



## 2020 DART Virtual Summer Research Day

### Neural Reactivity in Response to Alcohol and Trauma Cues with Depression Severity as a Moderator in Patients with Comorbid Alcohol Use Disorder and Posttraumatic Stress Disorder

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**Background:** Patients with comorbid alcohol use disorder (AUD) and posttraumatic stress disorder (PTSD) experience severe impairments and are at increased risk for depressive symptomatology. The reward pathway, represented by dopaminergic projections from the ventral tegmental area to the nucleus accumbens (NAc), contains circuitry implicated in both AUD and PTSD. However, little is known about the neurobiological mechanisms underlying comorbid AUD/PTSD, and how neural circuits implicated in this comorbidity might be modulated by depression severity. The current study uses functional magnetic resonance imaging (fMRI) to examine blood-oxygen level dependent (BOLD) signal among individuals with AUD/PTSD while accounting for sex and depression severity.

**Methods:** AUD/PTSD participants (N=24) were enrolled in a larger clinical trial. Participants listened to personalized imagery scripts (trauma, alcohol, and neutral cues) during a baseline fMRI scan. General linear modeling characterized BOLD signal. Main effects for the group were modeled, as were effects for sex, depression severity, and the interaction of sex by depression severity. **Results:** In the alcohol versus neutral cue contrast, significant activation was found in bilateral inferior frontal gyrus (IFC) ( $Z=3.1$ ,  $p<.05$ ). In the trauma versus neutral cue contrast, significant activation was found in the middle and superior temporal gyrus ( $Z=3.1$ ,  $p<.05$ ). There were no effects for sex, depression severity, or sex by depression severity in either contrast. **Conclusion:** Contrary to hypotheses, findings suggest that depression severity is not associated with a difference in NAc activity among individuals with AUD/PTSD, whether responding to an alcohol or trauma cue. Among individuals with AUD/PTSD, IFC reactivity, a region involved in response inhibition and attentional control, might indicate an anticipatory effect during a salient alcohol cue. The middle/superior temporal gyrus, which may play a role in dissociative states in PTSD, shows

increased activity during a trauma cue. These neural regions might be particularly relevant treatment targets for AUD/PTSD.