Portable Monitoring System for Early Detection of Sepsis

A continuous, low-power, non-invasive monitoring system for early detection of sepsis both inside and outside the hospital

**Technology**

- Heart rate + variability
- Peripheral vascular resistance
- Pulse pressure variation
- Algorithms extract biomarkers indicative of sepsis

**Competitive Advantage**

- Produces results faster than current lab tests which can take up to 24 hours
- Untethered monitoring sensor with wireless communication
- Captures high resolution, real-time vascular dynamics information >> early indicators of septic shock
- Technology uses a “sensing ring” worn on the finger
- Sensor is small, simple, inexpensive + physically robust

**Commercialization Roadmap**

- Potential Partners: Apple, IBM, AirStrip, Phillips, GE Healthcare, Siemens Healthcare
- Class II Device 501(k) regulatory pathway
- License Technology

**PROJECT MILESTONES**

<table>
<thead>
<tr>
<th>Month</th>
<th>Milestone</th>
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<tbody>
<tr>
<td>1</td>
<td>Optimize mechanical structure of sensor ring</td>
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<tr>
<td>2</td>
<td>Finalize portable data collection unit</td>
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<tr>
<td>3</td>
<td>Conduct in-lab tests with predefined experiments</td>
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<td>4</td>
<td>Optimize computational methodology using in-lab test data</td>
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<td>5</td>
<td>Initiate data collection in ICU</td>
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<tr>
<td>6</td>
<td>Start analysis of data collected in ICU</td>
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**Collaborators**

- Rodney Daniels, MD
  - Pediatric Critical Care Medicine
- Kyle Gunnerson, MD
  - Emergency Medicine
- Ashwin Belle, PhD
  - Biomedical Image & Signal Processing
- Sardar Ansari, PhD
  - Biomedical Image & Signal Processing
- Kayvan Najarian, PhD
  - Computational Medicine & Bioinformatics
- Kenn Oldham, PhD
  - Mechanical Engineering

**Principal Investigators**

- Kayvan Najarian, PhD
  - Computational Medicine & Bioinformatics
- Kenn Oldham, PhD
  - Mechanical Engineering

**Team**

- SPEED
- PORTABLE
- SPECIFICITY
- NON-INVASIVE
- SIZE