

Lower Body Differential Pressure Chamber



Team

Ben Steen, Clayton Dosmann, Eric Smith, Langston Wesson, and Michael Blasucci

Industry Representative

Tyler Van Buren

Clinic Advisor

Paul Chevalier

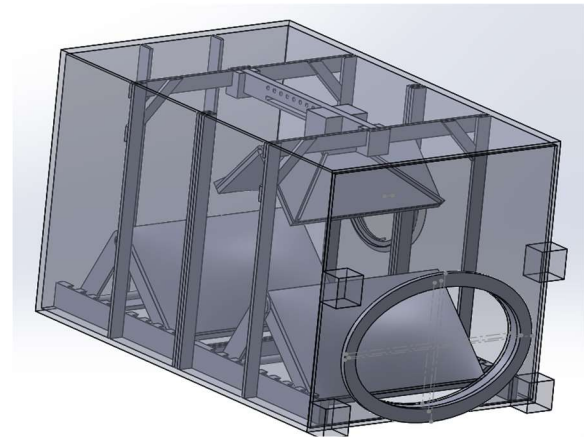


Project Summary

The LBDP Chamber is intended to be used as facilitating technology to electrocardiogram testing. Normally, to perform a dynamic electrocardiogram which can capture heart stress induced problems, exercise or drugs are utilized. This system will utilize positive and negative pressures applied to a patient's lower body to simulate aerobic stress or lowered vascular load. This type of solution is not available on the market today and targets obese and immobile patients or those for whom drugs are not a safe option.

Design Goal

The design and prototype will serve as a springboard for further development and production at Mayo Clinic. Valuable information including both successful and unsuccessful approaches to function, safety, and design will be delivered as part of a design history to promote the long-term success and marketability of this product.



Design Constraints

- Apply pressures to the lower body of a patient ranging from -100 to 60 mmHg
- Control with high accuracy in increments of 5 mmHg using closed loop control
- Design for patient and operator safety
- Can accommodate obese and immobile patients
- System can carry out 30-minute test intervals while maintaining patient comfort
- Lower body remains visible and can be interacted with through an access door