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## Brain Imaging Studies Reveal Neurobiology of Eating Disorders

Current treatments for anorexia and bulimia nervosa, which afflict an estimated 10 to 24 million Americans, are often limited and ineffective. Patients relapse. They become chronically ill. They face a higher risk of dying.

“A major reason contributing to the difficulty in developing new treatments for these disorders is our limited understanding of how brain function may contribute to eating disorder symptoms,” said Walter H. Kaye, MD, professor of psychiatry and director of the Eating Disorder Treatment and Research Program at the University of California, San Diego School of Medicine.

In recent, published papers, Kaye and colleagues report the situation is changing. Advanced brain imaging technologies, supported by grants from the National Institute of Mental Health, are beginning to be used to study and improve eating disorder treatments. Indeed, with funding from the Global Foundation for Eating Disorders (GFED), a New York City-based group that promotes eating disorder (ED) research and improved treatments, the UC San Diego Eating Disorders Center for Treatment and Research has launched a new initiative to create more effective ED therapies based upon brain imaging studies.

“Brain imaging research has allowed for a shift from simply describing a symptom to understanding the cause of a symptom,” said Kaye. “In the case of anorexia nervosa, imaging studies have helped us understand *why* people avoid eating and food and develop treatments that address the cause of the problem rather than secondary behaviors or symptoms.

“This is an important shift in the world of psychiatry similar to what revolutionized medical care decades ago. Today, if you show up at the doctor’s office with a bad cough, he or she might run diagnostics to determine whether the cough was bacterial or viral in order to administer the appropriate treatment. Similarly, the more we understand the specific causes of eating disorders, the more effective and targeted our treatments can become.”

The UC San Diego program, under the directorship of Kaye, Kerri Boutelle, PhD, associate professor of pediatrics and psychiatry, Leslie Karwoski Anderson, PhD, clinical assistant professor of psychiatry and GFED scholars Stephanie Knatz and June Liang, is developing an imaging-based treatment package specifically to address the neurobiology of anorexia nervosa, in which patients obsess about being or becoming overweight. To prevent weight gain or lose weight, people with anorexia nervosa typical may starve themselves or exercise excessively.

Kaye said one neurobiological target of anorexia and other eating disorders is anxiety. Most people get irritable when they do not eat and experience eating as both a reward and pleasant experience. Conversely, anorexic individuals frequently feel extreme anxiety when eating food – or even just anticipating eating – which results in severely reducing their food intake as a means of reducing their feelings of anxiety.

“Recent imaging research has uncovered specific alterations in the brain associated with this link between food and anxiety in anorexic individuals,” said Kaye. “This finding is important because it helps explain the of cause food restriction, the most critical and dangerous behavior in anorexia.”

The UC San Diego researchers have used the new information to create new treatment strategies, including psychoeducation – teaching patients why symptoms occur and how to more effectively cope.

“Many patients have described finally feeling a wave of relief after learning that the anxiety they experience is not their fault, but partly due to how their brain is responding to food,” said Kaye. “Understanding *why* their eating disorder is driving them to restrict allows them to better target their anxiety around meals. Strategies such as developing routines before meals have shown promise in reducing the anticipatory anxiety leading up to meals and food restriction.”

Kaye said the brain-based therapy also benefits families of patients with eating disorders.

“Through a better understanding of their family member’s eating disorder and its causes, family members have found comfort and hope with a ‘road map’ guiding them through the recovery.”

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