# Progress Report - Week 9

## **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:** November 7, 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 transseptal 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.

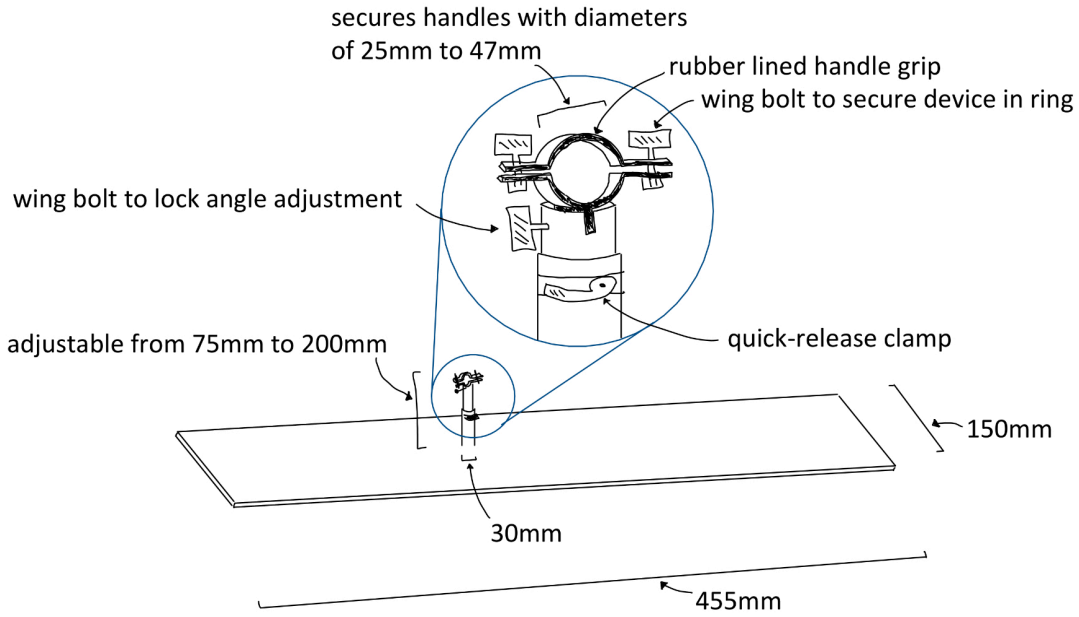
### Brief Status Update:

This week, the team utilized the information we gathered from shadowing Dr. Raval to continue working on the prototype. Going forward, we plan to finish our prototype next week and begin testing the device the following week. We plan to order any materials needed by the end of this week.

### Difficulties / Advice Requests:

N/A at this time.

## Current Design:




The team plans to move forward with the Body Weight Holder design. However, some modifications will be made. These include separating the device into two components, the base and the holder. The base will consist of the rectangular plate with a pole and will be placed underneath the sterile drape with the pole between the patient's legs. The holder component will attach to the pole over the sterile drape via an attachment mechanism, which could potentially be a magnet. The holder will also be modified to utilize a hinge jaw clamp that is easy for the user to secure. This will hold the handle of the catheter parallel to the table.

## Materials and Expenses:

| Item | Description | Manufac-turer | Mft Pt# | Vendor | Vendor Cat# | Date | # | Cost Each | Total | Link |
|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | | | |
| 3D printed prototype | 3D-printed model of our initial prototype concept | n/a | n/a | MakerSpace | n/a | 10/31/24 | 1 | $6.97 | $6.97 | n/a |
| - | | | | | | | | | $0.00 | |
| | | | | | | | | | | |
| - | | | | | | | | | $0.00 | |
| - | | | | | | | | | $0.00 | |
| - | | | | | | | | **TOTAL:** | **$6.970** | |

## Major team goals for the next week:

- Finish prototype
- Create testing plan

## Next week's individual goals:

- Sara:
  - Finish CNC permits
  - Finish prototype and work on testing protocols
- Max:
  - Help with testing
  - Talk to Guy (coordinator with Dr. Raval) about ordering more parts
- Noah:
  - Turn solidworks model into cnc vector paths and fabricate top section
- Kaden:
  - Create testing protocols and begin testing

## Timeline:

| Task | September | | | October | | | | November | | | | | December |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | 13 | 20 | 27 | 4 | 11 | 18 | 25 | 1 | 8 | 15 | 22 | 29 | 6 |
| **Project R&D** | | | | | | | | | | | | | |
| Background research | X | X | X | | X | | | | | | | | |
| Design development | | | X | X | X | X | X | X | X | | | | |
| Prototyping | | | | | | | | X | X | | | | |
| Testings | | | | | | | | | | | | | |
| **Deliverables** | | | | | | | | | | | | | |
| Progress Reports | X | X | X | X | X | X | X | X | X | | | | |
| PDS | | X | | | | | | | | | | | |
| Design Matrix | | | X | | | | | | | | | | |
| Prelim presentation | | | | X | | | | | | | | | |
| Prelim Report | | | | | X | | | | | | | | |
| Final Poster | | | | | | | | | | | | | |
| **Meetings** | | | | | | | | | | | | | |
| Client | X | | | | | X | | X | | | | | |
| Advisor | X | | X | X | | X | | | X | | | | |
| **Website** | | | | | | | | | | | | | |
| Update | X | X | X | X | X | X | X | X | X | | | | |

## Previous week's goals and accomplishments:

- Revise design as needed and continue prototyping.
    - The team has continued to work on the design and plans to finish up the prototype by the end of next week.

## Activities:

| Name | Date | Activity | Time (h) | Week Total (h) | Sem. Total (h) |
|---|---|---|---|---|---|
| Sara | 11/5/24 & 11/8/24 | Worked on CNC 1 permit, met with team to work on design | 3 | 3 | 20 |
| Max | 11/4/24 | Helped come up with testing ideas | 1 | 1 | 20 |
| Noah | 11/4/24 | Completed CNC 2 permit upgrade | 3 | 3 | 23 |
| Kaden | 11/4/24 | Brainstormed testing ideas | 1 | 1 | 17 |