

1067-92-1683

Lisa Melanson* (l-melanson@northwestern.edu), Technology Institute, ESAM Department, 2145 Sheridan Road, Evanston, IL 60208. *Effect of Arterial Geometry on Stresses in Intracranial Aneurysms*. Preliminary report.

Intracranial aneurysms are highly prevalent in the general population and pose life-threatening health risks if left untreated. Wall shear stresses, which are dependent on vessel geometry, can lead to changes in the material properties of the arterial wall allowing aneurysms to grow and potentially rupture. In this study, we examine both elastic and rigid arterial wall models to explore how this remodeling is influenced by geometry and fluid stress. In particular, we investigate the correlation between wall shear stress and aneurysm aspect ratio, outlet and inlet size, and tilt angle of the aneurysm. The two dimensional governing equations are solved numerically using an adaptive finite difference projection algorithm developed at the LBNL Center for Computational Sciences and Engineering coupled with an immersed boundary method. Both idealized arterial geometries as well as geometries extracted from clinical imaging data are considered. (Received September 21, 2010)