1014-92-1388 **Dawn Alisha Lott*** (dlott@desu.edu), Department of Mathematics, 1200 N. DuPont Highway, Dover, DE 19904, and **Hans R. Chaudhry**, **Michael Siegel** and **Charles J. Prestigiacomo**.

Three Dimensional Stress Distribution in Axisymmetric Cerebral Saccular Aneurysm.

Cerebral aneurysm is a localized dilation or swelling, of a blood vessel in the brain, where part of the vein or artery bulges like a balloon. Most studies on the mechanics of saccular aneurysm have primarily been done on the role of blood flow and loading in terms of blood pressure. Since the loads on the inner wall of aneurysm are responsible for expansion and then rupture, it is important to study the stress distribution in the wall of aneurysm, especially, when it is suggested that these lesions rupture when the wall stress exceeds the wall strength. We assume that saccular aneurysm resembles a thin spherical shell (a spherical membrane), and develop a strain energy function valid for finite strain to analyze 3-dimensional stress distribution in the aneurysm wall. We believe that it is more appropriate to use the thin spherical shape since previous tension-strain data was obtained using the Law of Laplace for spherical shell and the additional advantage of this approach is that we can predict three dimensional stress distribution. The influence of size, shape, and properties on the mechanics of saccular aneurysm including its rupture potential is discussed on the basis of our approach. (Received September 28, 2005)