

Progress Report - Week 1

Title: Stabilizer Device for Intra-Cardiac Echocardiography (ICE) to Assist Structural Heart Interventional Procedures

Client: Dr. Amish Raval

Advisor: Dr. Darilis Suarez-Gonzalez

Team: Sara Morehouse (Leader)

Max Aziz (Communicator)

Noah Hamrin (BWIG & BPAG)

Kaden Kafar (BSAC)

Date: September 19, 2024

Problem Statement:

Intracardiac echocardiography (ICE) is a technique commonly used during catheter-based interventional procedures to treat congenital heart disease, valvular heart disease and myocardial disease. Typically, the ICE catheter is advanced into the right atrial from a femoral vein, where it is positioned for imaging purposes. A separate catheter to perform the interventional procedure such as a transeptal needle or Watchman left atrial appendage occluder delivery system is then introduced. Many times, the ICE catheter drifts out of place, the imaging perspective is lost and the ICE catheter needs to be readjusted. Therefore, there exists a need for a simple re-sterilizable device to stabilize a variety of commercially available ICE catheters during interventional procedures. The device must prevent movement of the ICE catheter so that it does not migrate out of place when in use.

Brief Status Update:

This week, the team focused on drafting requirements for the project based on the information shared by Dr. Raval and our own background research. These requirements are compiled in the Product Design Specifications. Additionally, we continued researching any pertinent topics or background information to fully understand the design challenge. Looking forward, we are shifting our focus to design creation.

Difficulties / Advice Requests:

N/A at this time.

Current Design:

N/A at this time.

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|---------------------|---|---|--|--|--|--|--|--|--|--|--|--|--|
| Deliverables | | | | | | | | | | | | | |
| Progress Reports | X | X | | | | | | | | | | | |
| PDS | | X | | | | | | | | | | | |
| Design Matrix | | | | | | | | | | | | | |
| Prelim presentation | | | | | | | | | | | | | |
| Final Poster | | | | | | | | | | | | | |
| Meetings | | | | | | | | | | | | | |
| Client | X | | | | | | | | | | | | |
| Advisor | X | X | | | | | | | | | | | |
| Website | | | | | | | | | | | | | |
| Update | X | X | | | | | | | | | | | |

Previous week's goals and accomplishments:

- Goal: Continue developing a foundation of knowledge on ICE and the project requirements.
 - The team accomplished this goal as we continued to research as we drafted the Product Design Specifications.
- Goal: Draft and revise Product Design Specifications to be completed by Thursday (9/19) evening
 - The team completed the Product Design Specifications and revised based on feedback from our advisor, Dr. Suarez.

Activities:

| Name | Date | Activity | Time (h) | Week Total (h) | Sem. Total (h) |
|-------|-------------------|--|----------|----------------|----------------|
| Sara | 9/16/24 & 9/17/24 | Write sections of the PDS and collaborate with the team to revise the overall document. | 3 | 3 | 5 |
| Max | 9/19/24 | Wrote part of the PDS, met with Dr. Raval, and continued to research competing designs and safety hazards. | 3 | 3 | 5 |
| Noah | 9/16/24 & 9/17/24 | Worked on PDS and continued to research topics relating to the project | 3 | 3 | 5 |
| Kaden | 9/16 | Worked on PDS and revised portions needed. Research competition for the device. | 3 | 3 | 4 |