Vicodin is the most commonly prescribed pain reliever in the United States. Research indicates that there are two million people currently abusing Vicodin, the majority of which were initially exposed via prescription. Our goal is to determine the most effective strategies for reducing the population of Vicodin abusers. We focus on whether prevention methods aimed at educating on the potential for drug abuse or treatment methods implemented after abuse will have a greater impact. We consider one linear and two non-linear compartmental models in which medical users of Vicodin can transition into the abuser compartment or leave the population by no longer taking the drug. Abusers can transition into a treatment compartment, leaving the population through successful treatment or relapsing and re-entering the abusive compartment. The linear model assumes no social interaction, while both non-linear models do. Sensitivity analyses are conducted varying the rates of success of these intervention methods to determine which strategy has the greatest impact on controlling the population of Vicodin abusers. From these models, we determine that manipulating parameters tied to prevention measures has a greater impact on reducing the population of abusers than those associated with treatment. (Received September 17, 2013)