Edible Reinforcements: A Reward or Punishment?
by Patricia Novak, MPH, RD, LD
and
Carol Bradley, PhD, RDN, BCBA, LD, FAND

Food rewards to encourage behavioral change seem to make sense. People generally respond well to food as a reinforcer. The rationale for the use of food rewards in behavioral therapy is that food is a primary or natural reinforcer, which does not require any learning process in order to be effective. Other sources of behavioral or psychological reinforcers that occur naturally are warmth, air, sleep, water and sex. Of these natural reinforcers, food can be used in most settings and is easily provided without a significant amount of effort. Food as a reinforcer seems an obvious choice, but years of research does not lead us to conclude that food rewards are consistently effective.¹⁻⁴ In fact, use of a single sensory reinforcer has been shown to be equally as effective as a single food reinforcer, and multiple sensory reinforcers can be even more effective than multiple food reinforcers.²

When edible reinforcers are studied, usually as Applied Behavioral Analysis (ABA) therapy, the research focuses on how to systematically make the response to a reinforcer more rewarding.⁵⁻⁹ This means seeking answers to questions such as: Does satiation through regular meals influence food as a reinforcer? Are novel or familiar foods more effective? Is it the sensory characteristics of food that make it so effective? What is the best reward magnitude or schedule? The number of subjects in these studies is small because of the uniqueness of the subjects and their need for a more individualized intervention due to their lack of intrinsic motivation and lack of responding to social or sensory reinforcers such as praise or music.²⁻⁴

More recent research investigates individual response to the edible reward. Research questions attempt to determine who will be most responsive and how to measure response to a
Edible Reinforcements: A Reward or Punishment?

continued from page 1

Food reward. This research builds on older research while applying different learning theories and assessment techniques such as brain scans, EEG, heart rate and biochemical assessment.

- Do food rewards as extrinsic motivation, interfere with intrinsic motivation, which is thought to lead to more permanent change? How do neural pathways, particularly dopaminergic systems, influence motivation?

- Who are most receptive to food rewards? How do we measure reward sensitivity? Studies of typically developing, overweight individuals indicate greater response to food rewards than individuals who are not overweight. Greater impulsivity is also related to reward sensitivity.

- How does the brain respond to food rewards? Are there ways to enhance or depress the response? Much of this research has focused on identifying areas of the brain involved in reward response, role of neurotransmitters, and the influence of food rewards on eating habits.

Individuals with intellectual developmental disabilities (IDD) and autism spectrum disorders (ASD) may have characteristics that influence response to food rewards. Since feeding problems are common in this population, there is the potential that food is aversive. Highly palatable foods such as gummy bears and hard candy, frequently used to override satiation related to adequate meal intake, pose a safety risk due to oral-motor problems. Food-seeking behavior is common and associated with hypothalamic dysfunction (Prader-Willi syndrome, traumatic brain injury), sensory processing impairment, ASD, or the use of medications that enhance appetite as a side effect (anti-psychotics, SSRI’s). Even though food rewards are likely to be extremely reinforcing in these groups, the enthusiastic response to food reinforcers can interfere with the individual’s attention and emotional regulation. The reward may become the focus rather than the task, limiting learning and generalization. Ultimately, as the food reinforcer is faded, it can lead to behavioral problems such as food stealing or tantrums rather than behavioral solutions.

What conclusions, then, can be drawn from the studies on food as reinforcers? Interpretation is challenging, as the result of any reward protocol is dependent on who is administering the reward, how the reward is provided and the individual’s response, not only to the reward itself but also to the social and environmental situation. This is particularly salient for the IDD and ASD populations, both due to the universal use of food rewards in this population and the unique expression of specific diagnoses in the individual. At best, edible reinforcers have the potential to be effective but perhaps not any more effective than other commonly used rewards. While the benefits of food rewards remain questionable, the risks are well established.

The American Academy of Pediatrics, American Academy of Family Physicians, Academy of Nutrition and Dietetics, American Academy of Child and Adolescent Medicine, American Psychological Association, Mayo Clinic, and Yale Medical Group all recommend that food not be used as a reward.

Care-providers or interventionists may think that use of food rewards is inconsequential, but the frequency of use by multiple people and in many different settings can result in a significant amount of food being consumed. One study found that 70% of middle school teachers use food rewards and rewards most commonly used are candy, cookies, doughnuts or sweetened drinks. Food rewards promote dental caries, which is a significant issue for many individuals with IDD/ASD due to poor dental hygiene, access to dental care and the frequent need for anesthesia to complete dental work due to cooperation concerns. The most obvious issue with edible reinforcers is the risk of unintended weight gain with the potential for negative health implications.

Using food rewards in overweight children is medically contraindicated especially if the child exhibits weight-related health issues. Think also how confusing it is for the individual and family when weight management efforts seek to de-emphasize food while simultaneously being rewarded with food.

The RDN can help care providers, teachers and therapists understand the risks and limitations of food rewards while recognizing that it can be a challenge to change entrenched practices. The first step is determining what rewards are being used and if they are successful. Food rewards are often justified because they are presented as temporary since the ultimate goal in behavioral programs is fading and

continued on page 3
Edible Reinforcements: A Reward or Punishment? continued from page 2

extinguishing the use of the reward. Despite the plan to extinguish, food rewards are frequently used for many years and the message that food IS a reward has been established. Many published case reports cite examples of long-term use with variation in the food (chips instead of candy), scheduling or magnitude but rarely is the use of food questioned.\(^7\)

The challenge is finding the perfect match for the individual’s interests, sensory profile, developmental level, and diagnosis as well as the treatment goals and location of intervention. Before suggesting alternatives, a reinforcer preference assessment\(^24\) is needed to determine what will work best by meeting with the individual and people who know the individual well.\(^23\) Consider also if there are aspects of the diagnosis that may influence reward pathways.\(^10,21,23\) In ASD, “liking” and “wanting”, essential to reward use, may be atypical, with great implication for the effectiveness of any reward system.\(^23\) Brain imaging has identified limitations in using social reinforcers (social approval) for some individuals with ASD\.\(^23,24,25\) It is not that social approval is not desired but for some individuals, over-responsivity to social stimuli leads to avoidance of interactions, restricting use as reinforcement for the desired behavior.\(^24\) Sensory experiences as reinforcers may be particularly attractive as sensory seeking is a very common characteristic of children with ASD or IDD.\(^2,8\) Sensory reinforcers may include physical activity or a preferred activity, particularly self-stimulatory behaviors (if it is determined to be developmentally appropriate).\(^2\) Environmental factors may limit the use of some alternatives such as outside play or watching a favorite TV show.

Alternatives to edible rewards exist and ultimately can lead to more lasting change. The following questions may be helpful to ask when making recommendations regarding food rewards:

1. Are there health concerns that demand the elimination of food rewards? Food rewards are contraindicated in the presence of fatty liver, Type 1 or 2 diabetes, metabolic syndrome, hypertension, dental caries, excessive weight gain velocity or in disorders associated with hypothalamic dysfunction. A physician prescription forbidding food rewards may be needed for individual education or treatment plans.

2. Where and when are food rewards used? Collaborate with family members, support team (aides, babysitters), therapists and teachers. Consider not only direct rewards but also “token economies” where tokens may be redeemed for school supplies, jewelry, toys or other non-edible items.

3. Have alternatives to food reinforcers been trialed? Investigate what type of alternative therapies or reinforcers have been used, in what environments, length of time and results.

4. What are the individual’s interests? How do they express interest? As much as possible, seek out this information from the client. Include aides, parents, teachers and others in this process as each person may have a different perspective on the interests, talents and skills of the individual.

5. How will the reinforcers be used? Are they specific for individual tasks? Prioritize interventions related to safety. Consider if the task is reinforcing in itself.

Implementing Recommendations

The following are strategies to help implement recommendations to discontinue use of food rewards.

• Collaborate with all relevant team members in drafting recommendations.

• Provide clear, written instructions with attention to the literacy and numeracy of the individual and care providers. Make sure the information is provided to all members of the individual’s support, medical, educational and therapeutic teams.

• Establish outcome measures to assess effectiveness of new plan.

• Acknowledge that rigidity is a cardinal characteristic of ASD and change is hard for everyone. Additional support may be necessary.

• Identify a time frame for evaluation of the plan. Receive and acknowledge feedback from all team members.

Ideas for Non-Edible Rewards

It is important to determine the need for immediate or delayed rewards.

Media: use of computer or tablet, watching preferred video, listening to music, reading

Sensory:

• Auditory- making or listening to music or preferred sounds

• Tactile- sand play, play-dough, water play, fabric play, hair brushing

• Vestibular activities- swinging, jumping, running, rocking, bouncing on exercise ball

• Proprioceptive- physical activities, hug, hammering

• Physical activity- jumping, running, swimming, walking, bike riding, ball play

Personal preferred activity: string play, cards, stuffed animals, drawing, walking, sorting, puzzles, polishing nails, preferred outing (park, shopping center, market, train station)

Social: caregiver interaction, peer interaction, taking care of friends or animals, board games

Classroom/Group activities: taking roll, helping teacher with task, line leader, taking care of classroom animals, decorating bulletin board, extra free play

Case Study #1

HIPAA identifiers, including unique patient characteristics were removed prior to publication.

Mario, age 18, with diagnoses of ASD and Trisomy 21, has had acceler-
Edible Reinforcements: A Reward or Punishment?
continued from page 3

Ated weight gain over the past year. His parents report that there have been no changes in health, intake or activity at home, but he is in a new school program.

A visit to the school indicated that food is used to both reinforce appropriate behavior and teach independent living skills (outings to fast food restaurants, markets). The use of food reinforcers was evaluated and results are as follows:

- Tokens are earned when desired target behaviors are exhibited and used to purchase food in the classroom store. The classroom store primarily has foods such as cookies, candy and chips.
- Parties or movie days are also part of the token economy and include high calorie foods.
- Small candies have been used periodically throughout the year in behavioral therapy to address problematic issues (inappropriate social interactions).

Recommendations were developed in collaboration with Mario, his family, school staff (teachers, occupational therapist, psychologist) and RDN. The goals were to minimize exposure to food and provide Mario with opportunities to develop desired behaviors without continual food reinforcement. Mario enrolled in a social skills program rather than continue individual behavioral treatment. Behavioral reinforcers used in the social skills program were positive reciprocal interactions and activities with staff and peers rather than food. This not only eliminated the food reinforcement but also mimicked real-life social interaction. The classroom store was encouraged to stock non-food items such as jewelry, chapstick, decorations, socks and water bottles. Students were also now able to not just earn tangible items but also to earn experiences (e.g. walk with staff and time on computer). The focus of parties and movie days was shifted to be thematic and include foods related to the event or movie theme.

Case Study #2

HIPAA identifiers, including unique patient characteristics were removed prior to publication.

Dan, 21 years old, lives in a supported housing environment for individuals with ASD. The staff has noticed that Dan has been less interested in eating dinner. In the past, he would eat the majority of foods presented, even if they were not preferred, such as vegetables. Now he only eats highly preferred food at dinner, mainly breads and desserts. At times, he has no interest in eating dinner, refusing to participate. He does eat better on the weekends, but mealtimes generally are more informal with fewer staff and residents participating. Staff is concerned due to nutritional and social implications. Dan has a history of eating issues and often has had challenges eating a wide range of foods and maintaining appropriate weight. He rarely identifies feeling hungry and often needs to be reminded to eat but does enjoy eating preferred foods. The residents also help prepare meals and eat together; lack of participation is not only limiting intake but also development of self-care/cooking skills and social participation.

The RDN reviewed Dan’s current health status and activities. Dan has been healthy and there have been no medical issues. He continues to participate in physical activities, including a swim team through Special Olympics. Dan works at a large printing and mailing company with a disability support program. The director of this program recently began having regular food-related celebrations at about 4 pm, after the day’s tasks were completed. These included pizza, cupcake decorating and ice-cream socials. She felt the celebrations rewarded the work and allowed for social interaction between all employees.

The RDN met with the HR director to identify other options for employee interaction such as a game hour or volunteer time in the community as well as ideas for food-related activities (e.g. less frequent ice cream socials and container gardening). A program was started for recognition of “good work” that included award certificates and gift cards to electronics stores, supermarkets and miniature golf/arcade.

About the Authors:

Patricia Novak, MPH, RD, LD has over 30 years clinical experience working with children with autism, developmental disabilities and feeding disorders. She has published in leading journals, authored chapters and has been involved in parent and professional training. She served as BHN’s Intellectual and Developmental Disorders Resource Professional from 2014-16. Patricia currently is part of a ASD research group at the Waisman Center at U of Wisconsin, Madison. She can be reached at PatriciaNovakRD@gmail.com

Carol Bradley, PhD, RDN, BCBA, LD, FAND holds a MA degree in Nutrition and a PhD in School and Behavioral Psychology. She has served in a variety of positions in her 30 years of experience as a registered and licensed dietitian. Carol currently serves as a licensed behavior analyst at the state-supported living center in Lufkin, TX where she works with intellectually disabled individuals who are medically fragile. She has also held multiple board positions for the Texas Affiliate and committee positions for Weight Management and Behavioral Health Nutrition DPGs. Carol was honored as 2018 Texas Distinguished Dietitian. She can be reached at Carol.Bradley@hhsc.state.tx.us

References

3. Blair JM, Fox BR. Effects of differential reinforcement procedures on discrimination

continued on page 5
Edible Reinforcements: A Reward or Punishment?

continued from page 3


15. Puhl RM, Schwartz MB. If you are good you can have a cookie: How memories of childhood food rules link to adult eating behaviors. *Eat Behav.* 2003; 4:283–293.


Probiotics for Depression and Anxiety: Emerging Mechanisms and Considerations for Clinical Application

by Sarah Thomsen-Ferreira, MS, MPH, RD, CDN, CNSC, CLT, IFNCP, CHWC

This article was produced in collaboration with The Integrative RDN, a publication of Dietitians in Integrative and Functional Medicine DPG

Introduction

The microbiota-gut-brain axis has been explored broadly for its role in behavior and the mind, including pain perception, cognitive function, mood and emotion, temperament, stress management, and even social interaction. In the Journal of Physiological Anthropology, Selhub, Logan, and Bested hypothesize that increased prevalence of anxiety and depressive disorders can be attributed, in part, to a decrease in microbial diversity fueled by modern food choices such as decreased intake of dietary fibers acting as microbiota-accessible carbohydrates, citing population studies which link traditional healthy diets (such as Mediterranean or Japanese) with lower risk of anxiety or depression. Skillful application of therapeutic lifestyle interventions which strategically modify the microbiome, even if modifications are transient in nature, holds potential to address the significant burden of anxiety and depressive disorders.

The most recent data available from the Centers for Disease Control and Prevention indicates that 8 million ambulatory care visits (to physician offices, outpatient clinics, and emergency departments) carry major depressive disorder (MDD) as the primary diagnosis. Anxiety disorders, which include panic disorder and generalized anxiety disorder among others, are the most common class of mental disorders present in the general population. Anxiety is described as a frequent, negative emotional state characterized by feelings of worry and apprehension and accompanied by specific cognitive and behavioral manifestations. Anxiety is diagnosable as a disorder when “the anxiety, worry, or physical symptoms cause clinically significant distress or impairment in social, occupational, or other important areas of functioning.”

The experience of anxiety is accompanied by overactive activity in the amygdala and changes in prefrontal cortex, areas of the brain which regulate critical emotion. In addition to γ-aminobutyric acid (GABA), serotonin, opioid peptides, endocannabinoids, neuropeptide Y, oxytocin and corticotrophin-releasing hormone are also implicated in stress disorders.

The Inflammation Connection

Through immune-brain signaling pathways, chronic low-grade inflammatory processes are thought to impact neurochemical changes involved in the pathogenesis of neuropsychiatric disorders including major depression and anxiety disorders. Dinan describes major depression as a “common, debilitating stress-related disorder whereby patients frequently experience hypothalamic-pituitary-adrenal (HPA) alterations such as elevated cortisol levels in plasma, elevated corticotrophin releasing factor (CRF) levels in the cerebrospinal fluid, and increased concentrations of pro-inflammatory cytokines.” Specifically, increased expression of IL-1β, IL-6, TNF-α, interferon gamma (IFN-γ) and C-reactive protein (CRP) have been repeatedly observed in depressed patients. Administration of probiotics can alter levels of circulating cytokines, as has been seen with *Bifidobacterium infantis* normalizing peripheral pro-inflammatory cytokine concentrations. In a study assessing the effects of probiotic-supplemented yogurt (*Lactobacillus rhamnosus* GR-1 and *Lactobacillus reuteri* RC-14) in 20 subjects with inflammatory bowel disease (IBD), the yogurt decreased concentration of TNF-α– and IL-12–producing monocytes measured in peripheral blood. Additionally, decrease of those pro-inflammatory cytokines correlated with increased presence of regulatory T cells (CD4+CD25+), which are central to immune-based down-regulation of ongoing inflammation. The potential to use targeted probiotics to modulate inflammatory mediators and impact mood via neuroendocrine systems or the vagus nerve is emerging.

Probiotics and Psychobiotics

Probiotics are defined broadly as microorganisms that, when consumed, maintain or restore beneficial bacteria to the digestive tract. In contrast, the term psychobiotics describes “a live organism that, when ingested in adequate amounts, produces a health benefit in patients suffering from psychiatric illness.” Mechanistically, psychobiotics should have demonstrated behavioral effects, act as vehicles of delivery for neurotransmitters and have the ability to decrease pro-inflammatory cytokines and reduce HPA activity. The term microbial endocrinology has also been used to describe “bidirectional neurochemical interactions between the host’s neurophysiological system and the microbiome.”

continued on page 7
Probiotics for Depression and Anxiety: Emerging Mechanisms and Considerations for Clinical Application

continued from page 6

Essentially, the gut-brain axis consists of bidirectional communication between the gastrointestinal (GI) tract, or enteric nervous system, and the central nervous system, resulting in a linkage of peripheral intestinal functions with the emotional and cognitive centers of the brain. The enteric nervous system, often referred to as the “second brain,” consists of an estimated 200 million to 600 million neurons.

Signaling molecules from the microbiome include amino acid metabolites, short chain fatty acids and neuroactive substances. As peptides and hormones produced by bacteria can directly or indirectly regulate the host behavior, interventions targeting the gut-brain axis could be novel treatments for both anxiety and gastrointestinal disorders such as irritable bowel syndrome (IBS).

The interplay with the microbiota-gut-brain axis between health and disease has been investigated through various study designs, including germ-free studies, fecal transplantation studies, infection studies and probiotic and antibiotic studies. Probiotic administration studies are frequently used to explore the relationship between gut microbiota, brain, and behavior. The body of research developed around psychiatric disorders has integrated functional GI disorders including IBS, given the high comorbidity with anxiety disorders. A 2016 systematic review and meta-analysis by Huang, Wang, and Hu acknowledges that “the efficacy of probiotics for depression is controversial.” Including five full-text articles in their analysis, investigators found a standard mean difference of 0.30 favoring probiotic intake in the experimental (probiotic) group. However, oral probiotics only reduced depression rating scales for those under the age of 65.

Mechanisms

Cryan and Dinan outline several potential mechanisms by which microbiota affect central nervous system function:

- Altering microbial composition (allowing for improvements in gut barrier function)
- Immune activation through cytokine production: psychoneuroimmunology presents a cytokine theory of melancholic depression and postpartum depression, whereby cytokines and inflammatory messengers are predictive and linearly correlated with depression
- Vagus nerve (cranial nerve X)
- Tryptophan metabolism
- Microbial neurometabolites (generation of neurotransmitters and neuropeptides)

A contemporary challenge to firmly establish the impact of specific probiotic strains on depressive symptoms is the wide variation in duration of intervention, quantity and strains of probiotics, and different criteria used to define depression. At a phylum level, the microbiome represents at least 70 bacterial phyla with dominant bacterial phylotypes. The total weight of our gut microbes is estimated at 1% to 3% of total body mass, or 2 to 6 pounds of bacteria in a 200-pound adult. In an analysis of the fecal microbiome composition, patients with MDD (as compared to healthy controls) presented with significantly different concentrations of 72 different bacterial communities when analyzed at the genus level—most significantly, those with MDD exhibited increased levels of Enterobacteriaceae and Alistipes with reduced levels of Faecalibacterium. Faecalibacterium has demonstrated anti-inflammatory activity within the gut.

Synthesis and release of neurotransmitters has been demonstrated from the following various bacteria:
- B infantis can influence central 5-hydroxytryptamine (5-HT) transmission levels through elevating plasma tryptophan levels.
- Serotonin, also called 5-HT, is a metabolite of the amino acid tryptophan which plays an important role in the regulation of several bodily functions including mood. Although whether 5-HT acts as a primary deficit in depression remains unresolved, 5-HT deficiency does seem to be associated with severe depression and/or suicidality.
- Lactobacillus plantarum 299V has resulted in a significant rise in fecal Bifidobacteria levels. Bifidobacteria increases plasma tryptophan levels, impacting turnover of serotonin and dopamine in areas of the brain associated with depression and anxiety.
- GABA, the major primary inhibitory neurotransmitter of the central nervous system which counterbalances the excitatory neurotransmitter glutamate, can be produced by Lactobacillus, Lactococcus, Streptococcus, and Bifidobacterium strains.

Neurotransmitters produced by gut bacteria are able to cross the intestinal mucosa and can potentially affect physiological responses in the brain, while preclinical data in mouse models has helped to clarify other mechanisms through which gut-brain communication could be influencing mind and mood. One model for exploring bidirectional communication of the gut-brain axis is to use germ-free mice as a control. It has been demonstrated that, in germ-free mice, brain-derived neurotrophic factor (BDNF) expression is decreased in the hippocampus as compared with controls. BDNF is a plasticity-related protein which promotes neuronal growth and of which levels are reduced in the brain and serum of depressed individuals.

Although to this point preclinical animal studies represent the majority of microbiome research, human studies have begun to emerge to guide application. Of human studies completed, measurement has been achieved with a variety of measurement tools including the General Health Questionnaire (GHQ), the Depression Anxiety and Stress Scale (DASS), the Leiden Index of
Probiotics for Depression and Anxiety: Emerging Mechanisms and Considerations for Clinical Application

continued from page 7

Depression Sensitivity-Revised (LEIDS-r), the Positive and Negative Symptom Scale (PANSS), the State-Trait Anxiety Inventory (STAI), the Development Behavior Checklist (DBC), the Beck Depression Inventory (BDI), the Beck Anxiety Inventory (BAI), the Hopkins Symptom Checklist (HSCL-90), the Hospital Anxiety and Depression Scale (HADS), the Perceived Stress Scale (PSS), the Coping Checklist (CCL), and the Profile of Mood State (POMS) questionnaire.

In a recent double-blind, placebo-controlled, randomized parallel group study, volunteers received either the probiotic combination Lactobacillus helveticus R0052 and Bifidobacterium longum R0175 or placebo for 30 days. Daily administration of the probiotic significantly reduced psychological distress, as measured by the HSCL-90, the HADS and by the CCL. The HSCL-90 is a symptom inventory which measures symptoms of anxiety and depression, while the CCL is a questionnaire which captures the ways in which individuals deal with the internal and/or external demands of specific stressful encounters.

A triple-blind, placebo-controlled, randomized, pre- and post-intervention assessment study randomized 20 healthy participants to receive a multispecies probiotic to assess impact on cognitive reactivity of sad mood. The questionnaire used in this study was the LEIDS-r, a self-report questionnaire which measures vulnerability to depression. Over 4 weeks, study participants were provided with 2 g of freeze-dried powder containing Bifidobacterium bifidum W23, Bifidobacterium lactis W52, Lactobacillus acidophilus W37, Lactobacillus brevis W63, Lactobacillus casei W56, Lactobacillus salivarius W24, and Lactococcus lactis (W19 and W58). At time of assessment, those who had received the 4-week probiotic intervention experienced significantly lower cognitive reactivity to depression, especially to aggressive and ruminative thoughts.

Serotonergic Pathway

Recent recommendations published in American Family Physician for the diagnosis and management of generalized anxiety disorder and panic disorder in adults position selective serotonin reuptake inhibitors (SSRIs) as well as cognitive behavior therapy as first-line treatments for both conditions. The serotonergic system originates in the raphe nuclei in the brainstem with additional 5-HT receptors throughout the brain and within the myenteric plexuses.

Another mechanism whereby specific bacterial strains could modify mood is through the production of GABA which is the main inhibitory transmitter in the human cortex and which has receptors in the enteric nervous system. When L rhamnosus was dosed to a mouse model, animals demonstrated reduced anxiety as measured by various behavioral measures as well as altered expression of GABA receptors. However, when animals underwent vagotomy (preventing gut-brain communication), there was no change in GABA receptor expression and lack of anxiolytic effect.

In an 8-week randomized crossover trial in healthy males assessed using self-report stress measures, cognitive assessments and electroencephalogram, L rhamnosus (JB-1) dosed at 1x10^9 colony-forming units (CFU) did not demonstrate advantage to placebo for modifying stress-related measures or HPA response.

Probiotics in Clinical Use

Given that Selhub, Logan, and Bested attribute a degree of our limited microbial diversity (and subsequently altered gut-brain signaling) to decreased consumption of fermented foods, whole food sources of gut-healthy substrate are worth considering for their mood-boosting benefits. It is notable that food-based sources of probiotics (cultured and fermented foods) offer benefits which would not be seen with isolated probiotic supplements. In addition to enhancing activity of bacterial strains, traditional fermentation can also enhance protein quality and the bioavailability of nutrients relevant to mood, including folate and zinc. Preclinical and clinical studies have shown that zinc interacts with the serotonergic system to enhance antidepressant effects while suboptimal levels of both serum folate and erythrocyte folate have been associated with increased depressive symptoms and decreased treatment response.

Clinically, close attention should be given to the quality and microbial content of fermented food sources recommended to promote efficacy. In a study on the effects of probiotics on mental health and the HPA axis in petrochemical workers, Mohammedi et al compared the effect of probiotic yogurt, conventional yogurt and probiotic capsules. The probiotic yogurt contained L acidophilus LA5 and B lactis BB12 while the conventional yogurt contained Streptococcus thermophilus and Lactobacillus bulgaricus. The probiotic capsule contained 7 probiotic bacteria species as well as fructo-oligosaccharide. After 6 weeks of consumption, changes in DASS scoring demonstrated significant improvements in the probiotic capsule group and probiotic yogurt group, but not in the conventional yogurt group.

Tillisch et al demonstrated the ability for fermented milk to modify changes in midbrain connectivity when a small group of women were given a fermented milk product with probiotic strains Bifidobacterium animalis, B lactis, S thermophilus, L bulgaricus and L lactis. Over a 4-week period during which women consumed 125 g of yogurt twice daily, changes in activity (as measured by functional magnetic resonance imaging [fMRI]) in brain regions which control central processing of emotion and sensation were observed. In a study of 124 individuals, consumption of a milk-based drink with L casei demonstrated a statistically significant change in mood (using Profile of Mood States

continued on page 7
Probiotics for Depression and Anxiety: Emerging Mechanisms and Considerations for Clinical Application

continued from page 8

variables) only among those who scored in the third lowest tertile at baseline.40

Therapeutic use of probiotics may have an especially pronounced benefit for those with mood disorders which are comorbid to GI disease. After assessing case-control studies for frequency of anxiety and depression in those with IBS, Fond et al recommended that IBS patients be regularly screened for anxiety and depression symptomatology, given significantly higher prevalence of anxiety in IBS-C and IBS-D and of depression in IBS-D.41 A group of 44 adults with comorbid IBS (diarrhea or mixed-stool pattern) and mild to moderate anxiety or depression were given 1x10^{10} CFU of *B longum* NCC3001 per day. At week 6, fMRI scans demonstrated less activation of the amygdala when exposed to fear stimuli, which also correlated with reduction in amygdala when exposed to fear stimuli, demonstrating less activation of the NCC3001 per day. At week 6, fMRI scans demonstrated less activation of the amygdala when exposed to fear stimuli, which also correlated with reduction in depression scores.42

**Clinical Applications and Cautions**

When attempting to guide patients, clinicians should remain attentive to emerging research indicating strength of the evidence for various bacterial strains and strengths. For those integrating fermented foods regularly into their practice, Dolan et al provide a helpful product summary which reflects professional and commercial products as well as food sources of various bacterial strains based on work established thus far for both depression and anxiety. [This paper and table are free access through PubMed Central.]43 Where are we now? Since much of our knowledge comes from animal studies and cohesive interpretation of results of human trials is challenging due to variability in bacterial strains and methods used, there is a need for additional research in populations where participants meet criteria for clinical psychiatric disorders or a validated level of psychological disturbance to move the field of microbial endocrinology further into clinical practice.44 Given already established influences of the gut microbiota on brain and behavior, gut-brain psychology is expected to enhance the study and practice of psychology, neuroscience and psychiatry, with a focus on targeting the microbiome through probiotics, psychobiotics and microbiota transplantation to achieve improved mental health.1,28

**About the Author**

Sarah Ferreira is a Registered Dietitian, Integrative and Functional Nutrition Certified Practitioner and Certified Health and Wellness Coach. She is the owner of Mindfully Nourished Solutions, where she uses a whole-person, whole-food based approach to help women reclaim their nutritional wellbeing. Sarah received her BS in Nutrition Science with a minor in Psychology through Russell Sage College and earned a Master of Science in Nutrition and Food Management and a Master of Public Health in Public Health Practice. Learn more at mindfullynourishedsolutions.com.

**Disclosure:** The author would like to disclose that between the time of the writing and the publishing of this paper she began partnering with Amare Global.

**References**


Probiotics for Depression and Anxiety: Emerging Mechanisms and Considerations for Clinical Application

continued from page 9


CPE Questions for Probiotics for Depression and Anxiety: Emerging Mechanisms and Considerations for Clinical Application

1. Microorganisms that, when consumed in adequate amounts, have demonstrated behavioral effects and the ability to reduce HPA activity are best described as:
   a. Probiotics
   b. Prebiotics
   c. Psychobiotics
   d. Synbiotics

2. Decreased expression of BDNF in the hippocampus of germ-free mice compared to controls helps to demonstrate which of the following:
   a. The bidirectional communication of the gut-brain axis
   b. That BDNF promotes neuronal growth
   c. That BDNF is reduced in the brain and serum of depressed individuals
   d. Several mechanisms by which microbiota affect central nervous system function

3. In addition to having active bacterial strains, traditionally fermented foods offer which of the following benefits:
   a. Higher levels of tryptophan
   b. Increased bioavailability of zinc
   c. Contribute to increased fecal Bifidobacteria levels
   d. Enhance expression of GABA receptors

4. According to Selhub et al, which aspects of traditional dietary patterns, such as Mediterranean and Japanese, may be protective against depression and anxiety?
   a. High levels of folate, zinc and magnesium
   b. Low added sugar and high protein levels
   c. High omega-3 content from fish, nuts and seeds
   d. Traditionally fermented foods and high dietary fiber

5. Signaling molecules produced by the microbiota include which of the following:
   a. Fructo-oligosaccharides and corticotrophin releasing factor
   b. Dopamine and glutamate
   c. Amino acid metabolites, short chain fatty acids, and neuroactive substances
   d. Firmicutes and Proteobacteria
Dialectical Behavioral Therapy: Using an Evidence-Based Psychotherapeutic Modality to Enhance Effectiveness of Nutrition Therapy for Eating Disorders

By Stefanie R Boone, MS, RD, CEDRD

Introduction

Strong counseling skills are an important component of providing nutrition therapy for clients with eating disorders; because an eating disorder (ED) is a psychiatric diagnosis, registered dietitian nutritionists (RDNs) should be psychologically informed.1-3 ED clients often have co-occurring psychiatric diagnoses, as well as trauma, and attachment issues,4-5 and as a result, can exhibit certain maladaptive patterns in the way they think, feel, and behave. Though these psychological issues are primarily addressed in psychotherapy, they often play out in nutrition therapy as well. While eating disorder dietitians (EDRDs) are responsible for clients’ nutritional healing, they must also be highly competent in counseling to be able to navigate the strong emotions, negative or inappropriate affect, and relational issues that present in nutrition sessions.6

There are several evidence-based psychotherapeutic modalities that EDRDs currently integrate into their nutrition sessions to enhance effectiveness with clients.6-9 For example, motivational interviewing (MI) is effective for working with ambivalence around recovery,6,10 and components of Cognitive Behavioral Therapy (CBT), particularly thought records and correcting cognitive distortions, can aid in addressing the faulty thinking that keeps clients stuck in their ED behaviors.5,11,12 This article will focus on the usefulness of a third modality, Dialectical Behavioral Therapy (DBT), and its core concepts in nutrition therapy for EDs.

Dialectical Behavioral Therapy (DBT)

DBT is a skills-based behavioral treatment that uses a dialectical philosophy. The term “dialectical” means a synthesis of opposites. For every viewpoint that exists there is an opposite, and opposing points of view can both be true; the truth emerges from the integration of the opposing positions.13,14 There are currently two modalities under the umbrella of DBT: Traditional DBT (T-DBT) and Radically Open-DBT (RO-DBT). Dialectical thinking, radical openness, validation, and biosocial theory are the four concepts to be explored in this article. EDRDs can enhance their ability to effectively handle the complexity of treating eating disorders by learning and implementing these foundational DBT skills, all of which can be used in nutrition therapy to increase empathy, strengthen the therapeutic relationship, and facilitate nutritional healing.

Traditional DBT (T-DBT)

Traditional DBT (T-DBT) refers to the skills-based cognitive behavioral treatment developed in the late 1980s by Marsha Linehan, PhD, ABPP. This modality was originally developed to treat chronically suicidal individuals diagnosed with borderline personality disorder (BPD), and it is now a widely used evidence-based treatment for substance dependence, depression, post-traumatic stress disorder (PTSD), and eating disorders.13,14 T-DBT targets clients who struggle with impulsivity and moderate to severe emotion dysregulation, both traits of emotional undercontrol (UC).15,16 The ED behaviors usually exhibited in clients with these traits are overeating and purging.17 T-DBT includes skills for mindfulness, emotion regulation, distress tolerance, and interpersonal effectiveness.

Radically Open DBT (RO-DBT)

Radically Open DBT, developed by Thomas R. Lynch, PhD, FBPsS, builds upon T-DBT, and targets clients with an overcontrolled (OC) personality style. People with OC tend to inhibit emotional expression and have a high ability to tolerate distress. They are highly sensitive to threat, averse to novelty, and have a low reward sensitivity (meaning stimuli that would usually be pleasurable to most people do not feel as rewarding or pleasurable in an OC client). These tendencies lead to social signaling deficits that make it hard for clients to connect with other people.15,18 The ED behaviors most often associated with these traits are food restriction, flexible responding, enhanced social connectedness, and vulnerable expression of emotion. Radical openness (RO) is the core philosophical principle in RO-DBT.

Four Core DBT Concepts to Inform Nutrition Therapy

Dialectical Thinking

Dialectical thinking is an effective antidote to the black-and-white thinking that can be common in ED clients.17 When thinking and speaking dialectically, use the language of “and” instead of “but” in the spirit of finding the kernel of truth in opposing viewpoints.13 For example, a client in ED recovery may be ambivalent about recovering; this is due to a dialectic between wanting to get rid of the ED while at the same time wanting to hold onto it. These two opposing desires are true simultaneously. Approaching this situation dialectically, one desire does not negate the other. If a client or clinician were to believe that the client either wants to get better or doesn’t, much suffering would result from this polarized view, as every slip would be...
Dialectical Behavioral Therapy: Using an Evidence-Based Psychotherapeutic Modality to Enhance Effectiveness of Nutrition Therapy for Eating Disorders

interpreted as proof of the client’s lack of desire to recover. This perpetuates a cycle of black-and-white thinking that can keep a client stuck.

A core dialectic woven throughout DBT is the idea that for a client to progress, some measure of self-acceptance must coexist with the desire to change.13 One cannot happen without the other. Additionally, the EDRD needs to accept where a client is in the recovery process, even though the EDRD is also helping the client make changes in thinking and behavior. When a client is not progressing in his or her nutrition work, it can be tempting to keep finding different ways to work on behavior change. While persistence is vital, at a certain point it can be helpful to simply acknowledge and accept that the client is stuck. This allows an opportunity to regroup and reduces the chance of client and clinician becoming overly frustrated. When the EDRD senses it’s appropriate, the focus can shift back to behavior change. Knowing which to focus on in nutrition therapy at any given time is a valuable skill for an EDRD to cultivate and takes a combination of training, practice and intuition.

Dialectical thinking can help clients overcome black-and-white thinking around food judgments (foods can have both positive and negative qualities) and body image (clients can work on body acceptance while desiring to change their body). Clinicians can think dialectically about the issue of blind weighing, food addiction, and many other controversial issues that ED treatment providers often disagree about.

Radical Openness

Radical openness (RO), the core skill of RO-DBT, promotes open-mindedness and challenges clients and clinicians to be receptive to disconfirming feedback and new experiences. To practice RO, one must be able to notice when one is being closed, inflexible, and rigid, and be willing to ask oneself questions that promote open-mindedness (e.g. “Is there something I can learn here? Is it possible I don’t know all the answers? Is there another way to look at this?”).15 EDRDs can use radical openness in nutrition therapy for EDs to cultivate a non-judgmental stance with clients. How the EDRD chooses to address a client’s food beliefs or preferences can make or break the therapeutic relationship with the client. Though many clients have ED-related food fears that drive their food choices/avoidances, it’s also possible that a client’s choices are not ED-motivated. For example, a client may avoid red meat for many reasons; though it may be fear that red meat will cause weight gain, it may also be dislike from a taste perspective, not feeling well after eating it, or ethical beliefs around eating red meat.

Another example includes clients who endorse digestive distress after eating a reasonably sized meal; the EDRD might suspect the client is exaggerating the discomfort to avoid following the full meal plan, and on the other hand, the client may be experiencing gastroparesis-induced digestive distress. In truth, both of these may be at play. In this way, radical openness can strengthen the therapeutic bond via the client feeling heard and validated. Clients greatly appreciate an EDRD with an open mind who does not automatically dismiss a food avoidance as a disordered behavior without exploring it in session.

Validation

The skill of validation is vital for both rapport building and keeping the client engaged in nutrition therapy. Validation refers to the act of acknowledging and accepting a person’s feelings, thoughts, behaviors and internal experience as valid and understandable.13,20 To validate, EDRDs must be able to show empathy (the accurate understanding of the person’s experience), and communicate that the person’s response makes sense in the context of the person’s situation, history, or belief system.13,15 Validation helps the client feel seen, heard, and understood. Validation can help a client with emotion regulation, while invalidation tends to increase emotional upset.13 EDRDs can unwittingly invalidate a client around food, exercise, and body image beliefs and behaviors if they are not mindful and attuned to their clients. While it’s easy to make assumptions as to what a client is thinking or feeling, one must be careful not to automatically attribute food behaviors to the ED. An EDRD can inadvertently come across as judgmental or invalidating via facial expressions, body language, or verbal language.

Key points for using validation include:

- Validating is not the same as approving, agreeing or condoning.13 One can validate a client’s urge to binge in the context of the need to self-soothe paired with a lack of alternate coping skills in the moment, and at the same time not condone binging as a healthy solution.

- Don’t validate the invalid.13 For example, if a client is distressed about her body composition or shape because she thinks it makes her look unattractive or weak, one can validate that her feelings are understandable in the context of society’s cultural ideals but not validate the faulty belief that her body shape actually does make her unattractive or weak. Similarly, one can validate that a client’s urge to purge makes sense in the moment (he or she is terrified of weight gain) but should not validate that purging is an effective weight loss strategy.2,6

Biosocial Theory

Biosocial Theory is predicated on the idea that the development of mental illness or personality disorder may be due to biological predispositions in the person interacting with social factors in the environment.21 Each DBT modality has a biosocial theory that attempts to explain the origins of the client’s maladaptive coping styles.16 Biosocial theories posit that UC or OC issues develop due to the interaction between biology and environment.

Biosocial Theory of Emotion Dysregulation

In T-DBT, the biosocial theory of emotion dysregulation attempts to explain causes and conditions that often contribute to developing a UC
Dialectical Behavioral Therapy: Using an Evidence-Based Psychotherapeutic Modality to Enhance Effectiveness of Nutrition Therapy for Eating Disorders

continued from page 12

coping style (impulsivity, emotional lability, mood-dependent behaviors). The theory asserts that emotion dysregulation evolves as a coping style when a child with a biological temperament that is highly sensitive and reactive is paired with caregivers who pervasively invalidate emotional expression. The child “learns” that escalating emotional expression is the only way the child will get his or her needs met (attention, care). The child cannot learn how to manage intense emotions effectively, as emotional undercontrol is reinforced in the environment. What this means for an EDRD in session with a UC client, is that the client may escalate or overreact to a seemingly harmless comment in a way that feels disproportionate to the situation. The dietary component of treatment (e.g., nutrition sessions, meal outings, grocery outings) causes a particularly high level of emotion dysregulation. Experiential (meal and grocery) sessions can cause anxiety, anger, and intense distress when clients are outside their comfort zone. An undercontrolled client might cry or panic during a meal session, or might shut down if intensely activated, which could happen even in a seemingly benign conversation about nutrition. Keeping the biosocial theory in mind, one can stay grounded, avoid personalizing, and cultivate empathy around the idea that this client may not know what else to do in this moment to be heard.

EDRDs must be able to recognize what dysregulation looks like in the individual client to be effective in nutrition therapy for EDs. When clients clearly express intense emotions this is easy, but often the cues are more subtle (e.g., dissociation, shutting down, becoming non-verbal, shallow breathing, facial expression, and voice quality). The EDRD learns a client’s signals over time by non-judgmental observation and asking the right questions in a sensitive manner, such as:
- “I’m noticing you are tearing up. Are feelings coming up around this?”
- “How are you feeling right now? You seem quiet.”
- “Are you present right now or somewhere else?”

Validating a client’s emotional response can help the client emotionally regulate and reduce any shame about the emotional reaction (e.g., “It makes sense that you’d be anxious/emotional/distressed considering how hard this is for you to do.”).

The impulsive or mood-dependent decisions UC clients often make when they are dysregulated can interfere with ED treatment. This can manifest in the form of no-shows, late cancellations, and arriving late to sessions. These clients also may struggle with maintaining appropriate boundaries with clinicians (e.g., excessive phone calls, emails, and texts, overall lack of regard for clinicians’ communication policies). To avoid potential surprises and ruptures, the EDRD is advised to clearly state potential consequences of no-shows, late cancellations, arriving late to sessions, and lack of adherence to communication policies.

Biosocial Theory of Disorders of Overcontrol
As previously mentioned, people with OC have a superior ability to inhibit emotional expression and tolerate distress. They are highly sensitive to threat, averse to novelty, and have a low reward sensitivity. In RO-DBT, the biosocial theory of overcontrol elucidates what happens when a child with the biological temperament described above grows up in a caregiving environment that positively reinforces perfectionism and inhibition of emotional expression. The result tends to be a client who is a perfectionist, is attracted to rules, dislikes the unexpected, and avoids emotional expression.

Along with OC comes social signaling deficits (e.g., inhibited or disingenuous expression of emotion), which make it hard for these clients to connect with other people. The EDRD should be prepared for the scenario that the OC client could be hard to read in session. Their facial expressions may not match their internal experiences. They can appear pleased when they are angry, or angry when they are neutral. One may have difficulty connecting with these clients, or perceive they are uninterested or angered by what one is saying. Fear of conflict, rejection, and being perceived as non-compliant may drive an OC client to agree to things in session with no intention of following through (e.g., they may say yes to a meal plan knowing they cannot adhere to it). These fears also cause the client to be extremely compliant with clinicians’ policies on cancellations, lateness, and boundaries around communication outside of session.

Though compliance can seem like a positive thing, one must be mindful that the compliance is fear-motivated, and helps the client avoid conflict, sometimes to the detriment of showing authenticity with the clinician.

Rigidity around food and exercise is how the OC manifests in the form of an eating disorder. EDRDs must keep in mind that these clients are not just being willful when refusing to eat a new food or change an exercise routine. Rather, they have not learned how to be open and flexible, and these states feel unsafe to them. Clients with an OC coping style are not going to be excited about trying a new food, changing up an exercise routine, or taking steps to relieve suffering (e.g., eating). In fact, an OC client’s brain feels rewarded when following rules and tolerating distress. As such, it would be unrealistic to expect an OC client to admit to being in pain from overexercise or that starvation feels bad.

The theories discussed above provide a gateway to understanding what drives clients’ affect and behaviors. The maladaptive coping styles of UC and OC developed as a way for clients to get their needs met (love, safety, security, approval) from a very young age.

Conclusion
DBT has an abundance of useful skills for EDRDs to incorporate into their nutrition counseling. Since dialectical thinking, radical openness, validation, and biosocial theory are effective tools for the psychotherapeutic component
Dialectical Behavioral Therapy: Using an Evidence-Based Psychotherapeutic Modality to Enhance Effectiveness of Nutrition Therapy for Eating Disorders

continued from page 13

of ED treatment, it stands to reason that these same skills can increase effectiveness in nutrition therapy as well.

Thinking dialectically, as well as using radical openness, can inform an EDRD’s work in a positive way. One important role of the EDRD is to help clients increase flexibility and openness with food, exercise, and body image issues; the EDRD can model these concepts by always keeping an open mind and actively listening to the client’s point of view. Exploring the perfectionism and rigidity in a gentle and non-judgmental way with clients, as well as within the clinician, can open the door to helping clients on a deeper level. Validating a client’s emotions, fears and beliefs, even if one doesn’t have the same viewpoint, is a trust-building tool. Finally, knowledge of the biosocial theory has the potential to increase empathy in the EDRD by providing valuable insight into the causes and conditions that led the client to maladaptive coping behaviors.

One does not have to be a psychotherapist to integrate a psychotherapeutic modality into a nutrition session. An overview and suggested clinical applications of central T-DBT and RO-DBT concepts has been provided in this article; recommended reading and training resources are listed below. Additionally, EDRDs can seek professional supervision from a DBT-informed clinician. Because treating eating disorders can be complex, it’s advantageous to have a variety of tools in our toolbox, as we never know when a certain skill or concept will resonate with a client and contribute to recovery.

About the Author

Stefanie Boone, MS, RD, CEDRD is a nutrition therapist for men and women with eating and exercise disorders. She has worked with clients in her private practice in Santa Monica, CA individually and in groups for the past 20 years, using a combination of philosophies centering around Intuitive Eating, DBT and ACT to help clients heal their relationship with food, exercise, and body image. Stefanie has an added specialization in treating eating disorders in people who have co-occurring mood disorders and addictions.

Contact Information:
Email: steff@stefanieboonerd.com
Phone: 310-892-6852

References

DBT Educational Resources
For Traditional DBT:
• https://behavioraltech.org/

For RO DBT:
1. http://www.radicallyopen.net/about-ro-dbtt/  
Dialectical Behavioral Therapy: Using an Evidence-Based Psychotherapeutic Modality to Enhance Effectiveness of Nutrition Therapy for Eating Disorders

continued from page 14

November 1, 2018.


Acknowledgments

The BHNewsletter would like to thank the following reviewers for their assistance with this issue:

Julia Cassidy, MS, RD, CEDRD-S
Marci Evans, MS, CEDRD-S, LDN
Jacqueline Larson, MS, RDN
Joan Guthrie Medlen, MEd, RDN
Kathryn Russell, MS, RD
Diane Spear, MS, RDN, LD, FAND
Holly A. Van Poots, RDN, CSP, FAND
Jaimie Winkler, RD, LDN, CEDRD-S

BHNewsletter has a new look and new publication schedule. Our now-semi-annual newsletter still delivers the same in-depth, relevant, peer-reviewed content members have come to expect now with 2 CPE articles in each issue.

Get involved!
Volunteer to author or review. Let us know if you have questions, comments or suggestions. Email newslettereditor1@bhndpg.org

If you’re missing something you’re used to seeing in the quarterly newsletter you may just need to look a little further. Check your inbox:

Don’t miss our new monthly newsletter BHN in the kNOW.
This publication connects BHNFamily on a timely basis with content you don’t want to miss!

- feature articles
- words from our Executive Committee
- reports
- highlights from our electronic listserv
- election information
- and more.

Look for a BHN DPG e-blast toward the end of every month.

Get connected!
Share information and ideas with BHN in the kNOW.
Email bitkeditor@bhndpg.org

BHNewsletter is published twice a year as a publication of Behavioral Health Nutrition, a dietetic practice group of the Academy of Nutrition and Dietetics. All issues are published electronically; members receive an email announcement and link for direct access. Newsletters are available on the BHN Website at www.bhndpg.org.

CPE Credit: BHNewsletter offers at least one CPE article with each publication. CPE articles, test questions and certificates are available at www.bhndpg.org. BHNewsletter also falls under the Professional Portfolio Guide’s CPE Section-200 Professional Reading for peer-reviewed, science-based articles equivalent to one-half (0.5) to one (1.0) CPE if read within 5 years of publication.

Address Changes and Missing Issues: Contact the Academy of Nutrition and Dietetics with your new address information. If you missed an issue, contact Becky Hudak at newslettereditor1@bhndpg.org.

Advertisement Policy: BHN accepts advertisements for the semi-annual newsletter. Ads are subject to approval of the editorial board. For guidelines and fee schedule contact Becky Hudak at newslettereditor1@bhndpg.org.

Advertisements should not be construed as endorsement of the advertiser or product by the Academy of Nutrition and Dietetics or by BHN.

Submissions: Articles about successful programs, research, interventions and treatments, meeting announcements and educational program information are welcome and should be forwarded to the editor by the next deadline.

Future Submission Deadlines
Fall 2019: June 1, 2019
Spring 2020: December 1, 2019

Editor:
Becky Hudak, RDN

Assistant Editors:
Caitlin Royster, RDN, LDN
Meg Salvia, RDN, CDE, CEDRD
Marni Silver

Newsletter Review Board:
Katie Gustafson, Manager, DPG/MIG Relations
Megan Kniskern, MS, RD, LD/N, CEDRD-S
Jaimie Winkler, RD, LDN

Individuals not eligible for Academy of Nutrition and Dietetics membership may apply to become a “Friend of BHN” for the subscriber cost of $50.00. A check or money order should be made payable to Academy/DPG #12 and sent in care of the BHN Treasurer (see officer contacts in this newsletter).

Copyright 2019 BHN. All rights reserved.

The BHNewsletter may be reproduced only by written consent from the editor. Direct all requests to newslettereditor1@bhndpg.org.
Executive Officers 2018-2019

*Chair (2018-2019)
Megan Kniskern, MS, RD, LD/N, CEDRD-S
chair@bhndpg.org

*Chair-Elect (2018-2019)
April N. Hackert, MS, RDN, CEDRD
chair@bhndpg.org

*Past Chair (2018-2019)
Janice Scott, MS, RDN, DSC, LD
pastchair@bhndpg.org

*Treasurer (2017-2019)
Jennifer Costello, RD, LCSW
treasurer@bhndpg.org

*Secretary (2018-2020)
Carly Siceloff, MS, RD, LDN
secretary@bhndpg.org

*HOD BHN Representative (2018-2021)
Sharon Lemons, RDN, CSR, FAND, LD
hodrepresentative@bhndpg.org

Membership Team

*Membership Chair (2016-2019)
Lester Rosenzweig, MS, RDN, CDN
membershipchair@bhndpg.org

Resource Professionals

Addictions Resource Professional (2018-2020)
Ashley M. Lytwyn, MS, RDN
addictionresourceprofessional@bhndpg.org

Hailey Goodrich, RD, LDN
eatingdisordersresourceprofessional@bhndpg.org

Jean Daniello, MS, RDN, LDN, CDE
intellectualdevelopmentaldisabilitiesresourceprofessional@bhndpg.org

Mental Health Resource Professional (2018-2020)
Julia Cassidy, MS, RDN, CEDRD-S
mentalhealthresourceprofessional@bhndpg.org

Student Liaison Committee Chair
Kelsey Rose
studentliaisoncommittechair@bhndpg.org

Nominating Committee Chair
Christina Lowey, RD, LD
nominatingcommittechair@bhndpg.org

Nominating Committee Member
Julie Duffy Dillon, MS, RD, NCC, LDN, CEDRD
nominatingcommitteemember1@bhndpg.org

Public Relations Team

*Public Relations Director
Kathryn Fink Martinez, MS, RD, LD, CEDRD
publicrelationsdirector@bhndpg.org

Sponsorship Chair
Sarah Gleason, RD, LD, CEDRD
sponsorshipchair@bhndpg.org

Webinars Coordinator
Eugenia Goh, MS, RD, LDN
webinarcoordinator@bhndpg.org

Social Media Coordinator
Julie Cole, MS, RDN, CEDRD
socialmediacoordinator@bhndpg.org

Website Coordinator/Editor
Kathryn Russell, MS, RDN, FAND
websitemaster@bhndpg.org

Policy and Advocacy Leader and Reimbursement Chair
Kacy Grossman, RD
policyandadvocacyleader@bhndpg.org

Publications Team

*Publications Chair
Jaimie Winkler, RD, LDN
publicationchair@bhndpg.org

Newsletter Editor
Becky Hudak, RDN
newlettereditor1@bhndpg.org

Newsletter Associate Editor
Meg Salvia, RDN, CDE, CEDRD
newsletteeditor2@bhndpg.org

Student Newsletter Editors
Marni Silver
studentassistantnewslettereditor2@bhndpg.org

CPE Test Writer
Kathryn Mount, MS, RDN, LDN
cpetestwriter@bhndpg.org

Newsletter CPE Manager
Caitlin Royster, RDN, LDN
newslettercpemanager@bhndpg.org

DPG/MIG Relations

Manager, DPG/MIG Relations
Katie Gustafson
The Academy of Nutrition and Dietetics
kgustafson@eatright.org

*Voting Member

Contribute an article or topic for future BHN Newsletter issues!
Contact newslettereditor1@bhndpg.org or one of the BHN leaders listed in this newsletter.

Executive Officers 2018-2019

Mission: Empowering BHN members to excel in the areas of Addictions, Eating Disorders, Intellectual and Developmental Disabilities and Mental Health by providing resources and support.

Vision: Optimizing the physical and cognitive health of those we serve through nutrition education and behavioral health counseling.

Academy of Nutrition and Dietetics website: www.eatright.org
BHN website: bhndpg.org
BHN practice standards: www.bhndpg.org/members/practice-standards/