1116-VM-1861 **Caleb L Adams*** (cadams5@radford.edu), Department of Mathematics and Statistics, Radford University, PO Box 6942, Radford, VA 24142. *An Extensible Mathematical Model of Glucose Metabolism.*

The impact of diabetes in the United States is immense. An estimated 29.1 million individuals, or 9.3 percent of the population, have diabetes. Nearly one-third of the cases is undiagnosed. The total of the direct and indirect medical costs associated with diabetes in 2012 was projected to be $245 billion. With the percentage of individuals being diagnosed with diabetes on a continual rise, one study estimates as many as one in three adults in the United States could have diabetes by 2050.

One must understand the glucose regulatory system of the healthy body to understand diabetes. Presented is the evolution of a model of ordinary differential equations beginning with a three-variable model of glucose, insulin, and glucagon mimicking the return of blood glucose levels to a constant, or basal, state. The extension includes the effects of a finite store of hepatic glycogen and whose solution demonstrates the short-term return of glucose concentration to near basal levels despite the constant energy usage which draws upon the glycogen stores. Long-term glucose homeostasis is explained by investigating the storage of a glucose load in the postprandial period and dispersion of stored glucose during the extended postprandial period. (Received September 21, 2015)