VDR3 Report  
Kiersten Cady and William Wartman  
FSU-FAMU College of Engineering  
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Dr. Shayne McConomy

The current state of our selected design is that general CAD models have been generated as well as 3D printed in PLA. Alternative models might require some design changes to meet our Sponsor’s additional requirements, but the selected model is ready for initial testing. This process will involve insertion into bone block simulant and testing utilizing our testing apparatus. Most of the testing equipment such as the rotary table and the strain gauge have been acquired. The bone blocks have been purchased but have not arrived yet.

The work moving forward will focus on finishing the existing testing apparatus and documenting a testing procedure. This includes finalizing the implantation method that will be used along with the procedure for testing the forces that design can withstand. Once these have been completed comparative testing will be conducted between our selected design and Exactech’s Equinox model. The selected design may require modifications after the testing is conducted to accommodate any issues that arise.

The main problems with this process will be achieving a steady force with the testing apparatus which is currently configured to be operated manually. A weight or spring mechanism will be used to apply a continuous force that will be measured using a load cell. All the hardware and equipment has been purchased and arrived. Another problem that may arise is ensuring that the force applied is large enough for optimal testing results and able to be accurately measured using the equipment.

The designs we will be testing are displayed in the figures below along with the Equinox (current model). It is assumed through concept selection techniques that the external 6 fin design with the hollow internal cylinder will be the most optimal design to achieve the targets set.

Main Concepts

A group of green objects

Description automatically generated

A group of grey objects

Description automatically generated

