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AWARDS

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2020 BEST PRACTICES AWARD



Preventive
SOLUTIONS

**2020 GLOBAL
REMOTE CARDIAC MONITORING
COMPANY OF THE YEAR AWARD**

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Background and Company Performance

Industry Challenges

According to the World Health Organization, cardiovascular disease (CVD) is the leading cause of mortality, accounting for nearly 17.9 million annual global deaths.¹ In the United States (US), studies show that approximately 47% of sudden cardiac deaths happen outside the hospital environment, which indicates that early signs of heart ailments often go unnoticed.²

Among the several CVD conditions, sudden cardiac death (SCD) and arrhythmia represent 15% to 20 % of all global deaths, accounting for 17 million people dying annually with SCD proportions in the overall cardiovascular mortality constantly growing, irrespective of preventive measures.³ Survival from SCD due to arrhythmia depends on early resuscitation and defibrillation. However, access to public defibrillators is inadequate; hence, challenging the hospital discharged patients' survival rates.

Evaluating cardiovascular auscultation is valuable for the timely diagnosis of heart conditions, such as heart failure, valvular heart disease (VHD), and atrial fibrillation (AFib). An insight from such data merely through a stethoscope is subjective as it depends on the physician's qualitative analysis. An electrocardiogram (ECG) assesses heart activity at one point in time. Thus, it is insufficient to trace irregular heartbeats (arrhythmia) and symptoms that come and go, necessitating monitoring heartbeat over time through a Holter monitor.

Traditional 24-hour cardiac monitoring through Holter devices enables physicians to track patients with suspected arrhythmias in an outpatient ambulatory setting. However, conventional Holter is ineffective due to the low diagnostic yield for patients who have intermittent arrhythmias and symptoms. Also, an extended period of monitoring improves effectiveness but compromises patient convenience, as patients find it intrusive and cumbersome.⁴ Therefore, external remote cardiac monitoring platforms employing smart technology are key to providing continuous or intermittent heart monitoring to assess patients' conditions relative to their cardiac rhythm and provide reliable electrocardiographic data to manage arrhythmia recurrence.

Frost & Sullivan's research indicates that the cardiac monitoring market in the US, Europe, and Asia-Pacific generated \$875.7 million in 2018. The market expects to reach \$1,422.8 million by 2023, increasing at a compound annual growth rate (CAGR) of 10.2%, with the high growth rate attributed to a surge in the wearables segment. Frost & Sullivan projects the market revenue for wearables, valued at \$180 million in 2018, to grow at a CAGR of 28.0% and reach \$618.5 million by 2023. These estimates include only the medical-grade wearables for ECG monitoring.⁵

¹ "Cardiovascular Diseases." World Health Organization, World Health Organization, www.who.int/health-topics/cardiovascular-diseases/#tab=tab_1.

² NCHS Data Brief; No. 103; Cheryl D Fryar et al.; August 2012; "Prevalence of Uncontrolled Risk Factors for Cardiovascular Disease: United States, 1999–2010"

³ *Arrhythmia & Electrophysiology Review* 2018;7(2):111–7.; <https://www.aerjournal.com/articles/sudden-cardiac-death-arrhythmias>

⁴ <https://www.heart.org/en/health-topics/heart-attack/diagnosing-a-heart-attack/holter-monitor>, accessed July 2020

⁵ *Analysis of the Global Cardiac Monitoring Market, Forecast to 2023* (Frost & Sullivan, January 2020)

The highly fragmented cardiac monitoring market witnesses a disruption, primarily driven by new low-cost monitoring patches and clinical-grade wearables. Frost & Sullivan expects digital solutions will affect the usage volume of Holter and cardiac event monitors. Furthermore, data from wearable devices will drive artificial intelligence (AI) and data-driven diagnosis to enhance the diagnostic value of these devices.

Visionary Innovation & Performance and Customer Impact of Preventice Solutions

Founded in 2004 and headquartered in Eagan, Minnesota, Preventice Solutions (Preventice) develops and markets digital health solutions and remote monitoring services for patients at risk of cardiac arrhythmias. The solution connects patients to their care teams for continuous monitoring and provides timely insights to drive improved health outcomes.

Evolving its product offering as per patient and physician needs, Preventice offers a broad portfolio of products and services from Holter to Mobile Cardiac Telemetry. The company's tech-enabled service model includes BodyGuardian® family of monitors under its wearable portfolio, third-party sensors, and the PatientCare Platform.

Transforming Preventive Care and Compliance through Remote Cardiac Monitoring

Committed to advance cardiac monitoring and address patient needs, Preventice designed the BodyGuardian®, a compact, trustworthy, wireless heart monitoring device to track patient triggered and asymptomatic rhythm monitoring. The system monitors hundreds of thousands of patients annually and provides an ambulatory ECG for arrhythmias such as atrial fibrillation, tachycardia, bradycardia, and pause. The system attaches to the patient's chest through a disposable BodyGuardian® Strip, with medical-grade adhesive and electrode gel. The device monitors the heart while the patient is on-the-go without disrupting normal activities. The system records and measures heart health pointers every ten seconds, and average activity level via a 3-axis accelerometer every 60 seconds. Certified experts survey the data and notify care teams with insights related to life-threatening cardiac events, enabling seamless patient experience and compliance.

In 2018, Preventice launched the BodyGuardian® MINI, its newest product version. It is the first fully waterproof-submersible arrhythmia monitor globally and differentiates from other commercial Holter monitors in its small design and battery life that is among the longest in the industry. The product is indicated for monitoring arrhythmias in both pediatric and adult patients. It is the world's smallest available reusable long-term Holter monitor with a wearable patch offering, unlike other commercial long-term monitors.

The repositionable device has multiple placement options; it is usable either as a patch (single-channel device) or attached to a traditional lead set to get three channel signals that provide more data. The patch optimizes patient comfort and wearability. It is conveniently movable, re-applicable, and replaceable (separates from the adhesive and reattaches to the new adhesive) during the study period without compromising on data collection or requiring additional clinic visits. The adhesive used by Preventice does not require significant skin preparation and offers an easy and comfortable wearing experience, unlike other patches that require skin abrasions and alcohol resulting in patient discomfort. Variable attachment

options allow patients to opt for alternatives to the patch in case of low adhesive tolerability. For example, the BodyGuardian® Bridge accessory uses standard electrodes with a patch-like footprint.

The compact size allows placing the monitor on the center of the chest to capture the P-wave data optimally, providing high clinical yield. The ultra-small, lightweight system enables up to 14-days of continuous ECG measurements, conveniently and quickly transferable to a physician in an easy-to-read, data-rich report. The monitor design and ease-of-use enable patients to follow an unhindered daily routine, bolstering patient compliance without interrupting cardiac monitoring. For example, the fully waterproof design, a key market differentiator, captures patients' arrhythmia during water sports or swimming. Additionally, the product's 16-day battery life for long-term Holter use-case is market disruptive.

The latest version, BodyGuardian® MINI PLUS is one device for all remote monitoring modalities running as a short or long-term Holter, cardiac event monitor, or mobile cardiac telemetry monitor. Available in a configuration with either one or two wearable monitors, the MINI PLUS includes a specially provisioned smartphone to collect ECG data in near real-time. Data is available throughout the monitoring period for mobile cardiac telemetry and can be available immediately for analysis once the study period ends for Holter. Also, the electronic diary catalogs symptoms on the smartphone for easy patient entry and automatic transmission to experts for summarizing symptoms and arrhythmia correlations in results. The monitoring device meets the needs of clinical research objectives by virtually connecting study subjects and their care teams. The flexible design provides remote programming capabilities with the ability to change monitoring types and thresholds through the extended monitoring periods to suit following study participants for long periods of time and meeting variable study requirements.

The PatientCare, HIPAA-compliant self-managed cloud-based platform works in tandem with the wireless monitors and transmits near real-time data, 24 hours a day, seven days a week, 365 days a year. It enables physicians, researchers, and care teams to collect, analyze, interpret, and manage patient data securely without requiring multiple patient site visits throughout the study.

To assist physicians in understanding the real-time monitoring data for every patient and assist clinical decision support, Preventice developed the BeatLogic® deep learning algorithm platform to detect, classify, and interpret variations in heart rhythm data collected through the BodyGuardian® technology. The company's recently published study in the May 2020 edition of the journal Heart Rhythm establishes the BeatLogic® algorithm's unparalleled accuracy and capabilities in classifying both beat and rhythm. BeatLogic® algorithms fared excellently when compared to other industry leading algorithms on MIT Ventricular Ectopic Beats classification, and all Afib algorithms on the MIT-BIH Atrial Fibrillation Database. The study points out that the beat detection sensitivity and positive predictive values are 99.84% and 99.78%.

The accuracy levels of its deep learning platform enable Preventice to set new gold standards in the market and allow physicians to draw intuitive insights from voluminous near real-time data to design appropriate care strategies for patients, like never before.

Multiple Business Models Support Unique Needs of Physician Practices

Preventice differentiates in the market by delivering multiple business models when compared to any other single player. The company offers traditional split-bill and flexible business solutions (an outsourced version of the service). The flexible model assists physicians in determining several choices for managing their inventory and monitoring studies. In the split-bill model (traditional industry approach), Preventice provides and charges for the technical interpretation work using standard Common Procedural Technology CPT codes (medical billing and coding). The practice performs and charges for the professional interpretation using standard CPT codes and whoever assists the patient with equipment set-up and education takes the fees associated with any set-up CPT codes.

Preventice offers a second model enabling the practice to purchase and maintain the equipment, conduct the billing, and bill a global CPT code, with Preventice charging a flat fee for its extensive interpretation work. The third and most rapidly growing segment is its full-service business. Preventice offers the same hardware and software to its practices. Due to BeatLogic® and its accuracy levels, Preventice makes it highly valuable for practices to bring and carry monitoring in-house efficiently.

Especially relevant for practices with earlier experience and expertise in Holter and centralized telemetry units, the company provides the software leveraging BeatLogic® and the hardware to conduct ambulatory cardiac monitoring. The practices pay on a subscription-based model to use the software and monitoring solution. Additionally, cardiology practices can harvest the data for their research or add to other patient care solutions requiring an ambulatory monitoring system.

COVID-19 Response Strategy

The recent coronavirus (COVID-19) pandemic resulted in lowered elective procedures at hospitals and practices. The company realized a general lack of awareness amongst cardiology groups about its unique capabilities that enable near real-time remote evaluation of cardiac symptoms and arrhythmias. To that end, Preventice conducted campaigns to spread awareness and highlight its services to help clients continue business operations while in lockdown. For example, for the split bill customers, the company increased shipping monitors directly to patient's homes and providing tele-visits, instruction and support to remotely initiate monitoring. Customers who adopted the company's hardware and software subscription business model incorporated remote cardiac monitoring into remote office visits for evaluation and management of patients, and features like ECG Insight® enabled clinicians to better manage their patients. Physicians who leveraged many of the unique features found ways to continue their practice and serve patients without requiring them to visit the clinic physically. As a result, Preventice witnessed a growth in customers leveraging near real-time cardiac monitoring services and its advanced remote monitoring features.

Also, practices shifted from using low-yield short-term Holter to higher clinical yielding long-term Holter and mobile cardiac telemetry monitoring to increase the value to compensate for the complexities of enabling and activating patients remotely. Cardiology groups recognized the added value of having more data for service types that offer extended monitoring and

appreciated the added value of near real-time data as they can access features like ECG Insight®. Using the ECG Insight® feature for mobile cardiac telemetry, physicians gained instant access to the full disclosure data within telemetry reports to improve timely diagnosis and guide care remotely. When the monitoring center finds events on patients, they generate an event report for physicians that enable assess to the patient's condition. The ECG insight® feature also facilitates viewing detailed ECG charts (120 seconds of ECG data scrollable at a time, intuitive navigation to variable times), heart rate trends, symptoms correlations, and arrhythmia burdens.

The ECG Insight® feature allows physicians to see all rhythms a patient is having and generate data requests for a specific data section for medical records or treatment reasons.

Secondly, hydroxychloroquine and azithromycin prescription to patients raised concerns over prolonged QTc (part of the heart's electrical signature recorded by ECG) causing severe arrhythmic episodes. To that end, patients can press the device button, generate an event report and enable physicians to measure QT prolongation using online calipers manually. Preventice also began the QT monitoring service to automatically measure the QTc of patients with COVID every four hours to track changes within a millisecond threshold.

The features and additional services enable the company to maintain a high-performance level during the pandemic.

Future Growth Perspective

Preventice expects the increased demand for long-term monitoring services and the home hook-up remote monitoring capabilities to sustain growth through the pandemic. The company also entered the chronic care management (CCM) and remote patient management (RPM) segments. It couples some of its traditional ambulatory services into the CCM, and RPM solutions in the telehealth space, which is likely to witness high growth. As practices are trying to apply ad-hoc techniques to evaluate patients remotely, physicians will formalize processes that leverage Preventice solutions such as BodyGuardian® 360 that enables remote connection capabilities with patients. The company currently monitors 500,000 patients annually and is growing rapidly.

Conclusion

Identifying and managing arrhythmias in patients with a clinical history of arrhythmia or at-risk for sudden cardiac death depends on continuous Holter monitoring, event monitoring, and continuous remote telemetry.

Preventice Solutions (Preventice) offers a comprehensive portfolio of highly accurate and sensitive BodyGuardian® family of remote monitors. The fully-waterproof BodyGuardian® MINI is the world's smallest, multi-modal, replaceable, and repositionable monitor. With the longest battery and enhanced capabilities, the system enables quick, timely, rich, and detailed insights into the patient's heart condition for risk management and optimized care, while allowing patients to follow their daily routine.

Additionally, Preventice's highly accurate and validated BeatLogic® deep learning algorithms detect, classify, and interprets variation in heart rhythm data collected through the BodyGuardian® technology. The robust algorithm support sets new industry benchmarks in accuracy and sensitivity through the intuitive clinical decision-making from voluminous real-time ECG data. Preventice's total solution enables risk-mitigation, prevents hospitalization and re-admission, improves physician efficiency, and bolsters timely intervention. With multiple business models that include traditional and flexible solutions, Preventice efficiently supports physician practices' variable needs and requirements.

With its strong overall performance, Preventice Solutions earns Frost & Sullivan's 2020 Global Company of the Year Award in the remote cardiac monitoring market.

Significance of Company of the Year

To receive the Company of the Year Award (i.e., to be recognized as a leader not only in your industry, but among non-industry peers) requires a company to demonstrate excellence in growth, innovation, and leadership. This excellence typically translates into superior performance in three key areas—demand generation, brand development, and competitive positioning—that serve as the foundation of a company’s future success and prepare it to deliver on the 2 factors that define the Company of the Year Award: Visionary Innovation and Performance, and Customer Impact).



Understanding Company of the Year

Driving demand, brand strength, and competitive differentiation all play critical roles in delivering unique value to customers. This three-fold focus, however, must ideally be complemented by an equally rigorous focus on Visionary Innovation and Performance to enhance Customer Impact.

Key Benchmarking Criteria

For the Company of the Year Award, Frost & Sullivan analysts independently evaluated each factor according to the criteria identified below.

Visionary Innovation & Performance

Criterion 1: Addressing Unmet Needs

Requirement: Implementing a robust process to continuously unearth customers' unmet or underserved needs, and creating the products or solutions to address them effectively.

Criterion 2: Visionary Scenarios through Mega Trends

Requirement: Incorporating long-range, macro-level scenarios into the innovation strategy, thereby enabling first-to-market growth opportunity solutions.

Criterion 3: Implementation of Best Practices

Requirement: Best-in-class strategy implementation characterized by processes, tools, or activities that generate a consistent and repeatable level of success.

Criterion 4: Blue Ocean Strategy

Requirement: Strategic focus on creating a leadership position in a potentially uncontested market space, manifested by stiff barriers to entry for competitors.

Criterion 5: Financial Performance

Requirement: Strong overall business performance in terms of revenue, revenue growth, operating margin, and other key financial metrics.

Customer Impact

Criterion 1: Price/Performance Value

Requirement: Products or services offer the best value for the price compared to similar offerings in the market.

Criterion 2: Customer Purchase Experience

Requirement: Customers feel they are buying the optimal solution that addresses both their unique needs and their unique constraints.

Criterion 3: Customer Ownership Experience

Requirement: Customers are proud to own the company's product or service and have a positive experience throughout the life of the product or service.

Criterion 4: Customer Service Experience

Requirement: Customer service is accessible, fast, stress-free, and of high quality.

Criterion 5: Brand Equity

Requirement: Customers have a positive view of the brand and exhibit high brand loyalty.

Best Practices Recognition: 10 Steps to Researching, Identifying, and Recognizing Best Practices

Frost & Sullivan analysts follow a 10-step process to evaluate Award candidates and assess their fit with select best practice criteria. The reputation and integrity of the Awards are based on close adherence to this process.

STEP	OBJECTIVE	KEY ACTIVITIES	OUTPUT
1 Monitor, target, and screen	Identify Award recipient candidates from around the globe	<ul style="list-style-type: none"> • Conduct in-depth industry research • Identify emerging sectors • Scan multiple geographies 	Pipeline of candidates who potentially meet all best-practice criteria
2 Perform 360-degree research	Perform comprehensive, 360-degree research on all candidates in the pipeline	<ul style="list-style-type: none"> • Interview thought leaders and industry practitioners • Assess candidates' fit with best-practice criteria • Rank all candidates 	Matrix positioning of all candidates' performance relative to one another
3 Invite thought leadership in best practices	Perform in-depth examination of all candidates	<ul style="list-style-type: none"> • Confirm best-practice criteria • Examine eligibility of all candidates • Identify any information gaps 	Detailed profiles of all ranked candidates
4 Initiate research director review	Conduct an unbiased evaluation of all candidate profiles	<ul style="list-style-type: none"> • Brainstorm ranking options • Invite multiple perspectives on candidates' performance • Update candidate profiles 	Final prioritization of all eligible candidates and companion best-practice positioning paper
5 Assemble panel of industry experts	Present findings to an expert panel of industry thought leaders	<ul style="list-style-type: none"> • Share findings • Strengthen cases for candidate eligibility • Prioritize candidates 	Refined list of prioritized Award candidates
6 Conduct global industry review	Build consensus on Award candidates' eligibility	<ul style="list-style-type: none"> • Hold global team meeting to review all candidates • Pressure-test fit with criteria • Confirm inclusion of all eligible candidates 	Final list of eligible Award candidates, representing success stories worldwide
7 Perform quality check	Develop official Award consideration materials	<ul style="list-style-type: none"> • Perform final performance benchmarking activities • Write nominations • Perform quality review 	High-quality, accurate, and creative presentation of nominees' successes
8 Reconnect with panel of industry experts	Finalize the selection of the best-practice Award recipient	<ul style="list-style-type: none"> • Review analysis with panel • Build consensus • Select winner 	Decision on which company performs best against all best-practice criteria
9 Communicate recognition	Inform Award recipient of Award recognition	<ul style="list-style-type: none"> • Announce Award to the CEO • Inspire the organization for continued success • Celebrate the recipient's performance 	Announcement of Award and plan for how recipient can use the Award to enhance the brand
10 Take strategic action	Upon licensing, company able to share Award news with stakeholders and customers	<ul style="list-style-type: none"> • Coordinate media outreach • Design a marketing plan • Assess Award's role in future strategic planning 	Widespread awareness of recipient's Award status among investors, media personnel, and employees

The Intersection between 360-Degree Research and Best Practices Awards

Research Methodology

Frost & Sullivan's 360-degree research methodology represents the analytical rigor of our research process. It offers a 360-degree view of industry challenges, trends, and issues by integrating all 7 of Frost & Sullivan's research methodologies. Too often companies make important growth decisions based on a narrow understanding of their environment, leading to errors of both omission and commission. Successful growth strategies are founded on a thorough understanding of market, technical, economic, financial, customer, best practices, and demographic analyses. The integration of these research disciplines into the 360-degree research methodology provides an evaluation platform for benchmarking industry participants and for identifying those performing at best-in-class levels.



About Frost & Sullivan

Frost & Sullivan, the Growth Partnership Company, enables clients to accelerate growth and achieve best-in-class positions in growth, innovation, and leadership. The company's Growth Partnership Service provides the CEO and the CEO's Growth Team with disciplined research and best practice models to drive the generation, evaluation, and implementation of powerful growth strategies. Frost & Sullivan leverages more than 50 years of experience in partnering with Global 1000 companies, emerging businesses, and the investment community from 45 offices on six continents. To join our Growth Partnership, please visit <http://www.frost.com>.