



## MEMBERSHIP SPOTLIGHT

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### TITLE

**Changing Brains Changes the Game:  
Clinical Relevance of Habit and Reward Circuitry in Eating Disorder Treatment**

One of the hallmarks of Anorexia Nervosa (AN) is rigidity. As eating disorder professionals, we risk becoming rigid in our work, treatment philosophies, and practices when we operate in a vacuum.

We starve ourselves and patients of the fruits of cross-disciplinary learnings. Broadening our perspective to include insights from mental health and medical specialties beyond the eating disorder world may help us better understand challenging core symptoms shared between eating disorders and other diagnoses. We then become open to new ideas and innovative interventions for patients who fail multiple attempts at current evidence-based treatments.

How do we affect real change in life-threatening compulsive eating behaviors? We understand that insight itself is insufficient to create behavioral change, especially among patients with deeply entrenched eating disorders.

Habitual behaviors have been shown to be mediated by frontostriatal circuits, which link areas of the brain involved in reward processing (striatum) with the thinking, planning and “rational” frontal cortex.

In health, this connection leads to behaviors consistent with one’s reported goals or outcomes. In certain disease states, as recently shown with AN, alterations in this circuitry are associated with persistent, maladaptive food choices that are incompatible with recovery—even when the patient reports a genuine desire to recover. So, what drives this inconsistency?

There has been much neuroscientific research illuminating aberrant reward circuit functioning in patients with substance use disorders (SUD), who habitually “choose” maladaptive and dangerous substance use over more adaptive options.

The parallels between compulsive consumption of drugs in addiction and eating behaviors symptomatic of bulimia nervosa (BN) and binge eating disorder (BED) has long been appreciated. Yet, until recently, there has been little focus on aberrant reward pathway processing and uncontrollable compulsive behavior in persistent AN.

In part, it has been a stretch to associate loss of control with a disease that seems to epitomize behavioral control. Sadly, there remains much stigma in society and

even within our field associated with loss of control—whether it’s the patient with SUD who cannot stop drinking or the patient with BED who cannot stop bingeing. In SUD, BN and BED, even the naïve eye can recognize loss of control.

A deeper look is required in order to appreciate what the patient with AN could possibly have in common with the one suffering from alcoholism or BED.

Studies that examine the brains of patients with eating disorders provide that deeper look. A recent study published in *Nature Neuroscience* highlights the role of altered brain circuitry underlying compulsive food choices (low calorie, low fat) made by patients with AN. Disturbances in the brain regions responsible for habit formation and reward processing were revealed. Similar abnormalities have been found in brain studies of patients with other diagnoses, such as SUD and obsessive compulsive disorder (OCD).

How do we reconcile this given these disorders have little in common with respect to diagnostic criteria? A deeper look at AN reveals that the experience of weight loss and food control for sufferers is linked both with reward (positive reinforcement of maladaptive behavior) and avoiding discomfort from new behaviors/eating (negative reinforcement). When we look at transdiagnostic disease traits such as compulsivity, we begin to appreciate what seemingly disparate illnesses have in common.

This would be merely an academic exercise if not for translational research. Several habit-breaking approaches with preliminary positive results among patients with SUD and OCD include cognitive remediation therapy, exposure response prevention, deep brain stimulation and repetitive transcranial magnetic stimulation. There are preliminary reports of using these methods in patients with eating disorders. It takes years, even decades, to bring novel treatments into gold-standard, evidence based approaches. Until that time, how do we affect behavioral change for our eating disorder patients?

First and foremost, brains must be nourished in order to change. Refeeding is a necessary precursor to changed neurocircuitry and changed behaviors. Until old habits are unlearned and new habits solidified, patients must be willing to rely on “ancillary” circuits to guide their decisions and behaviors.

This necessitates extensive professional, peer and family support. The capacity to trust and believe in that support requires a leap of faith. We ask our patients to make that leap each time we encourage an action or thought that is contrary to what their brain may be telling them in active disease.

So until we have DBS, or rTMS, or novel medication strategies, we rely on our capacity to foster trust and build community for our patients. Without our ability to engender hope, believability, and faith, our gold standard treatments will remain un-ingested by the patient dying of this eating disorder. Even the best medication won't work if the patient is unwilling to take it.

Foerde, K., Joanna E Steinglass, J.E., Shohamy, D., and Walsh, B.T. (2015). Neural mechanisms supporting maladaptive food choices in anorexia nervosa. *Nature Neuroscience*, 18(11): 1571-1573.



### **Author Bio**

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