

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

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Progress Report for Week 1-3: September 2 – September 18

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:

Not Applicable

Summary of Accomplishments

- The team reconvened for the fall to identify several areas of potential improvement in the prototype that was delivered in the spring. Additionally we began to identify goals for the semester to validate an updated design in how it fits into the workflow.
- Met as a team and decided to retain roles and responsibilities from the previous semester.
- Held first client meeting to gather feedback about the existing design and to identify weak and strong points to the design.
 - Identified some cumbersome operation of the prototype. The large arm also goes against the user model for motion and limits some of the potential motion. While the range and positioning ability is good, it is not ideal for adjustment purposes.
 - The probe clamping device could benefit from refinement. While the “claw” concept does work to stabilize the probe, its orientation hinders adjustability.
 - Also established potential for validation avenues with new prototype
 - Verify effectiveness in generating useful and improved imaging
 - Verify integration into workflow and difference in setup and operations behaviors
 - Potentially develop cost-benefit analysis of resources gained/lost with the integration of the device to a typical study.
- Purchased a “Goose-Neck” style stand to test for integration to the design.

This Week's Goals

- Finalize redesign of probe clamping mechanism/device.
- Purchase/Order raw materials for construction of the clamping mechanism/device.
- Craft redesigns for other areas of the probe holder
- Begin designing validation plans.

