Use cases for Final Project (DRAFT)

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Use Case 1: Power On

Primary actor: User
Secondary actor: AED
Scope: Usage of the AED
Level: User
Precondition: The AED is in its initial state and not on yet.
Minimal guarantee: The AED will not operate in an unsafe mode.
Success guarantee: The AED will correctly check if it can operate safely and display a green light.
Main success scenario:

1 User presses the power on button.

2 AED begins self tests.

3 AED performs battery check: verifies that the battery is attached and has sufficient capacity.

4 AED performs electrode connection check: verifies that the defibrillation electrodes are properly pre-connected to the device.

5 AED performs ECG circuitry check: verifies that ECG signal acquisition and processing electronics are functional.

6 AED performs discharge check: Verifies that the device's defibrillator electronics are functional and can charge and discharge at 2 joules.

7 AED performs software check: Verifies proper function of the Fully Automatic AED Plus microprocessor electronics and the integrity of its software. (probably not going to include this)

8 AED performs CPR sensor check: Verifies that CPR monitoring and compression depth detection are functional.

9 AED performs display and audio check: Verifies that voice prompts and displays are functional.

10 AED displays green status indicator light and voice prompts "AUTOMATIC DEFIBRILLATOR. UNIT OK."

Extensions:
If any check fails, it will abort the checks and turn the status indicator light red and the voice prompt will say "UNIT FAILED.".
3a. On failure, the voice prompt will say "CHANGE BATTERIES.".
4a. On failure, the voice prompt will say "PLUG IN CABLE.".

Use Case 1.1: Preliminary Checks

Primary actor: User
Secondary actor: AED, Patient
Scope: Usage of the AED
Level: User
Precondition: The AED is operating within safe parameters.
Minimal guarantee: The AED will continue operation.
Success guarantee: The AED will continue operation while help is on the way
Main success scenario:

1 AED flashes indicator light and prompts "CHECK RESPONSIVENESS.".

2 User shouts to the patient "ARE YOU OK???" and shakes the patient.

3 AED flashes indicator light and prompts "Call for help.".

4 User gets help.

Use Case 2: Electrode Placement (Includes Use Case 1)

Primary actor: User
Secondary actor: AED, Patient
Scope: Usage of the AED
Level: User
Precondition: The AED is operating within safe parameters.
Minimal guarantee: The AED will not proceed in resuscitation until pads are on in the correct configuration.
Success guarantee: The AED has its pads attached correctly to the patient's bare chest, and is the correct size of the patient.
Main success scenario:

1 AED will say "ADULT PADS.", indicating the adult pads are installed.

2 AED will flash indicator light and say "ATTACH DEFIB PADS TO PATIENT'S BARE CHEST. ENSURE PROPER AGE PADS ARE INSTALLED."

3 User exposes patient's bare chest.

4 User attaches the pads according to the instructions on the pads.

Extensions:
1a. Alternatively, it may say "PEDIATRIC PADS.", indicating that child pads are installed.
4a. If the patient's age range does not match with the pads installed, then the user should attach the correct ones before proceeding.
4b. If the pads are not attached correctly, the AED will prompt "CHECK ELECTRODE

PADS." and does not proceed.
4c. If the electrodes are not attached correctly, the AED will prompt " PLUG IN CABLE" and does not proceed.

Use Case 3: Analysis (Includes Use Case 2)

Primary actor: User
Secondary actor: AED, Patient
Scope: Usage of the AED
Level: User
Precondition: The AED is operating within safe parameters and electrodes are correctly placed.
Minimal guarantee: The AED will classify the signal as some kind of arrhythmia.
Success guarantee: The AED will correctly classify the signal's arrhythmia.
Main success scenario:

1 AED will flash indicator light and say "DON'T TOUCH PATIENT. ANALYZING."

2 AED will analyse the ECG signal from the pads, classifying it as a shockable rhythm.

Extensions:
2a. If rhythm is non-shockable, AED will say "NO SHOCK ADVISED.", and the system proceeds to Use Case 5: Compressions

Use Case 4: Shocks (Includes Use Case 3)

Primary actor: User
Secondary actor: AED, Patient
Scope: Usage of the AED
Level: User
Precondition: The AED has classified the patient's arrhythmia as shockable.
Minimal guarantee: The AED will not shock without input, and gives the necessary precautions.
Success guarantee: The AED, with the user's authorization, will deliver the necessary shock to the patient.
Main success scenario:

1 AED will flash the shock button's indicator light.

2 User will press the shock button.

3 AED will trigger Use Case 3.

4 User will warn others to stand clear, and to not touch the patient.

5 AED will say ”SHOCK WILL BE DELIVERED IN THREE, TWO, ONE...”.

6 AED will beep its shock tone and say ”SHOCK DELIVERED.”.

Extensions:

Use Case 5: Compressions (Includes Use Case 3 and 4)

Primary actor: User
Secondary actor: AED, Patient
Scope: Usage of the AED
Level: User
Precondition: The AED has either advised no shock or delivered a shock.
Minimal guarantee: The AED gives the necessary instructions to the user.
Success guarantee: The User will carry out the AED's instructions and perform sufficient CPR.
Main success scenario:

1 AED will flash indicator light and say ”START CPR.”.

2 The user will perform 2 breaths for every 30 compressions.

3 AED will say ”STOP CPR”.

4 AED will proceed to Use Case 3: Analysis

Extensions:
2a. The user will pay attention to the LCD screen while performing CPR to ensure good quality compressions.