

Project Design Specification—Ultrasound Probe Holder (Group 44)

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Function:

A simple, stable, adjustable ultrasound probe holder to aid in the ultrasonography of arterial reactivity. The holder would stabilize the ultrasound probe to improve image quality and reduce noise for better diagnostic effectiveness

Client Requirements:

- Stable, won't fall over or move probe
- Adjustable for small changes
- Cost efficient
- Ergonomic

Design Requirements:

- 1) Physical and Operational Characteristics
 - a) *Performance requirements* – Easily adjustable without interfering with the ultrasound, able to make small adjustments quickly, able to securely hold the probe, able to hold the patients arm while in use
 - b) *Safety* – The materials should not be hazardous and should not interfere with the ultrasound
 - c) *Accuracy and Reliability* – The device should be able to make small changes quickly and hold its position without changing. It should have 6 degrees of freedom motion
 - d) *Life in Service* – The device should last at least five years
 - e) *Shelf Life* – The device should be able to be stored indefinitely without compromising its integrity, must be able to be stable for 5 to 10 minute periods
 - f) *Operating Environment* – The probe holder will be used in typical laboratory and clinical settings
 - g) *Ergonomics* – The device should be able to accommodate a large range of users without interfering with the ultrasound procedure
 - h) *Size* – The device should be small and compact, should be able to fit for different sized probes
 - i) *Weight* – The probe should be as lightweight as possible while proving a stable support
 - j) *Materials* – The materials should be cost efficient and should not interfere with the ultrasound procedure
 - k) *Aesthetics* – The device should be aesthetically pleasing
- 2) Production Characteristics
 - a) *Quantity* – Only one product is currently needed, but it should be designed with the intention of mass production
 - b) *Target Product Cost* – The device should less than \$1000
- 3) Miscellaneous

- a) *Standards and Specifications* – The device should follow all required standards in regards to ultrasonography
- b) *Customer* – The device will be used by medical personnel in a laboratory or clinical setting
- c) *Patient-related concerns* – The device should not harm the patient
- d) *Competition* – There are currently some ultrasound probe holders being patented, but none are available commercially. Additionally, most of the current competition must be mounted to the wall.