1086-49-1872 **Maya Elise Johnson*** (mayaj@math.tamu.edu), 2301 Eastmark Dr., Apt. 340, College Station, TX 77840. *A Mathematical Model of the Effects of Growth and Remodeling on the Artery in a Hypertensive State.*

Hypertension is a medical condition in which the arterial wall is subject to a chronic high blood pressure of at least 140/90 mmHg. Persistent high blood pressure causes the heart to exert more energy to circulate blood through the blood vessels and can lead to life threatening conditions including stroke, heart attack and aortic aneurysm. It becomes very important to develop models to study conditions like hypertension and their effect of the body when considering the need for preventative measures and improved treatments. The current mathematical model addresses the effects that the body's natural tendency towards growth and remodeling has on an artery under various high blood pressures. This is achieved by solving a boundary value problem for the stress experienced by an unloaded residually stressed pressurized artery and then solving a minimization problem to determine how growth and remodeling has to occur in order to bring the body back to a preferred stress state after having been perturbed by hypertensive blood pressures.

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