**Use Cases Final Project COMP 3004 Group 11**

**USE CASE 1: TURN THE POWER ON**

Primary Actors: Patient

Scope: Cranio-Electro Stimulation (CES) device

Level: User goal

Stakeholders and Interests:

Patient - wants to use the Cranial Electrical Stimulation device as a relaxation and meditation tool.

Health Care Providers – want to prescribe this device to patients for whom it is safe to use and want to supervise the use of the device by certain patients who have other complications.

Device manufacturing company – wants to manufacture a properly working Cranial Electrical Stimulation for its customers in order for the company to earn revenue and make profit.

Precondition: Patient is comfortable, has a 9V battery connected inside the battery compartment, and has both ear clips connected to the CES jack on the side of the device.

Minimal guarantee: The power LED of the device turns on and displays the battery level.

Success guarantee: The power LED of the device turns on, displays the battery level, and has sufficient battery to allow the user to select a session.

Main success scenario:

1. Patient holds down the power button until the power LED turns on.

2. The Cranio-Electro Stimulation (CES) graph displays the battery level for a few seconds. See use case *Detect Battery Level.*

3. The patient then selects one of the three selectable session groups. See use case *Select Session Group and Type.*

Extensions:

2a. The battery level is not displayed:

2a1. The patient replaces the battery in the device.

2a2. The patient contacts the service department of the manufacturing company for device

repair.

3a. A session is not selected within first 2 minutes of turning the device on:

3a1. The Cranio-Electro Stimulation (CES) device turns off.

**USE CASE 2: TURN THE POWER OFF**

Primary Actors: Patient

Scope: Cranio-Electro Stimulation (CES) device

Level: User goal

Stakeholders and Interests:

Patient - wants to use the Cranial Electrical Stimulation device as a relaxation and meditation tool.

Health Care Providers – want to prescribe this device to patients for whom it is safe to use and want to supervise the use of the device by certain patients who have other complications.

Device manufacturing company – wants to manufacture a properly working Cranial Electrical Stimulation for its customers in order for the company to earn revenue and make profit.

Precondition: Device is currently powered on.

Minimal guarantee: Device shuts off after holding the power button.

Success guarantee: Device shuts off within a second after holding the power button.

Main success scenario:

1. The patient holds the power button down.

2. The device shuts down.

Extensions:

1a. A session is currently running while the patient holds the power button down:

1a1. The Cranio-Electro Stimulation (CES) device takes up to a second to power off.

2a. The device does not shut down when the patient presses the power button:

2a1. The patient contacts the service department of the manufacturing company for device

repair.

**USE CASE 3: END A SESSION**

Primary Actors: Patient

Scope: Cranio-Electro Stimulation (CES) device

Level: User goal

Stakeholders and Interests:

Patient - wants to use the Cranial Electrical Stimulation device as a relaxation and meditation tool.

Health Care Providers – want to prescribe this device to patients for whom it is safe to use and want to supervise the use of the device by certain patients who have other complications.

Device manufacturing company – wants to manufacture a properly working Cranial Electrical Stimulation for its customers in order for the company to earn revenue and make profit.

Precondition: Current session is completed naturally (without the patient ending the session early)

Minimal guarantee: The device ends with a Soft Off.

Success guarantee: The device ends with a Soft Off and LED lights of the device scroll from 8 to 1

Main success scenario:

1. The session ends with a Soft OffTM: which is a gradual reduction of the CES stimulus.

2. After the Soft OffTM occurs, the unit will proceed to power off.

3. The CES device graph’s LED lights scroll from 8 to 1 to confirm that a Soft OffTM is in progress.

Extensions:

1a. The session does not end with a Soft Off:

1a2. The patient contacts the service department of the manufacturing company for device

repair.

2a. The unit does not turn off after Soft Off:

2a1.The patient contacts the service department of the manufacturing company for device

repair.

3a. The LED lights of the device do not scroll from 8 to 1:

3a1. The patient contacts the service department of the manufacturing company for device

repair.

**USE CASE 4: DETECT BATTERY LEVEL**

Primary Actor: Patient

Scope: Cranio-Electro Stimulation (CES) device

Level: User goal

Stakeholders and Interests:

Patient - wants to use the Cranial Electrical Stimulation device as a relaxation and meditation tool.

Health Care Providers – want to prescribe this device to patients for whom it is safe to use and want to supervise the use of the device by certain patients who have other complications.

Device manufacturing company – wants to manufacture a properly working Cranial Electrical Stimulation for its customers in order for the company to earn revenue and make profit.

Precondition: There is a battery inserted in the CES device and it has been turned on.

Minimal guarantee: The battery level is displayed on the graph for a few seconds when the device is first turned on.

Success guarantee: The battery level is displayed on the graph for a few seconds when the device is first turned on and it is monitored and the correct level is displayed periodically while the session is running, where the level bars also blink as a warning when the battery is low.

Main success scenario:

1. The battery level is displayed on the graph for a few seconds when the device is first turned on.

2. As the therapy session starts, the battery starts to deplete according to the length of therapy and intensity selected by the patient. The higher the intensity and length of therapy selected, the faster the battery depletes.

3. The battery level is monitored and displayed periodically as the session runs.

4. When the battery gets low, the graph displays two bars and blinks as a warning.

5. When the battery becomes critically low, the graph displays a single blinking bar as a warning. If this happens when the unit is turned on, then the patient replaces the battery immediately. If this occurs during a therapy session, then the session ends early, and the battery indicator continues to blink for a short period of time.

6. If the session ended early due to the battery becoming critically low, then the patient changes the battery before the next session begins.

7. The battery level stays the same after the device turns off and until it is turned back on again.

Extensions:

1a. The battery level is not displayed on the graph for a few seconds when the device is first turned on:

1a1.The patient replaces the battery in the device.

2a. The battery depletes quicker than usual, even for shorter durations of therapy and lower intensities.

2a1. The patient replaces the battery in the device.

2a2. The patient contacts the service department of the manufacturing company for device

repair.

3a. The battery levels are not displayed periodically as the session runs:

3a1. The patient contacts the service department of the manufacturing company for device

repair.

3b. The battery levels are not correctly monitored, and wrong values are displayed:

3b1. The patient contacts the service department of the manufacturing company for device

repair.

4a. The graph does not display two blinking bars when battery is low:

4a1. The patient replaces the battery in the device.

4a2. The patient contacts the service department of the manufacturing company for device

repair.

5a. The graph does not display one blinking bar when battery is critically low:

5a1. The patient replaces the battery in the device.

5a2. The patient contacts the service department of the manufacturing company for device

repair.

5b. The patient does not replace the battery immediately even when the battery is critically low when the unit is turned on:

5b1. The session ends early, and the battery indicator continues to blink for a short period of

time.

6a. The patient does not change the battery before the next session when the current session ended early due to battery being critically low:

6a1. The device does not turn on during the time of the next session.

6a2. The device turns on, the graph displays a single blinking bar and the device immediately

turns off.

7a. The battery does not retain its value when the device is normally switched off:

7a1. The patient replaces the battery in the device.

7a2. The device does not turn on during the time of the next session.

**USE CASE 5: SELECT SESSION GROUP AND TYPE**

Primary Actor: Patient

Scope: Cranio-Electro Stimulation (CES) device

Level: User goal

Stakeholders and Interests:

Patient - wants to use the Cranial Electrical Stimulation device as a relaxation and meditation tool.

Health Care Providers – want to prescribe this device to patients for whom it is safe to use and want to supervise the use of the device by certain patients who have other complications.

Device manufacturing company – wants to manufacture a properly working Cranial Electrical Stimulation for its customers in order for the company to earn revenue and make profit

Precondition: The CES device has sufficient battery and has sessions programmed into it.

Minimal guarantee: The power button can be used to switch between session groups.

Success guarantee: Lit group icon changes as power button is used to switch between groups and a session number is highlighted as INT up or down is pressed.

Main success scenario:

1. The patient presses and releases the power button to switch between the three standard session groups (20 seconds, 45 seconds, user designated).

2. As the patient switches between the standard session groups, the lit group icon changes.

3. The patient then presses the INT up or down buttons to highlight a session number.

4. The selected session’s frequency icons light up to indicate the frequency range and CES pulse type that will be used.

5. Patient presses the select button to start the highlighted session.

6. The session number flashes and begins after five seconds.

Extensions:

1a. The power button does not work to switch between the session groups:

1a1. The patient contacts the service department of the manufacturing company for device

repair.

2a. The lit group icon does not change.

2a1. The patient contacts the service department of the manufacturing company for device

repair.

3a. The INT up or down buttons do not work:

3a1. The patient contacts the service department of the manufacturing company for device

repair.

4a. The selected session’s frequency icon does not light up:

4a1. The patient contacts the service department of the manufacturing company for device

repair.

5a. The select button does not work:

5a1. The patient contacts the service department of the manufacturing company for device

repair.

6a. The session number does not flash:

6a1. The patient contacts the service department of the manufacturing company for device

repair.

6b. The session does not begin after five seconds:

6b1. The patient replaces the battery in the device.

6b2. The patient contacts the service department of the manufacturing company for device

Repair.

**USE CASE 6: PERFORM CONNECTION TEST**

Primary Actor: Patient

Scope: Cranio-Electro Stimulation (CES) device

Level: User goal

Stakeholders and Interests:

Patient - wants to use the Cranial Electrical Stimulation device as a relaxation and meditation tool.

Health Care Providers – want to prescribe this device to patients for whom it is safe to use and want to supervise the use of the device by certain patients who have other complications.

Device manufacturing company – wants to manufacture a properly working Cranial Electrical Stimulation for its customers in order for the company to earn revenue and make profit

Precondition: The patient has selected a session and the session has begun

Minimal guarantee: Device performs a connection test.

Success guarantee: Device performs a connection test, displays the connection status and runs with either an ‘Okay’ or ‘Excellent’ connection.

Main success scenario:

1. Device enters a test mode to check for an electrical connection at the start of the session.

2. The graph displays the current status of the connection (No Connection, Okay Connection, or Excellent Connection).

3. Once a connection has been confirmed, the display will go blank.

4. The device runs with either an ‘Okay’ or ‘Excellent’ connection.

5. The intensity is adjusted. See use case *Adjust Intensity.*

Extensions

2a. The ear clips are disconnected:

2a1. The device pauses the session and waits for the ear clips to be reconnected. No connection (7 and

8 blinking) will display for a few seconds. The graph scrolls up and down indicating that the unit is

returning the voltage to a safe testing level (this may take up to 20 seconds).The L and R lights may

turn on as well.

2b . The device does not display the current connection status:

2b1. The patient contacts the service department of the manufacturing company for device

repair.

4a. “No connection” is displayed (the red 7 or 8 LED lights blink):

4a1. To get a better connection, the patient wets their earlobes with tap water or a tiny amount of conductive gel.

**USE CASE 7: ADJUST INTENSITY**

Primary Actor: Patient

Scope: Cranio-Electro Stimulation (CES) device

Level: Summary

Stakeholders and Interests:

Patient - wants to use the Cranial Electrical Stimulation device as a relaxation and meditation tool.

Health Care Providers – want to prescribe this device to patients for whom it is safe to use and want to supervise the use of the device by certain patients who have other complications.

Device manufacturing company – wants to manufacture a properly working Cranial Electrical Stimulation for its customers in order for the company to earn revenue and make profit

Precondition: There is a good connection.

Minimal guarantee: Intensity is adjusted as the INT up or down is pressed.

Success guarantee: Intensity is adjusted as the INT up or down is pressed with the graph lights 1 to 8 showing an approximate intensity level and when adjusting the intensity, the topmost lit number blinks.

Main success scenario:

1. The patient presses the INT up button to increase the intensity and INT down button to decrease the intensity.

2. As the patient adjusts the intensity, the topmost lit number blinks.

3. The patient sets the intensity so that it can just barely be felt.

4. The graph lights 1 to 8 show an approximate intensity level and the correct number lights up.

Extensions:

1a. The INT up or down button does not work to switch between the intensity levels:

1a1. The patient contacts the service department of the manufacturing company for device

repair.

2a. The topmost lit number does not blink.

2a1. The patient contacts the service department of the manufacturing company for device

repair.

3a. The patient sets the intensity too high:

3a1. This may result in skin irritation for the patient.

4a. The graph lights do not work to show the correct intensity level:

4a1. The patient contacts the service department of the manufacturing company for device

repair.

USE CASE 8: RECORD THERAPY AND ADD TO HISTORY OF TREATMENT

USE CASE DIAGRAM