Engineering an Overdose Detection Device

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“Over 105,000 persons in the U.S. died from drug-involved overdose in 2023,” (Ahmad 2024). By creating a device that can detect an overdose and neutralize the effects, hundreds of lives could be saved. The device uses a pulse oximeter module, a thermometer, and a microcontroller to function. All components of the device are permanently soldered into a prototype PCB board using 20-gauge solid-core wire. An LED begins flashing when the device detects abnormal vital signs. The results of this project show that the device functions exactly as intended. It measures the biometrics of the user and warns the user if the vitals are unhealthy. All tests conducted with this device were used only on the student researcher. A control test was done using a medical-grade pulse oximeter. The device was tested several times on varying parts of the body to determine accuracy. The Finger was the most accurate, followed by the forearm and then the shoulder. The successful development of a device that detects overdoses could save hundreds of lives. One of the main reasons there are so many overdose deaths is that the window to use an antidote is 30-90 minutes (New York State Department of Health, 2023). This device could become the first resort after an overdose.

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