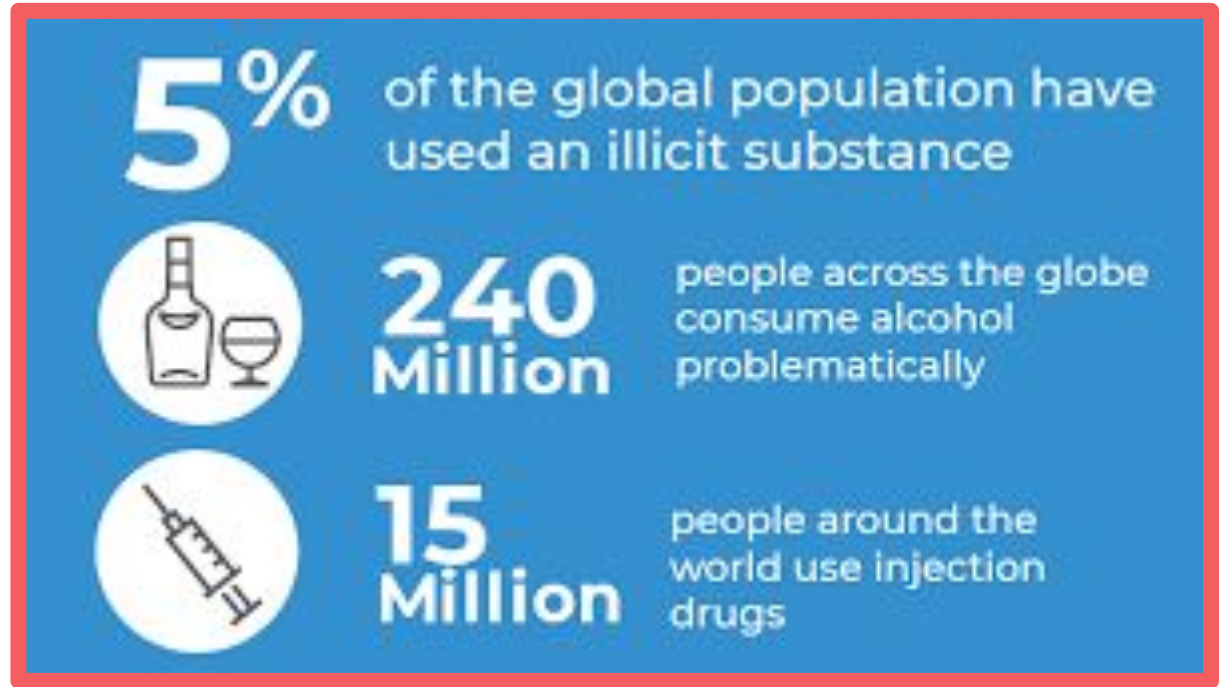


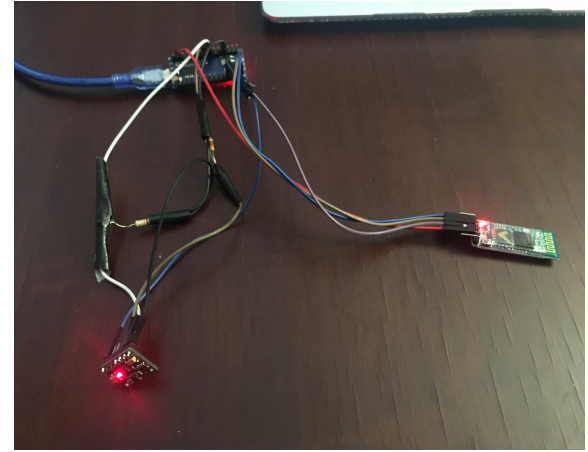
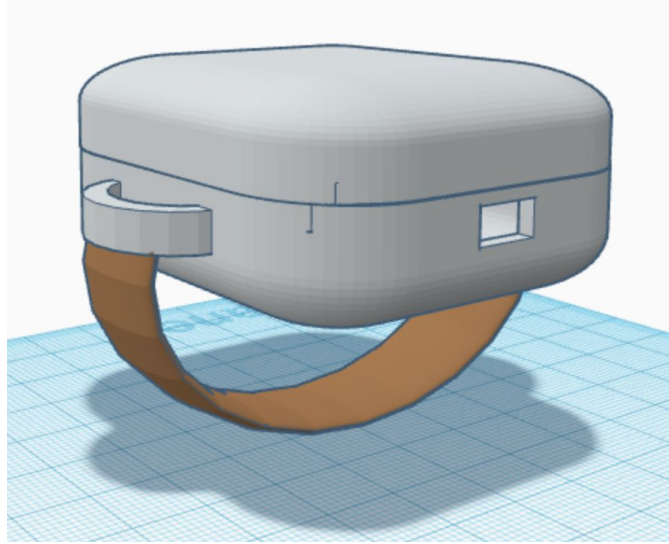
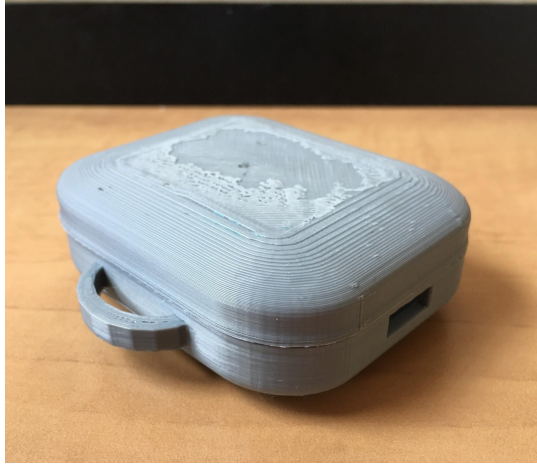
**An Opioid Overdose Detection Device**

# THE OVERDOSE CRISIS

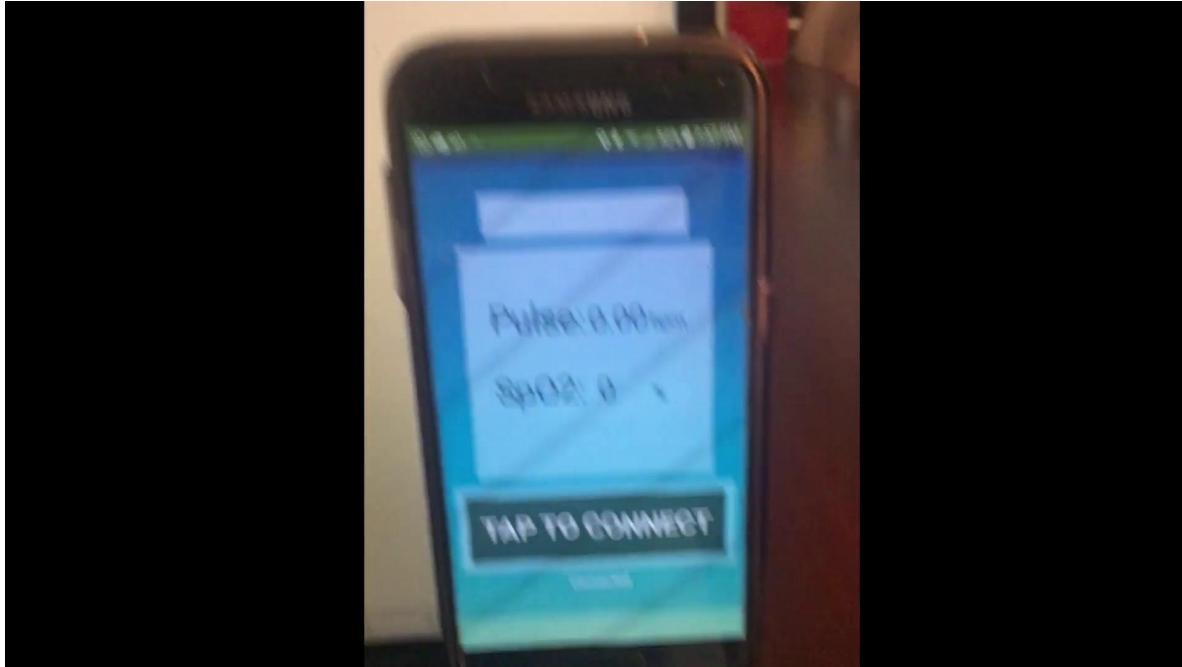
*"We were tasked to create a discrete, non-invasive device that can detect an opioid overdose and send a GPS location to an emergency contact as soon as it is detected."*



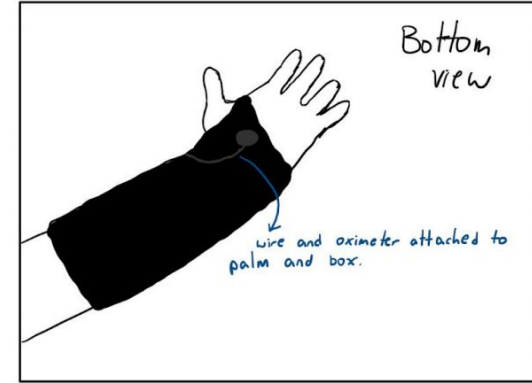
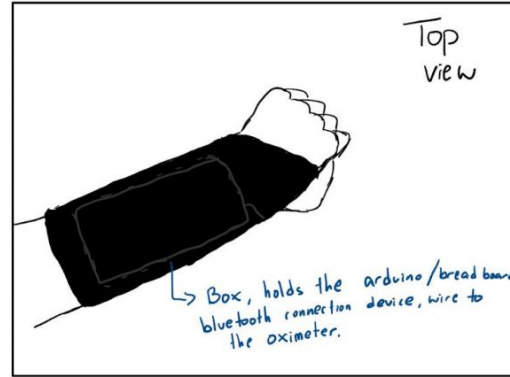
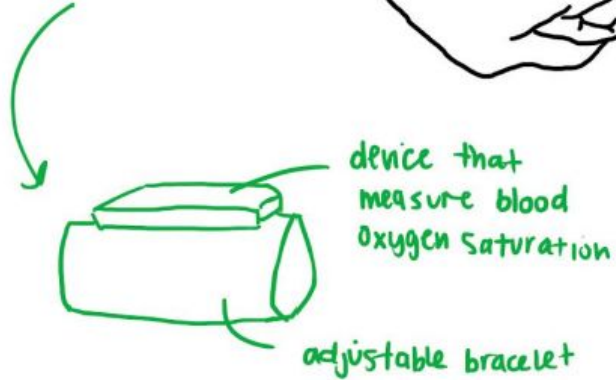
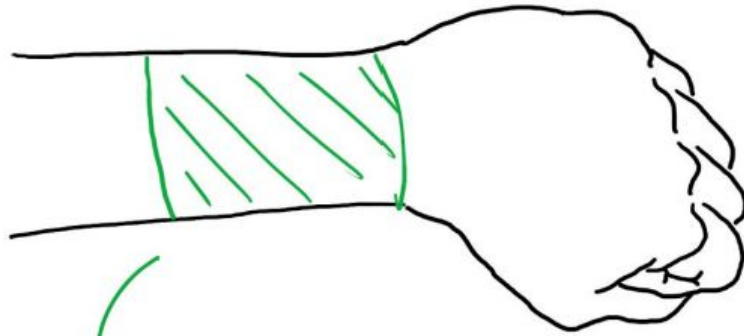
# Final Device



# The LifeLine (Video)



# Device Frame



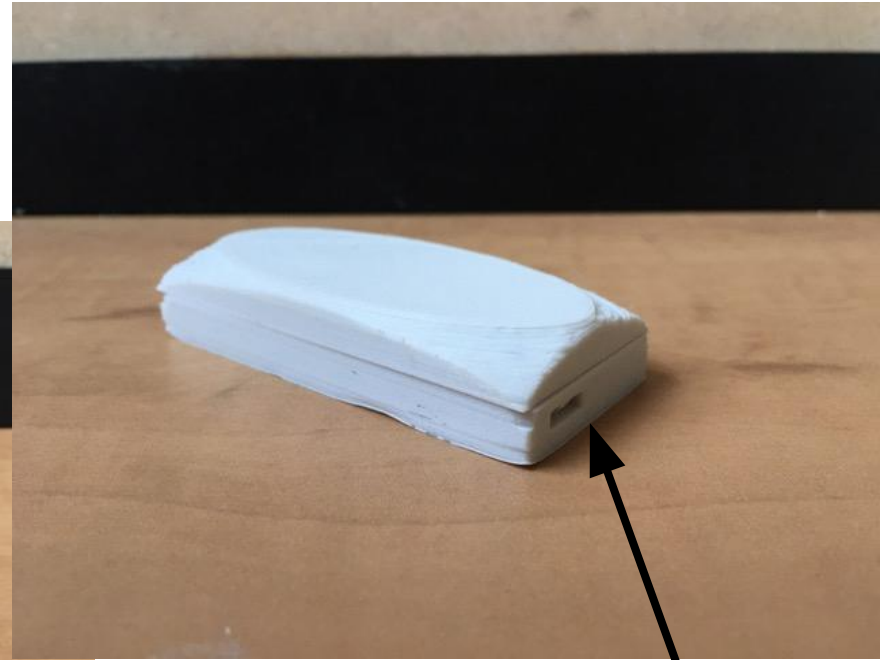
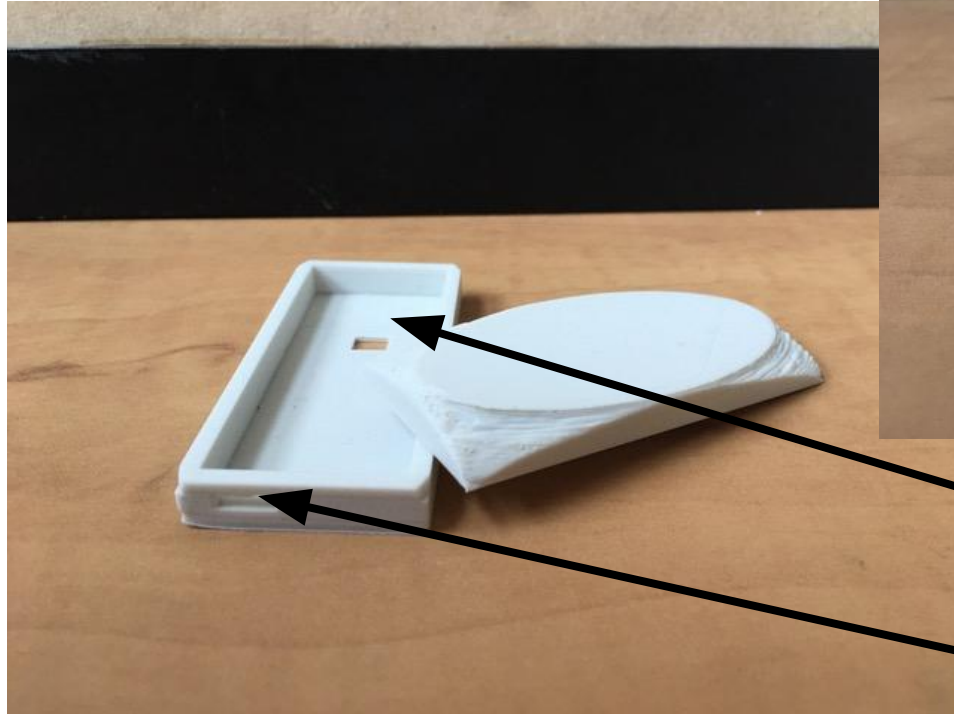
# Initial Design

# Next Step

Shown to  
you during  
our last  
presentation



# HOLES



Oximeter Sensor Hole

Charging Hole





-PCB Board  
-Battery

To Fit:

-All Components  
-Wires

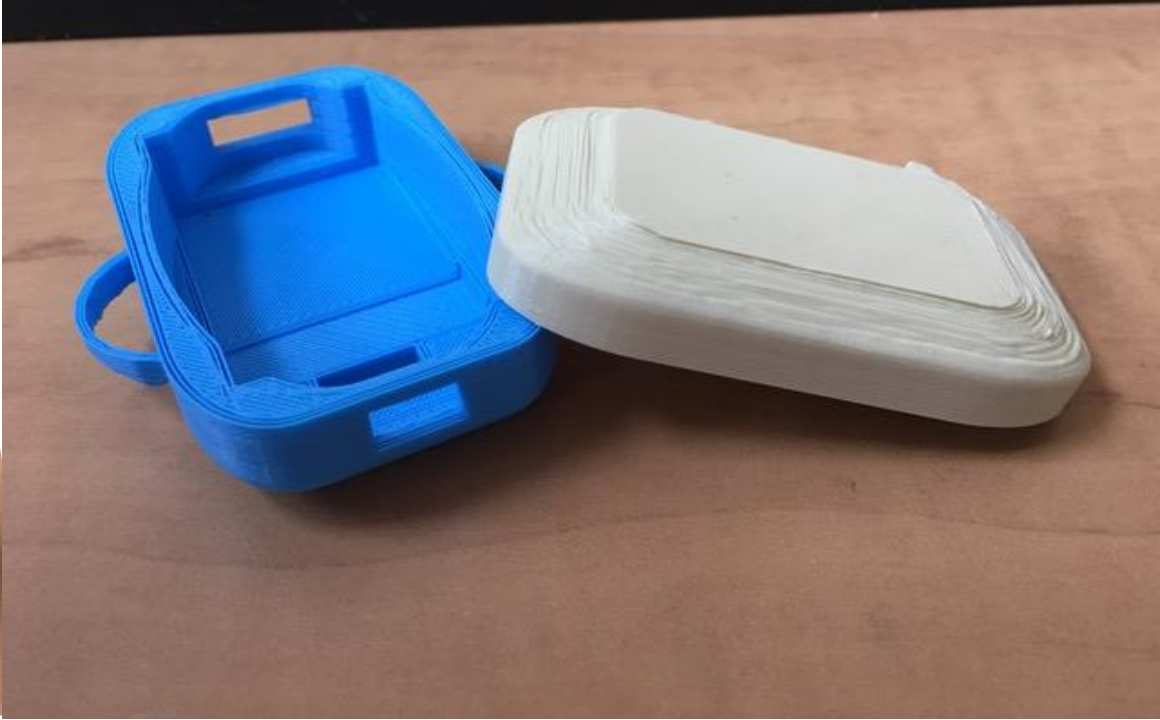
**SIZE and  
GROOVES**





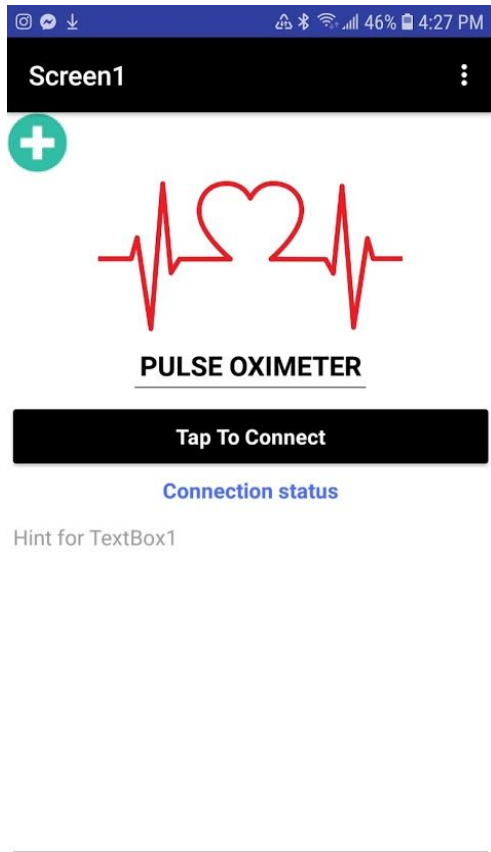
# AESTHETICS

1. Comfort
2. Won't get caught
3. Aesthetic (Sleek)



# FINAL DEVICE FRAME

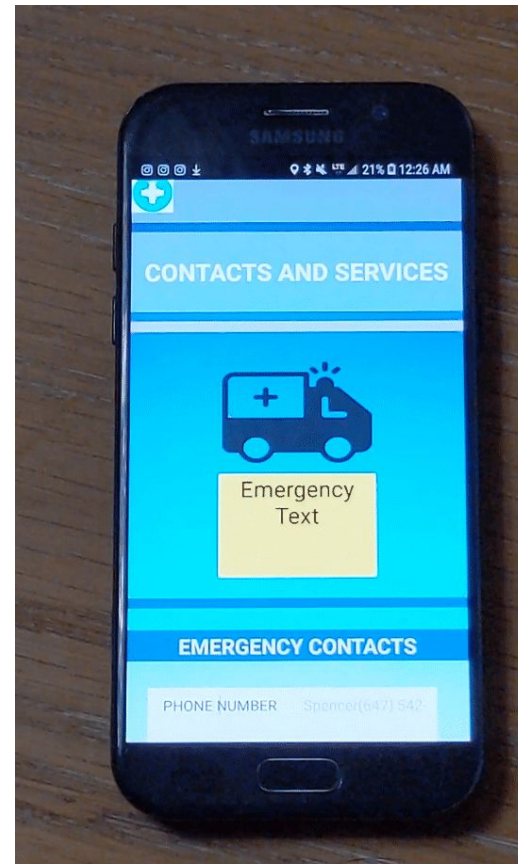




# LifeLine Application

## Final goals

- Softer on eyes
- Easier to navigate with new features
- More visually appealing

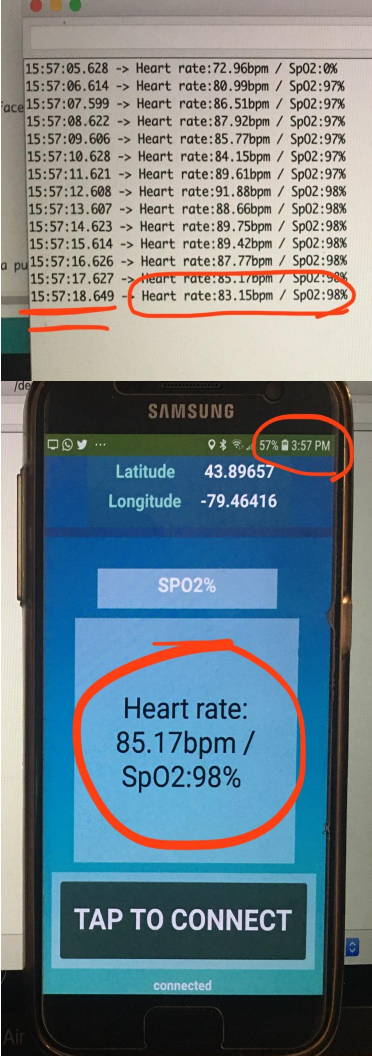
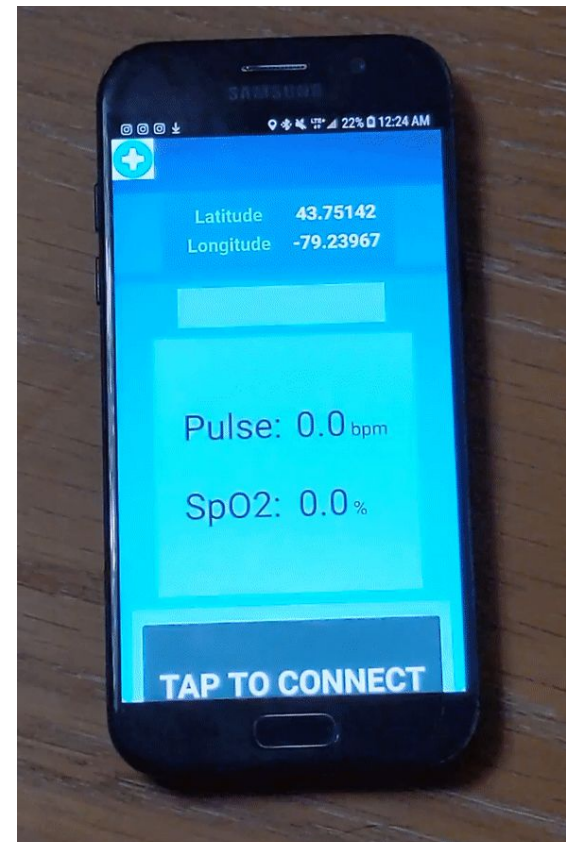


# Features

## Oximeter and Bluetooth

- Simple connection to bluetooth
- Shows if user successfully connected to bluetooth

- Fast, responsive readings from oximeter
- Large text for visibility



15:57:05.628 -> Heart rate:72.96bpm / SpO2:0%  
15:57:06.614 -> Heart rate:80.99bpm / SpO2:97%  
15:57:07.599 -> Heart rate:86.51bpm / SpO2:97%  
15:57:08.622 -> Heart rate:87.92bpm / SpO2:97%  
15:57:09.606 -> Heart rate:85.77bpm / SpO2:97%  
15:57:10.628 -> Heart rate:84.15bpm / SpO2:97%  
15:57:11.621 -> Heart rate:89.61bpm / SpO2:97%  
15:57:12.608 -> Heart rate:91.88bpm / SpO2:98%  
15:57:13.607 -> Heart rate:88.66bpm / SpO2:98%  
15:57:14.623 -> Heart rate:89.75bpm / SpO2:98%  
15:57:15.614 -> Heart rate:89.42bpm / SpO2:98%  
15:57:16.626 -> Heart rate:87.77bpm / SpO2:98%  
15:57:17.627 -> Heart rate:85.17bpm / SpO2:98%  
15:57:18.649 -> Heart rate:83.15bpm / SpO2:98%



# Features

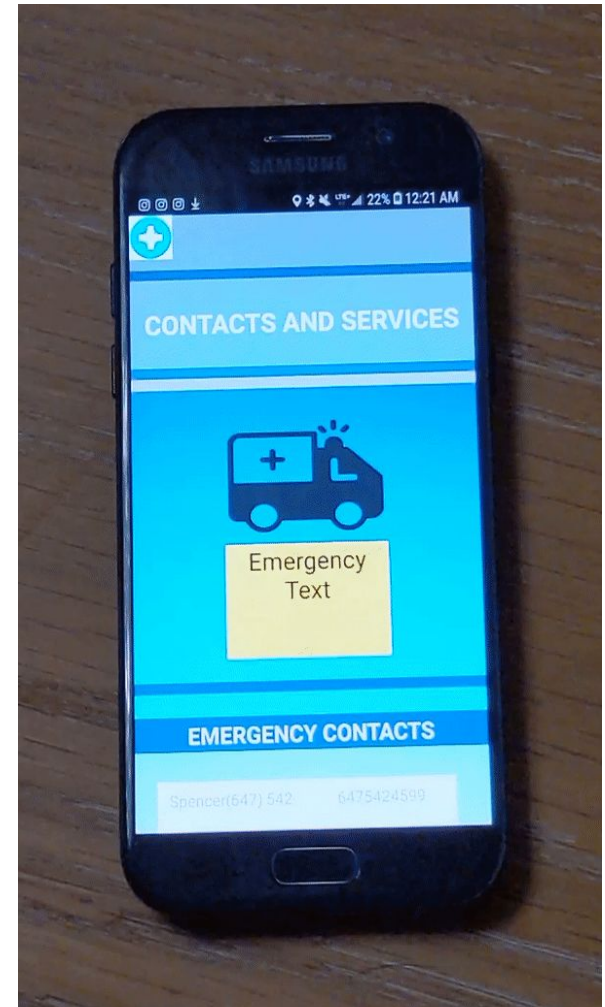
## Emergency text, alarm + failsafe

- Save up to 2 contacts
- App will send automatic text once SPO2 level < 90 unless user completes failsafe

App issues prompt asking user if they are overdosing

Prompt timer runs out, Alarm goes off, emergency text sends to saved contacts

User completes the prompt Alarm stops, terminates text



# DILEMMAS & DECISIONS MADE



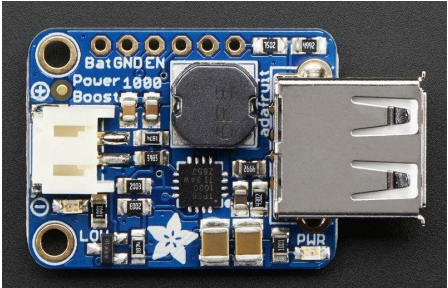
# BATTERY LIFE VS SIZE

Current Requirements: 70 mA

Battery Options	#1	#2	#3
Weight	13.6g	4.54g	8.3g
Size	5.1 x 6.5 x 0.8 cm	4 x 3 x 0.38 cm	2.95 x 5 x 0.85 cm
Current (mA)	2500	450	1000
Battery Life (hours)	35	6	14
Total:	12	12	13

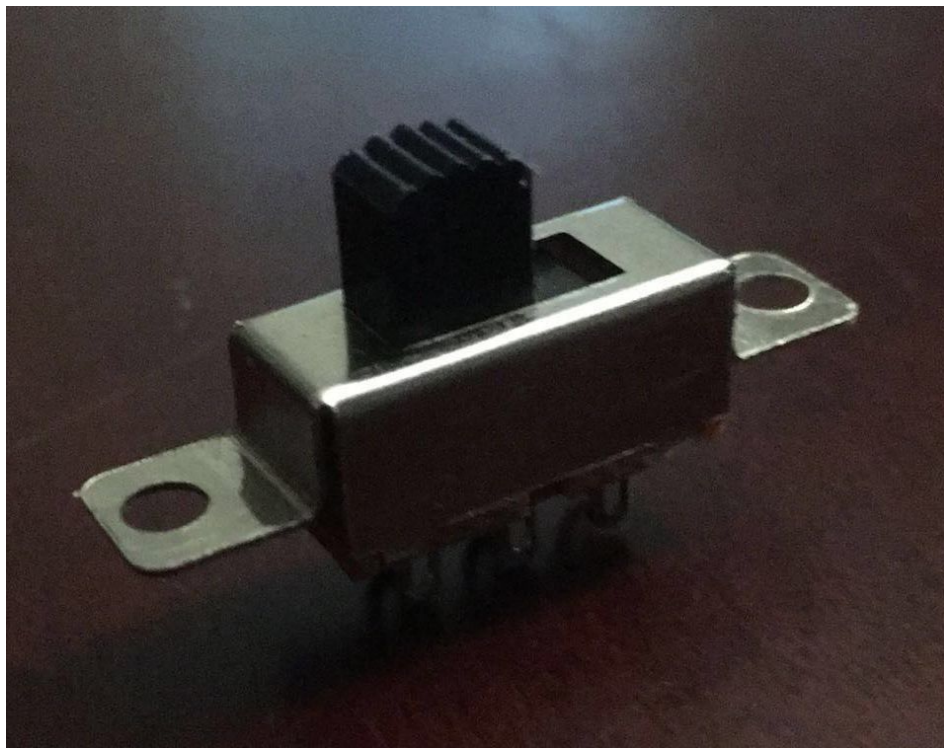
Green	3pt
Yellow	2pt
Red	1pt

Battery Life	5pt
Size	2pt
Weight	1pt



# OPTIMIZING BATTERY CONSUMPTION

ON/OFF Switch



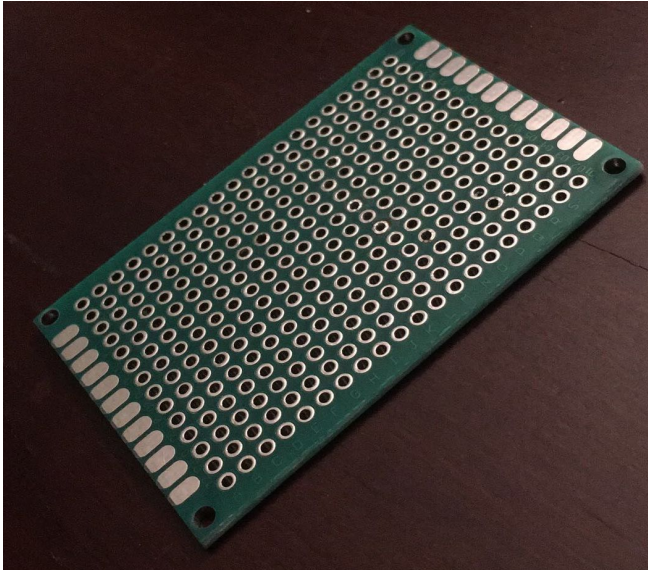
Reading intervals

Time(s)	Max30100 (pO2)	Standard Oximeter (pO2)
0	98	98
5	97	98
10	98	97
15	96	97
20	95	96
25	98	96
30	97	98
35	97	98
40	96	98
45	96	97
50	95	98
55	95	98
60	95	98
65	97	94
70	97	95
75	96	95
80	94	97
85	94	97
90	92	96
95	91	94
100	94	94
105	94	92
110	93	91
115	92	89
120	85	87
125	88	86
130	84	84
135	85	85
140	82	85
145	81	82
150	81	80

Comparing Pulse Oximeter VS MAX chip readings

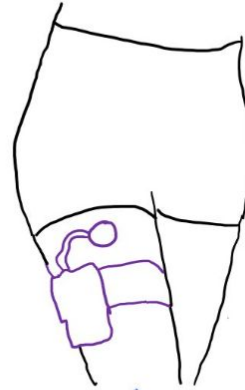
# OTHER

## USE OF PCB BOARD



## NALOXONE AUTO-INJECTION

### Design A:



↳ leg band holds pouch with naloxone  
↳ When needed, pumps naloxone up cathode tube & into leg through injected needle

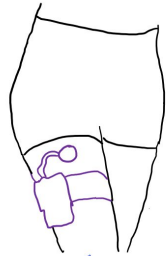
Figure 2.5.2-A. Leg Needle Injection Design.

- Needle is injected in leg and is connected to cathode tube
- The leg pouch holds the naloxone and main device system

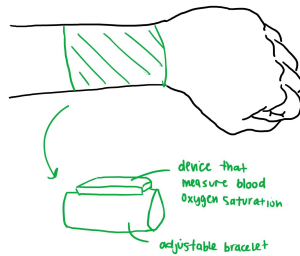
# Lessons Learned & Improvements

# Challenges

Gradual development of ideas and knowledge.

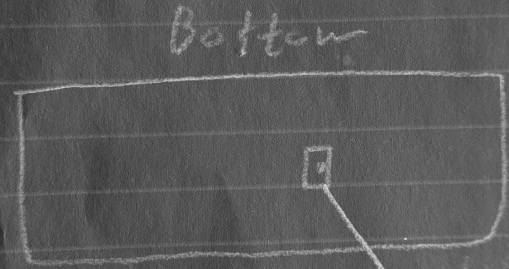
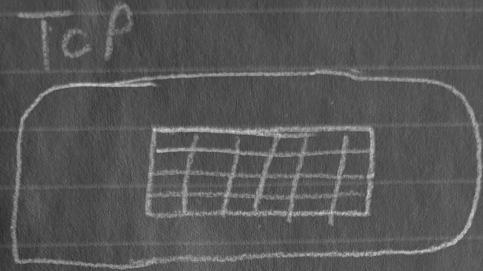


↳ leg band holds pouch with naloxone  
↳ when needed, pumps naloxone up cathode tube & into leg through injected needle

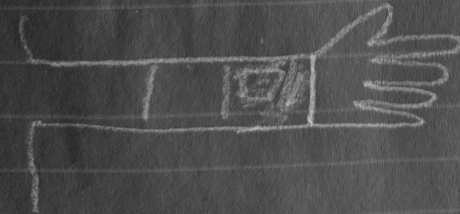


2.1.2-B  
2.1.3-C  
2.1.4-A,C  
2.1.5-B,C

} Combination



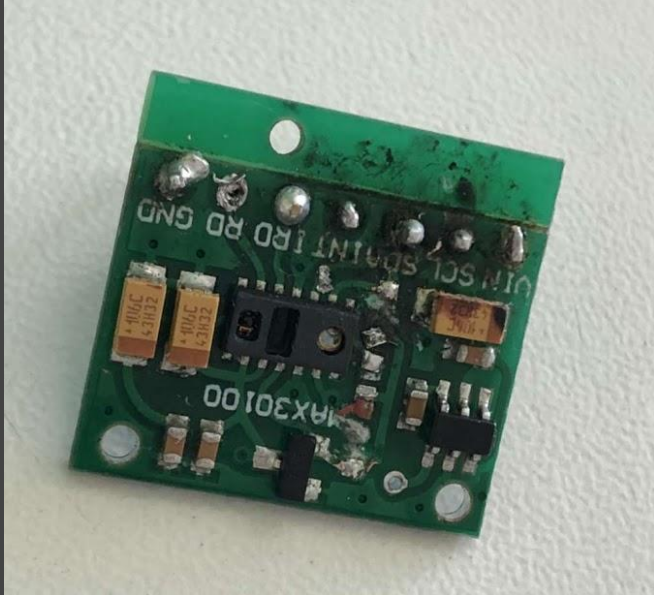
pulse oximeter



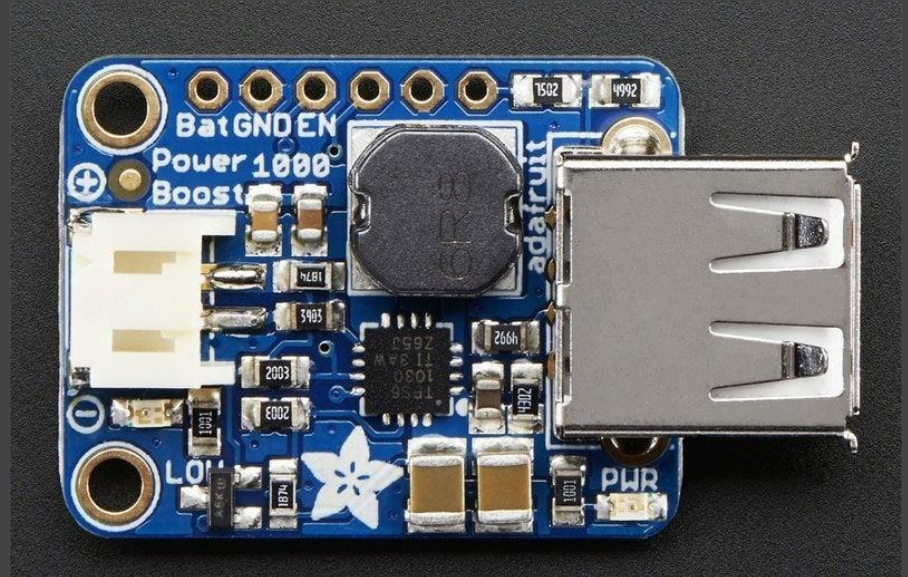


# Lessons Learned

MAX30100(Oximeter)



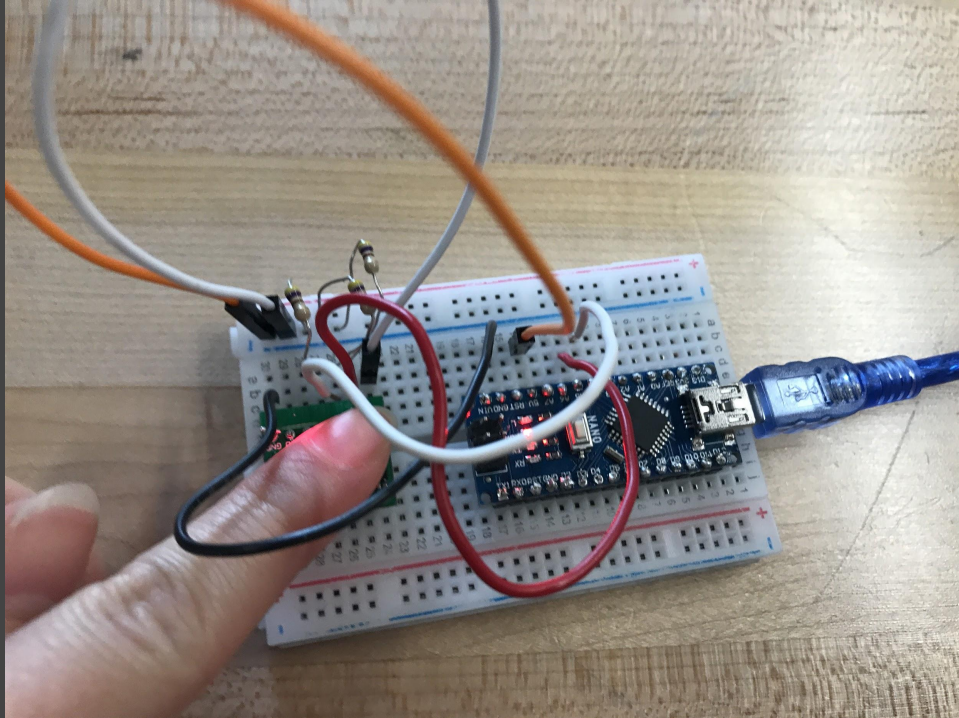
Powerboost 1000C  
(Charger/Micro Booster)





# Prototyping

SpO2 placement and accuracy test.



***Conclusion***