

# BHN Newsletter

**Behavioral  
Health  
Nutrition**

a dietetic practice group of the  
**eat right.** Academy of Nutrition  
and Dietetics

*BHN: Fuel Your Brain, Feel Your Best!*



## BHN Case Study 2016-6

Submitted by  
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*In-depth screening by the RDN, identifying and addressing underlying contributing factors, combined with collaboration between team members, can achieve personalized nutrition and mental health care, yielding meaningful results for patients.*

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

This 21-year-old male was referred to nutrition services, by his primary care physician, for obesity and elevated triglycerides. His health history reflects problems with depression, suicidal attempts, chest pain, anxiety, ADHD tendencies, irritability, aggressive impulses, expressive and receptive language disorder, inability to read, borderline intellectual functioning, (suspected) insulin resistance, night eating and self-reported heartburn and stomach aches.

**Diagnoses:** Mild Intellectual Disability; Impulse Control Disorder; Obsessive Compulsive Disorder; Depressive Disorder NOS; Reactive Attachment Disorder; Schizophrenia (hearing voices); Metabolic Syndrome; Insomnia; Hypertriglyceridemia; Hypertension and Obesity. Additional diagnoses discovered during nutrition therapy: Obstructive Sleep Apnea; Vitamin Deficiency and MTHFR Allele Polymorphism.

**Family and Social History:** There is an early family history of abuse and neglect. At age 10 he was placed into the state foster care program and was periodically hospitalized for mental health issues. He attended special education classes through age 18, aged out of state foster care and was placed in a state-funded group home. In the last 6 months he has lived in a community Medicaid waiver funded supported-living home with two roommates. He has worked various jobs in food service, auto detailing, and cleaning. Temper and oppositional behavior have caused barriers to holding a job. However, it is very important to him to make money and to have friends. Video games, movies and cooking are his favorite activities. He advocates for himself, talks easily with others and negotiates very well. Communication is difficult when he is upset and may begin to argue. With behavioral supports he is developing coping skills, such as calming talk and removing himself from the difficult or escalating situation, to better manage stress and behavioral responses. He manages most of his own daily living skills with assistance

**Objectives:** After reading and studying this case, participants

1. Will be able to describe the need for additional tests when routine screening is not sufficient for determining the health risks or interventions suggested by health or nutritional indicators.
2. Will identify changes in laboratory values resulting from following the Nutrition Care Plan that resulted in reducing this patient's health risks.
3. Will be able to describe which members of the interdisciplinary team worked together in treating this patient.
4. Will be able to identify drug nutrient interactions which affected the nutritional status of this patient



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**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**

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## From the Chair

Janice Scott, MS, RDN, CSP, LD



As I reflect on the most recent FNCE® meeting in Chicago, I am left with a few striking thoughts. Registered Dietitian Nutritionists care about people. We are excited about our study of nutrition science and we know that sharing our knowledge will improve the lives of our patients and clients. RDNs rise above the noise of unproven schemes and costly regimens to demonstrate that what people need can be found by following scientific principles.

BHN RDNs go beyond just food. BHN RDNs work in a unique intersection between nutrition and neurological function. We work with people who are not always easy or beautiful. We invest our time and talents to help them find a path of self-care that involves eating well. We walk alongside folks struggling to put their lives in order and care-givers for those not able to care for themselves. We demonstrate how food forms the basis of positive physical and mental health. Our compassion sets us apart from the ordinary.

It is good to review the BHN Mission, Vision and Goals to remind us why we chose this practice group.

**Mission**

Provide resources and support which empower Behavioral Health Nutrition members to excel in the areas of addictions, eating disorders, intellectual and developmental disabilities and mental health.

**Vision**

Optimize the physical and cognitive health of those we serve through nutrition education and behavioral health counseling.

**Goals**

1. The public trusts and chooses Registered Dietitians as food and nutrition experts.
2. BHN members improve the health of the clients we serve.
3. Members and prospective members view BHN as vital to professional success.
4. BHN members collaborate across disciplines with food and nutrition communities.

This year at the FNCE® member breakfast, I stood in awe of the dietitians that are national leaders and influencers in the realm of behavioral health. In addition to their scientific knowledge, their heart for the nutrition care of the population we serve shines through all their work. I shared a table with Dr. Shirley Ekvall, PhD, RD, LD, author of the quintessential guidebook for care of children and young adults with developmental disabilities. Later, I stood in the coffee line with David Wiss, MS, RDN, CPT, the nationally recognized expert in nutrition for addiction recovery. Our own chair-elect, Megan Kniskern, MS, RD, CEDRD was featured as the BHN Spotlight speaker this year. Her thought-provoking presentation showed us how food aversions often masquerade as food allergy claims. In the field of mental health, Dr. Ruth Leyse-Wallace, PhD provides expertise through her writing and mentoring of young behavioral health dietitians. Finally, I've been privileged to work with Sharon Lemons MS, RDN, LD, FAND, Diane Spear, MS, RDN, LD, FAND and Wendy Wittenbrook, MA, RD, LDN whose work on the Standards of Practice and Standards of Professional Performance for Nutrition Care of Persons with Intellectual and Developmental Disabilities is used on a state and federal level to inform current health policy.

BHN members are doing an amazing job upholding our vision and achieving our mission. We look forward to continuing to meet and expand our goals in order to make our practice group one of the best DPGs in the Academy of Nutrition and Dietetics. On behalf of all the members of the executive board may you have the best holiday season and an incredible new year.

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managing finances, medication, food purchasing and preparation, transportation to medical appointments and work and support with regard to health, hygiene, and safety. He has participated in Special Olympics and owns a bike he can ride.

**Nutrition Physical Exam:** Height: 72"; Weight: 316 lbs. (increased 20.4 lbs. in previous 3 months); BMI 42.9 kg/m<sup>2</sup>; Obesity Class III (high morbidity risk); Self-reported body aches, hair loss, night sweats, leg cramps, and fatigue.

**Reported Diet:** Low Fat/Cholesterol Diet prescribed by physician along with Nutrition Consultative Services. Care staff report nocturnal eating. He has been known to drink an entire gallon of milk in one sitting and frequently seeks food, snacks, and candy. Beverages consumed are Kool-Aid, water, juice, milk, coffee and tea. He likes most foods with no reported eating problems.

**Information from Consults/**

**Referrals:** Members of the interdisciplinary team included the primary care physician, psychiatrist, behavior therapist, social worker, and residential and vocational service providers. Patient and multiple staff have reported history of conflicts when carrying out programs or treatment plans. The psychiatrist noted mood disorder and psychotic episodes with diagnosis of Schizophrenia with report of hearing voices. It is not entirely clear which mental health/behavioral diagnoses are "new," but the number appears to have increased over the past 2 years with subsequent increase in medications and medication changes.

**Medications:** Issues with medications included multiple previous trials of Abilify, Prozac, Topamax, and Vistaril to address impulse control and depression, in addition to Remeron prescribed as a sleep aid. Prozac and Remeron acted as appetite stimulants resulting in significant weight gain and were subsequently discontinued. Table 1 provides an overview of medications.

**Relevant Laboratory Results:** CBC, CMP, Lipid Profile, and HgbA1C every 6 months. (see Table 2)

Table 1. Medication overview

Current Medications	Dosage and Directions	Diagnosis/Reason Prescribed	Potential Side Effects/ Interactions Those patient reported having are underlined.
Oxcarbazepin	600mg 2 tab BID	Mood Stabilizer	<u>Increased risk of suicidal thoughts or behavior</u> ; decreased T4 and serum sodium levels; <u>nausea</u> and vomiting, chest pain
Topiramate	100mg BID	Impulse Control Disorder	Change in way food tastes; <u>nausea</u> ; weight loss; <u>nervousness</u> ; Upper Respiratory Infection (URI); <u>speech or language problems</u> ; trouble concentrating or paying attention; <u>confusion</u>
Mirtazapine	15 mg @ 8pm	Depression	<u>Increased appetite and weight gain</u> ; drowsiness; dry mouth; constipation; low serum sodium levels; <u>agitation</u> ; <u>hallucinations</u> ; <u>nausea</u> and vomiting; <u>Elevated serum triglyceride and total cholesterol levels</u> . Patients with preexisting hyperlipidemia may require closer monitoring during mirtazapine therapy, and adjustments made accordingly in their lipid-lowering regimen.
Melatonin	5mg @ 8pm	Sleep Aid	<u>Daytime sleepiness</u> , <u>headaches</u> , <u>dizziness</u> ; <u>depressed mood</u> , <u>irritability</u> ; <u>stomach pain</u>
Zyprexa	20 mg @8pm During Tx: Tapered and discontinued	Mood Disorder	<u>Increased appetite and weight gain</u> ; <u>insomnia</u> ; <u>restlessness</u> ; slurred speech; uncontrolled movements of the face, neck and back; unsteady gate or balance; <u>heartburn and indigestion</u> ; <u>mood changes or depression</u> ; increased serum glucose, <u>cholesterol and triglyceride levels</u>
Simvastatin (Zocor)	40 mg @8pm During Treatment discontinued and replaced with Simcor	Hypercholesterolemia and Hypertriglyceridemia	Unexplained muscle pain, body pain or weakness; <u>headache</u> ; <u>hair loss</u> , constipation; <u>nausea</u> ; avoid grapefruit, grapefruit juice and alcohol.
Fluoxetine (Prozac)	40 mg @8pm During Treatment: lowered to 20 mg, titrated and subsequently discontinued	Schizophrenia	<u>Insomnia</u> ; weakness; <u>restlessness</u> ; <u>nausea and indigestion</u> ; decreased appetite; Prozac, a serotonin re-uptake inhibitor (SSRI), <u>interferes with absorption of nutrients including Vitamin D</u> .
Metformin	Initiated during treatment	Hyperinsulinemia; potentiates the effect of insulin and appetite	Decreases blood glucose, HgA1C, cholesterol and triglycerides; decreases folate and B12 absorption; nausea, vomiting, bloating and diarrhea
Mirtazapine (Remeron)	Rx was discontinued prior to nutrition consultation due to weight gain and other side-effects	Sleep Aid	Specific serotonin antagonist; <u>increased appetite and weight</u> , constipation, <u>drowsiness</u> , <u>weakness</u> and <u>flu-like symptoms with back, muscle and joint pain</u> ; <u>increased cholesterol and triglycerides</u>

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### Nutrition Diagnoses and Recommendations:

- Morbid obesity (Class III) due to excessive energy intake as evidenced by 178% IBW and BMI: 41.9 kg/m<sup>2</sup>. Diagnostic code E66.01.
- Possible methylenetetrahydrofolate reductase (MTHFR) gene polymorphism contributing to mood disorders with reduced effectiveness of antidepressants, GI distress, and increased cardiac risk. Diagnostic code E72.12
- Suspected drug and drug/nutrient interactions with current medications as evidenced by reported side-effects such as low energy, unplanned weight gain, insomnia, night sweats and leg aches indicating a need for lab testing for vitamin D levels and consideration of supplementation. Diagnostic code R.63.5.
- Elevated serum cholesterol and triglyceride levels related to ingestion of high carbohydrate, high fat foods as well as medication effects on appetite and metabolism. Diagnostic code E78.5.
- Possible sleep disorder with reduced deep resting REM sleep necessary for health and closely related to insulin resistance; recommend testing of serum insulin levels which may drive the excessive hunger, specifically for carbohydrates. Diagnostic code G4730.

### Rationale/Guidelines/Criteria Utilized (as they correlate to the diagnoses/recommendations above):

- Obesity Classification.** *The Clinical Guidelines on the Identification, Evaluation, and Treatment of Overweight and Obesity in Adults: Evidence Report* was developed by the National Institutes of Health National Heart, Lung and Blood Institutes (NHLBI) Expert Panel released in June 1998. [http://www.nhlbi.nih.gov/health-pro/guidelines/current/obesity-guidelines/e\\_text-book/txgd/414.htm](http://www.nhlbi.nih.gov/health-pro/guidelines/current/obesity-guidelines/e_text-book/txgd/414.htm).

**Table 2. Laboratory Results and Changes During Treatment**

Test/Values	Normal/Expected Level	Initial Lab	7 Months	12 Months	Other
Total Cholesterol	120-200 mg/dL	234	148	97	
Triglycerides	50-150 mg/dL	1435	784	193	
Hgb A1c	4.0 – 6.0 %	4.8			appeared normal due to extremely elevated insulin levels
Glucose	70 – 99 mg/dL	89 mg/dL			appeared normal due to extremely elevated insulin levels
TSH	0.35-5.00 uIU/ml	1.45			
Homocysteine	Optimal: <11 mcmol/L		6	10	Genetic analysis for C677T and A1298C positive for mutation; risk for hyperhomocysteinemia
Insulin	3-9 uU/ml (high risk > 12)	118 uU/ml		44	
Vitamin D	30-100ng/mL	4	21	85	Treatment began at 50,000IU 1x/week, increased to 2x/ week
RBC	4.27-5.23	5.43			
MCV	86.6-96.8	85.6			
Weight		316 lbs		273	14% reduction in weight (43 lbs)
Height		72"			
BMI		42.9 kg/m <sup>2</sup>		34.9	

- MTHFR.** The MTHFR gene encodes an enzyme that produces 5-methyltetrahydrofolate (the bioavailable form of vitamin B9), which is the methyl donor to homocysteine for synthesizing methionine and works in combination with B6 and B12. The B vitamins are involved in a number of body processes including metabolism and absorption, regulation of sleep and mood, immune function, and reducing cardiac and obstetric risks. Polymorphisms in the MTHFR gene have been studied as possible risk factors for a variety of common conditions including heart disease, stroke, hypertension, high blood pressure during pregnancy (preeclampsia), eye problems, abnormal blood clotting, skeletal abnormalities, cognitive problems, and certain types of cancer. Elevated serum levels of B12, B9, and B6 can be seen in patients who are positive for MTHFR allele polymorphism. (See full details of rationale, treatment and references in Supplementary Material)
- Vitamin D.** Since every tissue in the body has vitamin D receptors, it has significant medical and psychological

consequences. Vitamin D, a fat-soluble vitamin that is also a hormone, is needed at every level for the body to function properly. In addition to its role in helping to build and preserve strong bones, teeth, and muscles, vitamin D activates genes responsible for regulating the immune system and releasing neurotransmitters that affect brain chemistry. Vitamin D is involved in the regulation of serotonin and dopamine and its receptors are located on cells in regions of the brain linked with depression. <https://www.psychologytoday.com/blog/the-breakthrough-depression-solution/201111/psychological-consequences-vitamin-d-deficiency>

Low vitamin D levels can cause fatigue, night sweats, leg cramps, weight gain, and non-therapeutic behaviors. Vitamin D absorption is likely impacted by anti-depressants that inhibit receptor sites necessary for absorption. In supplementation, the micellized form of vitamin D is converted to water-soluble and can be effectively absorbed despite use of SSRI drugs but it is not a

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covered expense. Mega-doses are also capable of being absorbed at varying levels but should be monitored. A desirable level of vitamin D is 50-70 ng/mL with the normal range being 30-100 ng/mL. Patients may exhibit signs of deficiency at low levels within what is considered to be a "normal" level. The RDI is not a reliable indicator for dosage when multiple medications are involved. Race, exposure to sunlight, and stress affect the absorption of vitamin D so trial and error along with monitoring labs is necessary to determine the correct supplemental dose.

- d. **Elevated Lipid Levels.** A disturbance of lipid metabolism is associated with metabolic syndrome and insulin resistance. Common to this condition is an accumulation of adipose tissue and increased cardiac risk.
- e. **Disordered Sleep.** Findings published in the *American Journal of Respiratory and Critical Care Medicine* indicate that sleep disordered breathing in obstructive sleep apnea is independently associated with insulin resistance. <http://www.atsjournals.org/doi/abs/10.1164/ajrccm.165.5.2103001>

### Nutrition Care Plan:

- a. Work with team to reduce or change medications that contribute to increased appetite, weight gain and other undesirable side effects that impact nutrition, mood and function.
- Test for MTHFR polymorphism and supplementation of l-methylfolate (bioavailable form of vitamin B9) to enhance the effectiveness of anti-depressant, which in turn may help to reduce the need for medication (see *Supplementary Material on MTHFR*)
  - Vitamin D testing, supplementation with micellized form or appropriate mega dose(s) and monitoring every 3-6 months.
  - Reduce medication-related cardiac risk factors by discontinuing Zocor and trying a statin drug

with fewer side effects while monitoring lipid levels.

- Check for possible sleep apnea.
  - Check for hyperinsulinemia.
  - Rule out Thyroid disorder.
  - Add omega-3 fatty acids in the form of fish oil supplement.
  - Check homocysteine levels.
- b. Decrease weight by 30 pounds over the next 12 months utilizing an individualized healthy eating plan (1500-1800 calorie daily meal plan; low fat; 30g fiber, including 4 servings or more of low-carb vegetables; 2-3 servings of no-added-sugar fruit; only 5-6 servings of unrefined/whole grain starches, 2 servings of dairy; a minimum of 15oz of lean protein spaced evenly throughout the day, beginning at breakfast; and adequate free fluids, calculated as ½ body weight times ounces daily)
- c. Increase activity levels.

**Patient Response:** Patient expressed interest in planned weight loss to improve health along with the desire to increase cooking skills to someday work as a cook. He wants to "feel better and make his own decisions about his health". Patient met routinely (at least monthly) with RDN to learn how to meet his nutrition and health needs, using the "5 finger" method for healthy meal planning. Picture cook-books and hands-on learning were required. He became familiar with his nutrition plan and reported inconsistencies when staff did not adhere to the nutritional guidelines or when the groceries in the home did not allow the plan to be followed as prescribed and as outlined in the outcome and action steps of the IP. His awareness increased staff accountability and the overall effectiveness of his program.

RDN provided a pedometer to measure activity levels with the goal of doubling activity levels quarterly to achieve 10,000 steps per day at least five days a week. Patient discovered that he could sit and shake the inexpensive pedometer and submitted 29,000 steps in a day initially so another measuring device became necessary. A FitBit would be beneficial but is cost-prohibitive.

As with any plan, success was limited to compliance. A sleep study was ordered and sleep apnea was confirmed so a CPAP was ordered (that would help reduce insulin levels and blood pressure) but patient did not wear it consistently so the machine was returned. He is now on a waiting list to get another CPAP. Patient relocated and was unable to sustain employment. The out of pocket cost for supplements was cost prohibitive and patient was willing to forego them, which would have been detrimental to his health, therefore, alternate approaches were required. For example, name brand Deplin was substituted with L-Methyl Folate HP at a lower cost. Vitamin D supplementation was provided in mega doses versus micellized form.

### RDN Response/Expectation:

- Underlying medical issues were identified and addressed by working with the team, including PCP and psychiatrist, regarding suggested testing and medications. Presumed insulin resistance diagnosis was clarified and determined to be hyperinsulinemia. Vitamin D testing and MTHFR, DNA Mutation Analysis requested.
- A meal plan was developed with the individual and staff during counseling session incorporating the dietary recommendations from the Nutrition Care Plan.
- Lab results were monitored and discussed with individual.

### Follow-up/ Progress:

**Prescription for nutrition-related consultation and treatment from the physician:** Medical Nutrition Therapy for Diagnosis of: Abnormal Weight Gain, Vitamin (D) Deficiency, Hyperinsulinemia, and Elevated Triglycerides.

**Therapeutic diet:** 1500-1800 Calorie Exchange, 30mg Fiber, Low Fat with nutritional supplementation to address deficiencies and genetic defect.

**Weight:** Weight decreased slowly by 34 pounds over 12 months to 273 lbs., BMI 34.9 kg/m<sup>2</sup>, Obesity Class I.

### Tests/Labs:

- MTHFR, DNA Mutation Analysis test results were positive for homozygous

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- mutation. Lab report states “The Methylenetetrahydrofolate Reductase enzyme plays a major role in homocysteine metabolism and contains several known polymorphisms (C677T and A1298C). This mutation is reported to reduce MTHFR activity, resulting in hyperhomocysteinemia. This condition is a risk factor for cardiovascular disease, increased risk for arterial and venous thrombosis, and an increased risk for obstetrical complications.”
- Thyroid labs were within normal limits.
  - Vitamin D levels initially tested at 4 ng/mL; with supplementation of 50,000IU weekly improved to 21 ng/mL (@ 7 months) so supplement was increased to 50,000IU every other day with a recheck of 85 ng/mL (@ 12 months). Dose was tapered to 2x weekly to maintain levels of 50-70 ng/mL.
  - Serum insulin level was tested at 118 uU/ml (optimal range 3-9, high risk range >12) while HGB A1C and Glucose labs remained within optimal levels, indicative of hyperinsulinemia vs. insulin resistance. Insulin levels improved to 44 (normal is 6.0-27.0 while optimal is 3-9) in the same time frame.
  - Within 12 months of changing medications and implementing therapeutic diet, total cholesterol decreased to 148 mg/dl (@ 7 months) then 97 mg/dl (@ 12 months) and triglyceride levels decreased significantly to 784 mg/dl (@ 7 months) then 193 mg/dl (@ 12 months) from the original 1435 mg/dl.
  - With the above changes and methylfolate supplementation, patient reduced his cardiac risk as evidenced by monitoring homocysteine levels (optimal range is below 11).

### Medication:

- Zyprexa was tapered and discontinued and Prozac was decreased to 20 mg in the AM resulting in desired weight reduction.
- Simvastatin was discontinued and replaced with Simcor that addresses

both cholesterol and triglycerides without the elevation side effects.

- Metformin was initiated to address hyperinsulinemia.
- Therapeutic doses of vitamin D initiated to address deficiency.
- Methylfolate added to treat MTHFR allele polymorphism.

**Other reported changes or improvement:** Medication induced muscle problems improved and hair loss was eliminated with medication changes. The Program Coordinator for this individual refers to the Methyl Folate HP (High Potency) supplement as the patient’s “brain pill.” He and his staff report significant improvement in overall mood and reduction in feelings of depression and behavioral outbursts.

### Lessons Learned from this Case:

The obvious lesson is that often a simple approach to improving health with diet and exercise alone will not work unless underlying contributing factors are identified and properly addressed. Therein lies the problem. Several barriers to service were encountered that had to be overcome to achieve successful outcomes. In this case, some of the standard labs did not reveal the whole picture. With routine screening, the patient would not have been identified to be at risk for diabetes, vitamin D deficiency, or an allele polymorphism, all of which were diagnosed based on results from additional tests. While some cardiac risks were obvious based on the lipid panel, the added risk of deep vein thrombosis would not have been identified without the MTHFR allele polymorphism test. It was the RDN that requested and advocated for the additional tests. Often, it is necessary to educate the physicians regarding the need for further testing, the proposed treatment, and the specific form and dose of supplement required since these are unregulated, over-the-counter substances that some physicians may not be aware of.

In this case, it required both a change of primary care physicians and the assistance of the psychiatrist. The justification for the MTHFR test can be a history of DVTs, depression, anemia, spectrum disorder, or in this case, mood and sleep disorders. Once

identified, recommendations regarding supplementation were made by the RDN and required physician approval. The MTHFR test was ordered by the PCP but the supplement was approved by the psychiatrist. Additionally, since supplements are not standard prescription drugs, they involve an out of pocket cost to the patient. This usually requires team consent (and educating them of the need and risks involved in not doing it). Initially, Deplin, a form of methylated folate recognized by many psychiatrists, was prescribed but the patient could not afford it so the RDN sourced the equivalent available in an over-the-counter supplement. The equivalent dosing information was obtained by consulting a biological scientist, however can be obtained by consulting an informed pharmacist regarding supplementation with L-Methyl Folate.

## Supplementary Material

### *MTHFR Gene: Function, Mutation and Treatment*

The MTHFR gene provides instructions for making an enzyme called methylenetetrahydrofolate reductase, which plays a role in processing amino acids and is important for a chemical reaction involving folate (vitamin B9). Specifically, this enzyme converts 5,10-methylenetetrahydrofolate to 5-methyltetrahydrofolate. This reaction is required for the multi-step process that converts the amino acid homocysteine to methionine, an amino acid used to make proteins and other important compounds.

At least 40 mutations in the MTHFR gene have been identified in people with homocystinuria. These mutations impair the function of the enzyme, some causing the enzyme to be inactivated and others leading to the production of an abnormally small, nonfunctional version of the enzyme. Without functional methylenetetrahydrofolate reductase, homocysteine cannot be converted to methionine. As a result, homocysteine builds up in the bloodstream, and the amount of methionine is reduced. Some of the excess homocysteine is excreted in urine (homocystinuria).

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An increase in homocysteine levels may contribute to the development of many other conditions including deep vein thrombosis, cognitive changes, and increased cardiac risk. Studies of MTHFR gene variations in people with these disorders have had mixed results, with associations found in some studies but not in others. Therefore, it remains unclear what role changes in the MTHFR gene play in the development of health problems. It is likely that additional factors influence the processing of homocysteine and those variations in homocysteine levels play a role in whether a person develops any of these conditions.

Of the many mutation combinations of MTHFR, the most common are categorized into four groups:

- *Homozygous*: an individual has both copies of either the 677 mutation, or the 1298 mutation, one from each parent.
- *Heterozygous*: an individual has one copy of the 677 mutation, or the 1298 mutation, plus a normal one from the other parent.
- *Compound Heterozygous*: an individual has one copy of the 677 mutation from one parent and one copy of the 1298 mutation from the other parent.
- *Triple homozygous mutations (more rare)*: an example would be one C677T, one A1298C, and a P39P or R594Q.

The two most common MTHFR mutations are C677T and A1298C. Treatment options for both are similar, but it is important to know the subtle differences between each type of mutation in order to most effectively address each mutation.

### MTHFR C677T

- If one is either heterozygous or homozygous for the MTHFR C677T mutations, the body has trouble converting folic acid into the active form of folate. The nutritional implications of this are twofold. First, individuals do not tolerate folic acid well. Consuming large amounts of foods fortified with folic acid or supplements containing folic acid may cause adverse reactions. Long-term, excessive folic acid in someone with MTHFR C677T may

increase the risk of developing cancer. Second, such patients are more likely to be folate deficient and should regularly eat foods containing natural folate, such as leafy green vegetables. Furthermore, a MTHFR C677T mutation may cause elevated levels of homocysteine in the body contributing to oxidative stress and increased risk of heart disease. Research suggests that increased homocysteine levels are thought to be a causal factor in common human diseases, such as stroke and dementia, especially in individuals with other risk factors.

### MTHFR A1298C

- MTHFR A1298C mutations affect conversion of methylfolate into BH<sub>4</sub>, or tetrahydrobiopterin. BH<sub>4</sub> plays an important role in neurotransmitter production, which is why MTHFR A1298C mutations are often associated with psychological disorders. The particular neurotransmitters affected include serotonin, dopamine, epinephrine, and norepinephrine. MTHFR A1298C mutations may also affect melatonin production, which often leads to sleep disturbances. BH<sub>4</sub> is also important for heart health and deficiency may play a role in the development of cardiovascular disease.

### MTHFR Treatment

The treatment of MTHFR mutations is multifaceted. The first step is to correctly identify which mutations are present. Once the mutations are identified, utilization of methylated forms of folate (methylfolate) and vitamin B12 (methylcobalamin) are primary treatment options. These supplements directly address dysfunction in methylation pathways. The forms of B vitamins found in typical multivitamins and supplements are not methylated. It is important to choose methylated forms to ensure adequate absorption and utilization. Dosing requirements will vary from person to person, so careful monitoring of supplementation response is important. Finally, addressing epigenetic problems through appropriate lifestyle changes may alleviate symptoms by down-regulating MTHFR gene expression.

As more research emerges on the effective treatment of MTHFR mutations,

the benefits of methylfolate supplementation becomes increasingly obvious. Methylfolate is the most active form of folate in the body. By taking methylfolate, the body is able to bypass any methylation defects affecting folate metabolism. This means the negative health effects of MTHFR mutations are lessened. Dosing requirements vary as homozygous mutations often increase methylfolate requirements compared with heterozygous mutations. A good strategy is to start with a modest dose and monitor how the person feels as the dose is increased every few days. It is also important to consider the form of methylfolate taken, as some forms are much more bioavailable than others. Metafolin and Extrafolate-S are two highly bioavailable forms. That's not to say other forms won't work, but the person may need to take at least twice as much to have the same benefit. Some psychiatrists are turning to Deplin, a name brand methylfolate supplement, available by prescription, to increase the effectiveness of anti-depressant medications.

There is an increasing body of knowledge on implications of the MTHFR allele polymorphism especially as it relates to cognitive function, cardiovascular health, and reproductive health. When professionals are requesting or interpreting lab values or recommending supplementation, it is important to understand and distinguish between folate and methylated folate for individuals with genetic defects.

### More on MTHFR:

- An extensive review of B vitamin polymorphisms and behavior published in the *Neuroscience and Biobehavioral Reviews* 47 (2014) 307–320 provides an excellent recap of the biochemistry and function of B vitamins and the role of genetic B vitamin polymorphisms in neurodevelopment and in brain-related disorders such as depression, schizophrenia, autism, Down's syndrome, and dementia. The article discusses previous findings from clinical studies and highlights gaps in knowledge (Mitchell et al., 2014), <http://www.sciencedirect.com/science/article/pii/S0149763414002048>.

**BHN Case Study 2016-6***continued from page 7*

- The journal *Molecular Psychiatry* states that “Schizophrenia-like syndromes, bipolar disorder, Parkinson’s disease, Alzheimer’s disease and vascular dementia have all been associated with one or more mutations of the MTHFR gene” (2006;11, 352–360). <http://www.stopthethyroidmadness.com/mthfr/>
- Two single nucleotide polymorphisms of the MTHFR gene, the C677T (Frosst et al., 1995) and the A1298C as well as the A2756G of the methyltransferase gene (MTR), have been studied in several populations (Weisberg et al., 1998) and supplementation with methylated forms may be beneficial in individuals with known allele polymorphisms.
- A study designed to formally describe patient and health care provider experiences with the diagnosis and clinical management of MTHFR <http://www.ncbi.nlm.nih.gov/pubmed/26484755> reported positive results with improvement in physical (60%) and mental/behavioral symptoms (36%) following treatment, including methyl folate with or without other B vitamins (Oberg et al., 2015). Of the thirty patients and eight doctors who participated,

doctors largely relied on trial and error to determine treatment doses, frequency and components.

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CPE credit (1.0 hour) is available from BHN for the full text version of the article, BHN Case 2016-6. Access the article at <http://www.bhndpg.org/cpe-articles-quizzes>

**CPE Questions for BHN Case 2016-6**

- Which lab tests in addition to usual screening were helpful in this case?
  - Fasting blood glucose with G6BT
  - Genetic allele polymorphism of MTHFR
  - Lactic acid dehydrogenase (LDH)
  - Thyroid panel
- What changes in laboratory values from following the Nutrition Care Plan resulted in reducing this patient’s health risks?
  - Cholesterol, triglycerides, homocysteine
  - Glucose, Hgb A1c, insulin
  - Vitamin D
  - All of the above
- Which of the following statements is true concerning supplements used to treat MTHFR mutations?
  - By taking B vitamins, the body is able to bypass any methylation defects affecting folate metabolism.
  - Methylated forms of B vitamins are found in typical multivitamins and supplements.
  - The most common supplements used to treat MTHFR mutations are methylfolate and methylcobalamin.
  - Treatment begins with a standard dosing requirement and increased according to how the patient feels.
- What drug-nutrient interaction side effects impacted the nutritional status of this patient?
  - Elevated cholesterol and lipid levels
  - Increased absorption of vitamins
  - Unsteady gait or balance
  - Weight loss and decreased appetite

*Editor's Note: Initially published for pediatric practitioners, this informative piece is relevant for any dietetic practitioner interested in sharing his or her knowledge and experience through writing. I hope this resource equips and inspires you to take the next step in becoming an author. And incidentally, my inbox is always open!*

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## Get the Word Out! Tips for Publishing

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As pediatric dietitians, we love what we do for a living! We are passionate about our careers, and thus generously give time and energy to projects beyond our day-to-day responsibilities. We mentor dietitians new to pediatrics, precept dietetic interns, educate residents and fellows, volunteer for professional organizations, and so much more. With the development of clinical ladders, the Academy's Standards of Practice and Professional Performance, and most recently the development of the advanced practice dietitian certification, the bar has been raised for what is expected.<sup>1,2</sup>

Professional development is not only essential to our job satisfaction, but it is also crucial for the future of dietetics. Professional development can be fostered in a variety of ways, but the focus of this article will be publication. Unfortunately, many are intimidated by professional writing. However, publishing offers a tremendous opportunity to share our knowledge and experience with professionals (in healthcare or other fields), as well as the lay public (e.g., patients, caregivers, and support groups). The purpose of this article is to provide pediatric dietitians with the resources to engage confidently in professional writing.

### Getting Started

The first step in the publication process is to identify a venue in which to publish. Many authors start small and work their way up to more complex projects as they gain experience. One of the easiest strategies to "break into" publishing is to network with colleagues and seek out opportunities. Examples of professional organizations that dietitians can join to establish a network include the following: Academy of Nutrition and Dietetics

state and local associations, Academy Dietetic Practice Groups (DPGs), and local chapters of the American Society for Parenteral and Enteral Nutrition.

### Types of Writing Projects

The possibilities are endless, but the following categories summarize the most common forms of publications.

#### Articles

Peer-reviewed journals are considered the most prestigious venue for publishing, as there is critical assessment of manuscripts by experts.

These articles are often indexed in PubMed, but not always. According to its website (<http://www.ncbi.nlm.nih.gov/pubmed>), PubMed comprises more than 24 million citations for biomedical literature from MEDLINE, life science journals, and online books.<sup>3</sup> In niche specialties (such as pediatric nutrition), some journals may not be found with a PubMed search. This is because journals must meet rigorous requirements to be accepted for indexing in MEDLINE.<sup>4</sup> Therefore, it is crucial to be aware of other strategies to search for nutrition-related articles such as nursing journal indexes. Consult a medical library for guidance on utilizing these alternatives to PubMed.

Typically abstracts are available via PubMed. Journal subscription (either institutional or individual) is required to obtain full text articles. However, the National Institutes of Health (NIH) Public Access Policy was established in recent years, which mandates that investigators submit final peer-reviewed journal manuscripts that arise from NIH funds to PubMed Central.<sup>5</sup> The policy ensures that "clinicians, patients, educators, and students can better reap the benefits of papers arising from NIH funding by accessing them on PubMed Central at no charge."<sup>6</sup>

Examples of peer-reviewed article categories include the following:

- Research: randomized controlled trial, intervention, case control, retrospective
- Review: comprehensive review of specific nutrition topic of clinical relevance
- Case Reports: an unsystematic clinical observation based on a single case. A case report states the outcome or response of a single patient to a diagnostic strategy or treatment.
- Case Series: an unsystematic retrospective clinical observation about more than one case. A case series sometimes reports on a variety of different diagnostic or therapeutic approaches.

Non-peer-reviewed articles have not undergone the peer review process. These articles are typically not indexed in PubMed. Examples include the following:

- Commentary articles (e.g., Letter to the Editor)
- Articles for popularized publications (e.g., Parents magazine)
- Non-profit organization newsletters (e.g., Oley Foundation)

Additional types of writing projects include: a textbook chapter, poster session/abstract for professional conference, manuals or guidelines, and policies/procedures.

Online publications and newsletters are yet another type of publication. Examples include:

- Non-profit organizations (e.g., Oley Foundation, Food Allergy Research and Education—formerly FAAN)
- Pediatric Nutrition Care Manual\*
- Academy of Nutrition and Dietetics practice groups (i.e., DPGs)\*

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- American Society for Parenteral and Enteral Nutrition\*
- Disease-specific professional organizations (e.g., Genetics and Metabolic Dietitians International, North American Society for Pediatric Gastroenterology, Hepatology and Nutrition)\*
- Hospital websites
- Support groups for patients and caregivers
- Magazines (e.g., Family Circle)
- Blogs

*\* denotes peer-reviewed publications*

### Considerations for Authors— Before Starting a Project

Before accepting a “solicited” publication project (i.e., an editor contacts you), what questions should you ask? It is important to gather as much detail as possible when considering a writing project in order to make an informed decision.

#### Time Line

If the requested turn-around time seems unrealistic (e.g., less than 4 weeks), it is reasonable to request an extension. For examples of how to develop a practical time line, refer to Tables 1a and 1b: Example Time Lines for Publication Projects.

#### Accept or Decline?

Sometimes it may not be possible or appropriate for a potential author to accept an offer to publish. There could be a scheduling conflict, or the topic may not be within the individual’s area of expertise. If one decides to decline, it is a professional courtesy to suggest alternative authors. This should be discussed with the colleague prior to giving his/her contact information to the editor.

#### Consider Co-author(s)

There are numerous advantages to enlisting the help of others. Before proceeding down this path, however, it is recommended to ask the editor if it is acceptable to bring on co-author(s) for “solicited” publications. Once a co-author is approved, it is crucial to have a frank

discussion regarding the delineation of each person’s responsibilities. With multiple authors, there is the unique issue of the order of author names in the byline. Check with the editor for the journal’s recommendation for author order—a mentor might be listed last; first author generally writes the manuscript.

Advantages of having a co-author(s) include the following:

- An expert in the topic/specialty field can easily assist with literature search and technical review of the manuscript
- Multi-disciplinary point of view as well as an opportunity to learn from other’s experiences
- Helps to split the work load
- Opportunity to bounce ideas off someone else and brainstorm
- A more experienced writer can function as a mentor, sharing his/her experience/knowledge as well as technical expertise

Historically, it was not uncommon for someone to be included as an author but contribute minimally to the study and/or manuscript. In recent years, strict guidelines have been established to clearly delineate who qualifies as an author.

Each author must meet the following Authorship Criteria:<sup>7</sup>

1. Substantial contribution(s) to conception and design, acquisition of data, or analysis and interpretation of data; AND
2. Drafting the article or revising it critically for important intellectual content; AND
3. Final approval of the version to be published; AND
4. Agreement to be accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

In addition, each author must complete a Contributions/Authorship Form for the publisher describing his or her contribution to the project.

#### Choose a Topic

Of course an author should write about something with which he/she is very familiar. But it is equally important

### Tables 1a and 1b. Example Time Lines for Publication Projects

Date	Task
2/15	Agree to write chapter due 10/1
2/30	Receive author guidelines
3/1-3/15	Brainstorm rough outline
3/15-4/30	Do literature search, refine outline
5/1	Start rough draft
7/15	Send manuscript to internal reviewers
8/1	Reviewers give feedback
8/1-9/15	Do further literature search as needed, edit manuscript
9/15-9/22	Put everything aside for 1 week
9/23-10/1	Review the manuscript and make edits, submit
Date	Task
2/15	Agree to write chapter due 7/1
2/15-3/15	Develop outline and begin research
3/15-4/1	Refine outline and continue literature search
4/1-5/15	Write draft
5/15	Send draft to internal reviewers
6/1	Reviewers give feedback
6/1-6/15	Do further literature search as needed, edit manuscript
6/15-6/22	Put everything aside for 1 week
6/23-7/1	Review the manuscript and make edits, submit

also to consider the interests and needs of the target audience (e.g., journal subscribers). An author should contemplate his/her motivation or purpose for choosing the topic. Examples of an author’s purpose for choosing a topic may include the following:

- To provide a review of the literature
- To describe a change in a standard of care
- To present findings from a clinical trial or retrospective study

#### Conduct a Literature Search

Previously published work is the foundation for your manuscript, or

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at least the background/introduction section for articles reporting research findings.

Details to consider when conducting a literature search:<sup>8</sup>

- What has already been published on the topic?
- Does your paper offer new information or a different perspective?
- References should be relevant and recent (rule of thumb is <5 years old)
- If a study is dated but is the GOLD STANDARD on the topic—use it!
- Be selective—don't include every reference you read as background
- Read the full articles that are cited as references
- Quote accurately

### Choosing a Journal to Submit a Manuscript

Before you begin writing, determine to which journal you intend to submit the manuscript. Submitting to a journal that is not a good fit for your manuscript is one of the main reasons a paper is rejected. The subject matter should be appropriate for the audience. If you are submitting research findings, ensure that the trials were pre-registered. Section 801 of the Food and Drug Administration Amendments Act (FDAAA 801) requires Responsible Parties (generally the principal investigator) to register and submit results of clinical trials with ClinicalTrials.gov. Although the law applies only to specific types of clinical trials (drugs, biological products, and medical devices) most journals require, as a condition of publication, registration in a public trials registry.<sup>9,10</sup>

Be aware that authors can only submit an original manuscript to one journal at a time! When deciding to which journal to submit a manuscript, many authors are torn between choosing a top tier journal (also referred to as "high impact") or a less competitive journal. Choosing a prestigious journal inherently comes with a higher risk of rejection. Following the strategy of starting with a top tier journal can

significantly delay publication because the author needs to submit to another journal if the initial journal has completed the editor's review process and is then rejected.

Many people are unaware of how journals are ranked, which is ultimately what determines which journals are classified as "top tier." The Reuters Impact Factor is a "measure of the frequency with which the average article in a journal has been cited in a particular year or period."<sup>11</sup> Something to keep in mind is that a journal's impact factor (and thus its ranking amongst other journals) is significantly influenced by a journal's inclusion of review articles. This is because review articles are typically cited more often than individual research articles, particularly for background and discussion sections of other articles.

Authors are encouraged to contact the journal's editor with questions prior to manuscript submission. Editors are typically amenable to give feedback about whether the topic is in line with the journal's goals and readership.

Further details on this topic are explored elsewhere in the literature.<sup>12</sup>

### Author Submission Guidelines

Thoroughly review the journal's author submission guidelines before "putting pen to paper". These are rules that a publisher observes to ensure clear and consistent presentation of written material.

Author guidelines typically include details for addressing each of the following issues:<sup>13</sup>

- Format (margins, line spacing, etc)
- Word count limit (generally does not include abstract, tables/figures, and references)
- Abstract
- Abbreviations
- Tables
- Figures
- Disclosures, permissions, and acknowledgments
- References (which citation style?)

The guidelines are usually posted on the journal's website, and are often entitled "Manuscript Preparation and Submission Requirements" or "Author Guidelines." If an editor initiates contact

and requests that you write an article (e.g., "Invited Review"), he/she should provide the author submission guidelines or where to find them. Some journals have a formal or unique writing style; to increase the likelihood of acceptance (for unsolicited manuscripts) it is imperative that authors follow the journal's style. Choose the type of manuscript—this varies by journal, but options often include research, review, etc. Consult the journal's author submission guidelines to determine which category of manuscript best matches your goal. The type of manuscript will determine the article's components and length.

### Start Writing

After all that... you can finally start writing!

Determine a method/strategy for writing that works best for you—large blocks of time or shorter/more frequent segments. Some authors prefer the latter style, in which they write a paper in sections (i.e., chunking). Set aside time for writing and editing based on your preferred method.

Develop an outline—this is imperative, as it optimizes the literature search process and helps the author refine the topic and content. The outline can be considered a "road map" for the project. When authors do not have an outline, the outcome is often lack of a clear and logical structure and a poorly defined goal/purpose.

Consider the following steps when creating an outline:

- 1) Brainstorm: List all ideas that you want to include in the manuscript
- 2) Organize: Group related ideas together
- 3) Order: Arrange material in subsections from general to specific (or from abstract to concrete)
- 4) Label: Create main and sub-headings

An efficient strategy is to insert notes within the outline as you perform a literature search, rather than highlighting or taking notes on the original article (the classic methods). The resultant detailed outline serves as the author's "skeleton" manuscript. It is not necessary for the notes to be complete sentences when added to the outline; just include key points and supporting details or quotes as well as

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the reference. The author can go on to refine the wording and expound upon the content after the outline and literature search is complete.

### General Tips for Writing

- Use active voice (versus passive).
- Focus on concise sentence structure— 1-2 concepts per sentence.
- Avoid “filler” words—less is more! Avoid verbosity.
- Avoid jargon (Table 2: Jargon and Wordiness).
- Ensure each paragraph has a topic sentence—details within a paragraph should relate to or support the topic sentence.
- Do not double space between sentences.
- DO double space between paragraphs.

An article’s title can determine whether the manuscript is considered by the editor. Also, second to the abstract, the title is the most viewed part of an article.

Tips for choosing an effective title include:

- Avoid lengthy titles (author guidelines may include word count limit for the title).
- Avoid abbreviations.
- Choose an effective format—be descriptive, do not generalize; use active language.

### Pitfalls and Ethical Issues

Common pitfalls and ethical issues of writing include the following:<sup>14,15</sup>

- 1) Plagiarism (including self-plagiarism)
- 2) Ghost writing
- 3) Improper citation
- 4) Not registering trials
- 5) Not having Institutional Review Board (IRB) approval for research studies, case series, and case studies
- 6) Undeclared conflicts of interest

An in-depth discussion of plagiarism is beyond the scope of this article. However, given the importance of this issue it is recommended that you

refer to additional resources for further details and guidance.<sup>16</sup>

Improper citation is when an author does not give proper credit to the original source of information. An example of this is reprinting a previously published table or figure without the consent of the publisher. Please be aware that authors of the original content will not usually have the authority to grant reprint permission, as authors are typically required to sign an Author Agreement which transfers his/her copyrights to the publisher.

### The Peer Review Process

An essential component to the success and quality of peer-reviewed journals is the contribution of peer reviewers. Interestingly, there is not an industry standard or guideline to clarify the peer reviewer’s role.

In general, peer reviewers are expected to:

- Conscientiously read the article
- Assess the article based on the reviewer’s previous reading and experience
- Critique the strengths and weaknesses of the paper, and recommendations for its improvement. The recommendations may address the form or structure of the article, content that should be added or deleted, and references that should be clarified/considered.
- Be timely
- Provide a balanced perspective
- Provide an overview as well as a critique of the individual sections—do not “line edit”

Peer reviewers should bear in mind that the review should reflect the spirit of mentoring, providing constructive criticism. It is inappropriate to use abrasive or condescending language, although unfortunately this does sometimes occur.

Novice authors are typically unaware of the steps that ensue after a manuscript is submitted. An overview of the publication process is outlined in Figure 1, and described in further detail below.

A manuscript is submitted by the author. The editor briefly reviews the manuscript and determines whether it is appropriate to send on for peer

**Table 2. Avoid Jargon and Wordiness**

Instead of this:	Use this:
A considerable amount of	much
On account of	because
A number of	several
Referred to as	called
In a number of cases	some
Has the capacity to	can
It is clear that	clearly
It is apparent that	apparently
employ	use
fabricate	make

Adapted from: Day, RA. *How to write and publish a scientific paper*, 5th edition, Oryx Press, 1998.

**Table 3. Common Reasons a Manuscript Is Rejected for Publication**

Not appropriate for the journal
Poor writing—typos, grammatical errors, poor sentence structure
Did not follow Author Submission Guidelines
References are outdated or incomplete
Additional reasons specific to research studies—incorrect statistical analysis, insufficient sample size, etc.

Adapted from: Hasse JM. Developing the “Write” Skills for Publishing. *Nutrition in Clinical Practice*. 2013; 28(2); 153-157.

review. Peer reviewers are usually given two to three weeks to review a manuscript. They provide edits/feedback and rank the manuscript—accept, accept with minor revisions, resubmit with major revisions, or reject.

The editor will compile the peer reviewers’ edits/feedback and send to the author, who in turn is expected to respond to peer review feedback and/or make edits. Typically authors are given one to two weeks to respond. The author must respond to the peer review feedback point-by-point with either the edits/additions made to the manuscript, or an explanation of why the author is choosing not to incorporate the suggested changes.

A detailed description of how to respond effectively to peer review feedback can be found elsewhere in the literature.<sup>17,18</sup>

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### Compensation

Authors typically do not get paid for their work. Publishing an article in a peer-reviewed, scientific journal is often a matter of prestige. For those in academia it may be required for promotion. For others, advancement in a hospital's clinical ladder could require peer-reviewed publication. Textbook publishers often provide a complimentary copy of the book to contributing authors, and occasionally to the reviewers as well. Authors publishing in "non-traditional" venues (e.g., magazines or blogs) may receive financial compensation; however, this is not typically lucrative.

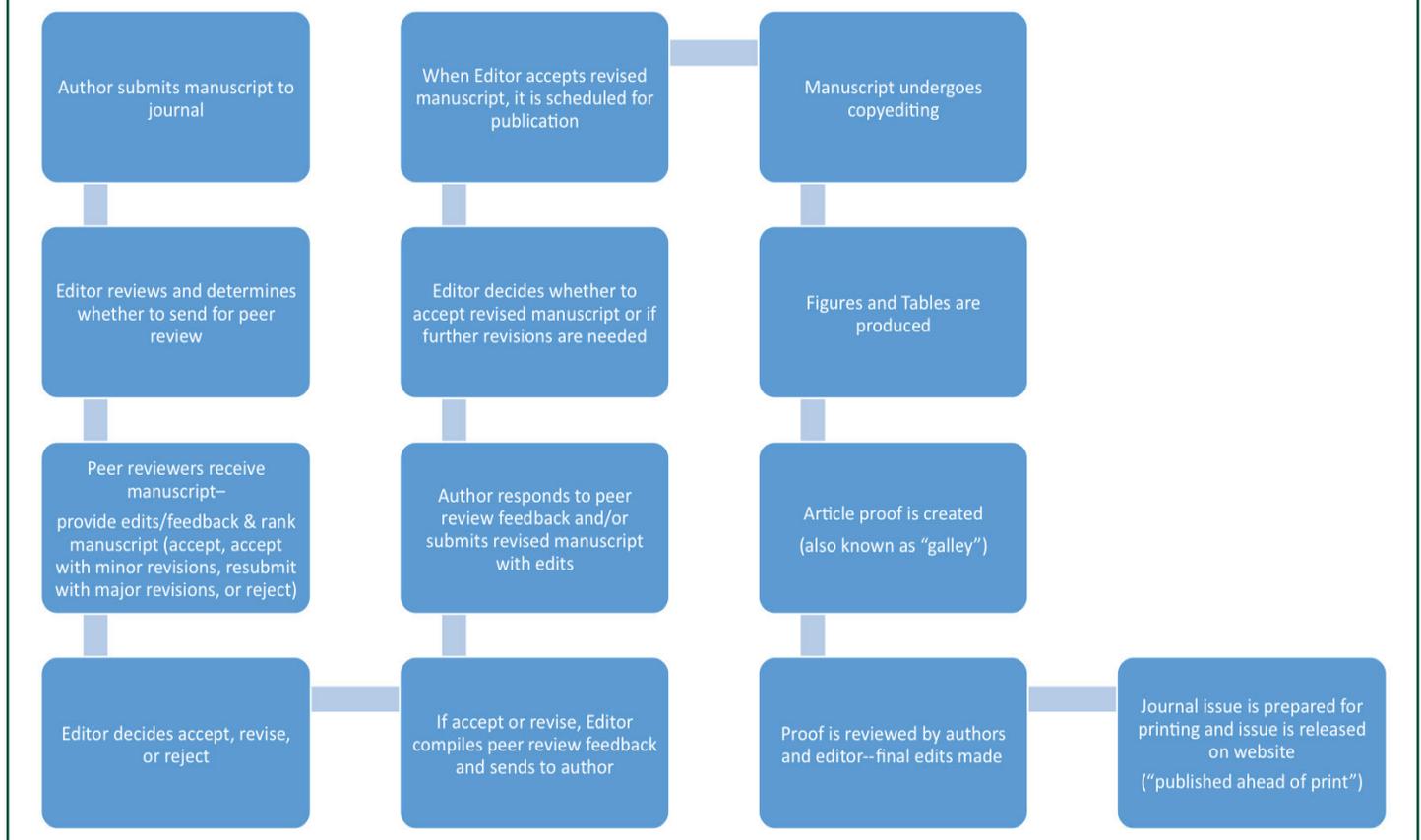
### Conclusion

Although it requires significant time and energy, publishing is a rewarding adventure. No two projects are the same, and the possibilities are endless. It is a continual learning experience, even for the seasoned writer.

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Figure 1. Publication Process



# First *Ever* Conference: International Society for Nutritional Psychiatry Research

by

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This first-ever conference uniting the fields of nutrition and psychiatry research (<http://www.isnpr.org>), was held in Washington DC, in July/August, 2017, with well-published researchers from around the world presenting research and commenting on the implications of the current state of the environment, food supply, and mental health. Three BHN members attended the conference.

A poster session included preliminary doctoral research results by April N. Winslow, MS, RDN, CEDRD; BHN member. Her poster entitled Food Matters; Exploring dietary patterns among individuals with symptoms of anxiety disorder revealed total dietary fat content is associated with increased physical symptoms of anxiety (e.g., diarrhea, temperature dysregulation, and tachycardia).

## Interview with the authors, who attended the conference:

### **BHN**Newsletter: Why did you attend ISNPR 2017 and how was it significant for you?

**RL-W:** Many of the speakers were researchers whose work I have read and whose work has been included in my books on nutrition and mental health. It was a thrill to meet many of them and hear their first-hand reports. These included plenary speakers from around the world: Professor Michael Berk, MD; Professor Michael Crawford, PhD; Professor John Cryan, PhD; Associate Professor Marlene Freeman, MD; Joseph Hibbeln, MD, Acting Chief, Nutritional Neuroscience Laboratory, NIH ; Professor Felice Jacka, PhD; Alan Logan, ND; Professor Susan Prescott, MD, PhD; Alex Richardson, PhD, Founder Director at Food And Behaviour Research; Professor Jerome Sarris, ND; Professor Kuan-Pin Su, PhD; Professor Marjolein Visser, PhD. Experiencing the level of interest, commitment and variety of topics presented was gratifying and left me hopeful that the effect of nutrition on mental health is being recognized and validated around the world.

### **BHN:** What was your impression of the mix of professions represented at ISNPR?

**RL-W:** It was an eclectic and exciting assembly of professionals. Clinical, epidemiological, historical, and bench levels of research were reported. Speakers represented Australia, New Zealand, England, Ireland, Canada, Spain, Amsterdam, China and others, as well as the U.S. (NIH, Massachusetts General and Harvard). Psychiatrists, psychologists, naturopaths, dietitians, professors, epidemiologists and others presented their work.

### **BHN:** What role do you see RDNs playing in the international psychiatric-nutrition research picture?

**SF:** Behavioral Health RDNs have an opportunity to build on and translate knowledge into practice from emerging applied and clinical research describing mechanisms through which nutrition impacts psychiatric health. The past few decades have seen 1) an unprecedented intake of sugar and refined carbohydrates<sup>1</sup> 2) a transition from animal fats sourced from pasture-raised animals to refined vegetable oils<sup>2</sup>, 3) a shift toward an excessive dietary Omega 6: Omega 3 ratio<sup>3</sup> and 4) the dietary integration of new food dyes and preservatives<sup>4</sup>. Practitioners with a thorough understanding of nutritional risk factors, clinical assessment, and targeted intervention are sorely needed to help navigate these nutritional landmines. Dietitians have the training to enhance cognition and mood through strategic nutritional interventions, such as promotion of diet-enhanced brain-derived neurotrophic factor (BDNF), and to address cardiometabolic comorbidities secondary to lifestyle and use of psychiatric medications.

### **BHN:** What are the implications for RDNs that mental health researchers are rigorously pursuing nutrition research?

**RL-W:** With increased validation and recognition of nutrition as influential or

causative in mental health conditions, RDNs need to be well-trained regarding interactions between behavioral health, nutrients, and eating habits, as well as the quality and availability of foods. Current knowledge in behavioral health and nutrition will be needed for application in clinical and community arenas. RDNs can make a contribution with clinical research that adds their expertise to the research mix. Population-specific reports, case studies, and effectiveness of program approaches in improving outcomes can all be reported by RDNs working, educating, or studying in behavioral health.

### **BHN:**How has this conference influenced your perspective on scope of practice?

**SF:** ISNPR broadened my sense of how the RDN skill set can translate into clinically meaningful outcomes within behavioral health settings. Tailored and progressive psychiatric nutrition interventions are not only foundational to facilitating positive psychiatric outcomes, but are also cost effective to implement when impacting measurable reductions in mood disorder severity scores as well as improvements in cardiometabolic health. An unpublished economic analysis of the "Supporting the Modification of Lifestyle in Lowered Emotional States" (SMILES) trial<sup>5</sup>, which included one-on-one interventions from a dietitian, found that the dietary intervention group, as compared to a social support group, led to an average of \$358 less out-of-pocket costs per patient during study duration. Dr. Felice Jacka described the need to refine, replicate, and scale up clinical and population level dietary interventions which include economic analysis.

### **BHN:** What was the most significant thing you learned in terms of practical application?

**SF:** We have sufficient pre-clinical and mechanistic evidence to tailor recommendations for 'feeding our brains'. Although there is much to be learned,

## First Ever Conference: International Society for Nutritional Psychiatry Research

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we know that changes in dietary patterns can impact brain structure and function with improved cognitive and mood health as an outcome.

### BHN: What impressed you as the most urgent issue presented?

**RL-W:** Many presentations coalesced for me into the following alarming chain of factors :1) DHA and EPA are vital to a developing fetus, 2) young women need to be well-nourished before pregnancy and over 50% are unplanned,<sup>6</sup> 3) children need DHA for brain development, adults need EPA for brain function, 4) the ocean reached its maximum for fish supplies of essential fatty acids in 2000 or earlier,<sup>7</sup> 5) un-natural feeds (corn in place of algae, bugs, grass, etc) used in fish, chicken and cattle farming are changing the presence of essential fatty acids in the food supply,<sup>8</sup> 6) this world-wide phenomenon has the capability to change human brain function and the fate of the human species.<sup>9</sup>

### BHN: Did you observe a common thread in the messages presented?

**SF:** A comprehensive nutritional approach to prevention and treatment of mental health disorders appreciates interconnectedness of brain and body, including attention to blood sugar regulation, fatty acid status, micronutrient deficiencies and risk factors for deficiencies (especially zinc/iron/magnesium), vitamin D status, microbiome health, iodine deficiency, vitamin B12, food additives and allergies.

### BHN: Has anything you learned changed your perspective on our western diet's influence on mental health?

**SF:** Aside from nutritional risk factors for poor mental health, including sugar, trans fat, and mercury, foods often considered and recommended as health-promoting within a western diet do not necessarily promote optimal brain structure and function. A group of clinician-researchers, including Drew Ramsey, MD and Laura LaChance, MD,

recently compiled a list of the top 'antidepressant nutrients' based on their own, yet unpublished, literature review. Nutrients identified as having the best evidence for impacting brain structure and function included long chain Omega-3 fatty acids, vitamins A, K, B6 and B12, thiamine, folate, magnesium, iron and selenium.<sup>10,11</sup> Through their project "Antidepressant Foods: An Evidence-Based Nutrient Profiling System", plant and animal foods were ranked based on nutrient per calorie for each nutrient and then given an aggregate antidepressant food score. Top ranking results for aggregate scores, including teff, goose eggs, and chicken liver, were noted in some cases to be a 'divergence from mainstream dietary recommendations'; low-fat milk and skinless chicken breasts did not make the cut!

### BHN: Is there a call to action for BHN RDNs?

**RL-W:** RDNs are advised to 1) Include biochemical data for nutrients that commonly influence mental status in nutritional assessments, 2) Structure documentation of clinical or epidemiological goals, observations, and outcomes, so that it can be easily accessed and re-structured for official depersonalized reports of observations, conditions treated, and changes made as a result, 3) Maintain and use a file of relevant research to support your requests, recommendations, and programs.

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### About the Authors

**Dr. Leyse-Wallace** retired from clinical practice and has published three books: *Linking Nutrition to Mental Health*; *Nutrition and Mental Health*, as well as a reader-friendly version of her doctoral dissertation *The Metaparadigm of Clinical Dietetics: Derivation and Applications*. She lives in Alpine, California in San Diego County and has three adult children and five grandchildren.

**Sarah Ferreira** is a RDN with complementary certification as an Integrative and Functional Nutrition Certified Practitioner. She is the owner of Nourished Brain Solutions, where she leverages a whole-person, whole-food approach to explore the impact of nutrition on mood and cognition. Her individualized approach integrates an assessment of nutritional, genetic, environmental, and lifestyle factors into a collaborative nutrition care plan using cutting-edge research designed to facilitate meaningful and restorative changes based around client goals and priorities. See more at [www.nourishedbrainsolutions.com](http://www.nourishedbrainsolutions.com).

## In the BHN Pipeline!

### Look what's happening on the BHN website at [bhndpg.org](http://bhndpg.org)

- We now have a “**BHN Member Spotlight**” section on our home page. Check it out! Get in the spotlight and submit your bio using the template provided.
- **Mentoring program:** Now online in the members only section. Sign on as a mentor or mentee. Our member, Jessica Barth Nesbitt is managing this program.
- **Member Forums** in the members only section where we encourage members to check out postings and to post your own general questions and share advice. Read the instructions to post and get started!
- **Member Market Place:** Check out the store! Add your own book, reference, or service.
- **BHN Speaker's Bureau:** Check out the list of speakers already available! Go to the Speakers Bureau tab to complete a survey if you are interested in participating.
- **Events Calendar:** This feature is managed by Jamie Dannenberg. If you have events to post go to the calendar and send it to the web coordinator.
- **Communicating with Members:** Consider joining our electronic mailing list to connect with about 300 BHN members at this time, ask questions and get responses. To join, go to the EML tab in the members only section to send a request.

Have you signed up for our inaugural **Online Interactive Retreat** on February 9, 2018? Presenters will address Addiction, Athletes, Bariatrics, Mental Health, Health at Every Size, Weight Stigma, Eating Disorders and More!

BHN*Newsletter* is seeking expert reviewers for CPE articles in all BHN specialty areas. Please contact Caitlin Royster at [croyster102@gmail.com](mailto:croyster102@gmail.com)

## Delegate Update



**Cynthia Burke, MS, RD, LDN**  
Delegate BHN

The House of Delegates is gearing up for the 2017-18 year, our 100th anniversary! At the Fall 2017 HOD meeting, October 20-21, 2017 we had two dialogue sessions discussing “Championing the Registered Dietitian Nutritionist in Positions of Leadership (in Public Health and Government positions)” and “Ethics”.

The Mega Issue Question that was deliberated was “How Can Nutrition and Dietetics Practitioners Secure Influential Public Health Positions in Institutions, Organizations, and Government Bodies?” There was also a dialogue about the New Code of Ethics and its practical applications for all members.

For further information on these topics, the Backgrounder and Fact Sheet are available at <http://www.eatrightpro.org/resource/leadership/house-of-delegates/about-hod-meetings/fall-meeting-materials>.

In other news, The ACEND Board is pleased to release the Future Education Model Accreditation Standards for the Associate, Bachelor's and Graduate Degree Programs. Information can be found on the ACEND website at: <http://www.eatrightpro.org/resources/acend>. ACEND will host Virtual Town Hall meetings on the second Thursday of each month at 1 p.m. (Central Time).

“Your delegate is your link to the House of Delegates and The Academy.” The Academy of Nutrition and Dietetics House of Delegates, as the voice of members, governs the profession and develops policy on major professional issues. To learn more about the HOD, access the following link: <http://www.eatrightpro.org/resource/media/multimedia-news-center/videos/what-is-the-house-of-delegates>.

## Slate of Candidates for the 2018-19 Officer Positions

The Behavioral Health Nutrition DPG Nominating Committee is pleased to announce the slate of candidates for the 2018-19 officer positions:

### Chair-Elect

(3 year position as Chair-Elect, Chair, Past Chair)  
April N. Winslow, MS, RDN, CEDRD

### Secretary

(2 year position)  
Carly Sicheloff, MS, RD, LDN

### Nominating Committee Chair-elect

(2 year position as Nom Com Chair-elect, Nom Com Chair)  
Julie Duffy Dillion, MS, NCC, RD, CEDRD

### HOD Rep for BHN

(3 year position)  
Tammy Beasley, RDN, CSSD, LDN, CEDRD  
Sharon Lemons, MS, RDN, LD, FAND

**Thank you, BHN DPG Nominating Committee**

## Student Corner

# Evolution of Nutrition Services: 132 years at Utah State Hospital

by Erika J. Smith

The Utah State Hospital, established in Provo, UT in 1885, has a rich history of caring for those with mental illness. The hospital, which started as an asylum, was separated from the nearest residents by swampland and a dump. Today, the swampland and dump have been replaced with a municipal park and neighborhoods. Nutrition services have also progressed throughout the hospital's history.<sup>1</sup>

When USH first opened the staff and patients had to be entirely self-sufficient in producing their food. They owned farms, miles of apple orchards, cows, chickens, other animals, a barn, and even a cannery. They made their own butter and cooked food from scratch. At the time utensils were considered dangerous for patients. All their food was poured into a bowl, often leaving it looking unappetizing. This practice continued until the 1930s when staff started serving patients family style meals.<sup>2</sup>

Food prep continued to change during the 1940s and 1950s with the addition of recreational activities.<sup>2</sup> Patients were encouraged to hold jobs on the hospital campus if their condition allowed. Patients became involved in cooking their own meals as part of the therapeutic community in which they lived. Therapeutic communities were designed to help patients learn to be more independent and to develop a form of self-government.<sup>3</sup> Each unit held council meetings where complaints about food would frequently come up.<sup>2</sup> Representatives from each unit's council met to try to make hospital-wide improvements. This type of system is still in place today. One current patient said that working in the kitchen gives him a sense of accomplishment. Patients feel their voice is heard when they attend unit meetings and hospital-wide meetings.<sup>4</sup>

Many diet changes were made in the 1990s and early 2000s. Studies revealed that individuals with mental illness often have comorbidities and a lower life expectancy.<sup>5</sup> This discovery led to the addition of more modified diets and a ban on smoking on hospital grounds.<sup>2</sup> In the early 2000s there were several new antipsychotic drugs released. Many of these drugs increased patient's appetites and caused them to gain weight.<sup>6</sup> This led to an emphasis on portion sizes for patients in mental institutions.<sup>2</sup>

Modified diets also progressed throughout the hospital's history. The first modified diet implemented was for dysphagia patients when the hospital first opened. Dysphagia means difficulty swallowing. These patients need to eat soft foods that are cut into small pieces

or pureed. By the 1980s more specialized diets were created such as gluten-free and lactose-free.<sup>2</sup> It should be noted that USH has progressed in how food is served to patients. One of the newest changes is the addition of an eco-spoon, made from a digestible material, in case it is swallowed. Patients at risk of self-harming with utensils used to be assigned a finger food diet. The eco-spoon has given patients more food options, which helps to preserve their dignity.<sup>4</sup>

The dietetics team continues to improve food for patients. About 80% of meals are still prepared from scratch, including the bread. More desserts, including cheesecake, pureed cherry cobbler, and pureed brownie, were added for dysphagia patients. More options for vegan, heart healthy, and carb control diets are being developed as well. Patients can request diet modifications, which need to be approved by dietitians, psychiatrists, or medical doctors.<sup>4</sup>

Food surveys are sent out periodically in an effort to improve patient satisfaction. A new BBQ sauce recipe was developed in response to complaints. The hospital holds itself to high standards. Melissa Baugh RD, CD, one of USH's registered dietitians, said, "I do not want to use the fact that we are an institution as an excuse for poor quality meals. I have heard patients say that meals are a lot of what they look forward to in a day."<sup>3</sup> Both nutrition and meal quality have progressed throughout the hospital's history and staff hopes to continue to improve satisfaction for patients.

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## Interested in getting involved in BHN?

We have opportunities available for students to publish articles, manage student work and assist Executive Committee members!

Please email our Student Liaison, Emily Conner, at [studentliaison@bhndpg.org](mailto:studentliaison@bhndpg.org) for more information if you are interested.

## eBlast From the Past!

[Click here](#) for inspiration and insight into scope of practice from the Fall 2012 BHN*Newsletter*, page 7:

"Nutrition Counseling Boundaries: Connecting with Patients without Practicing Psychotherapy"

by Jessica Setnick, MS, RD, CSSD, CEDRD

## Council on Future Practice Publishes 2017 Visioning Report

Exponential changes are on the horizon with major advancements in health care, medicine, technology and food systems.

[Read the Council on Future Practice's Visioning Report 2017: A Preferred Path Forward for the Nutrition and Dietetics Profession](#)

and become proactive in the movement to collectively create our preferred future.

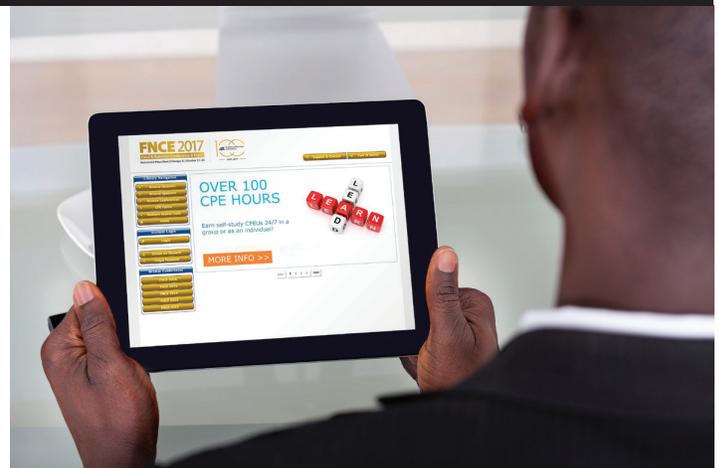
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**Mission:** Empowering BHN members to excel in the areas of Addictions, Eating Disorders, Intellectual and Developmental Disabilities and Mental Health by providing resources and support.

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