Progress Report - Week 17

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

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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.

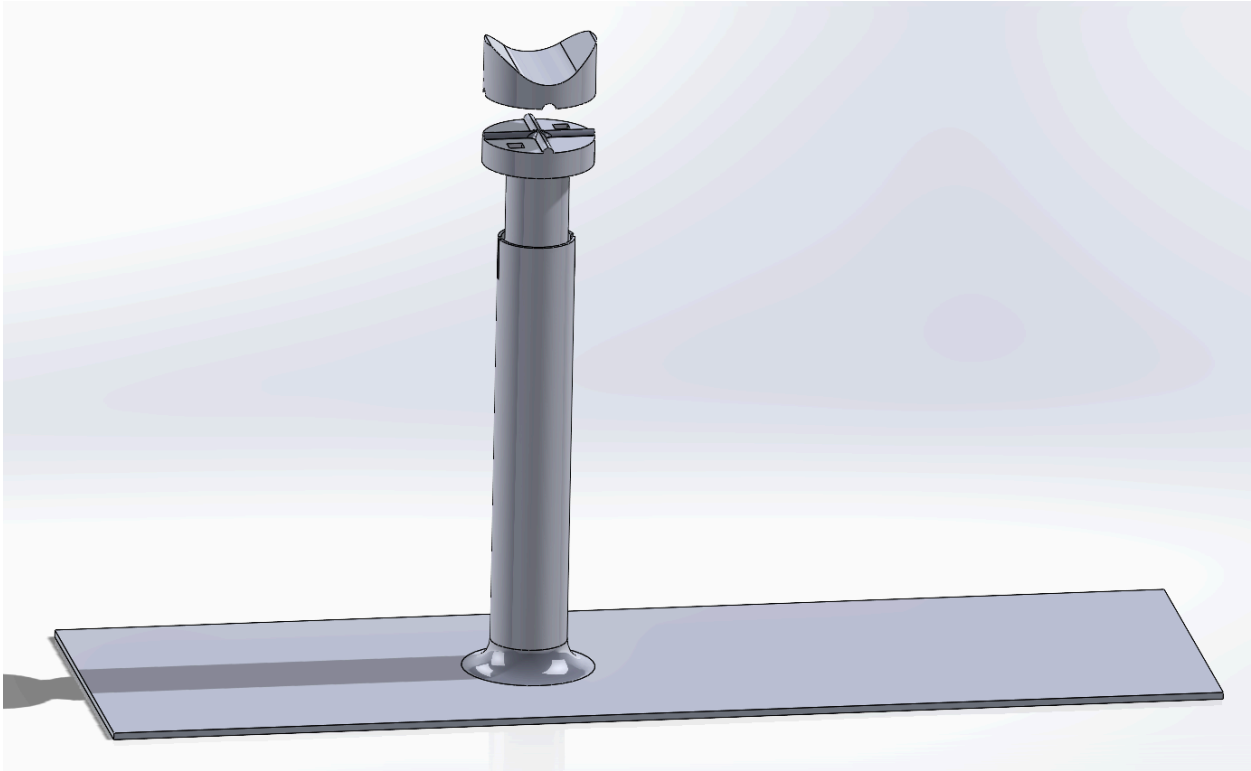
Brief Status Update:

This week the team prepared for the fabrication process which will be completed next week.

Difficulties / Advice Requests:

N/A at this time.

Current Design:



The Body Weight Holder design consists of 3 main components: the base plate, the shaft, and the top holder. The base plate will be welded to the bottom part of the shaft, and the top part of the shaft will be inserted into the bottom shaft and held in place with a quick release clamp. This clamp will allow for adjustable height. The top part of the shaft includes a circular base that will have magnets, which will attach to the top holder component. The magnets will allow the top holder to be secured to the shaft through a surgical sterile drape. Additionally, the top holder will be lined with rubber on the internal surface to provide a secure hold on the catheter handle. There will also be rubber straps that secure over the handle of the catheter.

Materials and Expenses:

Item	Description	Manufac-turer	Mft Pt#	Vendor	Date	#	Cost Each	Total	Link
3D printed prototype	3D-printed model of our initial prototype concept	n/a	n/a	MakerSpace	10/31/24	1	$6.97	$6.97	n/a
PLATT Bike	Quick release	PLATT	n/a	Amazon	11/8/24	1	$8.99	$8.99	amazon.com

Seat Post Clamp Aluminium Alloy Bicycle Quick Release Seatpost Collar 34.9mm	clamp - 34.9 mm size								
McMaster 5848K11	¼”x ¼” x ⅛” magnet	McMaster	5848K11	McMaster	11/8/24	2	$2.57	$5.14	https://www.mcmaster.com/5848K11
McMaster 5848K15	⅜” x ⅜”x ⅛” magnet	McMaster	5848K15	McMaster	11/8/24	2	$3.10	$6.20	https://www.mcmaster.com/5848K15
McMaster 5848K83	¼” x ¾”x ¼” magnet	McMaster	5848K83	McMaster	11/8/24	2	$6.76	$13.52	https://www.mcmaster.com/5848K83
DGSL Neoprene Rubber Sheet	1" Wide x 1/16" Thick x 10' Long Rubber sheet	DGSL	n/a	Amazon	11/8/24	1	$9.99	$9.99	amazon.com
Adhesive Rubber Strips Neoprene Rubber Sheets, Rolls & Strips with Adhesive Backing	2" Wide x 1/16" Thick x 10' Long Rubber sheet with adhesive backing	n/a	n/a	Amazon	11/8/24	1	$12.98	$12.98	amazon.com
McMaster 89955K169	1-⅜” OD shaft - 1ft long	McMaster	89955K169	McMaster	11/8/24	1	$29.37	$29.37	https://www.mcmaster.com/89955K169
McMaster 89955K959	1-⅛” OD - 1 ft long	McMaster	89955K959	McMaster	11/8/24	1	$25.20	$25.20	https://www.mcmaster.com/89955K959
McMaster 4459T188	Sheet metal 4130 easy-to-weld steel 6”x36”	McMaster	4459T188	McMaster	11/8/24	1	$63.80	$63.80	https://www.mcmaster.com/4459T188

McMaster 6673T34	4130 steel rod 2”x1ft	McMaster	6673T34	McMaster	11/8/24	1	$88.65	$88.65	https://www.mcmaster.com/6673T34
McMaster 5848K11	¼”x ¼” x ⅛” magnet	McMaster	5848K11	McMaster	2/21/25	12	$2.57	$30.84	https://www.mcmaster.com/5848K11
Black Rubber Utility Strap, Adjustable Utility Strap with Clip, Easy to Use Tension Strap with Buckle for Securing, Fastening, Bundling and Lashing, Short Securing Straps	Strap	Labriciyon	768530834464	Amazon	2/21/25	1	$6.99	$6.99	https://www.amazon.com/Utility-Adjustable-Securing-Fastening-Bundling/dp/B0DNQCQV6L
							Total:	**$308.64**	

Major team goals for the next week:

- Complete fabrication of final prototype

Next week’s individual goals:

- Sara:
  - Assemble top components with magnets for attachment after the metal components are fabricated
  - Begin work on patenting
  - Outreach activity
- Max:
  - Weld
  - Deal with patenting

    - Outreach activity
- Noah:
    - CNC mill the middle part during reservation time
    - Outreach activity
- Kaden:
    - Weld steel components for metal prototype
    - Outreach activity

Timeline:

Task	Jan	Feb				March					April				May	
	26	2	9	16	23	1	8	15	22	29	5	12	19	26	3	10
Project R&D																
Empathize	X	X	X													
Background																
Prototyping																
Testings																
Deliverables																
Progress Reports	X	X	X	X	X	X										
Prelim presentation						X										
Final Poster																
Meetings																
Client		X														
Advisor	X	X	X	X	X	X										
Website																
Update	X	X	X	X	X	X										

Previous week's goals and accomplishments:

- Prepare toolpaths for CNC fabrication

Activities:

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Sara	3/5	Worked on outreach activity	1	1	9
Max	3/5	Worked on outreach activity	1	1	10
Noah	2/7	Worked on preliminary report	1	1	12

Kaden	3/6	Worked on welding plan	1	1	8