

## **UC1**

### **Denas sound settings use case**

Actor: Denas user(patient), denas device

Summary: This use case describes all the necessary steps required for the user to change some of the sound settings in the Denas device. The device needs to support features such as buttons and contact.

Pre-condition: The Denas medical device, a patient.

#### Description:

- 1) Patient uses the navigation button.
- 2) User navigates to "settings"
- 3) User presses the "sound" menu
  - 3.1) Three menus show up "General", "Contact", "Buttons".
- 4) User presses the sound option.
- 5) User presses on "general"
  - 5.1) Three sound levels are provided.
    - 5.1.1) User navigates and presses "Mute"
      - 5.1.1.1) System mutes all sound outputs.
    - 5.1.2) User navigates and presses "minimum".
      - 5.1.2.1) System adjusts volume sound accordingly.
    - 5.1.3) User navigates and presses "maximum"
      - 5.1.3.1) System adjusts volume sound accordingly.
  - 5.2) User presses "ok" to confirm adjustments.
    - 5.2.1) If the user presses the back button instead of "ok" normal settings should try be set.
- 6) User presses on "Contact"
  - 6.1) Two sound options are provided.
    - 6.1.1) User selects "on".
      - 6.1.1.1) System turns on "contact with skin" sound on.
    - 6.1.2) User selects "off".
      - 6.1.2.1) System turns off "contact with skin" sound off.
  - 6.2) User presses "ok" to confirm adjustments.
    - 6.2.1) If the user presses the back button instead of "ok" normal settings should try be set.
- 7) User presses on "Buttons"
  - 7.1) Two sound options are provided.
    - 7.1.1) User selects "on".
      - 7.1.1.1) System turns on "button sound" on.
    - 7.1.2) User selects "off".
      - 7.1.2.1) System turns off "button sound" sound off.

7.2) User presses “ok” to confirm adjustments.

7.2.1) If the user presses the back button instead of “ok” normal settings should try be set.

## **UC2**

### **Denas MED(minimum effective dose) use case**

Actor: Denas user(patient), denas device

Summary: This use case describes all the necessary steps required for the user to executed MED.

Pre-condition: The Denas medical device, a patient.

Description:

- 1) User navigates to the bottom option using the down button to where “MED” is located.
- 2) Patient clicks on the MED program menu.
- 3) MED menu shows up.
- 4) Comfort intensity is automatically set to 5 by default.
  - a) User changes the intensity between (5-15)
    - i) If a patient tries to surpass intensity 15, the device will handle it by keeping the intensity to its maximum number as there is no intensity above 15.
    - ii) If a patient tries to decrease the intensity below 5, the device will handle it by keeping the intensity to its minimum number as there is no intensity below 5.
- 5) User puts the electrodes of the device into the target area.
- 6) Device detects skin surface and starts countdown of period of minimum effective dose.
  - a) If the device is removed or does not detect skin, it should cancel the session.
- 7) After the first phase is done(I do not know the duration of a phase. need to do more research) a sound is played to notify the user.
- 8) After the second phase is done, return the user back to the MED menu.

### **UC3**

#### **Use Allergy Treatment**

Actor: Denas user(patient), denas device

Summary: This allows the user to navigate and start to the Allergy treatment

Pre-condition: A working Denas medical device, a patient, an Allergy treatment

Description:

- 1) User navigates to the “programs” menu
- 2) presses the “enter/ok” button
- 3) A second menu shows up with the following programs: “Allergy”, “Pain”, “Severe pain”, “Bloating”, “Neuro-Circulatory Dystonia”, “Gynaecology”, “Hypertension”, “Hypotonia”, “Head”, “Throat”, “Diarrhea” etc...
- 4) User selects “Allergy” and presses the “ok/enter” button
- 5) Software will change to “Allergy” mode.
  - a) Duration of the session is set to 10 minutes.
  - b) Frequency is set to 7710Hz
- 6) Unit displays the appropriate page for “Allergies”
  - a) User selects power level
- 7) User applies the unit(Electrodes) to the skin(presses contact skin button).
- 8) Contact sound is played to alert the user.
- 9) Device provides a timer starting at 10m decreasing every seconds.
  - a) If the timer decreases to 0, play a sound and show completion on the screen
  - b) If the user removes the device while the session is taking place. Pause the timer.
- 10) When the session is done play a sound and show completion and a pop-up message will show up.
- 11) If a user wants to exit treatment. Menu shows up with three options
  - a) User selects “return to treatment”
    - i) Device returns back to the treatment.
  - b) User selects “Save”,
    - i) Device saves the treatment to the recordings.
  - c) User selects “discard”,
    - i) device returns back to the main menu.

## **UC4**

### **Use Throat Treatment**

Actor: Denas user(patient), denas device

Summary: This allows the user to navigate and start to the throat treatment

Pre-condition: A working Denas medical device, a patient, an throat treatment

Description:

- 1) User navigates to the “programs” menu
- 2) presses the “enter/ok” button
- 3) A second menu shows up with the following programs. User navigates to the “Throat” program.
- 4) Power level menu shows up.
  - a) User chooses power level.
- 5) Throat page automatically shows up.
- 6) Frequency will automatically be set to 60Hz
- 7) User presses the “contact skin” button.
- 8) Timer will start from 10 ending to 00:00
  - a) If the user presses the “remove skin contact” button then the timer will pause.
  - b) If the user presses the “back” button, then the unit will return to the menu.
- 9) When the timer ends the unit will show completion and a pop-up message will show up.
- 10) If a user wants to exit treatment. Menu shows up with three options
  - a) User selects “return to treatment”
    - i) Device returns back to the treatment.
  - b) User selects “Save”,
    - i) Device saves the treatment to the recordings.
  - c) User selects “discard”,
    - i) device returns back to the main menu.

## **UC5**

### **Use Head Treatment**

Actor: Denas user(patient), denas device

Summary: This allows the user to navigate and start to the head treatment

Pre-condition: A working Denas medical device, a patient, an head treatment

Description:

- 1) User navigates to the “programs” menu
- 2) presses the “enter/ok” button
- 3) A second menu shows up with the following programs. User navigates to the “Head” program.
- 4) Power level menu shows up.
  - a) User chooses power level.
- 5) Throat page automatically shows up.
- 6) Frequency will automatically be set to 60Hz
- 7) User presses the “contact skin” button.
- 8) Timer will start from 05:00 ending to 00:00
  - a) If the user presses the “remove skin contact” button then the timer will pause.
  - b) If the user presses the “back” button, then the unit will return to the menu.
- 9) When the timer ends the unit will show completion and a pop-up message will show up.
- 10) If a user wants to exit treatment. Menu shows up with three options
  - a) User selects “return to treatment”
    - i) Device returns back to the treatment.
  - b) User selects “Save”,
    - i) Device saves the treatment to the recordings.
  - c) User selects “discard”,
    - i) device returns back to the main menu.

## **UC6**

### **Use Hypotonia Treatment**

Actor: Denas user(patient), denas device

Summary: This allows the user to navigate and start to the hypotonia treatment

Pre-condition: A working Denas medical device, a patient, an hypotonia treatment

Description:

- 11) User navigates to the “programs” menu
- 12) presses the “enter/ok” button
- 13) A second menu shows up with the following programs. User navigates to the “Throat” program.
- 14) Power level menu shows up.
  - a) User chooses power level.
- 15) Throat page automatically shows up.
- 16) Frequency will automatically be set to 77AMHz
- 17) User presses the “contact skin” button.
- 18) Timer will start from 5 ending to 00:00
  - a) If the user presses the “remove skin contact” button then the timer will pause.
  - b) If the user presses the “back” button, then the unit will return to the menu.
- 19) When the timer ends the unit will show completion and a pop-up message will show up.
- 20) If a user wants to exit treatment. Menu shows up with three options
  - a) User selects “return to treatment”
    - i) Device returns back to the treatment.
  - b) User selects “Save”,
    - i) Device saves the treatment to the recordings.
  - c) User selects “discard”,
    - i) device returns back to the main menu.

## **UC7**

### **Denas brightness use case**

Actor: Denas user(patient), denas device

Summary: This allows the user to change opacity brightness for the denas device

Pre-condition: A working Denas medical device, a patient, the ability to change brightness

#### Description:

- 1) User navigates the “settings” menu, and presses the “ok/enter” button
- 2) User navigates the “Brightness” menu using the “button” or “up” buttons, and presses “ok/enter” the button to confirm his choice.
- 3) Unit contains 5 levels of brightness. By default 3 is already selected.
  - a) Patient uses the “up” button to increase the brightness to 4 or 5. User then presses the “ok” button to confirm the choice.
    - i) If the user presses back before the “ok” button, then his previous settings are unchanged.
    - ii) If the user tries to surpass brightness level 5 then the device will keep it to 5.
  - b) Patients use the “down” button to change the brightness.
    - i) If the user presses back before the “ok” button, then his previous settings are unchanged.
    - ii) If the user tries to decrease the brightness level below 1 then the device will keep it at 1.
- 4) The brightness opacity will be adjusted accordingly.

## **UC8**

### **Denas time setup use case**

Actor: Denas user(patient), denas device

Summary: This allows the user to change the time on his device

Pre-condition: A working Denas medical device, a patient

Description:

- 1) User navigates to the “settings” menu using the “up” and “down” button.
- 2) User navigates to the “time” menu using the “up” and “down” button.
- 3) User adjusts the hour using the “Up” and “down”.
- 4) User adjusts the minutes by navigating to the right using the button. “Up” and “down” buttons are also used to change the hour.
- 5) User presses “ok” to confirm the settings
  - a) If the user presses back instead, the previous time should still be set and unaltered.
- 6) The unit adjusts the time accordingly.

## **UC9**

### **Frequency Selection Use Case**

Actor: Denas user(patient), denas device

Summary: This allows the user to select a specific frequency for a treatment.

Pre-condition: A working Denas medical device, a patient, device needs to be able to handle the a specific amount of frequency

Description:

- 1) User navigates to the “Frequency” Menu
- 2) Unit displays list of available frequencies for delivery
  - a) List contains: “1.0 - 9. 9Hz”, “10Hz”, “20 Hz”, “60 Hz”, “77 Hz”, “140Hz”. “200Hz”, and two special modes “77 10” and “77AM”.
- 3) User selects desired frequency
- 4) Unit prepares electrode to deliver selected charge
- 5) User selects power level from 1 to 100 using the “up” and “down” arrows
- 6) User applies Unit to affected area
- 7) Unit displays a timer of how long frequency has been delivered



- 8) Unit delivers the frequency continuously until treatment is over or user discards treatment

## **UC10**

### **Screening Use Case**

Actor: Denas user(patient), denas device

Summary: This allows the user to navigate and start a screening

Pre-condition: A working Denas medical device, a patient

Description:

- 1) User navigates to the "Screening" Menu
- 2) User applies unit to area they wish to "screen" and presses "OK"
- 3) Unit delivers small pulses for 5 seconds, reading tissue galvanic resistance
- 4) Unit displays number reading from 1 to 100, higher meaning higher tissue resistance
- 5) User can relocate the device and press "OK" again to take another screening
- 6) User can press "back" at any time to end screening mode

## **UC11**

### **Start Device**

Actor: Denas user(patient), denas device

Summary: This allows the turn on the device

Pre-condition: A working Denas medical device, a patient, a button to turn it on

Description:

1. Press and hold ON/OFF button.
2. The user is presented with a menu list of items and is ready to begin using the device.
3. If user presses ON/OFF while device is already ON the device will close and reset everything except for the recordings.

## **UC12**

### **Turn Off Device**

Actor: Denas user(patient), denas device

Summary: This allows the user to turn off the device

Pre-condition: A working Denas medical device, a patient, a button

Description:

- 
1. Press and hold OFF/ON button
  2. Device turns off display, and menu options disappear

## **UC13**

### **Change Power (add system changes?)**

Actor: Denas user(patient), denas device

Summary: This allows the user to select a specific power level for a treatment.

Pre-condition: A working Denas medical device, a patient, a up and down button, the hardware ability to change power level

Description:

1. A display of the current power level is shown.
2. User presses Up and down to change power level whenever a user selection a treatment or a frequency.
3. The current power level is then either increased or decreased, depending on the users choice, up until the user is satisfied with current power level.

## **UC14**

### **Frequency 10Hz use case**

Actor: Denas user(patient), denas device

Summary: This allows the user to select a specific frequency.

Pre-condition: A working Denas medical device, a patient, the hardware device needs to be able to handle the a specific amount of frequency selected

Description:

- 1) User navigates to the "Frequency" menu
- 2) presses the "enter/ok" button
- 3) A second menu shows up with the four choices of frequencies.
- 4) User navigates to the "10Hz" program.
- 5) A third menu shows up for the power selection. User selects any power.
- 6) A timer starting from 05:00 will show up
- 6) Frequency will automatically be set to 10Hz
- 7) User presses the "contact skin" button.
- 7) Timer will start from 05:00 ending at 00:00
  - d) If the user presses the "remove skin contact" button then the timer will pause.
  - e) If the user presses the "back" button, then the unit will return to the menu.
- 8) When the timer ends the device will show as DONE on the screen and a pop-up message will show up.
- 9) All settings and therapy will be added to the history of treatments if the user presses the "Save recording" button

## **UC15**

### **Frequency 20Hz use case**

Actor: Denas user(patient), denas device

Summary: This allows the user to select a specific frequency.

Pre-condition: A working Denas medical device, a patient, the hardware device needs to be able to handle the a specific amount of frequency selected

- 7) User navigates to the "Frequency" menu
- 8) presses the "enter/ok" button

- 9) A second menu shows up with the four choices of frequencies.
- 10) User navigates to the "20Hz" program.
- 11) A third menu shows up for the power selection. User selects any power.
- 12) A timer starting from 05:00 will show up
- 6) Frequency will automatically be set to 10Hz
- 7) User presses the "contact skin" button.
- 7) Timer will start from 05:00 ending at 00:00
  - f) If the user presses the "remove skin contact" button then the timer will pause.
  - g) If the user presses the "back" button, then the unit will return to the menu.
- 8) When the timer ends the device will show as DONE on the screen and a pop-up message will show up.
- 9) All settings and therapy will be added to the history of treatments if the user presses the "Save recording" button

## **UC16**

### **Frequency 60Hz use case**

Actor: Denas user(patient), denas device

Summary: This allows the user to select a specific frequency.

Pre-condition: A working Denas medical device, a patient, the hardware device needs to be able to handle the a specific amount of frequency selected

- 13) User navigates to the "Frequency" menu
- 14) presses the "enter/ok" button
- 15) A second menu shows up with the four choices of frequencies.
- 16) User navigates to the "10Hz" program.
- 17) A third menu shows up for the power selection. User selects any power.
- 18) A timer starting from 01:00 will show up
- 6) Frequency will automatically be set to 10Hz
- 7) User presses the "contact skin" button.
- 7) Timer will start from 01:00 ending at 00:00
  - h) If the user presses the "remove skin contact" button then the timer will pause.
  - i) If the user presses the "back" button, then the unit will return to the menu.
- 8) When the timer ends the device will show as DONE on the screen and a pop-up message will show up.
- 9) All settings and therapy will be added to the history of treatments if the user presses the "Save recording" button

## **UC17**

### **Frequency 77Hz use case**

Actor: Denas user(patient), denas device

Summary: This allows the user to select a specific frequency.

Pre-condition: A working Denas medical device, a patient, the hardware device needs to be able to handle the a specific amount of frequency selected

- 19) User navigates to the "Frequency" menu
- 20) presses the "enter/ok" button
- 21) A second menu shows up with the four choices of frequencies.
- 22) User navigates to the "77Hz" program.
- 23) A third menu shows up for the power selection. User selects any power.
- 24) A timer starting from 05:00 will show up
- 6) Frequency will automatically be set to 10Hz
- 7) User presses the "contact skin" button.
- 7) Timer will start from 05:00 ending at 00:00
  - j) If the user presses the "remove skin contact" button then the timer will pause.
  - k) If the user presses the "back" button, then the unit will return to the menu.
- 8) When the timer ends the device will show as DONE on the screen and a pop-up message will show up.
- 9) All settings and therapy will be added to the history of treatments if the user presses the "Save recording" button

## **UC18**

### **Record Session**

Actor: Denas user(patient), denas device

Summary: Ability to save a treatment information.

Pre-condition: A working Denas medical device, a patient, memory to store a treatment information.

1. If user presses the "back" button or "Menu" button three options will be shown.
2. User presses on "Save recording"
3. The device stores a record of the session with data including: time and date, power level, program/therapy, and frequency, and duration(how long the treatment lasted)

## **UC19**

### **Skins button use case**

Actor: Denas user(patient), denas device

Summary: Simulate contact skin for the treatments.

Pre-condition: A working Denas medical device, a patient, Some sort of sensor to detect the skin.

During any treatment, if the user presses the “skin” button, the timer for the treatment will automatically start.

- a) If the user “presses the off skin” button during a treatment, the treatment will automatically pause until the device has been reapplied to the skin.

## **UC20**

### **View Recorded Session**

Actor: Denas user(patient), denas device

Summary: Ability to view the recordings saved.

Pre-condition: A working Denas medical device, a patient, a saved treatment or frequency

- 1) In the main menu, user presses on the “History” menu option using the unit buttons
- 2) User presses on “View”
- 3) A table will show up with a list of the most recent added treatments from up to down.

## **UC21**

### **View Clear recording**

Actor: Denas user(patient), denas device

Summary: Ability to clear the recordings saved.

Pre-condition: A working Denas medical device, a patient

- 1) In the main menu, user presses on the “History” menu option using the unit buttons

- 2) User presses on "Clear"
- 3) Pop-up message will show up stating that all recording histories have been cleared.

## **UC22**

### **Battery Dies**

Actor: Denas user(patient), denas device

Summary: Device needs to turn off when there is no more battery.

Pre-condition: A working Denas medical device, a patient, battery that is not drained.

- 1) User presses the contact skin button during a treatment.
- 2) If the battery reaches 0 during skin contact, the battery dies and the device turns off.  
Pop-up message will show up stating that the device is out of battery
- 3) The user should then charge the device to use again.  
(Depending on the power level, the battery life will decrease accordingly(yet to have created a formula for it, apparently we create our own formula)).



Temporary Denas Use Case Diagram

## UC23

### Menu/back button use case

- 1) User presses the menu button
  - a) Device clears all menus and returns the user to the main menu indicating "program", "frequency", "History".
- 2) User presses the back button
  - a) Device checks the prevMenu variable to find out where the user was before.
  - b) Returns user to that menu.
    - i) prevMenu is then updated.



## **UC24**

### **Switching menu use case**

- 1) User uses the up and down button to change menu.
  - a) User selects "programs"
    - i) Provide all programs for user
  - b) User selects frequency
    - i) Provide all frequency for user
  - c) User selects history
    - i) Provide view and clear menu
  - d) User presses on view
    - i) See view recording use case
  - e) User presses on clear
    - i) Popup message appears. All recordings gets deleted.