Randomized Controlled Trial Evaluating the Effects of a Trust-Building Intervention on Adolescent Weight Self-Management Behaviors

**Background/Significance:** Adolescent obesity continues to be a serious concern in the US, placing young people at risk for multiple chronic conditions. Family-based interventions have been demonstrated to be most effective in combatting this challenge, but adolescents’ trust of their parents diminishes around age 14 as a result of developmental brain changes. This distrust may thwart family-based self-management of weight interventions; therefore, our study intends to build trust between adolescents ages 10-12 and their parents, alongside self-management of weight skills. Our premise is that self-management interventions that target both analytic components and emotional components of self-management will be most effective in helping individuals achieve self-management outcomes. We are using fMRI to examine the relationship between two large-scale cortical networks, the default mode network (DMN) and the task positive network (TPN), and their contributions to behavior. We posit that the TRUST intervention will influence the adolescent’s emotional (DMT) neural processing through the trust-building component (honesty, reliability, emotional connection), while the analytic (TPN) neural processing will be influenced by the skills building component (knowledge, skills, self-monitoring) of the intervention, both of which work together to promote healthy weight self-management behaviors (eating, physical activity, sleep). In addition, we hypothesize that the TRUST intervention will influence the adolescent’s neurological reward activation between social reward and palatable food reward demonstrated in the ventral striatum.

**Purpose/Study Aims:** The purpose of this pilot study is to evaluate the effect of the Trust-building weight Self-management Together (TRUST) intervention on weight management behaviors and neural processing among overweight and obese adolescents. Study aims include comparing the effects of the TRUST intervention with Enhanced Usual Care on BMI and quality of life in overweight/obese early adolescents and exploring differences in neural processing (DMT/TPN switching and reward activation).

**Methods:** We will recruit 30 adolescent/parent dyads. We will conduct a two-arm pilot RCT to describe the effects of the TRUST intervention on BMI (height and weight) and quality of life (PROMIS-25 Pediatric), mediated by the effect of cognitive task switching between the DMT and TPN neural networks (fMRI) and neurological reward activation in the ventral striatum (fMRI). The TRUST intervention is guided by Rotenberg’s Framework of Interpersonal Trust and includes eight 90-minute weekly sessions. The Enhanced Usual Care group will receive a single dietary and physical activity counseling session and eight weekly social phone calls for attention control. Participant dyads will complete SMART Center common data elements and other surveys at baseline, three months, and six months. Adolescent participants will also receive an fMRI at baseline and at three months.

**Analysis:** We will use a repeated measures ANCOVA model adjusting for the intervention arms and the baseline level of the outcome variable. This will enable us to determine the effect of the intervention and effect size estimates for use with future studies. The SMART Center Neurocognitive Core will direct the analysis of the neuro-cognitive task switching and reward activation (fMRI).

**Dates of study funding:** August 2016-July 2018

**Participant enrollment:** To begin August 2016

**Intervention delivery:** To begin November 2016

**Data collection:** To begin October 2016