

A wide-angle photograph of the Nashville, Tennessee skyline. The foreground is filled with a dense, lush green forest. In the middle ground, the Nashville skyline is visible, including several prominent skyscrapers. The sky is overcast with soft, grey clouds.

INVESTING IN ENTREPRENEURS THAT IMPROVE
HEALTHCARE

Investment Area of Interest:

Wearable Healthcare Technology

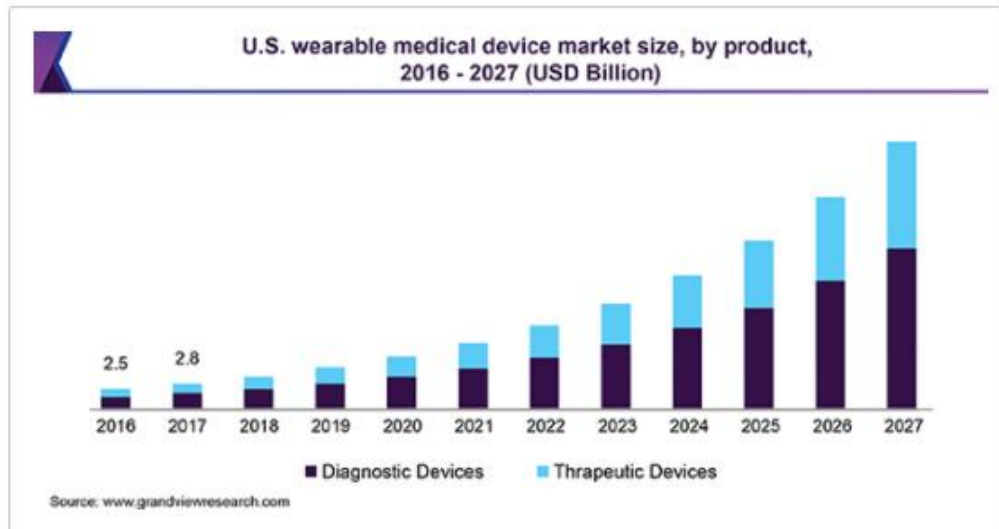
Prepared by [Nathan McLaughlin](#)

January 2021

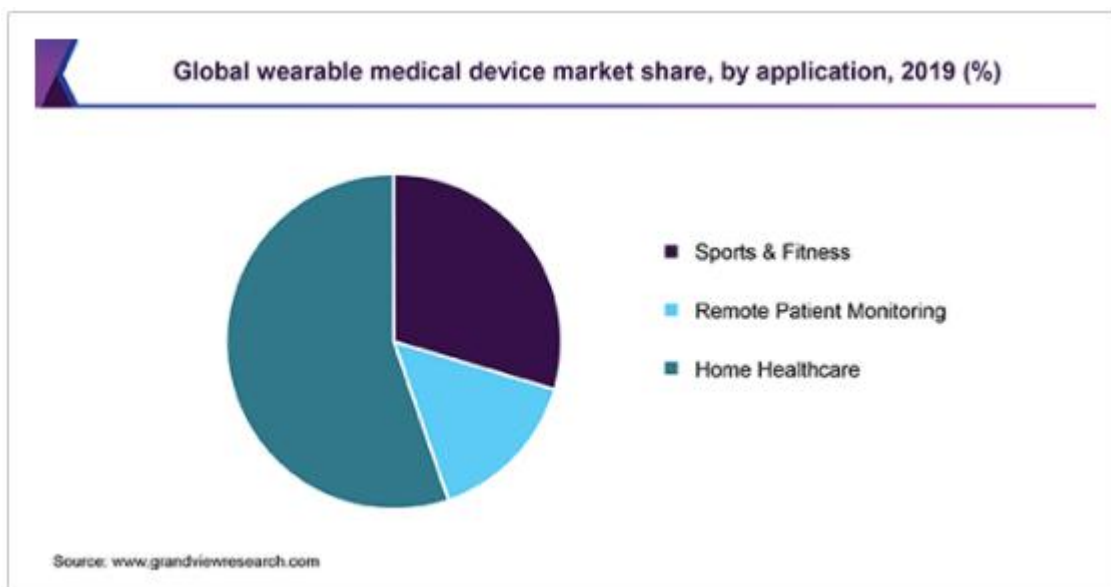
Overview of the Wearable Healthcare Technology Industry

Wearable healthcare technologies allow for the continuous monitoring of human physical activities and behaviors, including physiological and biochemical parameters during daily life. Commonly measured data includes vital signs such as heart rate, blood pressure, body temperature, as well as blood oxygen levels, posture, and physical activities through devices such as electrocardiogram (ECG). Other wearable devices have the potential to provide additional clinical information through photos and videos. Certain wearable devices can be attached to patient's clothing, shoes, watches, eyeglasses, etc. In addition, other wearable technology devices have recently evolved to be skin-attachable while other sensors can be placed into the patient environment such as chairs, car seats, and mattresses. Devices are typically connected to a smartphone which collects information and transmits data to a database for storage and analysis.¹

Wearable technology in healthcare has seen significant growth in demand, generating a booming market, and now insurers and other healthcare companies are discovering how supplying the new technology to their consumers and employees is beneficial. In 2019, the global wearable medical device market size was valued at approximately \$13 billion and is expected to see a 27.9% CAGR through 2027.² The growth in demand for the industry is being led by healthcare companies wanting to monitor patients to improve patient health outcomes while lowering the cost of care. In addition, consumers are increasingly wanting to monitor their own health with fitness devices such as Fitbit and Whoop watches. According to Business Insider Intelligence, more than 80% of consumers are willing to wear fitness technology.³



Wearable technologies can be extremely innovative solutions to healthcare problems and can directly impact clinical decision making. Some wearable technology applications are designed for the prevention of diseases and remotely monitoring patient health, such as weight control and physical activity monitoring. These new technologies have the potential to improve the quality of patient care while reducing the cost of care. For example, patients have the ability to rehabilitate outside of hospitals. As of 2019, the home healthcare segment, led by devices used for diabetes, hypertension, and heart health, held the largest market share compared to the sports and fitness and remote patient monitoring segments which can be seen below.

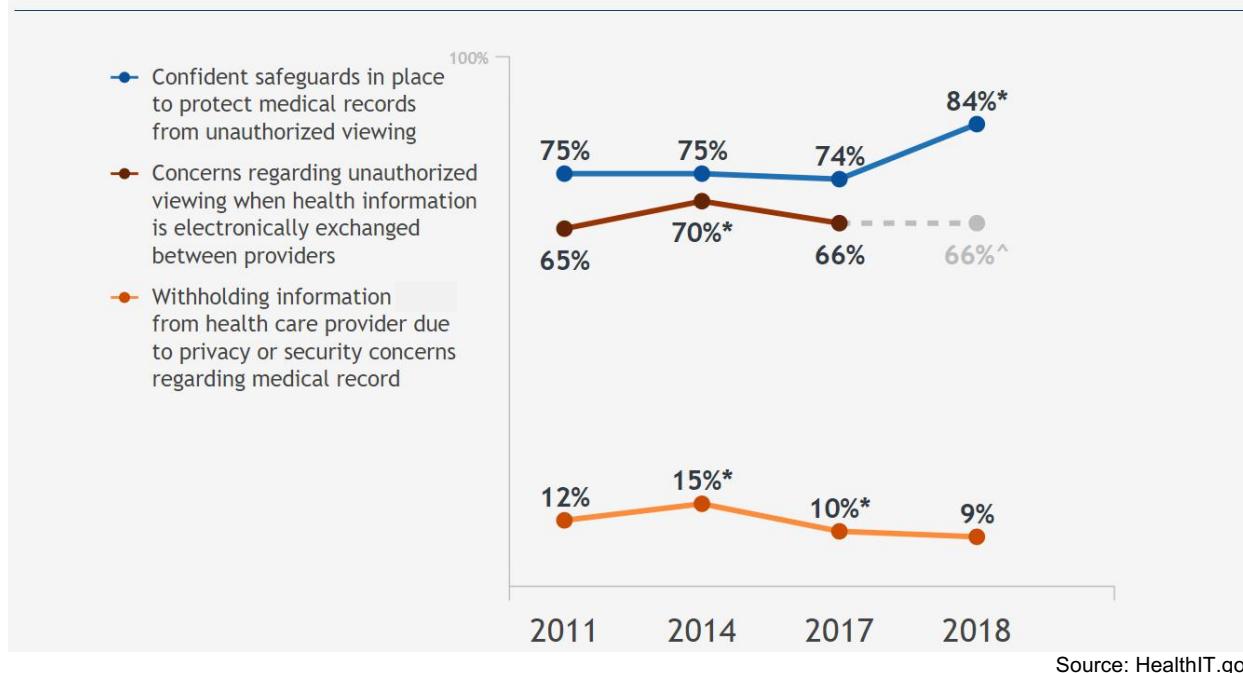


In this report, we will take a deep dive into the current challenges facing the industry as well as the different wearable healthcare technology segments and associated trends. Additionally, we will highlight specific examples from more than a dozen startups that are developing innovative wearable devices and their potential impact on the industry. The COVID-19 pandemic has accelerated patient monitoring and has caused patients to be more aware of their personal health. FCA believes that this is a vital area of the healthcare industry and its continued innovation and implementation will provide substantial value to both the quality of patient care and clinical decision making.

Challenges Facing the Industry

Patient Privacy

Due to the immense amount of personal data and information generated by wearable healthcare devices, specific checkpoints and workflow processes need to be put in place to protect the confidentiality and privacy of patients. The Health Insurance Portability and Accountability Act of 1996 (HIPAA), a US legislation that protects the privacy of individuals' medical records and applies to health providers and plans, must be taken into consideration given the continuous stream of data from personal devices. Hospitals and other healthcare providers must ensure that wearable devices are connected to a secure network and monitor databases continuously to prioritize data privacy and protect against potential cybersecurity attacks. To implement new wearable technology and collect patient data in a safe manner, health systems will likely need to set up a separate data network for wearable devices which comes with high initial costs.⁴



The figure above demonstrates that a majority of individuals are confident that their medical records are safe from unauthorized viewing but have concerns about when health information is electronically exchanged.⁵ As wearable technology is implemented over time, collecting and exchanging patient data in a safe manner will become increasingly complex and providers will be required to monitor data closely to maintain patient confidence in new technology.

Lack of System Connectivity

Health systems are currently lacking the necessary platforms to pull continuous streams of data from multiple types of patient devices for integration into their health records. This is largely because collecting patient data through wearable devices is a relatively new area of healthcare technology. The main barrier facing system connectivity is not having systems that are able to communicate and transfer data which makes it very difficult to integrate new patient data with historical patient data. The FHIR (Fast Healthcare Interoperability Resources) Specification is a standard for exchanging healthcare information electronically. The standard aims to simplify implementation without sacrificing information integrity by leveraging existing models for exchanging data between healthcare applications. FHIR has the potential to be the missing link between electronic health records (EHR) and the plethora of healthcare wearable devices.

In order to create data systems that operate efficiently with wearable devices, systems must have the ability to detect new devices, allow communication between providers and device makers, and allow devices to synchronize with EHRs. Moving forward, health providers must take advantage of new opportunities and partnerships between the makers of devices and health systems to reach high interoperability and streamlined communication between health record platforms, patient devices, and providers. Improving these relationships will provide improved healthcare efficiency, safer care, and support lower costs.⁴

Patient Data and Information Overload

Wearable healthcare devices produce an enormous amount of data that requires significant interpretation before becoming useful for patients and providers. Health systems must be prepared to store daily patient data streams and host a database that is constantly growing, and this can be a significant barrier to integration. Being able to extract and present providers with necessary patient data is one of the main implementation barriers of wearable technology.⁴

Successful solutions to this issue, such as artificial intelligence (AI), require the ability to extract and deliver meaningful and actionable information from the immense amount of data to providers and patients. In addition, creating a strong user interface for providers will increase provider engagement and adoption. A strong user interface will improve the overall efficiency of the technology, time and workflow process, and quality of care for patients.

One company helping to solve healthcare data connectivity challenges is Validic, based in Durham, North Carolina. Validic has developed a healthcare platform designed to simplify healthcare data. The company's platform can capture data from nearly 500 different in-home and remote-monitoring devices, sensors, fitness equipment and patient wellness applications. Collected data is then processed through a proprietary rules engine delivered via API and visualized clinical workflow enabling health systems, payers, and wellness organizations to access, manage, and utilize device-generated data. Validic raised its Series B in April 2015, and has raised \$19.6M to date.⁵

Patient Monitoring Devices

In the following sections we will cover a range of active wearable device startups in chronic diseases, musculoskeletal, physical therapy and recovery monitoring, cardiac monitoring, and other patient monitoring. In addition, we will give a brief overview of each subsector and cover current trends in the segment. Due to common overlap in many wearable devices and products, we have divided the startups into segments to give the reader a broad scope and understanding of each company.

Chronic Disease Devices

Wearable devices have been developed for continuous monitoring and early diagnoses for patients who have chronic diseases such as diabetes, asthma, Parkinson's disease, cancer, and mental disorders. To help monitor chronic conditions, the devices can track many different parameters such as step counting, energy expenditure, activity-time duration, sleep status, body temperature, oxygen saturation, and electrocardiogram.⁶

Chronic diseases are currently increasing and represent 71% of all causes of death worldwide, killing 41 million people each year.⁶ These diseases are typically more concerning for older adults and are commonly affected by environmental and lifestyle factors, therefore the ability to monitor chronic disease patient's daily status to find physical changes would be very beneficial.

Propeller Health, based in Madison, Wisconsin, is a leading digital health company dedicated to the management of chronic respiratory disease. Propeller develops products that help people with asthma or chronic obstructive pulmonary disease (COPD) manage their condition in partnership with their healthcare provider. The Propeller platform is currently used by patients, providers, and healthcare organizations across the U.S., Europe, and Asia. In 2019, the company created a pharmacy refill app which is partnered with five of the seven largest pharmaceutical providers in the U.S. including CVS, Kroger, Rite Aid, Walgreens, and Walmart. The Propeller product is a sensor that is attached to an inhaler which is connected to a smart device to provide real-time data. The company has demonstrated reductions in rescue inhaler use in several studies and populations, and more than 100,000 people have trusted Propeller to help manage their asthma or COPD.⁷

Lark, a San Francisco based digital health company, is a leading virtual care platform that addresses health plans' costliest challenges. The company's unique digital platform provides virtual care for diabetes, hypertension, and behavioral health through AI coaching, smart devices, and telemonitoring. Lark's diabetes care program helps patients gain better control of their diabetes through blood glucose measurement and coaching, nutrition therapy, educational content, and coaching on weight loss, activity, stress, and sleep. In addition, the diabetes prevention program helps partners identify and enroll prediabetics and provides personalized coaching to prevent the progression to type 2 diabetes. Lark's hypertension care program helps patients manage their blood pressure through measurement, coaching, and educational content. Lark's products are known for a user-friendly interface which creates increased patient engagement and adoption.⁸

Walk With Path, a London based firm provides multiple wearable devices that help patients with Parkinson's, Multiple Sclerosis, and sensory deficits. Many people who live with Parkinson's disease experience difficulties walking. Walk With Path's main product is a medical device that is strapped to a patient's shoes to help them overcome "freezing" while walking. A green laser line is projected on the ground which helps the brain initiate movement and gives patients the confidence to move on their own. In addition, Walk With Path has designed an insole that provides vibrational feedback to the soles of people at risk of falls. The insoles are for people with peripheral neuropathy, who are unable to feel the ground properly due to sensory deficit or with general balance issues. The insole collects data through a smart device which can then be shared with health care professionals.⁹

One of FCA's portfolio companies, Nvolve, uses a software platform and wearable devices to enable pain practices to monitor and manage the care plan and outcomes for their patients dealing with chronic pain. The company works with pain management practices or orthopedic practices and allows them to prescribe the patient a smartwatch and other devices to help monitor patient activity. Patients can then use Nvolve's mobile app to answer questions about their medical adherence, and the provider is able to use this data to change the patients care plan and improve outcomes. Providers are also able to ping the patient at their convenience to ask for a pain score.

Washington, DC based Otolith Labs has developed the first therapeutic device for the treatment of vertigo. The patented device has been shown to be safe and effective as a treatment for

motion sickness and is currently undergoing testing at three major universities in the U.S. Functional prototypes have been tested and further explored by Ford Motor Company, Jaguar Land Rover, and various research institutions. Otolith is currently working on integrated solutions for the U.S. Air Force, Defense Health Agency, NASA, and the NIH. The device has also proven to be successful in virtual reality sickness prevention and can be integrated into helmets, headsets, and other head worn equipment to reduce symptoms of motion sickness and eliminating the need to pharmacological solutions which can cause drowsiness.¹⁰

Propeller Health



Lark



Walk With Path



Otolith Labs



Chronic Disease Device Companies



Propeller Health is a leading digital health company dedicated to the management of chronic respiratory disease.



Propeller's inhaler sensor helps patients with asthma or COPD manage their condition in partnership with their healthcare provider.



Over a 12-month study, Propeller users experienced a 78% reduction in rescue inhaler use and emergency department and hospitalizations were reduced by 57%.



\$69M in funding since 2012
Acquired by ResMed in January 2019 for \$225M



Madison, Wisconsin
<https://www.propellerhealth.com/>



Lark provides virtual care for diabetes, hypertension, and behavioral health through AI coaching, smart devices, and telemonitoring.



Lark's unique digital platform creates a user-friendly experience to address the costliest chronic diseases.



Incentive for both patient and provider by cutting disease management costs in half while extracting real-time, actionable patient data for providers.



\$95.7M in funding since 2011
Lead investor is King River Capital



San Francisco, California
<https://www.lark.com/>



Walk With Path provides multiple wearable devices that help patients with Parkinson's, Multiple Sclerosis, and sensory deficits.



The company's products include wearable footwear such as shoes and insoles for shoes, enabling users to see visual cues to help with the foot movement and gait.



Path Finder is a class 1 medical device proven to alleviate freezing and help patients walk and balance.



\$1M in funding in 2019 from EIB-Institute as a part of European Commission Horizon Prize for social innovation.



London England, UK

<https://walkwithpath.com/>



Otolith Labs has created a compact wearable technology which prevents motion sickness and virtual reality sickness. OtoTech has no side effects, works instantaneously, and is virtually silent.



The same technology which works for vertigo also works for everyday motion sickness and can be integrated with any head-worn device including VR headsets, headphones, helmets.



Otolith's patented product is the first to offer a noninvasive and side effect free solution to vertigo suffered by over 15 million Americans.



\$2.4M in funding since 2016. Last funding was a seed round in April 2019.



Washington, DC

<https://otolithlabs.com/>

Musculoskeletal Care Devices

Many startups that are engaged in health app development have quickly realized that pain management is a segment where investments can pay off. One in three to one in five people, including children, are affected worldwide by musculoskeletal (MSK) pain conditions. The number of mobile health apps for MSK conditions have increased significantly due to organizational health and wellness initiatives focusing more on pain management and holistic care. The prevalence of MSK conditions continues to grow due to the increased aging population and unaddressed ergonomic problems of daily living, such as excessive sitting.¹¹

In general, the purpose of most MSK apps is to provide therapy for patients with MSK issues, and they can be used by large companies to improve their employees' health, prevent injuries, make recovery more effective, while keeping track of progress. Applications currently on the market use multiple approaches to decrease pain including customizing face-to-face treatment, using sensors that can be placed on different areas of the body to monitor pain and progress, and making the connection between the mind and body more powerful to alleviate pain.¹²

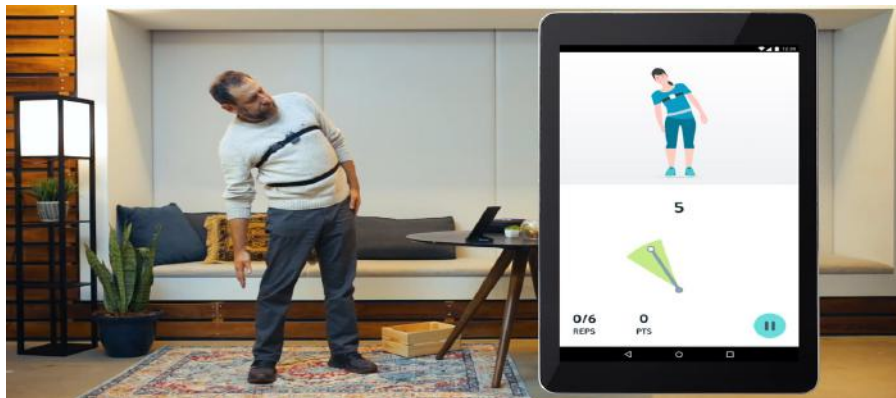
Hinge Health, based in San Francisco, is revolutionizing musculoskeletal care by providing digital care for preventing injuries, addressing chronic pain, and surgery rehabilitation. The company has had over 80,000 people join their program, and their products have led to an average of 60% in pain reduction and 2/3 of patients have avoided surgeries. Hinge Health's app and sensors give patients live feedback during stretches and exercises, provides personalized exercise therapy, and allows for unlimited 1-on-1 health coaching. Hinge Health is currently the only digital musculoskeletal care company with nearly 300 clients and has created an average of \$5,012 in average medical savings per participant.¹³

Similarly, Kaia Health uses cutting-edge AI technology to monitor, quantify, and analyze human movement. The company's technology turns a smartphone into a digital personal trainer or physical therapist by analyzing the body and offering real-time instructions and feedback. Kaia Health users report an average pain level decrease of 43% over a 12-week study and report a significant increase in mental health.¹⁴

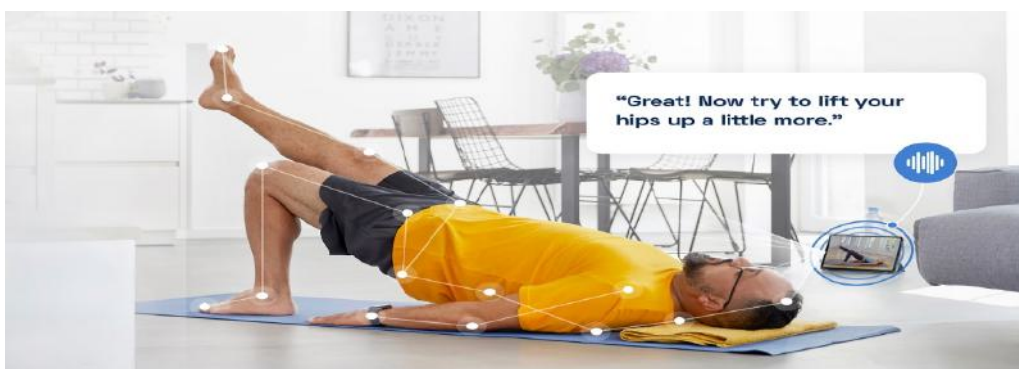
Sword Health, based in New York City, is a digital MSK therapy provider that pairs licensed physical therapists with innovative technology to help people overcome their chronic and post-surgical pain faster and more cost effectively. Since launching in 2015, the company has

worked with insurers, health systems, and employers in the U.S., Europe, and Australia to give thousands of people access to preventative, chronic, and post-surgical MSK care that gets results.¹⁵

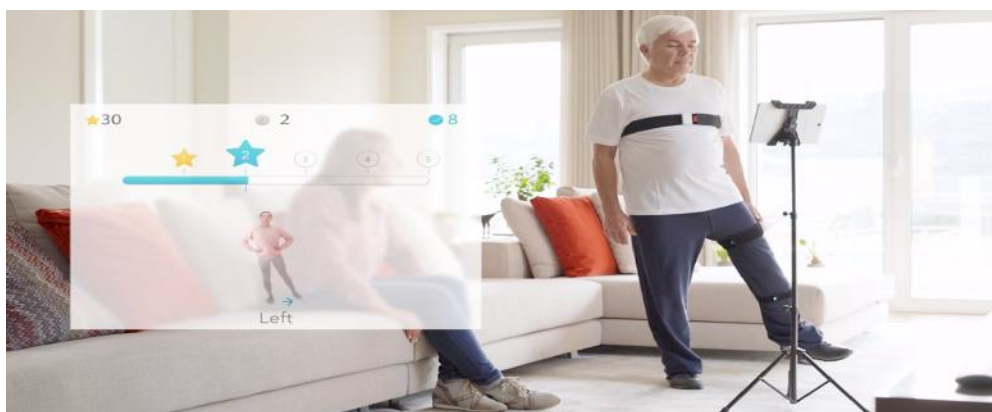
Hinge Health



Kaia Health



Sword Health



Musculoskeletal Care (MSK) Companies



Hinge Health is revolutionizing musculoskeletal care by providing digital care for preventing injuries, addressing chronic pain, and surgery rehabilitation.



App and sensors give patients live feedback during stretches and exercises, provides personalized exercise therapy, and allows for unlimited 1-on-1 health coaching.



Hinge Health's products have led to an average of 60% in pain reduction and 2/3 of patients have avoided surgeries.



\$436.1M in total funding, recently raised Series D on January 7, 2021
Lead investors are Bessemer and Atomico



San Francisco, CA
<https://www.hingehealth.com/>



Kaia Health uses cutting-edge AI technology to monitor, quantify, and analyze human movement.



Technology turns a smartphone into a digital personal trainer or physical therapist by analyzing the body and offering real-time instructions and feedback



Kaia Health users report an average pain level decrease of 43% over a 12-week study and report a significant increase in mental health.



\$48M in total funding, raised Series B in June 2020
Lead investors are Optum Ventures, Idinvest Partners, 3VC, Balderton Capital



Brooklyn, New York
<https://www.kaiahealth.com/>



Sword Health is a digital MSK therapy provider that pairs licensed physical therapists with innovative technology to help people overcome their chronic and post-surgical pain.



Sword's clinically validated programs work for all major MSK issues at any point in the journey: prevention, acute conditions, chronic pain, and post-surgical recovery.



Sword has worked with insurers, health systems, and employers in the U.S., Europe, and Australia to give thousands of people access to MSK care that gets results.



\$24.5M in total funding, Series A raised in February 2020
Lead investors are Khosla Ventures, Vesalius Biocapital Partners, Horizon 2020



New York, New York
<https://swordhealth.com/>

Physical Therapy and Recovery Monitoring Devices

Due to wearable technology becoming a popular fitness trend, it can be further used to improve patient rehabilitation, especially to those who undergo intense physical rehabilitation after a procedure. Healthcare providers and professionals have recognized that one of the biggest pitfalls to rehabilitation is a lower follow-up rate of patients and compliance on their medical advice, specifically in physical activity. Certain wearable technologies have been developed to address follow-up and activity issues by tracking patient activity post-surgery or injury.¹⁶

Recovery monitoring devices are more than just tracking simple parameters of physical activity such as counting steps. Newly developed devices use a combination of sensors, biometrics, and algorithms to analyze motions or motion analytics. Wearable technology can be used to create personalized training programs and devices that maximize recovery. For example, a patient can wear sensors that allow doctors and physical therapists to assess the kinetic movements to analyze flexibility, strength, balance, and speed.¹⁶

MioTherapy, based in Las Vegas, Nevada, is a digital healthcare company dedicated to bringing physical therapy to the 21st century, leveraging innovations in technology to offer a patient-centered and data-driven solution for clinical rehabilitation. MIO sensors are capable of highly consistent angle and range of motion measurements compared to more traditional methods. MioTherapy's platform and sensors increase patient engagement with guided games and exercises. Their studies have shown to improve patient compliance by up to 80% while also saving patients an average of \$2,745 using virtual physical therapy instead of traditional.¹⁷

Cipher Skin, based in Denver, Colorado, uses 3D real-time motion tracking and automated assessments to enable physical therapists, trainers, and athletes to build the safest and most effective programs, from rehab to high performance. Cipher's BioSleeve product is a smart compression sleeve which provides highly accurate and objective data including range of motion, heart rate, oxygen saturation, and muscle expansion. The company has also developed smart leggings that track the movement of knees and hips to measure subtle changes in function and joint position. In addition, users and providers can visualize real-time motion of their knees and arms in three dimensions using the Digital Mirror application. In June 2020, Cipher was awarded \$1.5 million from the U.S. Department of Defense to support the development and commercialization of their products with the Air Force Special Operations Command.¹⁸

Based in San Francisco, Neofect, helps stroke survivors and people with neurological and musculoskeletal injuries worldwide rehabilitate in a fun and effective way by providing gamified and innovative smart rehabilitation solutions that can be done virtually anywhere. The company's leading product is a smart glove that measures movements of the forearm, wrist, and digits with accelerometer and bending sensors. Neofect has also developed multiple devices that help patients with functional movements, balance, range of motion, strength, and muscle control following a stroke. The company has built relationships in 30 countries and over 3,000 hospitals globally, and their products are currently in use at Vanderbilt Medical Center, Stanford Healthcare, U.S. Department of Veterans Affairs, and many others.¹⁹

Physical Therapy and Recovery Monitoring Companies



Leveraging physical therapy innovations in technology to offer a patient-centered and data-driven solution for clinical rehabilitation.



MIO sensors are capable of highly consistent angle and range of motion measurements compared to more traditional methods.



Studies have shown to improve patient compliance by up to 80% while also saving patients an average of \$2,745 using virtual physical therapy instead of traditional.



Unknown



Las Vegas, Nevada
<https://www.miotherapy.com/index.html>



Cipher uses 3D real-time motion tracking and automated assessments to enable physical therapists, trainers, and athletes to build the safest and most effective programs.



Smart compression sleeves provide highly accurate and objective data including range of motion, heart rate, oxygen saturation, and muscle expansion.



Unlike wrist-based devices or heart rate straps, Cipher sleeves measure multiple parameters simultaneously to capture gapless data pinned to a single movement.



\$6.55M in total funding including \$1.5M from U.S. Department of Defense



[Denver, Colorado](https://cipherskin.com/)
<https://cipherskin.com/>



Neofect helps stroke survivors and people with neurological and musculoskeletal injuries worldwide rehabilitate in a fun and effective way.



Neofect's smart glove measures movements of the forearm, wrist, and digits with accelerometer and bending sensors.



The company has built relationships in 30 countries and over 3,000 hospitals globally.



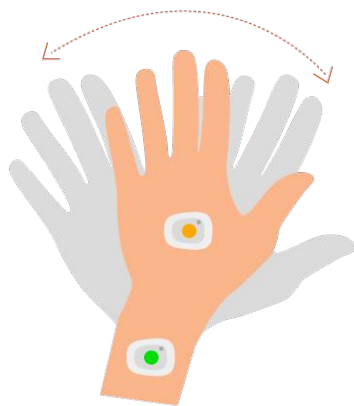
Raised a total of \$28.6M before IPO in November 2018.



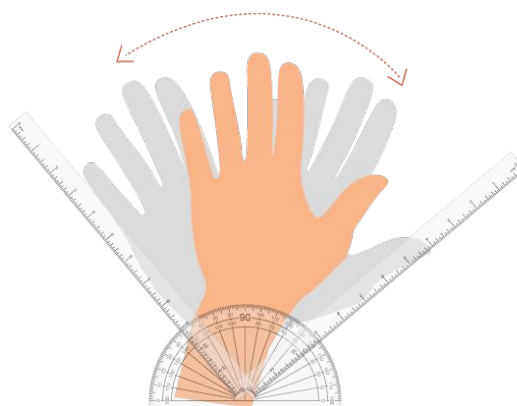
San Francisco, CA
<https://www.neofect.com/us>

MIO Therapy

Example Range of Motion Measurement: Wrist



Using MIO sensors: 3-5° error rate



Traditional goniometer: 5-10° error rate

Cipher Skin



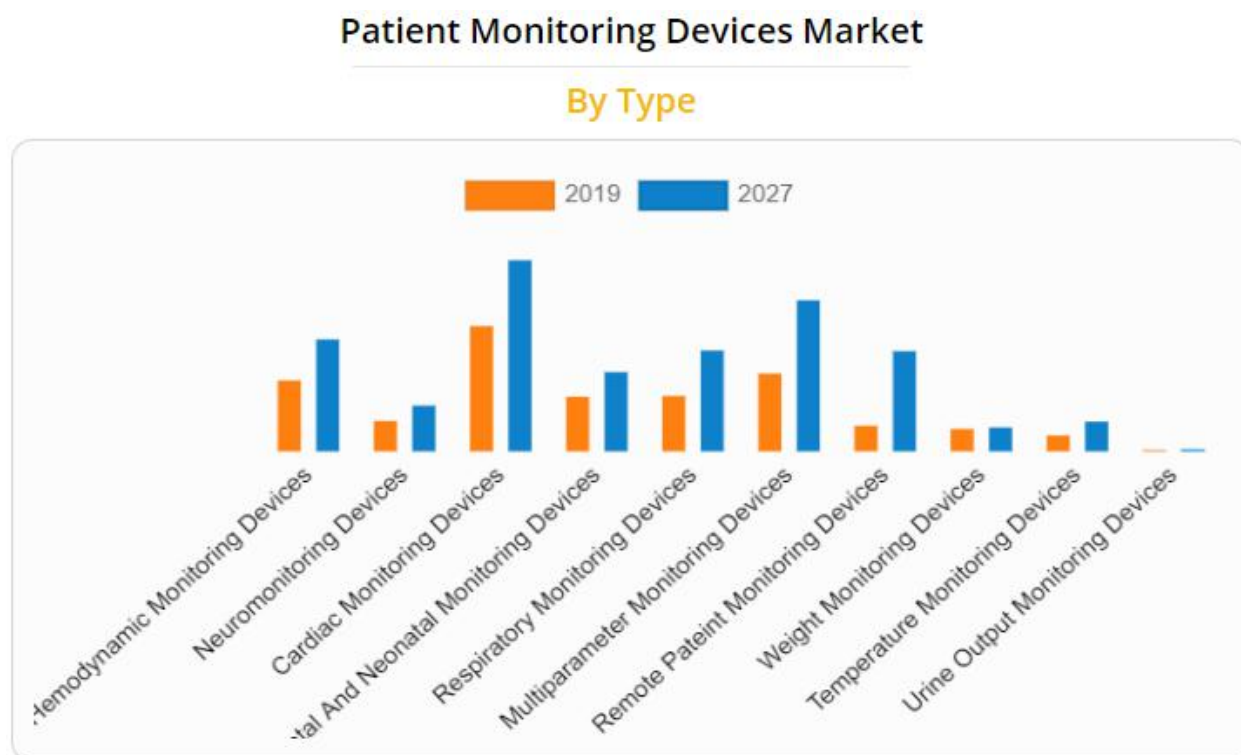
Neofect



Other Patient Monitoring and Virtual Care

In this section, we will cover other various types of patient monitoring devices. The global patient monitoring devices market is segmented on the basis of product type, which results in very niche types of products and companies. For example, patient monitoring products can be divided into neuromonitoring, cardiac monitoring, fetal and neonatal monitoring, respiratory monitoring, remote patient monitoring, temperature monitoring, etc. Patient monitoring devices can also be segmented into the basis of end user through hospitals, home settings, and ambulatory surgical centers. The COVID-19 pandemic has positively affected the patient monitoring device market. These devices are playing a crucial role to combat the pandemic and monitor patients through cardiac monitors, respiratory devices, and temperature monitoring.²⁰

Cardiac monitoring devices have historically dominated the patient monitoring device segment, representing around 26% of global market value in 2019, and its dominance is expected to continue moving forward. This market dominance can be attributed to the rise in various cardiovascular diseases such as congestive heart failure and strokes.²⁰



Source: Allied Market Research

Cardiac Monitoring Device Companies

Cortrium, based in Copenhagen, Denmark, is a developer of a wearable electrocardiogram (ECG or EKG) device intended for monitoring heart disease patients efficiently. The company's device uses standard electrodes and communicates to measure body surface temperature, activity, and respiration rate and includes electrocardiography for screening and diagnostics of cardiological diseases, enabling healthcare providers to screen patients for heart arrhythmia.²¹

Similarly, Mountain View, California based AliveCor is also a developer of ECG devices, however, their device is specifically designed to improve stroke prevention. The company's device lets patients monitor heart health via smartphones and provides physicians with an additional heart health assessment tool, enabling doctors to instantly analyze and detect atrial fibrillation and normal sinus rhythm in an ECG.²²

iRhythm Technologies is a commercial stage digital healthcare company redefining the way cardiac arrhythmias are clinically diagnosed by combining wearable biosensing technology with cloud-based data analytics and machine-learning capabilities. The company's 'Zio' system is proven and trusted by physicians to detect and diagnose irregular heart rhythms and has been prescribed to hundreds of thousands of patients. Patients can wear the Zio monitor during daily activities such as sleep, showering, and exercise while the device records every single heartbeat for analysis. In a study, physicians were able to reach a diagnosis 90% of the time with the Zio system.²³

Other Patient Monitoring Companies

Quil, based in Philadelphia, has developed a clinical information platform intended to deliver a custom, personalized, and engaging health itinerary. The company's platform delivers episodic care support content through a smartphone app and living room television, if permitted by the patient. The company was formed as a joint venture between Comcast and Independence Blue Cross in April 2019. Through the Quil platform, patients are able to message providers and ask questions leading up to a procedure, invite caregivers, and prepare with step-by-step interactive education. Clinicians can efficiently deliver care plans digitally, keep patients on track, reduce documentation, and more through Quil. For example, the Quil system aims to provide education on procedures such as joint replacement, live events such as pregnancy, and programs to support health goals such as nutrition and weight loss.²⁴

San Francisco based Sentio Solutions is a developer of biomarkers and digital therapeutics designed to change the way of diagnosis, management, and care for mental health. The company's "Feel" product is a holistic mental health program that uses its proprietary feel emotion sensor to quantify a person's emotional state. "Feel" uses cutting-edge data science to design personalized intervention strategies based on advanced evidence-based techniques. The "Feel" product is an emotion-sensing wristband and app that provides continuous monitoring and real-time personalized interventions for individuals that suffer from anxiety and depression. Sentio's solution for Augmented Mental Health uses a combination of behavioral methods such as cognitive behavioral therapy and positive psychology to solve major problems related to mental health management.²⁵

Ava, based in Zurich, Switzerland, is a patented multi-sensor bracelet which allows women to precisely and conveniently predict fertile days, letting them know the best five days to try for a baby. The device also allows women to keep tabs on periods and physical experiences as well as monitor weight, sleep, and stress levels.²⁶

Similarly, Babyscripts is a developer of a virtual pregnancy care platform designed to provide prenatal and postpartum care to expectant mothers. The company's platform offers risk-specific experiences to permit healthcare providers to manage pregnancies virtually for remote monitoring in pregnancy with the aim to eliminate maternal mortality and improve access to care for all mothers, enabling doctors to detect pregnancy-related risks swiftly.²⁷

CareSignal, based in St. Louis, Missouri, provides an accessible remote patient monitoring platform that improves payer and provider performance in value-based care by engaging and identifying rising-risk patients. Care teams receive real-time alerts enabling real-time prioritization and outreach, and patients respond to evidence-based questions via text messages or phone calls.²⁸

In November 2020, Amazon announced a set of new features aimed at making its Alexa devices more useful to aging adults. The company launched "Care Hub" which is an added option in the Alexa mobile app. The app allows family members to keep an eye on older parents and loved ones in order to receive general information about their activities and to be alerted if the loved one has called out for help. The Alexa device and the new "Care Hub" application is

already being used in senior living centers and other care facilities by the way of third-party providers. In addition, in August 2020, Amazon decided to enter the healthcare wearable device market with a new fitness band and subscription service called Halo. The Halo band is able to track cardio, sleep, body fat, voice tone, and other “labs” developed by partners such as meditation, improving sleep habits, or starting basic exercise routines. Where the Halo band differentiates itself is in two new features called Body and Tone. The Body feature uses your smart phone camera to capture a 3D scan of your body and calculates body fat, and the Tone feature uses a microphone on the band to listen to the tone of your voice and reports back on your emotional state throughout the day.²⁹

Other Patient Monitoring and Virtual Care Companies

 Cortrium is a developer of a wearable electrocardiogram (ECG or EKG) device intended for monitoring heart disease patients efficiently.	 Measures body surface temperature, activity, and respiration rate and includes electrocardiography for screening and diagnostics of cardiological diseases.
	 Cortrium’s main device C3+ is in use by physicians, hospitals, and healthcare professionals all around Europe, still room for expansion into U.S., Asia, etc.
	 \$1.75M total raised to date, still in early-stage VC Rounds Lead investor is InQvation
	 Copenhagen, Denmark https://www.cortrium.com/



Sentio Solutions is a developer of biomarkers and digital therapeutics designed to change the way of diagnosis, management, and care for mental health.



Feel's product is a holistic mental health program that uses its proprietary feel emotion sensor to quantify a person's emotional state.



Feel uses cutting-edge data science to design personalized intervention strategies based on advanced evidence-based techniques.



\$6.7M total raised to date, early-stage VC round raised in September 2020
Lead investor is Felicis Ventures



San Francisco, California
<https://www.myfeel.co/>



Babyscripts is a developer of a virtual pregnancy care platform designed to provide prenatal and postpartum care to expectant mothers.



Platform offers risk-specific experiences to permit healthcare providers to manage pregnancies virtually.



Launched in the U.S. in July 2016, now sold in 36 countries worldwide.



\$18.12M in total funding
Lead investors are Inova Health System and Koninklijke Philips



Washington, DC
<https://www.babyscripts.com/>



CareSignal provides an accessible remote patient monitoring platform that improves payer and provider performance in value-based care by engaging and identifying rising-risk patients.



Care teams receive real-time alerts enabling real-time prioritization and outreach, and patients respond to evidence-based questions via text messages or phone calls.



Offers out-of-the-box services and support-all customizable to any organizations standards of care to realize value quickly.



\$12.12M raised to date, Later Stage VC rounds
Lead investors are Cultivation Capital and UnityPoint Health Ventures



St. Louis, Missouri
<https://www.caresignal.health/>

Cortrium



Sentio Solutions "Feel"



Babyscripts



CareSignal



Additional Companies of Interest

Company	Description	Relevant Investors	Last Round	Sub-Category
VitalPatch	Provides accessories used in ECG and cardiac imaging	N/A	Undisclosed	Patient Monitoring (Cardiac)
StepRite (Medlab)	Devices for wellness and sports performance	Concho Valley Angel Network	\$0.91M (Aug-2018)	Patient Monitoring (Orthopedic)
TracPatch	Orthopedic implants to restore mobility and renew lives of patients	Sycamore Ventures	\$10M (Apr-2018)	Patient Monitoring (Orthopedic)
Psious	VR platform for mental health treatment	BStartup10, Bynd Venture, Smartech Capital	\$8.98M (May-2019)	Patient Monitoring (Mental Health)
Carrot	Digital health and wearable for quitting smoking	AllegisNL Capital, Johnson & Johnson Innovation	\$24M (Jul-2020)	Patient Monitoring (Quit Smoking)
Sana	Mask and headphones for physical and mental recovery	StartUp Health, Portfolia, Transhuman Capital, Harmonix	\$5.82M (Jul-2020)	Patient Monitoring (Mental Health)
Focus Motion	Orthopedic knee brace operates with any smart watch or fitness band	Anathem Ventures, CourtsideVC, Elysian Park Ventures	\$0.5M	Patient Monitoring
MbientLab	Wearable and smart sensor devices	N/A	Undisclosed	Patient Monitoring
MC10 Inc.	Wearable semiconductor-based tech for sports, medical, military	LabCorp Ventures, Well Ventures, Aberdare Ventures	\$2.47M (Jul-2019)	Patient Monitoring
Oura Ring	Wearable ring for more restful sleep and performance	Alumni Ventures Group, Gradient Ventures, Able Partners	\$28M (Oct-2019)	Patient Monitoring
Kinsa Health	Smartphone connected thermometer to collect human health data	Arab Angel, GSR Ventures, Pond Capital, Alumni Ventures	\$22.01M (Apr-2018)	Smart Thermometer
Aura	AI-enabled wearables, software, digital biomarkers	CDP Venture, Endeavor Catalyst, Innogest Capital	\$5.79M (Dec-2016)	Respiratory Infection Detection
Somatix	Patient monitoring software platform	Digitalis Ventures, Dreamit Ventures, NY Digital Innovation Lab	\$6.2M (Jul-2020)	Cognitive Behavioral Therapy
Bioness	Devices for mobility and independence	Teuza, GlenRock Israel	\$3.3M (Feb-2012)	Pain Management
Sprint PNS	Peripheral nerve stimulation platform for severe pain	Kli Capital	\$8M (Jan-2019)	Pain Management
SportGait	Concussion management for diagnosis and treatment	Angel (individual)	\$2.06M (Nov-2019)	Concussion Care

Conclusion

The digital revolution of healthcare, implementation of new technology, and development of wearable devices offers an opportunity to transform healthcare and empower citizens in taking charge of their own health while decreasing the cost of care. It also provides providers with valuable, actionable data and information that will improve the quality of care. Areas of concern that will need addressing are data security, patient privacy, and data/network connectivity. FCA believes that patient monitoring and remote data collection using wearable devices will substantially enhance the operational efficiency of healthcare services.

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