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Yang Kuang* (kuang@asu.edu), Department of Mathematics and Statistics, Arizona State University, Tempe, AZ 85287. *Dynamics and implications of some models of hepatitis B virus infection.*

Chronic HBV infection affects 350 million people and can lead to death through cirrhosis-induced liver failure or hepatocellular carcinoma. We present the dynamics of some recent models of HBV infection with logistic hepatocyte growth and a standard incidence function governing viral infection. Some of these models also incorporate an explicit time delay in virus production. All model parameters can be estimated from biological data. We simulate a course of lamivudine therapy and find that the models give good agreement with clinical data. Previous models considering constant hepatocyte growth have permitted only two dynamical possibilities: convergence to a virus free or an endemic steady state. Our models admit periodic solutions. Minimum hepatocyte populations are very small in the periodic orbit, and such a state likely represents acute liver failure. Therefore, the often sudden onset of liver failure in chronic HBV patients can be explained as a switch in stability caused by the gradual evolution of parameters representing the disease state. (Received August 05, 2008)