ID	Req Source	Use Case	Fulfilled By	Test	Description
1	The application interface contains power button, indicators, display, battery indicator, combo Box for defining patient health, check boxes for determining whether electrode is connected and spin box for compression depth	N/A	mainwindow.ui	Run the simulator in Qt to observe the ui.	Using QT's built-in user interface framework, the physical AED plus system was replicated.
2	Initialize Patient, AED, Electrode	N/A	mainwindow, AED, Electrode	Start a treatment and observe AED display change as time passes and the ECG wave of patient.	AED stores the battery level state and has an electrode. Patient's health stated can be defined by the testers using drop box.
3	Power the AED on	Use AED Plus (UC1)	mainwindow, AED	When the power button is pressed in the shutdown state, the AED will display "POWERING UP AED..."	After the AED powers up, it will guide rescue personnel through the rescue process according to the instructions.
4	AED Plus does the self-test to ensure unit OK	Use AED Plus (UC1)	AED, mainwindow, Electrode	Set the battery level to be low or disconnect the electrode, then observe if AED Plus works. Set the battery level to be high and connect the electrode and the self-check indicator will change from 'not ok' to 'ok'.	AED needs to ensure it has enough battery and electrode is connected to AED before starting working.
5	AED Plus gives an audible "CHECK FOR RESPONSIVENESS" prompt	Use AED Plus (UC1)	mainwindow	Start a treatment and observe AED display as the first indicator turns red.	This step teaches the rescuer to remain calm and check the patient's response.
6	AED Plus gives audible and visual "CALL FOR HELP" prompt	Use AED Plus (UC1)	mainwindow	Start a treatment and observe AED display as the second indicator turns red.	This step teaches the rescuer to call for emergency assistance.
7	The rescuer attaches Electrode pads to patient's bare chest	Analyze heart rhythm (UC2)	mainwindow	Start a treatment, if electrode pads are not connected or disconnected during the treatment, AED Plus will not work.	The AED needs to ensure that the electrode is attached to the patient's chest so that it can test the heart rate and provide subsequent shock and CPR feedback.
8	AED display the ECG waveform of the patient.	Analyze heart rhythm (UC2)	Mainwindow, AED, Electrode	Start a treatment, tester chooses and confirm the patient's health state. Observe the AED display when fourth indicator turns red.	The AED first reads the patient's health status and then displays the ECG wave.
9	AED determines whether a shockable rhythm is	Analyze heart rhythm (UC2)	Mainwindow, AED	Start a treatment, tester chooses and confirm the patient's health state.	The AED will instruct the patient accordingly based on their health

	present and give advice accordingly.			Observe the AED's instruction when fourth indicator turns red.	condition, in the case of ventricular tachycardia (V_TACH), ventricular fibrillation (V_FIB), they are shock rhythms that require to deliver shocks and perform cardiopulmonary resuscitation (CPR). In the case of pulseless electrical activity (PEA) or asystole, a shock is not advised, and the user is instructed to perform cardiopulmonary resuscitation (CPR).
10	rescuer presses a button on the AED to deliver the shock	Deliver shock (UC3)	AED, mainwindow	The rescuer presses the deliver shock button after seeing "detected. No shock advised." Prompt. Observe a decrease in the battery level.	Rescuers deliver an electrical shock to the heart to restore a normal rhythm.
11	Do compressions for 30 times and 2 breaths.	Deliver CPR on an Adult Patient (UC4), Deliver CPR on a Child Patient (UC5), Deliver CPR on an Infant Patient (UC6)	Patient, AED, mainwindow	When the AED advises that CPR can be initiated, the compression process can be observed in the console output.	Give 30 compressions followed by 2 breaths, known as "30:2". Aim for 5 sets of 30:2 in about 2 minutes. To save time, we change from doing 30 compressions to 5 compressions in the simulation.
12	Read and analyze CPR compression depth, and AED give real-time CPR depth feedback	Deliver CPR on an Adult Patient (UC4), Deliver CPR on a Child Patient (UC5), Deliver CPR on an Infant Patient (UC6)	Patient, AED, mainwindow	For each compression, the tester can manually enter the depth of compression to observe the corresponding prompt that AED would give.	AED will determine whether the current compression depth is appropriate according to the patient's age, if too high, it will prompt Push slower, if too low, it will prompt Push harder, if just right, it will prompt Good CPR.
13	Install the battery	Install or Replace Batteries (UC7)	AED, mainwindow	When pressing the Charge Battery button, the battery level to become to 100 again. Battery level can be observed from the battery progress bar. Testers can also change battery level by manually click the increase or decrease buttons.	Maintaining battery content provides support for resuscitation of patients.
14	Consume battery during analyzing and delivering shock	N/A	AED	Each time an AED performs analysis or delivers a shock, it consumes a corresponding amount of battery power, which	N/A

				decreases gradually during the simulation process.	
15	Power the AED off	Use AED Plus (UC1)	AED, mainwindow	After pressing the power button, the AED will clear the display and turn off all indicator lights.	N/A
16	Disconnect electrode from AED during the treatment	N/A	AED, mainwindow, Electrode	If testers disconnect electrode from AED during the treatment, AED will shut down and UI would reset to its initial state.	Check if the electrode remains connected to the AED throughout the entire treatment process.
17	Disconnect electrode from patient's chest during the treatment	N/A	AED, mainwindow, Electrode, Patient	If testers disconnect electrode from patient's chest during the treatment, AED will go back to ask rescuer to attach pads.	Once the electrode is attached to the patient's chest, it is necessary to continuously check whether it remains connected during the final two steps (i.e., analyzing for heart rate, delivering shock, and providing CPR instructions).
18	When battery is critically low, AED will refuse to analyze; when battery is low, AED will power off	N/A	AED, mainwindow	Tester can manually set the power level to be low and observe AED display.	N/A