



## Team

Akash Randhawa  
Emily Lukas  
Gurman Toor

Sean Garvey  
Stella Wang

## Client



Calvin Kuo  
Mahsa Khalili  
Saud Lingawi

## 1. Motivation

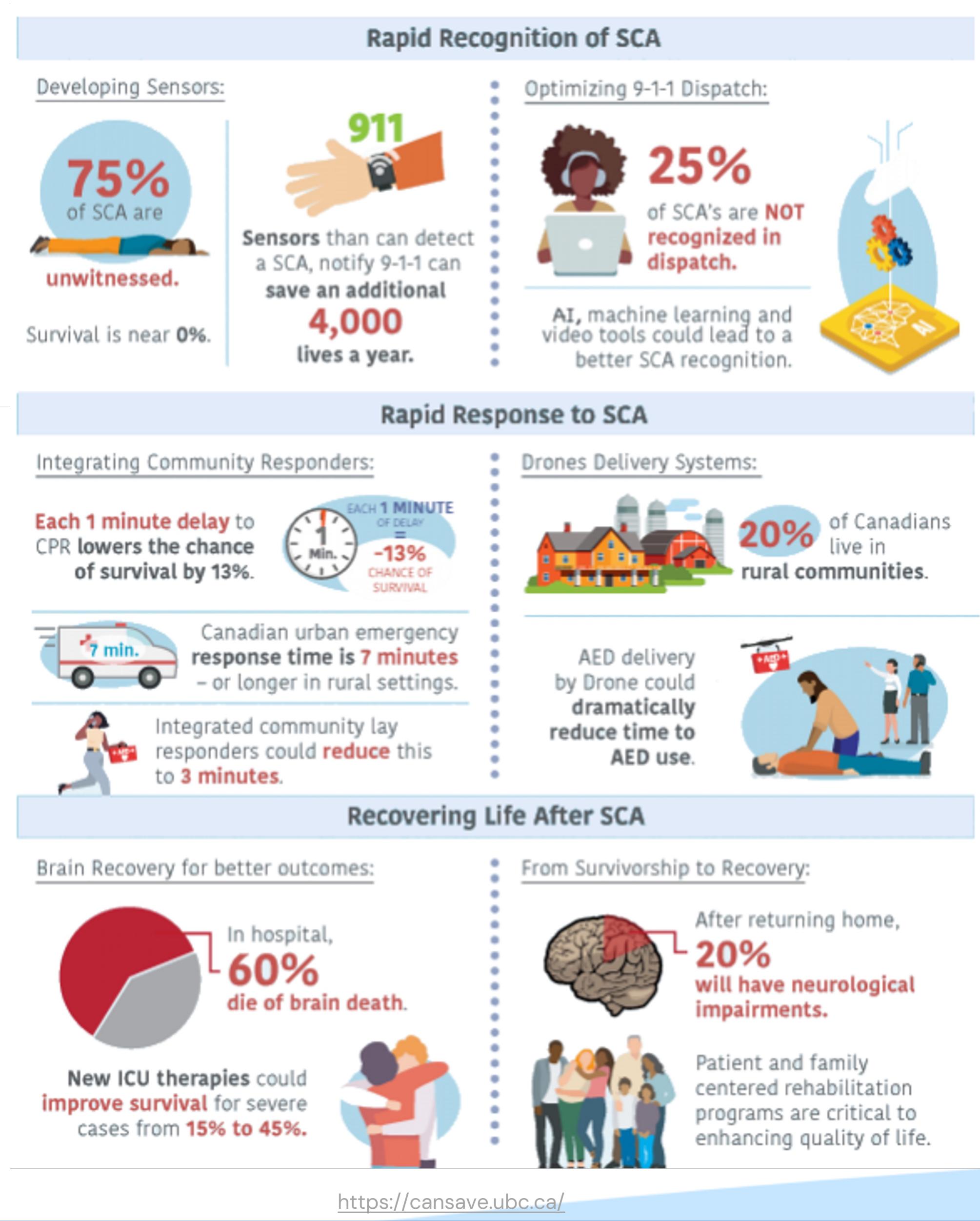
### Vision

Achieve the best survival rates from Sudden Cardiac Arrests (SCA) in the world

### Mission

Meet this challenge through defined, proactive and transformative research strategies and meaningful engagement of partners and stakeholders across the resuscitation landscape

## 2. Background



## 3. Problem

The current cardiac arrest survival rate is **less than 5%**

### Objective

- Develop a mobile app that:
- Uses any wearable data available to detect a cardiac arrest
- Phones emergency services
- Supports Bluetooth connections

### Audience

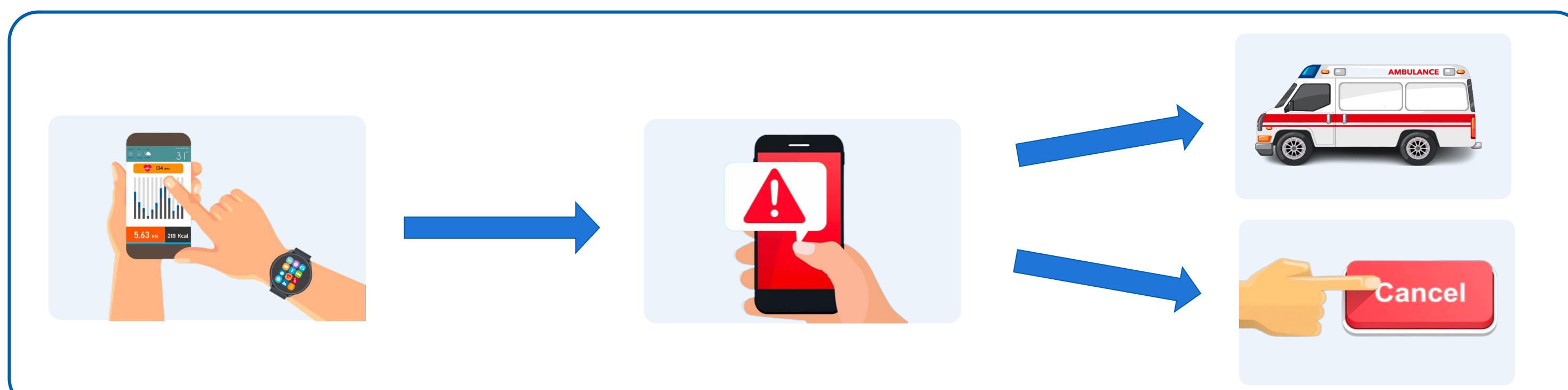
- CodeBlue is for the general public, especially:
- Individuals at risk of heart disease
- Elderly population
- High performing athletes

### Impact

- Improves the survival rate for unwitnessed sudden cardiac arrests (SCA)
- Can be integrated with wearable device prototypes developed by CanSAVE
- Provides a way to collect more patient data (ie. heart rate trends, cardiac arrest patterns, etc) to further cardiac arrest research
- **Save an additional 4000 Canadian lives/year**

## 4. Solution

Modular Phone App for Cardiac Arrest Detection



### Implementation

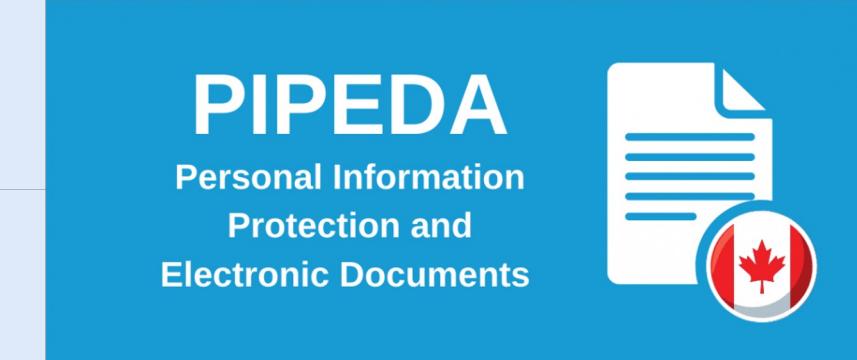


### Requirements

- Stream cardiovascular data from a CSV file
- Support wireless communication
- Uses cardiovascular input to monitor for cardiac arrest
- Emergency Procedure that calls 911
- Fast decision time for detection
- Fast and accurate streaming
- Easy to use and navigate

### Challenges

- Lack of cardiac arrest data
- Privacy constraints with sensitive data
  - PIPEDA, PIPA



## 5. Features

### Bluetooth Connection

- Detects nearby devices
- Establishes connection with wearable devices
- Allows customizing sensor information (name, sensor location)

### Detection Algorithm

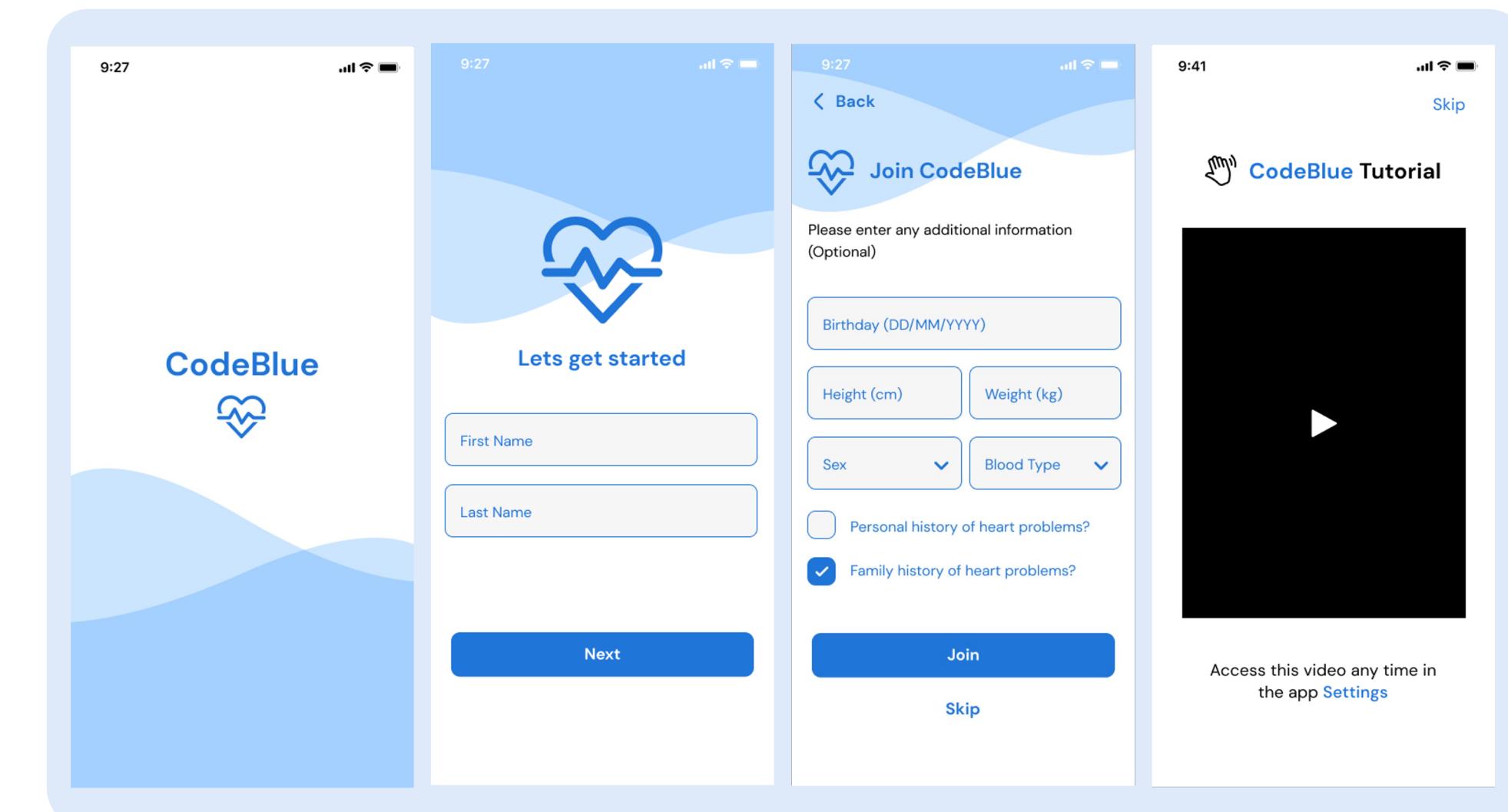
- Receives past 10-seconds of data + historical analyses
- Performs Fourier Transform
- Weighted score depending on sensor location
- Indicates if heart rate is in a safe range (30 < HR < 180)

### Emergency Procedure

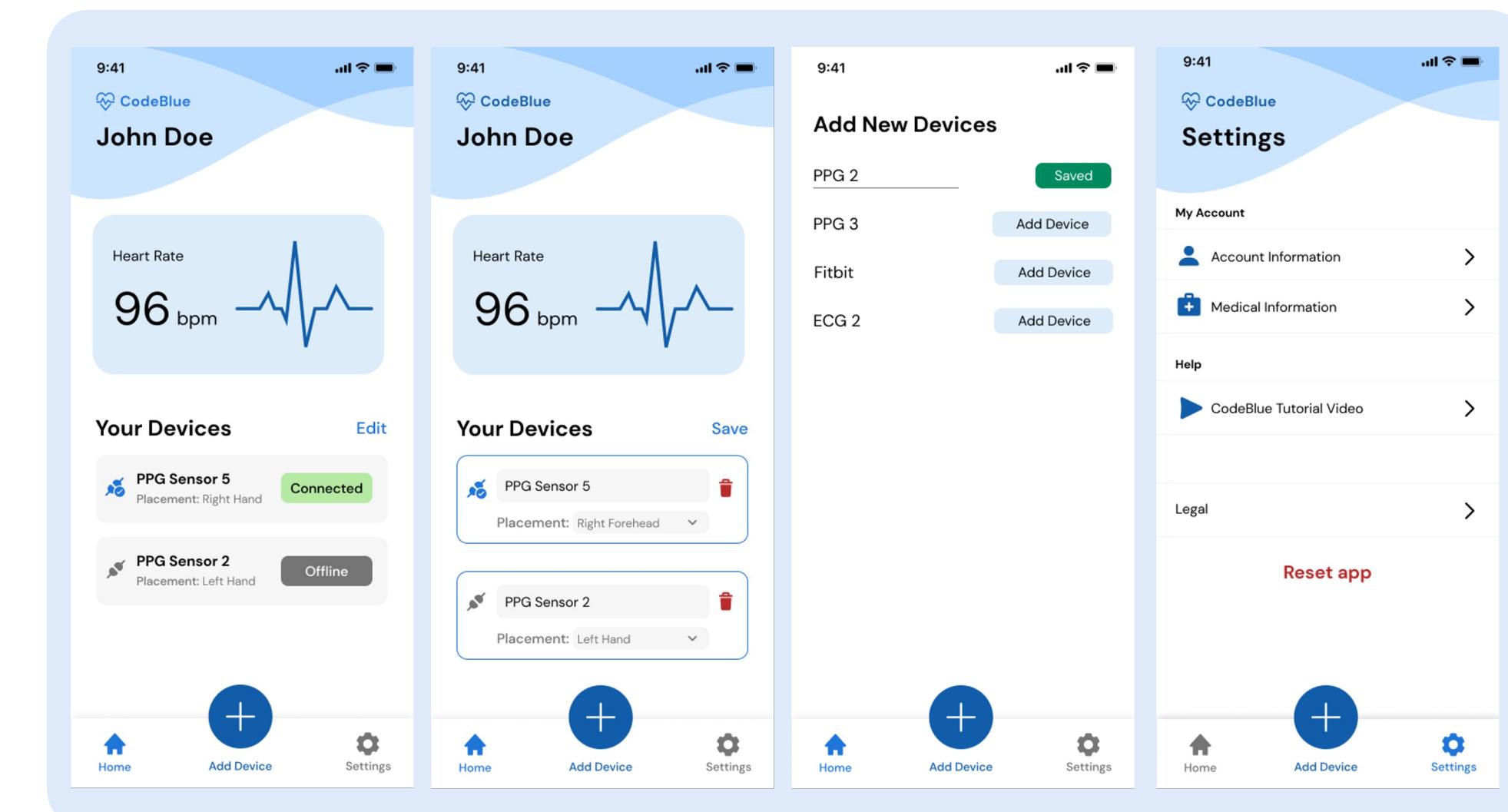
- Triggers a 9-1-1 call if there is no action from the user 30 seconds from detection
- Allows the user to expedite the call if they need help
- Allows the user to cancel if a false alarm was detected
- Prompts an EMS response

## 6. Design

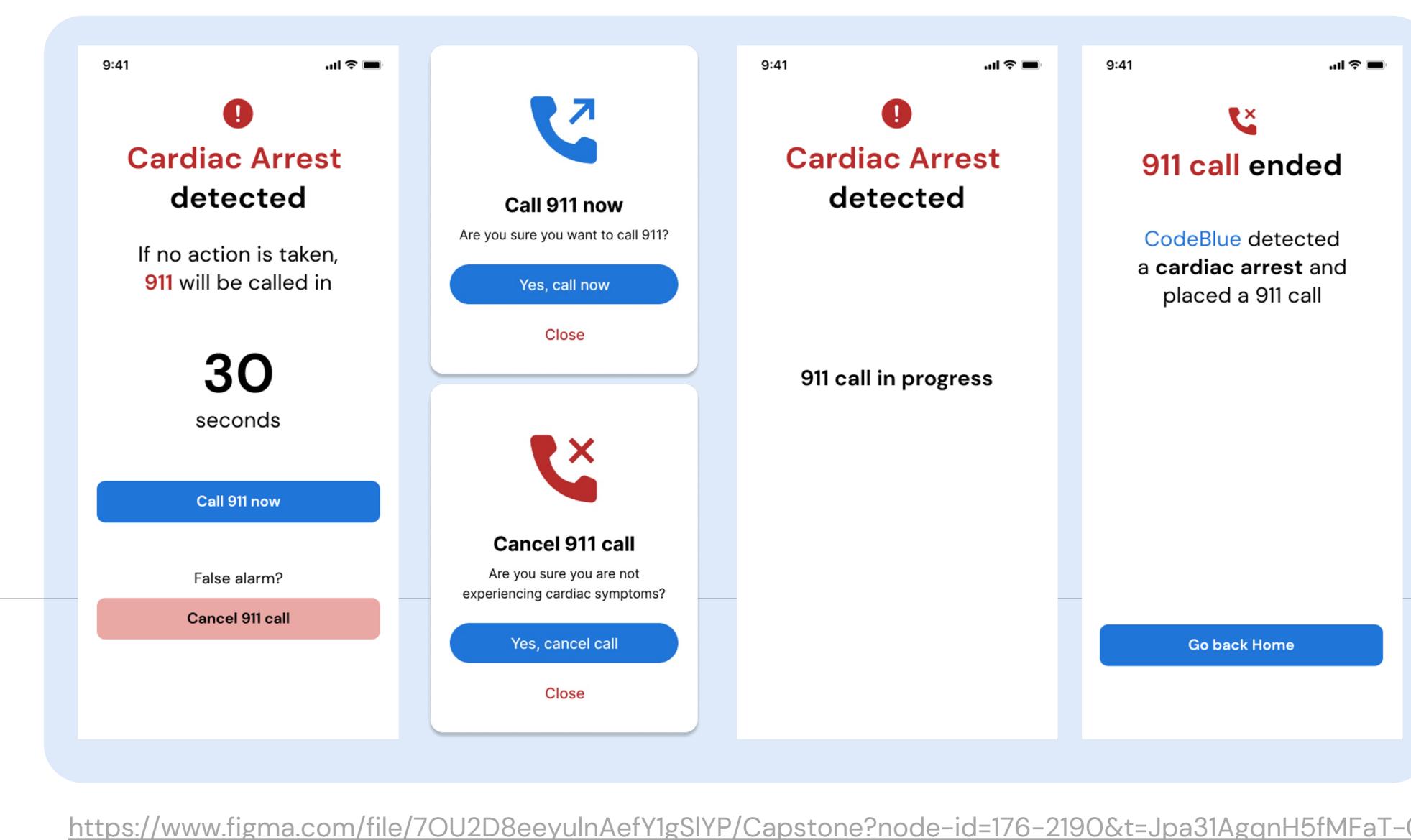
### Onboarding



### Home Screen & Setup



### Emergency Protocol



## 7. Future Work

1. Integration with hardware sensors
2. Improvements to algorithm (Predictions, factor in health conditions)
3. More vigorous testing to avoid false positive EMS calls
4. Confidence rating for algorithm decisions
5. Save additional user information (eg. Emergency contact information)
6. Improper sensor connection (Low battery, improper wear, alert warning)
7. Text to speech for EMS phone call