

Progress Report - Week 5

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: October 10, 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.

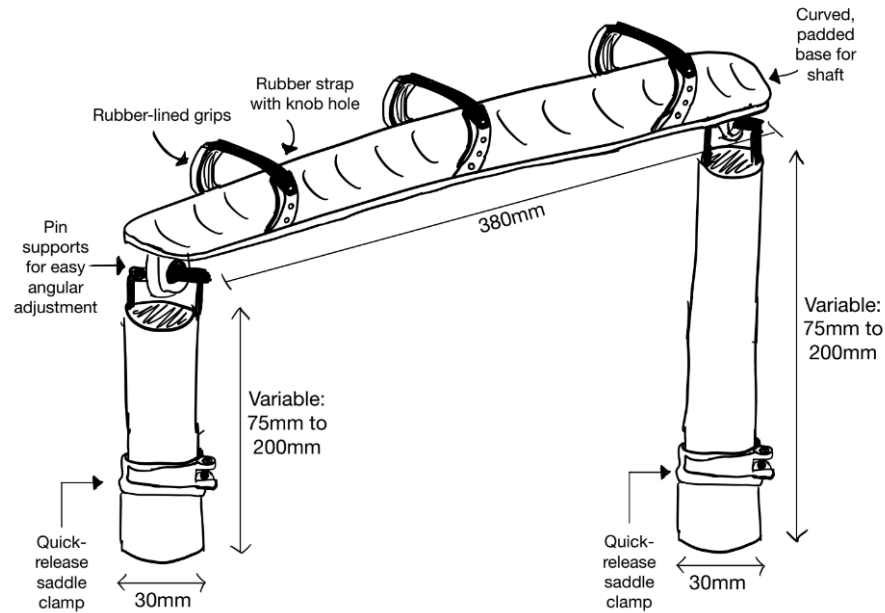
Brief Status Update:

This week, the team focused on completing the Preliminary Report following our presentation last week. In the next week, we hope to meet with Dr. Raval to get feedback on our design and solidify design choices to begin prototyping the following week. Additionally, we set up time to shadow Dr. Raval in the catheterization lab as he uses an ICE catheter, which will allow us to gain a better understanding of the use process requirements for the design.

Difficulties / Advice Requests:

N/A at this time.

Current Design:



As described in our Preliminary Report, our proposed design is the “Sliding Legs” design. It consists primarily of two cylindrical shafts, attached to a bottom plate, that support a base pad on which the shaft of an ICE catheter will rest. These cylindrical shafts are extensible via quick-release saddle clamps, the same mechanism that an adjustable-height bike seat utilizes. The base pad connects to the cylindrical shafts via simple pin supports, which will allow the base to rotate freely about these points. By simply altering the height of one or both of the cylindrical shafts, one can simultaneously adjust the angle at which the base pad, and by extension the ICE catheter, sits at. For further information about this design, refer to the Preliminary Report.

Materials and Expenses:

Item	Description	Manufacturer	Mft Pt#	Vendor	Vendor Cat#	Date	#	Cost Each	Total	Link
-									\$0.00	
-									\$0.00	
-									\$0.00	
-									\$0.00	
-									\$0.00	
-									\$0.00	
								TOTAL:	\$0.00	

Advisor	X		X	X	X									
Website														
Update	X	X	X	X	X									

Previous week’s goals and accomplishments:

- Goal: Complete preliminary report.
 - The team has completed the Preliminary Report and shared it with Dr. Raval.
- Goal: Complete modeling of designs in SolidWorks and get ready to begin rapid prototyping via 3D-printing.
 - The team will continue to work on this task once we discuss designs with Dr. Raval and get feedback.

Activities:

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Sara	10/7/24 & 10/9/24	Worked on Preliminary Report	4	4	13
Max	10/7/24 & 10/9/24	Worked on preliminary report	3	3	12
Noah	10/7/24 & 10/9/24	Worked on preliminary report	2	2	11
Kaden	10/7 & 10/9	Worked on preliminary report	2	2	11