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Adam J Lonnerberg* (adamlonnerberg@yahoo.com), 5555 Ironwood Dr., Newburgh, IN 47630, and **Pengcheng Xiao** (px3@evansville.edu). *A Modeling Study of the Hypothalamic-Pituitary-Adrenal (HPA) Axis Including Glucocorticoid Receptor (GR)*. Preliminary report.

The human stress response is controlled largely by the hypothalamic pituitary adrenal (HPA) axis. Models predicting the levels of the hormones involved very often are not analytically solvable. Many of these models, such as Gupta et al. 2007, predict a bistability in this axis. Said bistability results in two steady states, a normal high-glucocorticoid receptor (GR) state, and an alternate low-GR steady state. In the current study, we are able to simplify the HPA axis model in order to solve it more easily while maintaining key features such as the bistability thereof. This model's equilibrium and characteristic polynomial are both more easily derived when compared with previous models, and the latter can be more easily analyzed via the Routh-Hurwitz criteria and its Sturm chain. Simulations run with this model exhibit oscillation, a feature found in many recent models to account for the circadian rhythms of this axis. (Received January 22, 2017)