Cigarette smoking remains the single most preventable cause of mortality and morbidity in the United States. Long-term abstinence rates for even the most rigorous of smoking cessation treatments range between 20% and 35%. It is therefore essential that research continue to investigate novel smoking cessation interventions. Leading contemporary theories of addiction motivation posit that the escape or avoidance of negative affect withdrawal (NAW) symptoms (e.g., anger, anxiety, and depression/sadness) constitutes a strong motivational basis for cigarette smoking and plays a critical role in relapse to cigarette use. However, whereas NAW symptoms appear to exert a powerful influence on smoking cessation treatment outcome, smoking cessation interventions may exert only modest effects on NAW symptoms. Accordingly, it has been proposed that smoking cessation interventions may be augmented by aiding smokers in the practice of NAW regulation strategies. The primary goal of this investigation is to evaluate an early withdrawal exposure plus NAW regulation training intervention for smoking cessation. Specific aims include evaluating the efficacy of the treatment components and investigating potential mediators and moderators of the treatment components. Participants will be adult smokers (N = 400) of at least 5 cigarettes per day with the intention to quit smoking. Using a factorial design, participants will be randomized to early withdrawal exposure (yes vs. no) and behavioral intervention (NAW regulation training vs. relaxation control training), resulting in four distinct conditions. Our primary hypothesis is that early withdrawal exposure plus NAW regulation training will produce higher rates of seven-day point-prevalence abstinence at 1, 3, and 6 months after end-of-treatment, suggesting a synergistic (i.e., non-additive) effect of the two intervention components. Mediators (e.g., in-session withdrawal symptoms) and moderators (e.g., demographic characteristics, tobacco dependence) will be investigated via established analyses. These data will advance the experimental intervention with a focus on targeting mechanisms of change as well as participant characteristics to which the intervention may be tailored. The experimental intervention described in the current proposal has the potential to ultimately enhance the efficacy of existing smoking cessation interventions and will therefore contribute uniquely to the field.