

Cardiac Wearables: Bridging Technology and Cardiac Care

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"Tell me, and I forget. Teach me, and I remember. Involve me, and I learn." —Benjamin Franklin

OSU Physicians, Inc.

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No Disclosures

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Objectives

- To understand indications for wearable devices in cardiac care.
- To identify limitations of wearable cardiac monitoring.
- To distinguish between the types of devices and their utility in clinical practice.

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Indications for Wearable Devices

- **Arrhythmias:** Detecting irregular heart rhythms.
- **Conduction Disease:** Monitoring electrical signaling problems in the heart.
- **Evaluation of Syncope:** Assessing fainting or loss of consciousness.
- **Lightheadedness, Chest Pain, Dyspnea:** Assessing symptoms that could indicate a cardiac issue.
- **Heart Rate Monitoring**
- **Assist in identifying chronotropic incompetence**

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Types of Short-term Medical Grade Wearable Devices

Holter

- 24-48 hours of continuous monitoring.
- Requires patient to complete a diary.
- Requires verification of symptoms captured.
- Some devices interrupt daily routine
-i.e. bathing, patch sensitivity, bulky batteries

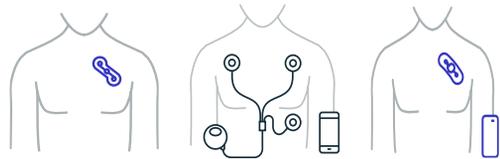


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Extended Medical Grade Wearable Monitors

- Longer duration compared to Holter.
- Trigger function available for symptom capture.
- Some may require maintenance or interrupt daily life



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How I look after my 5th PVC notification in the middle of the night!



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Other medical devices you may encounter

- LifeVest



Activity	Heart Rate	ECG	WalkTestSM	Health Survey	Body Position
<ul style="list-style-type: none"> • 24/7/365 day • Shows 3 min. intervals for each day 	<ul style="list-style-type: none"> • Automatically detects and reports heart rhythm alerts • Avg. daily heart rate • Avg. heart rate is not accurate for each day 	<ul style="list-style-type: none"> • Select clinical monitoring • Standardized and after treatment • Automatically records to certain lead-cable and multi-lead monitoring 	<ul style="list-style-type: none"> • Select tolerance level • Standardized measure clinical effort to exercise • Heart rate during the test can decrease to 50% or lower post-walk 	<ul style="list-style-type: none"> • Capture and track patient normal symptoms • Clinician can select up to 10 symptoms to capture and track weekly basis 	<ul style="list-style-type: none"> • Nighttime sleep high/night • Standardized patient position (supine/prone) • Body position while monitored in supine (Lying, sitting, etc.)

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Implantable Device

- Implanted device for continuous monitoring.
- 3-year battery life.
- Trigger device available for event recording.



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Pulse Oximetry

- Pulse monitoring



Blood Pressure monitors with rhythm notification

- Pulse monitoring
- Rhythm notification

Important to note inaccuracy with irregular rhythms. Best practice is to listen apically for clinical correlation. Radial pulse may not be beneficial in these rhythms either.



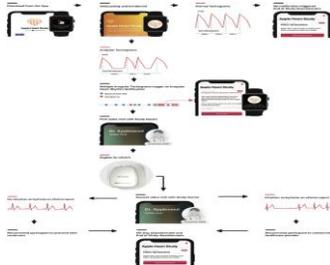
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Commercially Wearable Devices

- Apple Watch: ECG capabilities, heart rate monitoring, and irregular rhythm notifications.



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Commercially Wearable Devices

- KardiaMobile: Portable ECG device for home use.



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Commercially Wearable Devices

- **Fitbit:** Basic heart rate tracking, activity monitoring.
- **Fitbit Sense:** ECG
- **Detection of Atrial Fibrillation in a Large Population Using Wearable Devices: The Fitbit Heart Study.**



Note: These devices provide valuable data for personal health but may not replace clinical-grade

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Limitations of Wearable Devices

- **Infrequent Symptoms:** Limited diagnostic value for patients with occasional symptoms.
- **Poor Compliance:** Issues with patients wearing the device as instructed.
- **Poor Quality of Recordings:** Inconsistent or low-quality data that might impact diagnostic accuracy.
- **Limited Data:** Devices may not provide enough data for a comprehensive clinical assessment.

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Clinical Utility and Practice

- Wearable devices can complement traditional diagnostic tools, offering real-time data.
- They are especially useful in outpatient settings and for patients with intermittent symptoms.
- Clinical teams should be aware of the limitations of data quality and patient compliance.
- Integration of wearable device data with electronic health records (EHR) can enhance patient care.

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Conclusion

- Wearable cardiac monitors offer valuable insights into heart health.
- Choosing the right device depends on patient symptoms, the desired monitoring duration, and clinical needs.
- While these devices offer convenience and continuous monitoring, there are limitations in terms of data quality and patient compliance.
- Further advancements and research will continue to improve their utility in clinical practice.

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Thank you!

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