

Cardiac Wearables: Bridging Technology and Cardiac Care

Lindsey Bronstein APN, AACC

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

OSU Physicians, Inc.

©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

1

No Disclosures

©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

2

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.

©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

3

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

©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

4

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

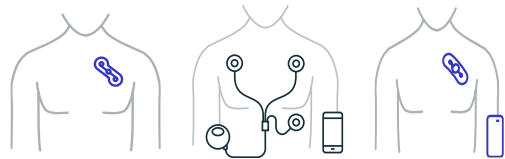


©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

5

Extended Medical Grade Wearable Monitors

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



©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

6

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



©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

7

7

Other medical devices you may encounter

- LifeVest

Light, breathable cloth garment

- Worn under the clothing, directly against the patient's skin
- Available in a wide range of sizes, fitting patients from 20" to 50"

Dry, non-adhesive electrodes and therapy pads

- Designed to detect certain life-threatening rapid arrhythmias and deliver appropriate treatment

Monitor

- Continuously monitors the patient's heart and is designed to alert the patient and caregiver if a treatment shock is warranted
- Large interactive touch screen communicates key device information to patient
- Response buttons allow a conscious patient to delay treatment

Activity

- Automatically corrects and adjusts heart rate
- Shows 1 min. heart rate to each day
- Log daily heart rate
- Log heart rate to each day

Heart Rate

- Automatically corrects and adjusts heart rate
- Shows 1 min. heart rate to each day
- Log daily heart rate
- Log heart rate to each day

ECG

- Automatically corrects and adjusts heart rate
- Shows 1 min. heart rate to each day
- Log daily heart rate
- Log heart rate to each day

WalkTest®

- Automatically corrects and adjusts heart rate
- Shows 1 min. heart rate to each day
- Log daily heart rate
- Log heart rate to each day

Health Survey

- Automatically corrects and adjusts heart rate
- Shows 1 min. heart rate to each day
- Log daily heart rate
- Log heart rate to each day

Body Position

- Automatically corrects and adjusts heart rate
- Shows 1 min. heart rate to each day
- Log daily heart rate
- Log heart rate to each day

©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

8

8

Implantable Device

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



©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

9

9

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.

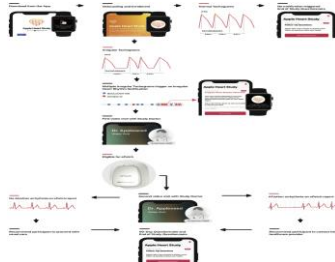
©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

10

10

Commercially Wearable Devices

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



©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

11

11

Commercially Wearable Devices

- KardiaMobile: Portable ECG device for home use.



©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

12

12

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

13

©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

13

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.

14

©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

14

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.

15

©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

15

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.

16

©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

16

Thank you!

17

©THE OHIO STATE UNIVERSITY WEXNER MEDICAL CENTER

17