Use Case 1: New Session (Normal Operation of Treatment)

Primary Actor: Patient

Stakeholders and Interests:

Patient - wants to safely undergo treatment

Therapist - wants the patient to be safely cured

Product Owner - wants the device to work safely

Precondition: The battery has enough charge to run a session

Success Guarantee: The session finishes and logs the data

Main Success Scenario:

1. The patient presses the power button to turn on the device
2. The patient presses the play button to select the New Session option in the main menu
3. The blue light turns on
4. The device starts the timer representing time remaining until end of session
5. The device starts the progress bar representing percentage of session completed
6. For all 21 EEG sites, at the same time, the device reads a signal for each individual EEG site on the headset
7. For all 21 EEG sites, at the same time, the device establishes a baseline average dominant frequency for each individual EEG site over the period of one minute
8. The green light begins flashing
9. For all 21 EEG sites, at the same time, every 1/16th of a second, until a second has passed, the device adds an offset frequency of 5 Hz to the baseline average dominant frequency for each individual EEG site
10. The green light stops flashing
11. For all 21 EEG sites, at the same time, the device recalculates the baseline average dominant frequency for each individual EEG site in the duration of a minute
12. The green light begins flashing
13. For all 21 EEG sites, at the same time, every 1/16th of a second, until a second has passed, the device adds an offset frequency of 10 Hz to the baseline average dominant frequency for each individual EEG site

14. The green light stops flashing
15. For all 21 EEG sites, at the same time, the device recalculates the baseline average dominant frequency for each individual EEG site in the duration of a minute
16. The green light begins flashing
17. For all 21 EEG sites, at the same time, every 1/16th of a second, until a second has passed, the device adds an offset frequency of 15 Hz to the baseline average dominant frequency for each individual EEG site
18. The green light stops flashing
19. For all 21 EEG sites, at the same time, the device recalculates the baseline average dominant frequency for each individual EEG site in the duration of a minute
20. The green light begins flashing
21. For all 21 EEG sites, at the same time, every 1/16th of a second, until a second has passed, the device adds an offset frequency of 20 Hz to the baseline average dominant frequency for each individual EEG site
22. The green light stops flashing
23. For all 21 EEG sites, at the same time, the device calculates the final baseline average dominant frequency for each individual EEG site over the period of one minute
24. The initial and final average dominant frequencies for each EEG site are uploaded to the Session Log alongside the date and time
25. The device displays a message stating that the session has ended
26. The blue light turns off
27. The device prompts the patient to press the menu button
28. The patient presses the menu button
29. The device returns to the main menu

Extensions:

1a. Patient presses the power button but there is no battery

1a1. The patient changes the battery

1a2. The patient presses the power button

1a3. The device turns on

1b. User selects NEW SESSION, but there is not enough battery to run a session

1b1. See *Use Case 4: Low Battery Response*

3-23a. Patient presses the stop button during the session

3-23a1. The device stops the timer

3-23a2. The device stops the progress bar

3-23a3. The device stops any actions in progress

3-23a4. The device notifies the patient that the session was canceled

3-23a5. The device prompts the patient to press the menu button

3-23a6. The patient presses the menu button

3-23a7. The device returns to the main menu

3-23b. Patient presses the pause button during the session

3-23b1. See *Use Case 7: Pause Button Pressed During Session*

3-23c. Contact is lost during the session

3-23c1. See *Use Case 5: Connection Loss between Electrodes and the Device*

<u>Use Case 2: Session Log</u>

Primary Actor: Patient

Stakeholders and Interests:

Patient - wants to view history of sessions

Therapist - wants the patient to be able to view history of sessions

Product Owner - wants the device to work

Precondition: The device is off

Success Guarantee: The user finishes viewing history, and goes back to menu

Main Success Scenario:

1. The patient presses the power button to turn the device on
2. The patient presses the play button to select the Session Log option in the main menu
3. The device displays a list of every Session's time and date
4. The patient clicks the menu button to return to main menu
5. The device returns to the main menu

Extensions:

1a. Patient presses the power button but there is no battery

1a1. The patient changes the battery

1a2. The patient presses the power button

1a3. The device turns on

Use Case 3: Date and Time Setting

Primary Actor: Patient

Stakeholders and Interests:

Patient - wants to change the date and time

Therapist - wants the device to accurately log date and time of sessions

Product Owner - wants the device to work

Precondition: The device is off

Success Guarantee: The device updates the date and time, and goes back to menu

Main Success Scenario:

1. The patient presses the power button to turn the device on
2. The patient presses the play button to select the Date and Time Setting option in the main menu
3. The patient changes any values for the date and time displayed on screen by pressing the up and down arrows
4. The device automatically saves the date and time
5. The patient presses the menu button
6. The device returns to the main menu

Extensions:

1a. Patient presses the power button but there is no battery

1a1. The patient changes the battery

1a2. The patient presses the power button

1a3. The device turns on

Use Case 4: Low Battery Response

Primary Actor: Patient

Stakeholders and Interests:

Patient - wants to safely undergo treatment

Therapist - wants the patient to be safely cured

Product Owner - wants the device to work safely

Precondition: The patient selected NEW SESSION, but there is not enough battery to run a session

Success Guarantee: The device has a full battery

Main Success Scenario:

1. The device warns the patient that there is not enough battery to run a session, and that they should replace the battery
2. The patient presses the power button to turn off the device
3. The device turns off
4. The patient replaces the battery
5. The patient presses the power button to turn on the device
6. The device turns on
7. The battery indicator of the device shows 100%

Extensions: None

Use Case 5: Connection Loss between Electrodes and the Device

Primary Actor: Patient

Stakeholders and Interests:

Patient - wants to safely undergo treatment

Therapist - wants the patient to be safely cured

Product Owner - wants the device to work safely

Precondition: A connection loss has occurred during a session

Success Guarantee: Connection returns, and the session continues

Main Success Scenario:

1. The red light flashes

2. The device starts beeping
3. The device begins a 5 minute timer
4. The device pauses the session timer
5. The device pauses the progress bar
6. The device pauses any actions in progress
7. The device tells the patient to reestablish contact with all electrodes
8. The patient establishes contact with all electrodes
9. The red light turns off
10. The device stops beeping
11. The device stops the 5 minute timer
12. The device resumes any actions in progress
13. The device resumes the session timer
14. The device resumes the progress bar

Extensions:

1a. Patient does not reestablish contact within 5 minutes

1a1. The session is terminated

1a2. The device turns off automatically

<u>Use Case 6: Therapy History Viewing with PC</u>

Primary Actor: Patient

Stakeholders and Interests:

Patient - wants to view details regarding the history of sessions

Therapist - wants the patient to be able to view the history of sessions

Product Owner - wants the session history on the PC to match up with the device

Precondition: The PC is on

Success Guarantee: The patient views the details for desired sessions

Main Success Scenario:

1. The PC displays the menu to the user
2. The user uses the arrows and the select button to choose which session information they want to see

3. The PC extracts the data from the database
4. The data is displayed on the screen
    a. Starting and Final overall baseline are displayed
    b. The table is populated with initial and final frequency values
    c. Graph of baseline EEG waveform is shown

Extensions:

1a. New Session completes successfully, menu needs to be updated with new session

1a1. User presses 'refresh button'

1a2 Pc clears the menu

1a3 Pc extracts all session dates from database and re displays them on menu

<u>Use Case 7: Pause Button Pressed During Session</u>

Primary Actor: Patient

Stakeholders and Interests:

Patient - wants to safely pause the treatment

Therapist - wants the patient to be safely cured

Product Owner - wants the device to work safely

Precondition: The patient presses the pause button during a session

Success Guarantee: The patient resumes the session

Main Success Scenario:

1. The device pauses the timer
2. The device pauses the progress bar
3. The device pauses any actions in progress
4. The patient presses the play button
5. The device resumes the timer
6. The device resumes the progress bar
7. The device resumes any actions in progress

Extensions:

1a. Patient does not reestablish contact within 5 minutes

1a1. The session is terminated

1a2. The device turns off automatically