

SteadyHand Progress Report #4

Date: 10/01/2026

Client: Dr. James Sohn

Advisor: Dr. Shawn Gomez

Team:

Anna Wood

Tess Brazee

Mara Van Dyke

Sam Anderson

Ben Pytlik

Miti Patel

Problem statement

Severe joint pain in the hands due to arthritis and other inflammatory conditions is now frequently treated using low-dose radiation therapy (LDRT). Current LDRT protocols require high setup reproducibility across 6 treatment sessions. Existing positioning systems are overly complex, use complicated indexing systems, and compress digits 2-5 together. This causes significant discomfort for patients and creates unnecessarily long setup times.

This project aims to develop a hand positioning device to be used in a clinical setting that minimizes setup time and patient discomfort while ensuring exact hand placement for each treatment session.

Brief status update

This week the group met with Dr. Sohn, and received feedback on three preliminary design ideas. Together we came to the conclusion to combine the best parts of each preliminary design into one encompassing design. Then we got together as a team and created a cardboard prototype of our chosen design which is pictured below. Additionally, we prepared slides for our preliminary design presentation and practiced presenting as a group.

Difficulties / advice requests

Current design

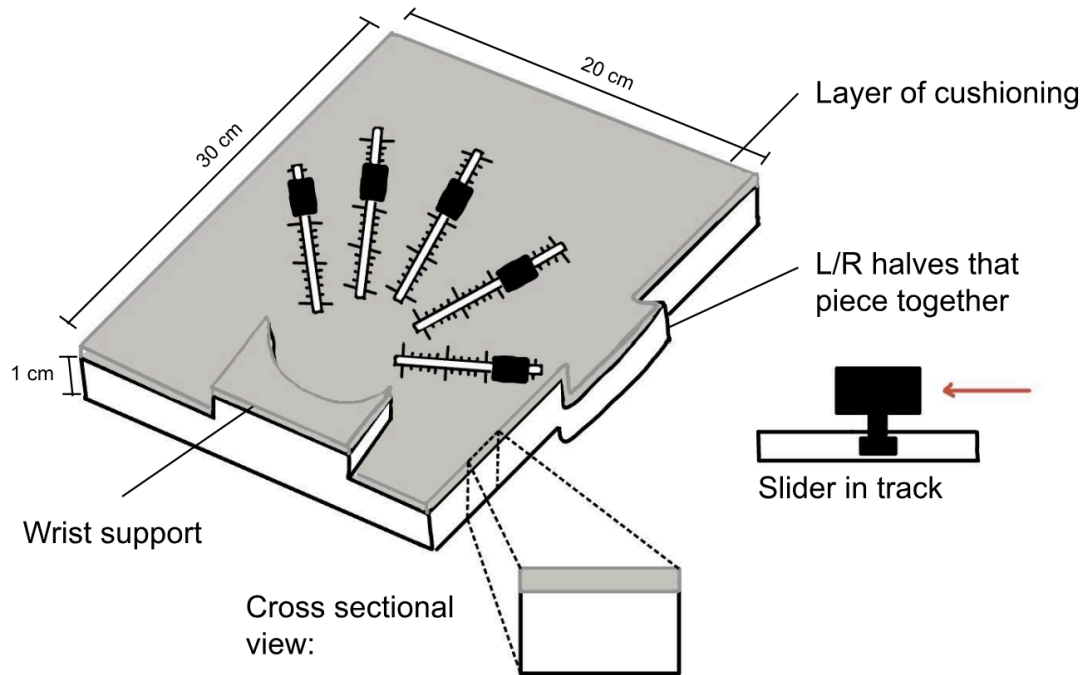


Figure 1. Chosen preliminary design sketch



Figure 2. Rough proof of concept prototype featuring a singular finger track and slider.

Goals

Major team goals for the next week

1. Learn more about procedure workflow
2. Create and refine CAD models to determine designs for 3D printing
3. Finish preliminary report.

Next week's individual goals

- Anna Wood
 - Work on and edit the preliminary report
 - Help split the group up into partnerships to focus on prototyping different aspects of the design
 - Research/find materials for learning about the setup and workflow of the procedure
 - Work on base plate CAD model
- Mara Van Dyke
 - Complete sections of preliminary report
 - Begin modeling finger holds in CAD
 - Work on wrist support designs with the team
- Tess Brazee
 - Complete assigned sections of preliminary report
 - Begin CAD modeling for a prototype
 - Research ABS as a material for 3D printing and its attenuation
- Sam Anderson
 - Start using Onshape to 3D model different parts of device
 - Figure out exactly what material we are going to use for the prototype and testing device
 - Work on assigned sections of the preliminary report
- Ben Pytlik
 - Complete assigned sections of the preliminary report
 - Research more about modeling materials
 - Begin 3D modeling with group members to determine utility of each idea
- Miti Patel
 - Work on modeling finger supports in CAD
 - Look into sourcing PETG/ABS for 3D printing
 - Work on 3D printing with group to determine suitable solutions

Timeline

Task	Aug.	Sept.					Oct.				Nov.					Dec.
	30	6	13	20	27	4	11	18	25	1	8	16	22	29	6	
Project R&D																
Empathize	X	X	X													
Background...				X	X											
Prototyping																
Testings																
Deliverables																

Progress Reports			X	X	X										
Prelim presentation															
Final Poster															
Meetings															
Client		X		X											
Advisor	X		X	X											
Website															
Update	X	X	X	X	X										

Filled boxes = projected timeline

X = task was worked on or completed

Detailed accomplishments

Previous week's goals and accomplishments

- Anna Wood
 - Combine preliminary designs into one drawing for prototyping
 - Presented preliminary design ideas to Dr. Sohn with the group
 - Worked on preliminary design presentation slideshow and met with the group to practice
 - Attended group meeting for cardboard prototyping
- Mara Van Dyke
 - Completed assigned design matrix sections of preliminary presentation
 - Discussed preliminary design with client and cleaned up sketch of design idea
 - Helped construct cardboard prototypes with the team
 - Researched Velcro as a potential prototype material
- Tess Brazee
 - Completed materials design matrix and collaborated with team members to refine and edit it
 - Discussed preliminary designs with client and collected information on revisions to be done for the final design
 - Met with design team to practice preliminary presentation and complete the presentation slideshow
 - Worked with team to refine and combine designs for our chosen design
- Sam Anderson
 - Finished the materials design matrix and refined it with team members
 - Worked on preliminary design presentation
 - Met with client to discuss our preliminary design
 - Researched PETG and how it can be implemented in our design
- Ben Pytlik
 - Continue materials research
 - Work on preliminary design presentation
 - Refine design matrix, finalizing the design of the prototype
 - Present preliminary design to the client
- Miti Patel
 - Brainstormed and determined final preliminary designs for hand positioning plate
 - Completed design matrix and met with client to determine next steps
 - Attended BSAC meeting with faculty

Activities

Name	Date	Activity	Time (h)	Week Total (h)	Sem. Total (h)
Anna Wood	10/1/26	Helped with prototype creation, worked on preliminary design presentations and conducted research on anthropometric hand size data, and practiced with teammates.	4.5	4.5	14
Mara Van Dyke	10/1/26	Completed preliminary presentation, cleaned up sketch of preliminary design idea, met with client to discuss ideas, worked on physical cardboard prototype	4	4	13.5
Tess Brazee	10/1/26	Worked on preliminary presentation, practiced presenting preliminary presentation, refined designs to incorporate into our chosen design, completed progress report	2	2	11.5
Sam Anderson	10/1/26	Fabricated a rough prototype, completed the preliminary design presentation, practiced the presentation with the team and by myself, worked on the progress report	4	4	12.5
Ben Pytlik	10/1/26	Modeled a prototype, worked on preliminary presentation, practiced presentation by myself and in front of group, completed progress report	4.5	4	12.5
Miti Patel	10/1/26	Created prototype, worked on preliminary presentation, completed progress report, presented preliminary presentation to large group	4	4	13