

## **Development of an ultrasound probe holder for arterial function testing (Probe Holder)**

**Client:** James H. Stein, MD

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**Team:** Leon Corbeille (BWIG)

Neal Haas (Communicator)

Peter Kleinschmidt (Leader)

Lein Ma (BSAC)

### **Progress Report for Week 3: February 6 – February 12**

#### **Problem Statement:**

To aid in the ultrasonography of arterial reactivity, a simple, stable, adjustable probe holder is needed. The stabilization provided by such a holder could potentially improve probe imaging quality and diagnostic effectiveness. The device should be able to be finely adjusted with 6 degrees of freedom, and free the hands of the technician for the duration of the study.

#### **Last Week's Goals:**

- Begin design brainstorm. Identify potential unique solutions to the problem
  - Things to address: Configurations, Materials, Dimensions
- Search for competition and possible intellectual property issues
- Refine PDS

#### **Summary of Accomplishments**

- Held first meeting with client. Better established scope, expectations of project.
  - Probe holder needed to stabilize ultrasound probe
  - Needs to be adjustable to 6 degrees of freedom (3 directional, 3 rotational)
  - Needs to accommodate range of probes used in studies
  - Should have "gross" positioning as well as fine-tuning capabilities for positioning
- Brainstormed possible different design concepts
  - Rack-and-pinion style gearing
  - Clamps/Clips with fine-tuning cranks
  - Snake-style motion
- Individual research and brainstorming was completed to refine feasibilities of different options
  - Began searching manufacturing suppliers for potential materials

#### **This Week's Goals**

- Schedule meeting with mechanical engineering professor for expert advice (Frank Fronczak)
  - No response yet, will look to schedule for next week
- Perform more thorough patent search/other research. Identify potential IP issues
- Continue conceptual brainstorm
  - Look for other positioning methods. Pre-existing devices, simple to construct, etc.
- Continue feasibility studies of ideas as they are formulated
- Begin process of obtaining Shop access for all members if not done so already.

**Project Difficulties:**

None to report

**Team Activities**

Members	Activity	Time Spent	Total
Team	Client Meeting, Advisor Meeting, Brainstorm Session	3.00 hr.	6.00 hr
Lein	Individual Research/Brainstorming	1.50 hr.	3.50 hr.
Leon	Website Construction, Research/Brainstorming	2.00 hr.	3.00 hr.
Peter	Progress Report, Manufacturing Research, Brainstorming	1.50 hr	3.00 hr.
Neal	Communications, Research	1.25 hr	1.25 hr.

**Project Timeline**

Task	Jan.		February				March				April				May	
	23	30	6	13	20	27	6	13	20	27	3	10	17	24	1	8
<b>Project Development</b>																
Brainstorm/Design Development																
Finalize Design																
Prototyping																
<b>Deliverables</b>																
Progress Reports																
Mid-semester Paper																
Mid-semester Presentation																
Final Paper																
Final Poster																
<b>Meetings</b>																
Client																
Advisor																
<b>Website</b>																

**Budget/Expenses**

No expenses incurred