



**NEURAL MECHANISMS OF MINDFULNESS-ORIENTED RECOVERY  
ENHANCEMENT**

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In the past decade, our nation has faced an unprecedented opioid epidemic that has caused addiction and overdose rates to rise dramatically. Since 1999, deaths from prescription opioids and the amount of opioids prescribed have quadrupled, yet Americans report no signs of increasing overall pain (CDC). A treatment is desperately needed not only as a rehabilitation therapy but also as a strategy for prevention.

This research evaluates a new and innovative mindfulness-based intervention called Mindfulness-Oriented Recovery Enhancement (MORE) that is designed to reverse the downward spiral shift in hedonic dysregulation that is commonly observed in individuals displaying substance use disorders. MORE is unique because it incorporates savoring and reappraisal strategies along with conventional meditation. Reappraising the discomfort of pain transforms the way one observes their distress, which could reduce emotional suffering. Savoring may potentiate the positive emotions one experiences, therefore leading to a decreased craving for opioids. Mindfulness strategies re-orient attentional bias towards opioid-related cues through the evaluation of cognitive processes non-judgmentally thereby increasing attentional control and reducing the conditioned behavior to medicate. Although more research is needed, studies suggest that MORE targets the neurobiological processes that underpin hedonic dysregulation.

Heart rate variability (HRV) is the beat-to-beat frequency variation governed by the autonomic nervous system and indicates increased responsivity to the environment. A high resting HRV may be indicative of homeostatic regulation (Thayer et al., 2012). In a pilot randomized control trial, MORE was used as a treatment (N=27) for alcoholism compared to support group therapy (N=26). Participants in MORE exhibited increased HRV following exposure alcohol cues, indicating increased appetitive response (Garland et al., 2010). Also, alcoholics with low HRV to alcohol cues were more likely to relapse following treatment (Garland et al., 2012). One of the ways MORE aims to reverse the downward spiral of addiction is by decreasing the attentional bias towards distressing sensations and other input that may fuel the addiction cycle. Changes in attentional responses may be reflected in physiological (autonomic) changes. Though the study is ongoing, we hypothesize that dispositional mindfulness, the tendency to be mindful in every day life, is associated with reduced craving and increased HRV reactivity to opioid cues – two factors correlated with opioid misuse risk. MORE may be an efficacious treatment for chronic pain and addiction to downturn the progression of the opioid epidemic.