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In order to make treatment accessible, psychologists are interested in developing outpatient treatment for problem drinkers who want to reduce, but not necessarily abstain from, alcohol consumption. While previous research demonstrated that medication and cognitive behavioral therapy (CBT) are effective outpatient treatments on average, there are still many factors that may impact an individual's success in reducing drinking. We use a Hidden Markov Model to demonstrate that different treatments affect not only the overall reduction in drinking, but also the probability of behavior change over time. While the addition of medication to CBT does not appear to increase the overall reduction of problem drinking (compared to CBT alone), the combination of treatments affects the transition rate from heavy drinking to social drinking. In addition, we evaluate the risk factors and dynamic relationships between drinking habits, everyday behaviors, and events that may impact a patient's success in reducing drinking and the probability of transitioning between behaviors (social and heavy drinking). We hope that our efforts will lead to models that can enhance clinical practice in the treatment of problem drinkers. (Received September 25, 2017)