Smoking cessation has been suggested to be more difficult for individuals with a history of chemical dependence. Previous research suggests a higher intensity of nicotine addiction, greater negative affect, and unfavorable psychometric assessment scores during cessation. The Indiana University Nicotine Dependence Program (IUNDP) treated over 1200 patients using a Mayo Clinic-based approach which assesses the behavioral, social, and physiological aspects of tobacco and nicotine dependence. The IUNDP was also instituted at FB. Participant charts (1992-2011) were selected from IUSD and FB for retrospective analysis. Chart selection criteria consisted of complete, pre- and post-quit measures for a minimum of four appointments, and two post-quit appointments. 107 charts from patients without history of chemical dependence (ND) and 123 from those with a chemical dependence (CD) history were reviewed. Student researchers, trained to a standardized protocol, captured 16 tobacco use and demographic variables, and 12 post-quit treatment measures. Analyses were made using Pearson chi-square tests for binary data, Wilcoxon rank sum tests for all other data, and Wilcoxon signed rank tests for changes between time periods. Comparatively, smokers in the CD group were likely to be male, and displayed an increase in the following: sensorimotor handling scores of the Horn psychological test of nicotine dependence, negative mood, anxiety, restlessness, and average withdrawal scores (p<0.05). Additionally, CD smokers had less decrease in anger, but a greater decrease in frustration (p<0.05). Despite some differences, smokers with and without a history of substance abuse were similar in their tobacco-related addiction parameters. Results suggest that smokers with a history of chemical dependence have greater difficulty during smoking cessation with respect to addiction-related sensorimotor manipulation and psychological withdrawal symptoms.