Since the AED is a device. So we choose to use state machine pattern. Which the device has different states and functions can access to this state parameter and find themselves is in a good place or not. Especially for buttons. Each button has a check for status before they are actually functional. If the state of device is not equal to their build-in requirements. Which means they should not be pressed. Button will give no responses. Also, functions have this feature too, the state of device changes will the workflow goes.

For the whole code structure. We used singleton pattern. Inspired by Wei-da Tseng. Which is simply one to one inheritance. The main window class have entity for its child: device and device have entity of its child: patient. It is easier to modify and retrieve data from child classes by this pattern and solves the problems of getting private parameter from patient. Now it only needs one getter function in device instead of lots of signals.