THROMBOSIS PREDITION FOR AN IMPLANTABLE BLOOD PUMP.

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All implantable medical devices are subject to a unique and harsh environment as well as a set of much higher standards then most devices. This is especially true for blood pumps. One of the many unique obstacles that must be faced in the design of blood pumps is the formation of thrombus. There has been extensive work characterizing the mechanism of thrombosis, although this is usually based on simple geometries i.e. in a stenosis. Additionally, some previous work has established a criterion for predicting the formation of thrombus as well as a qualitative description of the degree of thrombosis. The method for analysis consists of three parts: flow visualizations of the blood pump, Computational Fluid Dynamics (CFD) modeling to estimate shear stress and exposure time, and a material inspection using microscopy. We will attempt to demonstrate that this criterion can be used to predict the amount of thrombus that will form in a system. This prediction will then be compared with experimental data gathered from whole blood experiments in order to evaluate the efficacy of the prediction. This project will contribute not only to the design of the current blood pump, but is also valuable to any medical device that contacts blood.