Cardiac Arrhythmia and Ischemia Cluster

Biomedical Research Clusters

Cardiac Arrhythmia and Ischemia

Collaborators

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CardioThrive

Service

DBPs

Medtronic

Boston Scientific

Physio Control/Stryker
**CLINICAL STUDIES**

1. **Diagnostics:** Arrhythmia risk in structural heart disease
2. **Treatment Planning:** Ablation for atrial and ventricular arrhythmias
Cardiac MRI

Virtual Heart

Determine Arrhythmia Susceptibility

Non-Invasive Safe Effective

Ventricular Ablation Procedure Planning

catheterization

CARTO map

ablation lesions

referral for VT ablation

pre-ablation MRI image processing

simulation

ablation target

51% success rate 4-12 hours

referral for VT ablation
Atrial Ablation Procedure Planning

catheterization → CARTO map → ablation lesions

pre-ablation MRI → image processing → personalized simulation

referral for AF ablation

Atrial Ablation Procedure Planning

Simulation Guided Clinical Case at JHU
OTHER APPLICATIONS

- Risk stratification for
  - Non-ischemic cardiomyopathy
  - Hypertrophic cardiomyopathy
  - Tetralogy of Fallot

- Ablation for
  - Atrial fibrillation
  - Atypical atrial flutter

Next Steps: Modeling of VT in Hearts with Seg3D

Patient MRI → Anatomy Segmentation → Infarct Segmentation → Volume Reconstruction → VT Simulation
Next Steps: BSPM and ECGI on VT Patients

BSPM Electrode Placement