

FROST & SULLIVAN

VITALCONNECT

2022
NEW
PRODUCT
INNOVATION

NORTH AMERICAN
WEARABLE BIOSENSOR INDUSTRY

Best Practices Criteria for World-Class Performance

Frost & Sullivan applies a rigorous analytical process to evaluate multiple nominees for each award category before determining the final award recipient. The process involves a detailed evaluation of best practices criteria across two dimensions for each nominated company. VitalConnect excels in many of the criteria in the wearable biosensor space.

AWARD CRITERIA	
<i>New Product Attributes</i>	<i>Customer Impact</i>
Match to Needs	Price/Performance Value
Reliability	Customer Purchase Experience
Quality	Customer Ownership Experience
Positioning	Customer Service Experience
Design	Brand Equity

A Remote Monitoring Solution for Hospital Workforce and Resource Shortages

The COVID-19 pandemic increased the demand for remote monitoring technologies, home-based care, and telehealth services to face workforce and resource shortages in the healthcare industry. The growing number of chronic disease patients and the aging population drive the demand for these care delivery channels, boosting regulated monitoring device adoption.¹

Continuous patient monitoring wearable devices provide patient mobility information, detect health deterioration early, and reduce hospital staff workloads. Cardiac wearables experience fast growth as electrocardiogram (ECG) monitoring is a highly targeted feature for wearable technology companies. Frost & Sullivan estimates the global market for clinical-grade wearables at \$13 billion in 2021, increasing to nearly \$41 billion by 2026, with a compound annual growth rate (CAGR) of 25%. Cardiac wearables constitute the predominant segment during the forecast period, increasing from approximately \$966 million to \$4.8 billion, with a CAGR of 38.3%.²

Founded in 2011 and headquartered in San Jose, California, VitalConnect leverages wearable biosensor technology to develop wireless patient monitoring systems for urban and rural hospitals and private practice. The company uniquely addresses the remote monitoring framework for patient populations through its medical-grade wearable VitalPatch.

¹ *Global Clinical-grade Wearables Growth Opportunities* (Frost & Sullivan, September 2022)

² *Ibid.*

“With an embedded biosensor, the four-inch medical-grade wearable miniaturizes the observational capabilities of an ICU. The unique cardiac monitoring technology simultaneously examines eight essential patient vitals, looking for 21 different cardiac arrhythmias while sending all patient data to a secure cloud in real-time.”

**- Varun Babu,
Senior Industry Analyst**

With an embedded biosensor, the four-inch medical-grade wearable miniaturizes the observational capabilities of an intensive care unit (ICU). The unique cardiac monitoring technology simultaneously examines eight essential patient vitals, looking for 21 different cardiac arrhythmias while sending all patient data to a secure cloud in real-time.

The technology has 84 issued United States and international patents alongside 10 Food and Drug Administration (FDA) clearances.³

Setting New Standards with Revolutionary Technology

Traditional cardiac monitoring solutions like the Holter monitor have multiple wires and are difficult to carry due to their weight. Uncomfortable for patients, these solutions often provide suboptimal parameters for doctors to assess. In recent years, medical device companies have developed wearable solutions to improve monitoring and deliver high-quality remote patient care. However, such solutions fall short of comfortability and efficiency features to meet patients’ distinct needs and, thus, support compliance. A cardiac wearable biosensor company must offer a patient-friendly device with revolutionary monitoring capabilities generating valuable insights quickly per patients’ different prescriptions.

VitalConnect integrated its class two biosensor, the VitalCore processor, into a patch to create the VitalPatch. The device monitors eight core vital signs when affixed to a patient's chest and streams the readings to a secure cloud by connecting to a VitalConnect phone/tablet via low-frequency Bluetooth. Through the VitalConnect cloud platform, VistaCenter, healthcare providers (HCPs) can access the patient's single-lead ECG, heart rate, heart rate variability, respiration rate, body and skin temperature, posture, fall detection, and activity metrics from anywhere.

VistaCenter has an intelligent notification suite for heart rate, respiration rate, vital sign maximum/minimum combinations, and fall detection. VitalConnect's cardiac solution continuously analyses the VitalPatch ECG stream employing a sophisticated cloud-based algorithm, providing arrhythmia detection and event notification. Moreover, its expert team of cardiac monitoring technicians confirms every result and notifies the HCP when necessary.

The biosensor uses low-frequency technology, enabling it to monitor the patient 24 hours a day for an entire week before the battery runs off. The VitalPatch is fully disposable, and patients can discard it and



Courtesy of VitalConnect

³ VitalConnect Corporate Overview (VitalConnect, March 2022)

apply a new one after seven days if needed.

Unique Value to Any Patient, Anywhere, at Any Time

There is no other biosensor in the market with VitalPatch's capabilities, as it outperforms the competition in patient wear comfortability, data quality, data storage access, and efficiency.

Wear Comfortability

VitalPatch does not require assembly or charging, is fully disposable, and uses medical-grade, hypoallergenic adhesive, maintaining in place while minimizing the risk of irritation. The device weighs 12 grams and is malleable, making it easy to wear for the patient. It has IPX7 water resistance, meaning patients can shower and submerge in water up to one-meter depth for 30 minutes while wearing it.

According to the FDA, VitalPatch has the lowest number of complaints in the market and presents minimal adverse reactions.⁴ By allowing patients to continue their daily routines, the wearable biosensor optimizes compliance over the monitoring period.

Data Quality

VitalPatch produces an extremely clean ECG and monitors seven additional vital signs that run through a sensitive algorithm detection system. Unlike ECG-only devices, it delivers a complete view of the patient's health, considering essential vitals such as core body temperature, activity, and posture, among others.

Data storage access

Most clinical-grade cardiac wearable providers collect the data directly into the device, making patient-generated data (PGD) inaccessible until the monitoring period is over. Conversely, VitalPatch stores PGD

"VitalPatch stores PGD in the cloud, giving physicians full disclosure and real-time access to the information. It advances the level of care as patients do not need an emergency check if they feel unwell before the monitoring period is over."

***- Manuel Albornoz,
Best Practices Research Analyst***

in the cloud, giving physicians full disclosure and real-time access to the information. It advances the level of care as patients do not need an emergency check if they feel unwell before the monitoring period is over.

VitalConnect's solution also eliminates the need to ship back the biosensor, taking the diagnostic report timeline from 20-30 days to five days after the prescription of the device. Finally, VitalPatch enables deep data analysis by storing the last 16 hours of raw data.

Efficiency

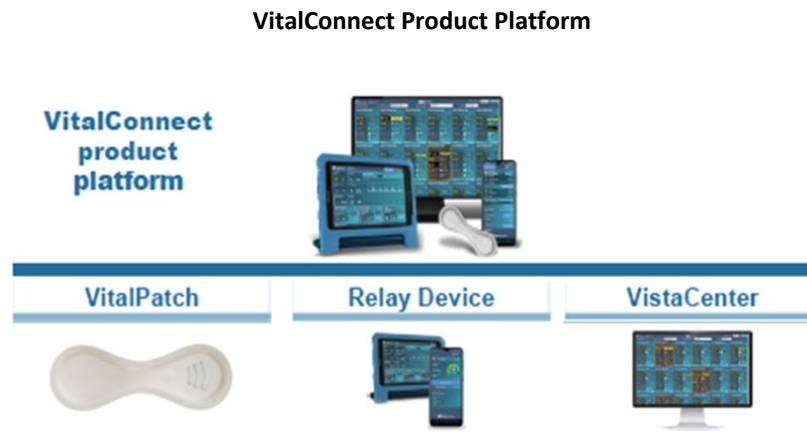
Doctors use different devices depending on the patient's prescription and monitoring requirements. Cardiac testing may include wearing a 24 to 48-hour Holter monitor, an extended Holter monitor, a cardiac event monitor, and a mobile cardiac telemetry device.

⁴ VitalConnect's Interview with Frost & Sullivan, September 2022

VitalConnect, on its side, drives value as a partner by supporting all use cases with only one device: the VitalPatch. The solution adapts to different prescriptions by following the physician's indications on the cloud platform. It increases hospital space capacity, minimizes confusion in workflows, and speeds up the prescription process, enhancing quality-care delivery either in the hospital setting or from the patient's home.

Guaranteed Satisfaction With an End-to-end Solution

VitalConnect goes beyond its extensive expertise and best-in-class solution capabilities, with customer value as a strategic imperative. VitalCore-powered, the company's platform solution is sophisticated, robust, and comprehensive. It can remotely monitor any patient, anywhere, at any time.



Courtesy of VitalConnect

Hospital level

The VistaCenter platform fits into the existing hospital infrastructure. It monitors several patients simultaneously, delivering early warning scores and fall detection alarms. The low-investment platform reduces the median cost of acute care and the 30-day post-discharge period by 67%.⁵

VistaCenter pairs with VitalPatch to improve staff efficiency and support 24/7 low-cost, customizable telemetry-grade monitoring.

Home monitoring level

VistaCenter allows HCPs to monitor non-critical patients who may require hospitalization in the comfort of their homes. The VitalPatch can be self-applied and paired with the VistaTablet/phone by the patient, ensuring rapid deployment.

Clinician and patient level

With accurate, real-time PGD access, the VitalPatch and the VistaCenter empower precision diagnosis. Doctors can easily plan patient-centered care leveraging the reported PGD through the wear period.

⁵ <https://vitalconnect.com/> (VitalConnect, 2022)

By eliminating the trial-and-error diagnostic approach, VitalConnect's platform solution reduces diagnostic errors and streamlines clinical operations for timely treatment. Moreover, its wearable technology frees patients of wires and interruptions in their daily routines, receiving comfortable home-based and personalized care.

Customer Service Excellence through a Customer-centric Approach

VitalConnect has deployed thousands of biosensors worldwide to care facilities such as Brigham and Women's, Hackensack Medical Center, Northwell Health, and John Radcliffe Hospital-Oxford University. The company's sales team and clinical support staff educate physicians on its technology's benefits and engage with the HCP workflows to set efficient processes. From a commercial standpoint, VitalConnect provides an affordable solution to heart failure patients' 30-day after-admission readmission penalties, saving considerable costs to the healthcare system.

Above and beyond, the company offers numerous web-based resources describing VitalPatch's capabilities and instructing its use in detail. Professional videos explain how to apply the VitalPatch and use the VistaCenter for remote monitoring (hospital and home-based). All devices have extensive manuals and brochures. Additionally, a section dedicated to frequently asked questions solves any urgent concerns from patients and physicians.

VitalConnect: Positioned for Growth

In the United States, six million patients receive cardiac monitoring through wearable devices.⁶ VitalConnect carved a niche in this large market with its accurate miniaturized ICU-like technology. The company reports capturing 2-3% of the unit share for mobile cardiac telemetry prescriptions in 2021.⁷

In the last 18 months since VitalPatch's market introduction, the company sequentially grew its business at a monthly rate of 8%. VitalConnect anticipates monitoring nearly 70,000 patients in 2022 with the goal of providing cardiac monitoring for over 150,000 patients in 2023.⁸

COVID-19 spotlighted the need for remote-monitoring technologies, and VitalConnect showcases this tendency with successful fundraisings. In September 2022, it announced completing an investment funded by Health Insight Capital to accelerate the monitoring of individuals who experienced heart failure, chronic obstructive pulmonary disease, and sepsis, among others.⁹ In January 2022, the company raised \$39 million to hire additional salespeople, marketing personnel, and support personnel.¹⁰

Frost & Sullivan believes VitalConnect is well-positioned to drive the wearable biosensor space into its next growth phase, capturing market share and gaining leadership in the coming years.

⁶ VitalConnect Interview with Frost & Sullivan (Frost & Sullivan, September 2022)

⁷ Ibid.

⁸ Ibid.

⁹ VitalConnect Announces Investment from HCA Healthcare to Accelerate Commercial Growth and Create Strategic Partnership: <https://vitalconnect.com/vitalconnect-announces-investment-hca/> (VitalConnect, September 2022)

¹⁰ VitalConnect Brings in 2022 with \$39M Financing: <https://www.mddionline.com/digital-health/vitalconnect-brings-2022-39m-financing> (VitalConnect, January 2022)

Conclusion

A wearable cardiac monitoring device company must understand the market's needs to create an end-to-end remote monitoring solution. Frost & Sullivan finds that VitalConnect delivers a solid biosensor designed and embedded with high-quality and reliable performance, embodying this concept. The company's VitalPatch monitors eight core vital signs and launches the data into a secure and easily accessible cloud platform solution. Unlike competing devices, it offers a 360-degree view of the patient's health status, aiding clinicians with high-quality, accessible data that eases hospital care. Furthermore, VitalConnect integrates a customer-centric, patient-centered approach to ensure that its offering addresses doctors' and patients' needs.

For its strong overall performance, VitalConnect is recognized with Frost & Sullivan's 2022 North American New Product Innovation Award in the wearable biosensor industry.

What You Need to Know about the New Product Innovation Recognition

Frost & Sullivan's New Product Innovation Award recognizes the company that offers a new product or solution that uniquely addresses key customer challenges.

Best Practices Award Analysis

For the New Product Innovation Award, Frost & Sullivan analysts independently evaluated the criteria listed below.

New Product Attributes

Match to Needs: Customer needs directly influence and inspire product design and positioning

Reliability: Product consistently meets or exceeds customer performance expectations

Quality: Product offers best-in-class quality with a full complement of features and functionality

Positioning: Product serves a unique, unmet need that competitors cannot easily replicate

Design: Product features an innovative design that enhances both visual appeal and ease of use

Customer Impact

Price/Performance Value: Products or services provide the best value for the price compared to similar market offerings

Customer Purchase Experience: Quality of the purchase experience assures customers that they are buying the optimal solution for addressing their unique needs and constraints

Customer Ownership Experience: Customers proudly own the company's product or service and have a positive experience throughout the life of the product or service

Customer Service Experience: Customer service is accessible, fast, stress-free, and high quality

Brand Equity: Customers perceive the brand positively and exhibit high brand loyalty

