

### Company

**Name:** CardioSounds LLC  
 Ann Arbor, MI

**Founded:** 2018

**Stage:** Seed

**Device:** Pre-FDA

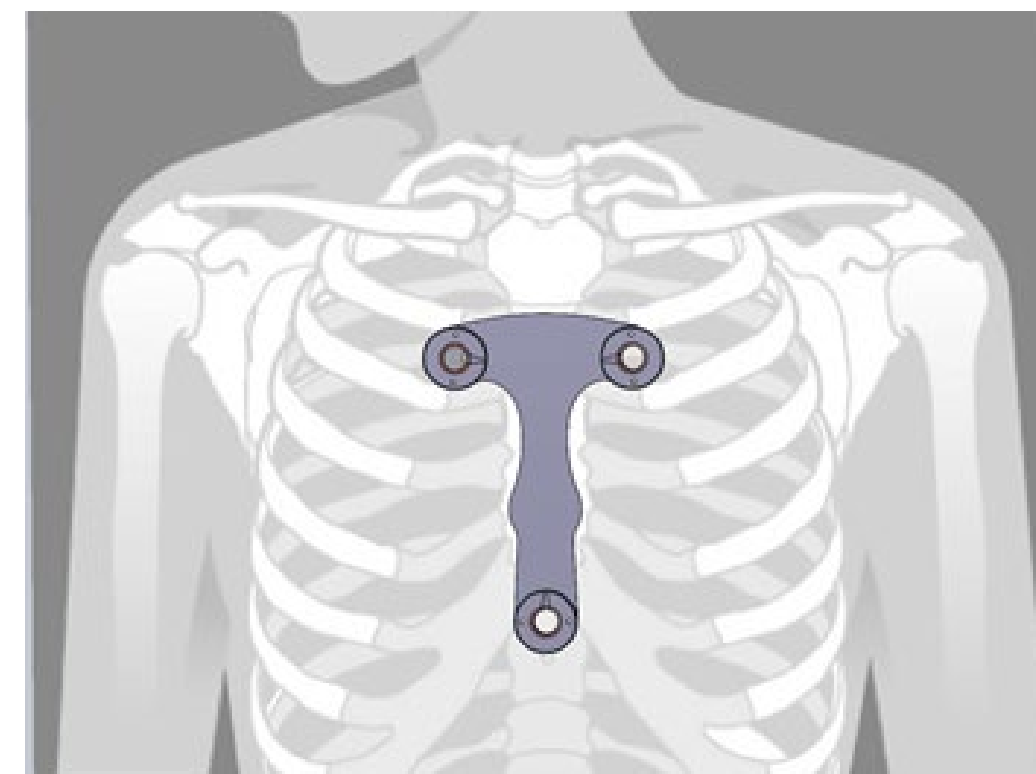
#### Key Words

- Non-invasive sensors
- Signal processing
- Machine learning / AI
- Cardiac monitoring

### Unmet Need

CardioSounds addresses an unmet clinical need for **advanced, non-invasive, low-cost monitoring** of disease progression **outside of the ICU** as manifested in the evolution of cardiovascular system function.

### Proposed Solution



- CardioSensors capture vibrational and electrical signals related to cardiac activity
- Signal processing and AI algorithms relate signals to indications of physiological state

### Approach

- Enroll patients admitted to hospital with COVID symptoms
- Collect data (using device); observe outcomes
- Develop AI classification model to predict future outcomes using CardioSounds' algorithms

#### Outcomes of Interest:

- Ventilator Utilization
- ICU Utilization
- Hemodynamic Instability
- Length-of-Stay / Mortality

### Team

CardioSounds is supported by an experienced entrepreneurial and clinical team

Kevin Wittrup, MSME, MBA  
 Serial entrepreneur  
 Technology commercialization

Dr. Steven Bolling, MD.  
 University of Michigan  
 Cardiac surgeon

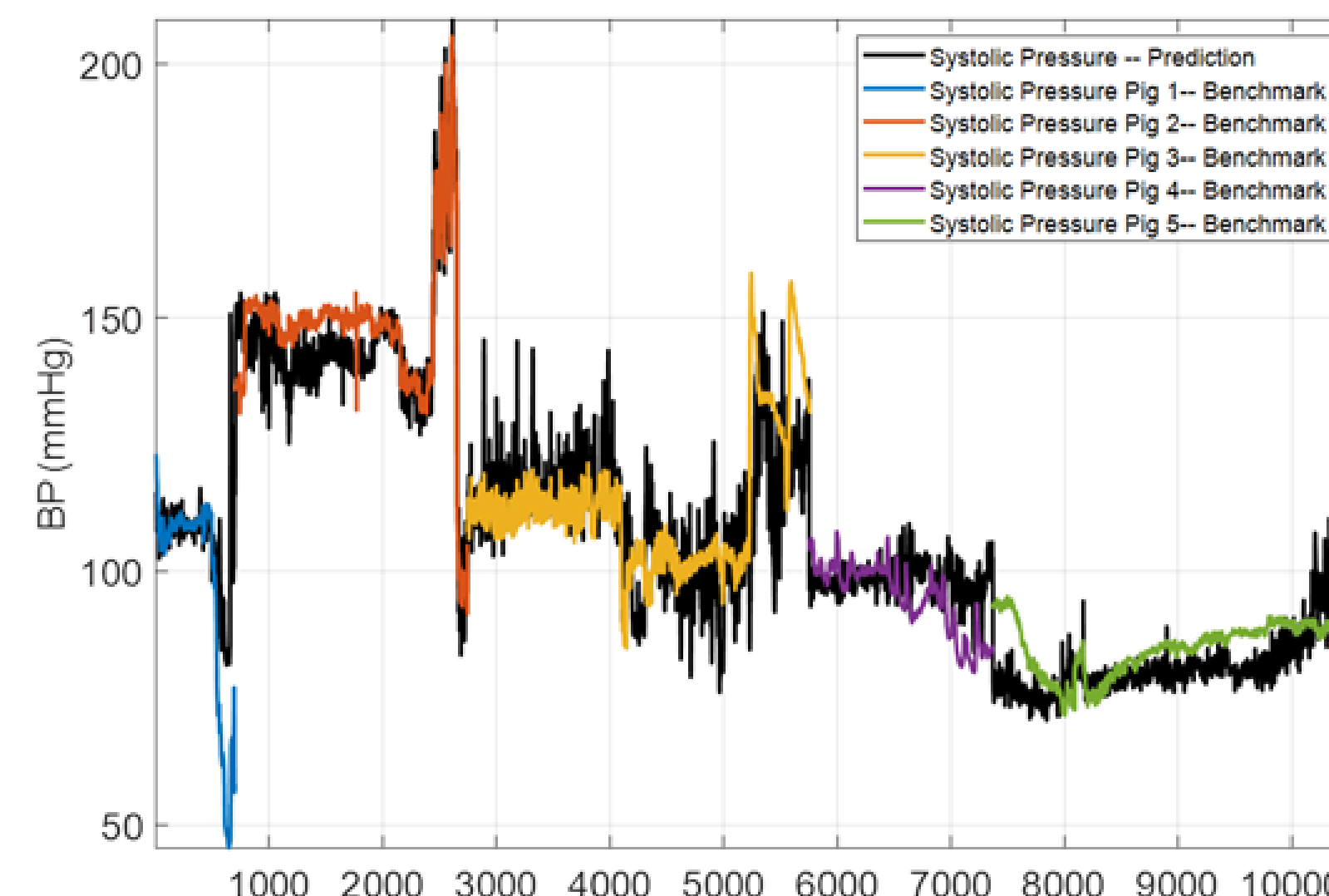
Kayvan Najarian, Ph.D.  
 University of Michigan  
 Machine learning / signal processing

Dr. Rob Sherwin, MD  
 Wayne St. University  
 Emergency medicine / clinical research

Dr. Joe Miller, MD, MS  
 Henry Ford Hospital, Detroit  
 Emergency medicine / clinical research

### Preliminary Data

Methodology has demonstrated potential in prior work



- **Study 1:** Tracking systolic arterial line BP in a pharmacological porcine subjects (N = 6) exhibiting range of hemodynamic states
- **Study 2:** Classifying human subjects for cuff BP in outpatient setting using rigorous AI model

Validation Set  
 (2407 cardiac cycles from 9 patients)

		Target Class		
		Normal	High	
Prediction	Normal	1110	55	95.3%
	High	9	1233	99.3%
		99.2%	95.7%	97.3%

Table 2: Classification Matrix

### Implementation

- **Technical:** Validate algorithm; evolve design
- **Market/Bus:** Establish strategic partners; secure Series A funding
- **Clinical:** Identify contraindications; establish efficacy & usability
- **Regulatory:** Establish regulatory pathway (510K is presumed)