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### Neuroscience-informed interventions for youth with history of traumatic stress

35% of youth living in communities of high violence will develop significant post-traumatic stress disorder symptoms. Current treatment modalities that anchor in Cognitive Behavioral Therapy (CBT) may leave 20-50% of youth without adequate symptom relieve. New treatment modalities that address executive function, memory and emotion regulation are needed and access and dissemination should be taken into consideration. This presentation will introduce Stanford's Cue-Centered Therapy (CCT) and a school-district wide prevention effort that involves yoga and mindfulness in students' curriculum. CCT integrates elements from CBT with other empirically validated interventions for traumatized youth (psychodynamic therapy, insight, self-efficacy, education). The prevention study focuses on health and wellness through meditation and exercise. Our research identifying key brain regions (e.g.; hippocampus, amygdala, prefrontal cortex) alterations in structure and function as related to traumatic stress informed the development of CCT. CCT demonstrated effectiveness in reducing anxiety, depression and post-traumatic stress symptoms in a randomized controlled trial. We are currently engaged in treatment outcome research to demonstrate CCT's efficacy in improving brain function and cognitive and emotional outcomes. The presentation will focus on our imaging (sMRI and fMRI) and salivary cortisol studies that set the stage for the development of CCT. In addition, sleep was investigated in our prevention study. A curriculum of yoga and mindfulness improves sleep variables and these will be presented. New treatment modalities and dissemination plans need to be developed to address the highly heterogenous group of children that fall under the diagnostic umbrella of Post Traumatic Stress Disorder (PTSD). Approaching both prevention and treatment that are informed by neuroscience research promises to make our interventions more focused and targeted.

### Recent Publications

1. Klabunde M, Weems C, Raman M and Carrion V G (2016) The Moderating Effects of Sex on Insula Subdivision Structure in Youth with Post Traumatic Stress Symptoms. *Depression and Anxiety*; 34(1): 51-58.
2. Weems C F, Klabunde M, Russell J D, Reiss A L and Carrion V G (2015) Post-traumatic stress and age variation in amygdala volumes among youth exposed to trauma. *Social Cognitive and Affective Neuroscience*; 10(12): 1661-7.

### Biography

Victor G Carrion is an Endowed Professor and Vice-Chair in the Department of Psychiatry and Behavioral Sciences at Stanford University and Director of the Stanford Early Life Stress and Pediatric Anxiety Program. He is in the Faculty at both Stanford University School of Medicine and Lucile Packard Children's Hospital. His multidisciplinary research on the behavioral, academic, emotional and biological late effects of experiencing trauma has led to the development and implementation of effective new interventions for treating children who experience traumatic stress.

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