**NEURESET USE CASES**

**USE CASE 1: Use A Neureset Device**

Primary Actor:

Patient

Stakeholders & Interests:

Patients – Want to be able to use the Neureset device to improve their symptoms or cognitive performance; for the device to operate safely, and for the device to be effective.

Neureset Designers *–* Want Neureset device to be simple to use and effective; for the device to correctly and safely apply treatment, and to respond appropriately in situations such as electrode contact loss.

Pre-conditions:

Device has been programmed, tested, and inspected for customer use.

Patient has been trained how to use the device correctly.

Device’s battery has been charged.

Success Guarantee(s):

The Patient can use the Neureset device to safely perform a direct neurofeedback treatment. The Neureset device will correctly perform EEG sampling and analysis to establish and apply correct neurofeedback treatment.

Main Success Scenario:

1. Patient turns on the Neureset device
2. Device’s red light turns on, indicating electrodes are not connected
3. Device menu presents three options (new session, session log, time and date), with ‘New Session’ highlighted
4. Device’s battery indicator shows current charge
5. Patient puts on EEG headset
6. Device checks EEG contact
7. Device’s blue light turns on, indicating good electrode contact
8. Device’s red light turns off
9. Patient presses select button on ‘New Session’
10. Device confirms electrodes are connected
11. Device initiates new treatment session
12. Device displays timer of approximately 45 seconds and a progress bar of 0%, indicating remaining treatment time
13. Device display timer begins ticking down
14. Device samples EEG data from all electrode sites concurrently for 5 seconds
15. Device calculates initial baseline average dominant frequency for each site at the end of the sampling
16. Device begins treatment application at the first EEG site
17. Device’s green light turns on to indicate treatment is being delivered
18. Device adds an offset frequency of 5hz to the baseline average dominant frequency corresponding to that electrode site
19. Device delivers an electromagnetic signal of that frequency to the electrode site every 1/16th of a second for 1 second
20. Device adds an offset frequency of 10hz to the baseline average dominant frequency corresponding to that electrode site
21. Device delivers an electromagnetic signal of that frequency to the electrode site every 1/16th of a second for 1 second
22. Device repeats process of for 15hz and 20hz offsets added to the initial dominant frequency
23. Device selects next EEG site
24. Device repeats steps 16 – 22 for remaining 6 electrode sites
25. Device completes treatment for all 7 electrode sites
26. Device’s green treatment indicator light turns off
27. Device calculates final baseline average dominant frequency for all 7 EEG sites concurrently over 5 seconds
28. Device finishes calculating final baseline
29. Device shows “treatment session complete” on display
30. Device creates and a session log and saves it to storage
31. Device returns to menu options

Extensions:

9.a. Device contact not established before starting new session

9.a1. Device displays warning message of insecure electrode contact

9.a2. Device returns to main menu after 3 seconds

9.a3. Patient adjusts helmet to re-correct electrodes

9.a4. Device’s blue light turns on to indicate secure electrode contact

9.a5. Device’s red light turns off

9.a6. Patient selects ‘New Session’

9.a7. Device proceeds with treatment

14.a. Device loses contact during treatment session (USE CASE 2)

24.a. Patient presses pause button during treatment session (USE CASE 3)

24.b. Device reaches critically low battery power during session (5% charge)

24.b1. Device displays message to user to charge battery for 3 seconds

24.b1.a. User does not connect device to charger

24.b1.a1. Device’s battery dies

24.b1.a2. Device turns off

24.b1.a3. Treatment session is ended and data is not recorded

24.b1.b. User connects device to charger

24.b1.b1. Device’s battery begins charging

24.c. Patient presses stop during a treatment session

24.c.1. Treatment session stops

24.c.2. Device displays warning indicating ‘Treatment Session Stopped’ for 3 seconds

24.c.3. Device display updates to show the main menu

24.c.4. Session data is not recorded

31.a. No option is selected for 5 minutes

31.a1. Device turns off automatically

**USE CASE 2: Electrode Loses Contact During Treatment Session**

Primary Actor:

Patient

Stakeholders & Interests:

Patient – Wants the device to notify them when the electrode loses contact and for treatment to resume once contact is re-established within a reasonable period.

Designer – Wants the device to notify the user when an electrode loses contact during treatment, for the device to resume treatment if the electrode contact is fixed within 5 minutes, and for the device to turn off automatically if device contact is not re-established.

Pre-Conditions:

Patient has begun a treatment session.

Device has been programmed to detect electrode contact from the EEG helmet.

Success Guarantee:

If any of the electrodes lose contact during a treatment session, the device will detect the contact loss, pause the session, and notify the user by flashing a red light and beeping. If contact is re-established within 5 minutes, the device will resume treatment, otherwise, it will turn off and the session data will be lost.

Main Success Scenario:

1. Device detects contact loss of one or more of the electrodes
2. Device pauses treatment session
3. Device’s blue light turns
4. Device’s red light turns on
5. Device begins beeping
6. Device display updates to show ‘Session Paused: Please Reconnect Electrodes’
7. User corrects electrode contact within 5 minutes
8. Device’s red light turns off
9. Device’s blue light turns on
10. Device stops beeping
11. Device resumes treatment
12. Device display updates to previous treatment time and progress remaining

Extensions:

2.a. Device pauses during 1 second treatment application

2.a1. Device’s green and blue lights turn off

2.a2. Device’s red light turns on

2.a3. Patient re-establishes electrode contact

2.a4. Device’s red light turns off

2.a5. Device’s blue and green lights turn on

2.a6. Device resumes treatment application

7.a. User does not re-establish electrode contact within 5 minutes

7.a1. Device turns off automatically

7.a2. Device does not record any of the session’s data

**USE CASE 3: Pause a Treatment Session**

Primary Actor:

Patient

Stakeholders & Interests:

Patient – Wants to be able to pause the treatment during a session and resume where they left off if re-started within a reasonable period.

Designer – Wants the device to allow users to pause a session, resume their treatment progress if re-started within 5 minutes, and for the device to turn off automatically if the session is not resumed within 5 minutes.

Pre-Conditions:

Patient has begun a treatment session.

Device has been programmed to allow pausing and resuming of a treatment session

Success Guarantee:

If the user presses the pause button during the treatment session, the device pauses the session, and notify the user by displaying a message. If the treatment is resumed within 5 minutes, the device will resume treatment, otherwise, it will turn off and the session data will be lost.

Main Success Scenario:

1. PATIENT presses pause button during a treatment session
2. Device detects pause button pressed
3. Device pauses treatment session
4. Device displays ‘Treatment Paused’
5. User presses play button within 5 minutes of pressing pause
6. Device resumes treatment session
7. Device display updates to show previous treatment progress

Extensions:

3.a. Device pauses during treatment application

2.a1. Device’s green light turns off

2.a2. Device display updates to show ‘Session Paused’

2.a3. Patient presses play to resume session

2.a4. Device resumes treatment session

2.a5. Device’s green light turns on

2.a6. Device display updates to show previous treatment progress

6.a. User does not resume session within 5 minutes

6.a1. Current treatment session is stopped

6.a2. Device turns off automatically

6.a3. Device does not record any of the session’s data

**USE CASE 4: View Neureset Session Logs**

Primary Actor:

Patient

Stakeholders & Interests:

Patient – Wants to be able to view previous treatments and their corresponding dates on the device, as well as connect the device to a PC to upload and view the treatment session data, including before and after frequency values for each electrode site with each treatment.

Designer – Wants the device to allow users to scroll through their previous sessions and upload and view treatment session data on their PC

Pre-Conditions:

Patient has completed at least one treatment session.

Device is turned on and not in an active treatment.

Success Guarantee:

If the user uploads the Device’s session date, the PC interface will show a list of the previous treatment sessions and when selected with double click, will show the before and after frequency data for each electrode site corresponding to the selected treatment.

Main Success Scenario:

1. Patient clicks menu button
2. Patient clicks arrow button until ‘Session Log’ option is reached
3. Patient clicks select button
4. Device display updates to show a list of the date and times of previous treatments
5. Patient pushes arrow buttons to scroll through the list
6. Patient clicks menu button to return to main menu

Extensions:

4.a. Patient has not completed any previous sessions

4.a1. Session log screen is empty with a message ‘No previous treatments’

5.a. Patient uploads session log data to PC

5.a1. PC UI displays list of session dates and times

5.a2. Patient double clicks a session item from the list on the PC UI

5.a3. PC UI displays treatment data for that session

**USE CASE 5: Change Date and Time on a Neureset Device**

Primary Actor:

Patient

Stakeholders & Interests:

Patient – Wants to be able to change the date and time on the device for accurate session logging.

Pre-Conditions:

Device is turned on and not in an active treatment.

Success Guarantee:

The user can change the date and time on the device.

Main Success Scenario:

1. Patient clicks menu button
2. Patient clicks arrows buttons until ‘Time and Date’ option is highlighted in main menu
3. Patient presses select button
4. Device display updates to show ‘Set Date & Time’ and the year/month/day it’s currently set to
5. Patient presses the up/down buttons to scroll through months until desired month is found
6. Patient presses select to proceed to day
7. Patient presses up/down buttons to scroll through days until desired day is found
8. Patient presses select to proceed to year
9. Patient presess up/down buttons to scroll through years until desired year is found
10. Patient presses select to proceed to hour
11. Patient presses the up/down buttons to scroll through hours until desired hour is found
12. Patient presses select to proceed to minute
13. Patient presses up/down buttons to scroll through minutes until desired minute is found
14. Patient presses menu button to return to main menu
15. Device display updates to show menu options

Extensions:

8.a. Patient set the day incorrectly and wants to change it

8.a.1. Device cursor is currently set to year

8.a.2. Patient presses ‘Select’ button to scroll to continue through the components until the cursor is returned to the day component

8.a.3 Patient uses up and down arrows to adjust day value

8.a.4. Patient clicks menu button to return to main menu

8.a.5. Device display updates to show main menu

5.a. Patient only wants to change the month

5.a.1. Patient scrolls through months with up and down arrows until desired month is found

5.a.2. Patient clicks menu button to return to main menu

5.a.3. Device display updates to show the main menu

