodies are also crucial in formulating guidelines and imposing ethical practices to protect individual's privacy and data security. Ethical considerations must be considered when collecting and using wearable data from a medical device. Patients must be fully informed about how their data will be used, collected, and shared.

Patent Protection for Wearable Medical Device

Patent reforms and trolls are another challenge medical device manufacturers face in countries such as the US and many European countries. In 2013, patent trolls entered the medical device industry by filing lawsuits against medical device companies. Hence, medical device companies can take necessary steps to protect mobile medical technology through patents and can secure financial and legal payments. With this, companies can minimize potential losses caused by patent trolls. Protecting patents in the medical device industry is the key to flourishing in the wearable medical device industry.

Competitive Outlook

Abbott, Lifesense, Apple, Samsung, Fitbit and Omron Corporation, Medtronic plc., and Koninklijke Philips N.V. are among major wearable medical device companies. These market players have significantly contributed toward advancing wearable medical devices in the healthcare sector. Several new product launches, strategic collaborations, expansion, and funding have recently been witnessed in the wearable medical device ecosystem.

The market of wearable medical devices is highly competitive without any dominant player.

In May 2023, Medtronic plc. entered into a set of definitive agreements to acquire EOFlow Co. Ltd., a manufacturer of the EOPatch device, which is a wearable, tubeless, and fully disposable insulin delivery device.

In 2019, Omron healthcare launched the first wearable pressure monitor 'HeartGuide'. HeartGuide is an oscillometric blood pressure monitor that detects blood pressure and daily activities of a person such as distance traveled steps, and calories burned.

In January 2023, Masimo company partnered with Koninklijke Philips N.V. to launch W1 smartwatch into Philips' range of patient monitoring software. The W1 wearable is equipped with sensors that collect respiration rate, pulse oximetry data, and hydration index readings.

Wearable Medical Device Developments

In May 2020, Koninklijke Philips N.V. launched next-generation wearable sensors for early patient deterioration detection including clinical surviellance during the COVID-19 pandemic.

In February 2022, Abbott developed consumer biowearables known as 'Lingo' that can track major body signals to help indivisuals better understand their overall health.

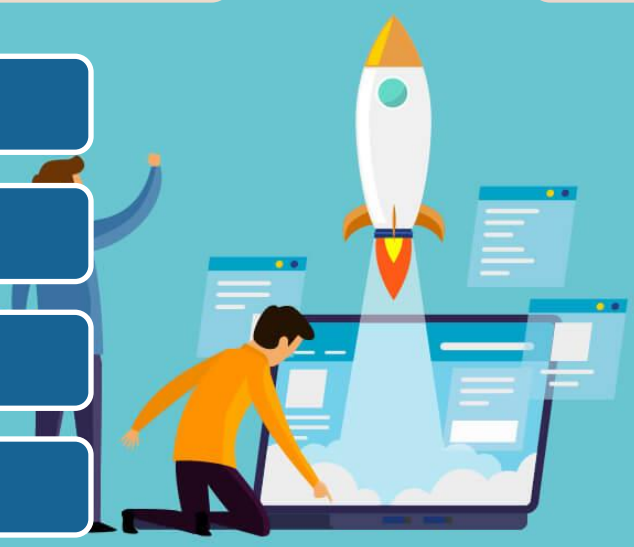
In June 2020, Koninklijke Philips N.V. launched fetal and maternal pods and patches for continious non-invasive monitoring of maternal heart rate, fetal heart rate, and uterine activity with a single use, 48 hour, disposable electrode patch.

In addition to the abovementioned key developments in wearable medical devices, rising funding expands the product portfolio. In October 2022, Acurable, a wearable medical devices company, declared an investment of €11.00 million (~US$ 11.89 million) in its Series A funding round. These funds were used to accelerate the expansion of its first product AcuPebble SA100 and drive the company toward its ambition to become the preferred solution for home sleep testing globally.

Companies such as Fitbit, Inc., Garmin Ltd., and Apple are among the several healthcare companies in the global wearable medical device market pushing the market forward. These companies are adding new technologies to their wearable devices to keep them compatible with medicinal use. Moreover, the rapid increase in the market growth encourages companies to increase their quality and accuracy to view the data generated and develop a way to share this data with healthcare providers instantly post monitoring.

Emerging/ Startup Wearable Medical Device Companies

- Garmin Ltd.
- Neurotech
- Augmedix
- Proteus



Existing Wearable Medical Device Companies

- Medtronic plc.
- Apple Inc.
- Koninklijke Philips N.V.
- Abbott

Source: Expert Interviews, Surveys, Secondary Research, and the Insight Partners Analysis

Potential of Wearable Medical Devices in Healthcare Ecosystem: Future Outlook

The future of wearable medical device is promising, driven by technological advancements, growing health awareness pertaining to wearable medical device, and increasing demand for personalized healthcare solutions. Innovations related to wearable medical devices and technological advancements in the healthcare ecosystem are also expected to boost the market in emerging nations for wearable medical devices. Rising diabetes and cardiovascular disorders are expected to significantly boost the market growth. For instance, in China, the prevalence of diabetes in the Chinese population aged 20–79 years is expected to increase from 8.2% to 9.7% during 2020–2030.

The market is anticipated to witness substantial growth owing to the below key factors:

1. Technological Advancements:

Advancements in sensors, miniaturization, battery life, and data processing competencies used for wearable medical devices enable more accurate and diverse health monitoring.

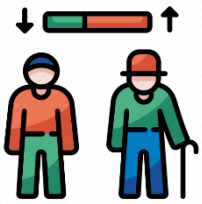
2. Remote Patient Monitoring:

Wearable medical device enables remote patient monitoring and helps physicians monitor vitals and health metrics without the physical presence of a patient.

3. Chronic Disease Management:

Wearable medical device plays a crucial role in managing chronic diseases, such as diabetes, respiratory disorders, and cardiovascular disorders. Continuous monitoring of health metrics results in timely intervention between patients and physicians.

4. Aging Population:



As the global population ages, an increased demand for healthcare solutions and wearable medical devices is expected. These devices provide real-time health data information to caregivers. According to the data retrieved from the World Health Organization in October 2022, the proportion of the world's population over 60 years will nearly double from 12% to 22% during 2015–2050.

5. Regulatory Consideration:

Regulatory authorities are more inclined toward the safety and effectiveness of medical devices and their usage among individuals. These authorities play a vital role in striking the right balance between innovation and patient safety.

6. Partnership and Collaboration:

Collaboration among technology companies, healthcare providers, and medical institutions is projected to drive innovation in the wearable medical device space. Partnerships can result in more comprehensive and validated clinical solutions.

7. Customization of Wearable Medical Devices:

As wearable devices are being used at a larger scale, these devices are expected to become more customizable to an individual requirement.

Futuristic Scenario

The global wearable medical device market is expected to reach US$ 9,927.16 million in 2020 and expected to reach US$ 51,734.14 million in 2030 at a CAGR value of 22.92% during the forecast period during 2022-2030

Wearable medical technology is anticipated to reduce the overall hospital cost to 16.00% and by 2037; it could save US$ 200 billion with its remote patient monitoring devices

By 2024, nearly 440 million wearable medical devices will be shipped globally

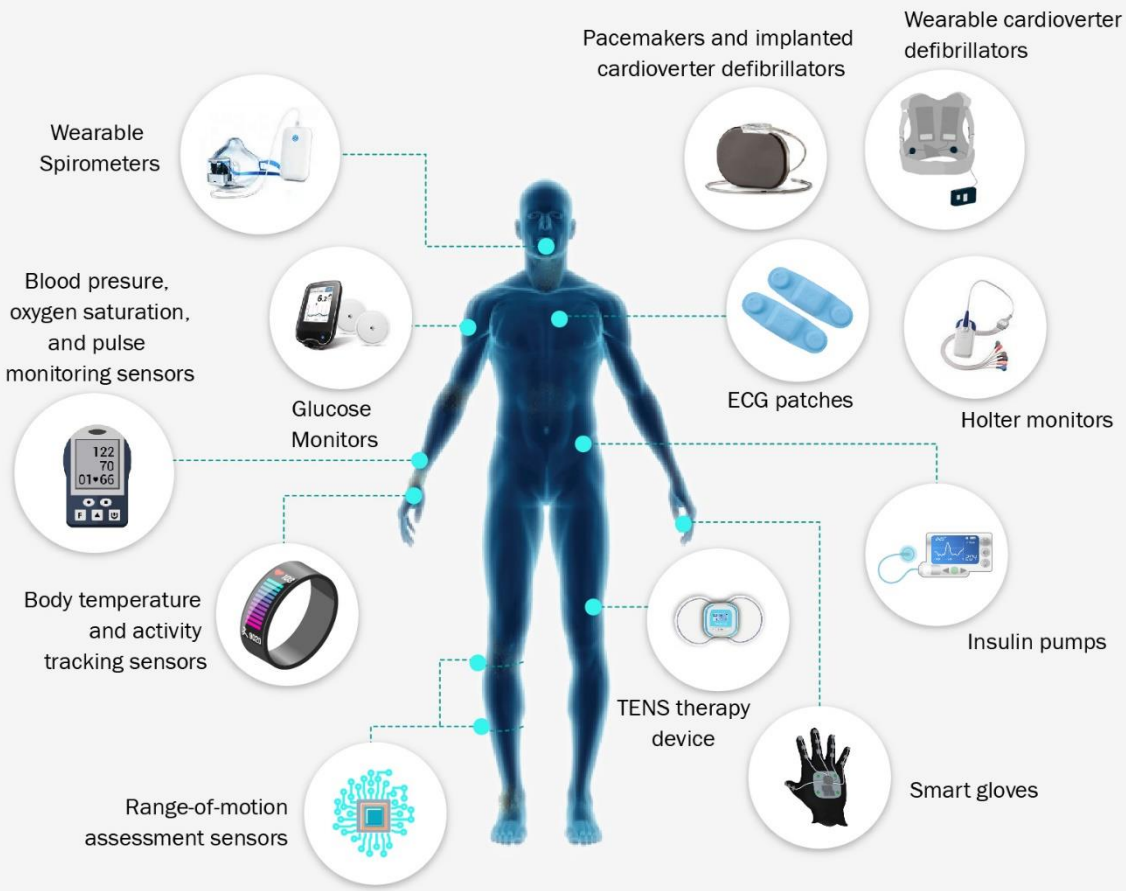
Sale of wearable medical device is projected to be fueled by the rising number of early adopters and innovators worldwide

Source: Expert Interviews, Surveys, Secondary Research, and the Insight Partners Analysis

Conclusion

The growing aging population can witness a significant burden of chronic diseases. The advent of personalized care services and wearable medical device technologies are not just a fad but are expected to be a game changer in the near future. These wearable medical devices are becoming integrated and advanced, signifying a promising future. Wearable technology in a medical device integrates artificial intelligence, healthcare data, and wearable electronic devices.

These technologies have endless possibilities in the healthcare sector due to the highly personalized, easily accessible, and affordable price of these wearable medical devices. Wearable medical devices encourage people to track their health metrics and adopt regular fitness routines. In addition, wearable medical device technologies have revolutionized health care and are expected to provide high-quality health services.



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Team Lead at Healthcare Domain

Revti is currently working for the healthcare division of The Insight Partners, a distinguished firm specializing in market research. With a robust background spanning around 5 years, she has worked across various verticals such as medical devices, animal health, biotechnology, and healthcare IT. She is also engaged in carrying out industrial reports, including custom, syndicate, and consults.

Her skill set encompasses conducting primaries acquiring prerequired data from them and analyzing the same for the development of engineering models. She has expertise in evaluating the potential of emerging markets and development of predictive market engineering models augmented by real-time market specific insights.

Revti holds a Masters in Biotechnology from Manipal University, Karnataka. In her experience in market research she has expertise in delivering several global as well as country reports , while meeting specific client requirements. She also holds experience in collecting data based on requirements, and consolidating information into actionable items, reports and presentations along with understanding business objectives and designing surveys to discover prospective clients preferences.