

Use Cases:

Use Case 1:

Name: Heart Rate Variability Check

Primary Actor: Patient (User)

Actor(s): Session Database (simulated by History class)

Goal: Patient completes session and is displayed coherent heart-rhythm summary readings

Main Success Scenario:

1. User turns on HeartWave.
2. The device turns on and displays the menu to the user.
3. User adjusts challenge level and breath pacer settings by going to Menu→Challenge Level.
4. User initializes a session by going to Menu→Start Session.
5. Screen shows heart-rhythm variability through the main HRV graph (HR vs time) with key metrics including coherence score, length, and achievement in real time.
6. The LED coherence light is red or blue, with an incoherent heart-rhythm pattern.
7. The user stabilizes their breath with slow and steady breaths, achieving a more pattern-like range in HRV.
8. Coherence light changes to green and the HeartWave beep activates.
9. When the user is finished using the machine, they end the session by going to Menu→End Session
10. User is shown summary view (challenge level, % of time in different coherence levels, average coherence, length of session, achievement score, entire HRV graph)
11. Session is added and stored to the device's memory/database
12. User turns off device

Extensions:

6a. The coherence light is already green and the user's HRV is coherent and does not require further stabilizing.

7a. The user is having difficulty regulating their breath.

7ai. The user follows the optional breath pacer setting using the pattern in strip of lights.

8a. The light remains blue or red.

8ai. The user must continue trying to regulate their breath.

8b. The signal of the device is interrupted and the program stops updating data.

8bi. The signal returns.

Use Case 2:

Name: Managing Session History

Primary Actor: Patient (User)

Actor(s): Session Database

Goal: The user views/deletes a session from the log history

Precondition: The user has completed at least one session with the HeartWave

Main Success Scenario:

1. User views the log history by going to Menu→Show History.
2. User selects a session by using the arrow keys to navigate the log, and selects a session with the selector.
3. User views the session data.

Extensions:

1a. User optionally deletes sessions by using arrow keys to navigate to the delete option.

1ai. User confirms their action.

Use Case 3:

Name: Reset Device

Primary Actor: Patient (User)

Actor(s): Session Database

Goal: The user resets the device to factory settings

Precondition: The user has data stored on the device

Main Success Scenario:

1. The user turns on the HeartWave device.
2. The user follows the path of Menu→Factory Reset
3. The user presses the reset option.
4. The user confirms they would like to clear all data from the device.

Use Case 4:

Name: Charge Device

Primary Actor: Patient (User)

Actor(s): Session Database

Goal: The user charges the battery to 100%

Precondition: The battery percentage of the device is low or at 0%

Main Success Scenario:

1. The user notices that the device battery is either low or empty
2. The user locates the charge button on the device interface
3. The user clicks the charge button
4. The device charges back up to 100%
5. The user can continue using the device again

Use Case Diagram:

