**Nutrition in Complementary Care**

*a dietetic practice group of the American Dietetic Association*

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**Eat Your Broccoli!**

Sheila Dean, DSc-C, RD, LD, CCN, CDE

Broccoli *Brassica oleracea italica* is a member of the Brassicaceae family, which includes such notables as cauliflower, kale, cabbage, collards, turnips, rutabagas, Brussels sprouts, and Chinese cabbage.1 Brassica vegetables all share a common feature: their four-petaled flowers bear resemblance to a Greek cross, which explains why they are frequently referred to as crucifers or cruciferous.2 Vegetables that are part of the crucifer family are of special interest since numerous epidemiological studies have shown that cruciferous vegetables have a role in the dietary prevention of cancers.3 This protective effect may be due to the presence of substances known as glucosinolates; substances that occur widely in plants of the genus Brassica, and are hydrolyzed by the enzyme myrosinase to yield, among other products, mustard oils. These oils are responsible for the pungent flavor of the vegetables, especially in mustard and horseradish.4 Myrosinase is present in plant cells in a separate compartment from glucosinolates. When the plant cells are damaged, e.g., by cutting or chewing, the myrosinase comes into contact with the glucosinolates and hydrolysis occurs. Upon hydrolysis of the glucosinolates, three major classes of breakdown products can be formed: isothiocyanates, nitriles, and thiocyanates.5 Many of these products are bioactive, causing upregulation of detoxification enzymes. These bioactive agents upregulate a number of both Phase I and Phase II detoxification enzymes, including CYP 1A1, and quinone reductase and glutathione S-transferase (GST), respectively.5

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**Detoxification: A quick review**

To help understand the role of crucifers in the process of detoxification, one must first understand some basic principles of detoxification, also referred to as biotransformation, as potentially toxic substances or xenobiotics (xenobiotics are chemicals or molecules that are foreign to the biologic system, originating externally OR internally) are transformed into water-soluble and rather benign molecules prepared for excretion.6 Biotransformation or detoxification enzymes metabolize a wide range of compounds, including exogenous or xenobiotic compounds such as carcinogens and therapeutic drugs, as well as endogenous compounds such as steroid hormones. In the case of lipophilic carcinogens, the metabolism of xenobiotics is often a two-step process. First, compounds are metabolized by cytochrome P450’s - a large family of enzymes - to generate reactive compounds. This is referred to as Phase I of the process of biotransformation. These intermediate metabolites are often more volatile and reactive than the original compound, and if not properly detoxified, can cause free radical production leading to secondary tissue and/or DNA damage. Next, the reactive intermediates are conjugated, or conjoined by other enzymes such as uridine diphosphate glucuronosyltransferase (UGT), in a process known as Phase II, resulting in a final product that is highly water-soluble and easily excreted in urine or bile, or can be further conjugated by GSTs to generate compounds that can be further degraded to excretable metabolites. In fact, there are several reactions that can take place via Phase II detoxification, including sulfation, glucuronidation (via UGTs), methylation, acetylation, amino acid conjugation, and continued on page 4
Welcome to the first electronic version of the NCC newsletter. We responded to members interest and desire to not only go green by using less paper, but also to give members a way to retain the newsletter without having to keep mounds of paper. Electronic newsletters are the wave of the future for many organizations and NCC chose to participate in this wave early as have several other DPGs. The CPE issues, Fall and Spring, will continue to be hard copy and will also be available on the NCC website.

As the Dog Days of summer are drawing to a close plans for this year’s Food & Nutrition Conference & Expo in Denver, CO is ramping up. NCC has many exciting offerings for members including the preconference symposium, Achieving Hormone Balance: An Endocrine Dance of Environment, Genes, Diet and Detoxification, and what sounds like a great reception co-hosted with the Vegetarian Nutrition DPG-Functional Food Tasting. More information about FNCE can be found throughout the newsletter.

The 2009-2010 Executive Committee continues to press forward in bringing complementary nutrition into mainstream healthcare. With anticipated changes brought with healthcare reform, I imagine that self care and functional and integrative care will take a front seat for many wanting to improve and maintain their health. Opportunities to learn more about functional medicine will be available from NCC members and presentations at FNCE as well as in upcoming newsletters and the IFM/NCC webinars.

I am anxiously awaiting FNCE and the opportunity to network with members, see old friends, and make new friends. As always, I will be in attendance at the various functions where NCC will be represented and encourage you to give me your feedback about the newsletter and to volunteer to assist with any number of opportunities the newsletter affords.

The newsletter continues to be the main vehicle to inform members about what is new in complementary nutrition and we hope that this new method communicating meets your needs. If you are unable to attend this year and you would like to offer an article or help out in any way, please to not hesitate to contact me at peaknut@cascadeaccess.com.

Those of you who make it to FNCE, I look forward to seeing and visiting with you.

NCC’s Executive Committee during the spring leadership retreat at Nutrilite’s Trout Lake farms in Washington State. From left to right are - front row Mary Alice Gettings, Alicea Trocker, Colleen Fogarty Draper, Kathy Bernard, Rita Batheja, Paula Mendelsohn, Laura Lagano, Kevin Ernst (Nutrilite’s Trout Lake farm manager), 2nd Row Ann Suls, Kathie Swift, Debbie Ford, Ane Marie Kis, Kathy Moore.

The views expressed in this newsletter are those of the authors and do not necessarily reflect the policies and/or official positions of the American Dietetic Association.

We invite you to submit articles, news and comments. Contact us for author guidelines.

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Dear NCC Members, as summer winds down, I hope this finds you enjoying some leisure time and perhaps savoring a great book. A couple of my favorites: The End of Food by Paul Roberts (I highly recommend) or The School of Essential Ingredients by Erica Bauermeister (a delicious, fun-read novel). It has already been a rewarding few months for me working with the NCC Executive Committee (EC) since I assumed the Chair position in June. In May, NCC held a Spring team building meeting in Hood River, Oregon, thanks to our generous supporter, Nutrilite. Amidst the beauty of the Northwest region, we updated our strategic plan and have been moving ahead with many initiatives already in motion, including:

Name Change: Thanks to everyone who participated in our name change survey. The number one choice, “Dietitians in Integrative and Functional Medicine” (DIFM), is currently being reviewed by ADA along with our revised Mission and Vision statement. A very special thanks to Colleen Fogarty Draper, NCC Nutritional Genomics Director, for taking the lead on this critical project.

Congratulations! The Scope of Dietetics Practice Framework Sub-committee (SODPFC) of the Quality Management Committee (QMC) has approved our NCC DPG proposal for the development of Standards of Practice (SOP) and Standards of Professional Performance (SOPP) for RDs in Integrative and Functional Nutrition. The Committee recognizes the importance of developing Standards for RDs in this practice field and supports our DPG’s efforts and determination in completing this project. A special thank you to Rita Batheja MS, RD, CDN who worked tirelessly on this proposal. All of us on the SOP/SOPP committee look forward to the exciting work ahead.

Welcome Kelly! Student members are one of our greatest assets and we enthusiastically welcome Kelly Moltzen as our new Student Representative. You may have read Kelly’s excellent article on Nutritional Genomics in our NCC newsletter but if you haven’t had a chance yet, it is archived on our website in Newsletter archives. Kelly is currently a MPH candidate at the New York Steinhardt School of Culture, Education and Human Development and a nutrition intern with Bronx Health, Reach, NY.

IFM/NCC Cutting Edge Webinar Series: The response to our July webinar on Food Allergies and Intolerances was outstanding so if you haven’t registered for these webinars, no worries, you have not missed out yet. All three webinars are archived, and once registered, you can view at your convenience up until the end of the year. These webinars are loaded with clinical pearls that I know you will enjoy and put into practice.

Pre-FNCE Conference: We chose a topic that is timely and important to all of us, “Achieving Hormone Balance: An Endocrine Dance of Environment, Genes, Diet and Detoxification”, so make your plans now to join us on Saturday, October 17th in Denver, CO for this cutting-edge workshop with our NCC Professional Advancement Director, Sheila Dean DSc-C, RD, LDN, CCN, CDE, leading the cast of expert presenters on hormone health. A pre-FNCE thank-you to our generous sponsor, Pharmavite.

FNCE: We have quite a line-up of NCC sponsored events and activities thanks to Ane Marie Kis MS, RD, LDN, our Development Director. Plan on joining us for:

- Functional Food Tasting with our Vegetarian Nutrition DPG friends: Sunday, October 18th @ 6pm
- An inspiring, call to action Open Forum Discussion: Integrative & Functional Medicine: Are RD’s Ready? Monday, October 19th @ 3pm
- Eye-opening NCC Member Breakfast Tuesday, October 20th @ 7am
- Yoga sessions daily

And of course, be sure to stop by and visit with us at our NCC DPG booth on Monday, October 19th at the DPG Showcase from 10:30 am - 1 pm, Booth 29.

You can check out the complete FNCE 2009 Agenda on our website.

Networking Relationships: Our Alliance Director, Alicia Trocker MS, RD, is doing a fantastic job in spearheading new networks, including the International Omega 3 Consortium for Learning in Health & Medicine led by Dr. Bruce Watkins PhD, FACC of Purdue University. The mission of the Consortium is to facilitate learning by consumers and healthcare professionals about omega-3 fatty acids in food, nutrition, and medicine and to advance education concerning technologies for broadening the food applications for these nutrients. The Consortium will provide evidence-based scientific research to NCC through webinars, quarterly newsletter updates, eblasts, podcasts and other educational materials. Stay tuned for fantastic omega-3 info!

New Feature: Colleen Fogarty Draper, NCC Nutritional Genomics Director, introduces her “SNiP” column in this inaugural electronic edition of our newsletter and we look forward to more SNiPs in the future.

Website Renovations: We are working on website upgrades and renovations thanks to the volunteer efforts of your EC team. We would love to hear from you with your suggestions on how our website can lead the list of your “Favorites” so, send them on to me at swiftnutrition@aol.com.

I am signing off with gratitude to you, our members, and to each and everyone on our NCC Executive Committee, and be sure to check the Leadership Directory in this newsletter to contact us!

Live the day!

Kathie

Kathie Swift, MS, RD, LDN
Chair’s Corner:

Summer 2009 Volume 12, Issue 1
www.complementarynutrition.org
Glutathione conjugation (via GSTs). All of which occur to help detoxify the original xenobiotic compound.\textsuperscript{5}

**Love your liver**

While detoxification is a very natural part of body function, it is not necessarily always a perfectly smooth functioning process that can be relied upon in every instance. Both Phase I and Phase II are highly dependent on multiple factors, including heavy reliance on many micronutrients. In the case of estrogen detoxification, for example, methyl donating nutrients such as folate; vitamins B2, B6, B12; trimethylglycine (TMG); and others such as magnesium, all promote the methylation of catechol estrogens such as the 2 hydroxy (2-OH) and 4 hydroxy (4-OH) estrogens.\textsuperscript{6} Vitamins A, E, and C; N-acetylcysteine; turmeric; green tea catechins; lycopene; alpha-lipoic acid; and various flavonoids are all involved in reducing the oxidation of catechol estrogens so that they do not go on to become readily oxidized forming quinones; quinones are reactive substances that can damage DNA and promote carcinogenesis directly or indirectly through the generation of reactive oxygen species (ROS).\textsuperscript{7} Additionally, the consumption of cruciferous vegetable containing glucosinolates is known to influence 2 hydroxyestrone at the expense of lowering the 16 hydroxy estrogen metabolites, which have demonstrated persistent estrogenic activity and promote tissue proliferation.\textsuperscript{8} If there is an insufficiency or deficiency of these and other key nutrients, whether it is the result of poor dietary intake or the displacement of important nutrients due to the consumption of the Standard American Diet (SAD) (characterized by high levels of refined sugar and flour products, preservatives, additives, pesticides, hormones, trans fats, excess animal protein, caffeine, alcohol, and artificial sweeteners), there exists the potential for health challenges associated with impaired and/or unbalanced Phase I and II detoxification mechanisms.\textsuperscript{9} Additionally, the prescription medications that millions of Americans are taking induce nutrient depletions of key micronutrients such as magnesium and folic acid, which are two key nutrients involved in detoxification.\textsuperscript{10} Underpinning this are the inherited genetic variations that also influence nutritional status and needs, which ultimately affect detoxification function.\textsuperscript{11} These variations, or mutations, in the genetic code can range from being rare to very common. Rare mutations are often identified because they have high penetrance or a major impact on health, whereas the more common variations are usually of low penetrance and often go unnoticed since there is no outward discernible characteristic or phenotype. Variations with a frequency in the minor allele of greater than 1 percent in one or more populations are termed polymorphisms.\textsuperscript{12} Variations in the DNA code can occur as a result of single nucleotide substitutions, deletions, insertions, or repeats.\textsuperscript{12} Typically, single nucleotide polymorphisms (SNPs) account for much of the low-penetrance variation, and may or may not affect gene function. In contrast, base-pair deletions, insertions, and repeats can have profound effects on function.\textsuperscript{12} However, genetic variation that changes gene function by increasing or decreasing the expression of a gene or altering the function of a gene product can ultimately affect nutritional needs. For example, of all populations observed to date, 40.9% have been found to possess the T allele (homozy + heterozy) +/- S.E. Of these, 19.3%. have the methyl tetrahydrofolate reductase (MTHFR) SNP, a genetic polymorphism that interferes with their ability to metabolize folic acid to the active form that is utilized by the body.\textsuperscript{13} Supplementing with a metabolically active form of folate that does not require enzymatic conversion, such as L-5-methyl tetrahydrofolate, will ensure adequate folate nutrition.\textsuperscript{14} It is entirely possible that an individual may not only consume a diet lacking in important methylating nutrients such as folic acid, but may also be on a drug that induces a nutrient depletion, such as oral contraceptives, and may possess the common MTHFR SNP. Taken together, these three strikes can result in serious impaired detoxification that can result in a multitude of systemic health conditions. These become part of a vicious cycle that results in prescribing even more drugs from the allopathic medical community to temporarily alleviate symptoms, while never truly addressing the core issues at hand. Given this information it is critically important that close attention is paid to individual nutritional status to help promote the healthy detoxification of the hundreds of xenobiotics we all consume, inhale, or are exposed to in some fashion, in this industrialized nation we live in each day.

**Crucifers: The crown jewels of nutrition?**

Cruciferous vegetables are unique because they are the richest sources of glucosinolates in the human diet.\textsuperscript{15} Glucosinolates are hydrolyzed by the enzyme myrosinase to yield isothiocyanates (ITCs). Even within the Brassica genus and species, different glucosinolates predominate and yield distinct ITCs.\textsuperscript{16} For example, glucoraphanin accounts for 35–60% of glucosinolates in broccoli, and is converted to the ITC sulfora-
phane. Whereas gluconasturtin, found in watercress, is hydrolyzed to phenethyl ITC (PEITC). Glucobrassicin, in broccoli and Brussels sprouts, is broken down to indole-3-carbinol (I3C), which is further converted to a range of polyaromatic indolic metabolites [e.g., diindolylmethane (DIM)] under acidic conditions in the stomach. To review GSTs, they are a family of cytosolic conjugating enzymes that catalyze the conjugation of reduced glutathione to common carcinogens as well as phytochemicals. Of the four primary GST classes – alpha, pi, mu, and theta – alpha and mu are the major hepatic GSTs, hence the terms GSTA1 and GSTM1. GSTM1 and GSTT1 have been shown to conjugate ITCs and indoles from cruciferous vegetables, and in turn isothiocyanates have been shown to induce GSTS. The induction of enzyme activity occurs rapidly within several days of cruciferous vegetable consumption and declines when they are removed from the diet. Several GST polymorphisms have been extensively studied. Mutations in GSTM1 and GSTT1 result in the absence of the functional enzymes resulting in potentially impaired detoxification pathways. Epidemiologic studies conducted in the United States suggest that individuals with the GSTM1+ genotype, indicating the presence of the gene, gain greater protection in terms of cancer risk and improved biotransformation from cruciferous vegetable consumption compared to those with the GSTM1-null (absent or deleted) genotype. Additionally, over two decades of research have demonstrated that, in humans, commonly consumed cruciferous vegetables, and their isolated constituents such as indole-3-carbinol, can affect the CYP1A family and the two major Phase II enzyme systems, GST and UGT, and alter steroid hormone metabolism. Human intervention studies have also examined directly the effects of cruciferous vegetable supplementation on carcinogen metabolism. The addition of watercress to the diets of smokers significantly increased the glucuronidation of nicotine- and tobacco-carcinogen metabolites, although it had little effect on oxidative metabolism. Similarly, broccoli and Brussels sprouts increased the metabolism of cooked meat-derived heterocyclic aromatic amines, implicating the induction of both CYP1A2 and Phase II enzymes involved in heterocyclic amine metabolism. Weng, Tsai, Kulp, and Chen noted in a paper on cruciferous vegetables that “this broad spectrum of anti-tumor activities in conjunction with low toxicity underscores the translational value of indole-3-carbinol and its metabolites in cancer prevention/therapy.” Furthermore, novel anti-tumor agents with overlapping underlying mechanisms have emerged via structural optimization of indole-3-carbinol and DIM, which may provide considerable therapeutic advantages over their parental compounds with respect to chemical stability and anti-tumor potency. Together, these agents might foster new strategies for cancer prevention and therapy. It should be noted that some glucosinolates have been shown to interfere with the metabolism of iodine by the thyroid gland, and hence, are goitrogens. As a result, goitrogens, substances that suppress the function of the thyroid gland by interfering with iodine uptake, may cause an enlargement of the thyroid.

Take home message

There appears to be sufficient evidence that the various glucosinolates in vegetables, particularly cruciferous vegetables, may have useful anti-cancer activity, since they increase the rate at which a variety of potentially toxic and carcinogenic compounds are conjugated and excreted. Although much of the focus has been on hepatic detoxification, unique genetic variations also need to be considered. One of the challenges at the individual level, however, is that SNPs do not act in isolation, but in families, in the background of thousands of other SNPs and environmental factors. There can be as many as three million functional SNPs per person and over 15 million locations where SNPs can occur. While applications of available genetic polymorphism data related to biotransformation and cancer risk are in the early stage for making recommendations at the individual patient counseling or public health levels, it is probably safe to say that our mothers, teachers, and nutritionists were right when they said “eat your broccoli!”

Sheila Dean, DSc (cand), RD, LD, CCN, CDE is the owner of a functional medicine private practice in Palm Harbor, Florida. A published author, national speaker and media spokesperson, Sheila continues her studies as a part-time doctoral student and adjunct professor at the University of Tampa. Contact Sheila at SDeanRD@aol.com or 727-781-4326 or visit www.IntegrativeNutritionSolutions.com

References

10. Pelton R, LaVelle J, Hawkins E, Krinsky D.
Eat Your Broccoli!

Ruth DeBusk, PhD, RD has been awarded the 2009 Outstanding Dietitian Award by the Florida Dietetic Association. This award is the highest honor presented to a Florida dietitian whose leadership and service are outstanding. Ruth is passionate about expanding the expertise of dietetics practitioners in emerging areas of practice and expanding the opportunities for practitioners.

She has been proactive in helping dietitians develop knowledge and practice expertise in cutting edge areas such as complementary nutrition, dietary supplements, functional nutrition, and nutritional genomics.

Ruth is presently involved in developing and teaching nutritional genomics courses at the graduate level and looks forward to expanding that initiative to practicing dietitians interested in developing expertise and skills in nutrition and genetics and learning how to apply nutritional genomics into their practice. Ruth is a founding member of NCC and its first Newsletter Editor and Publications Chair. She continues to serve as NCC’s Technical Advisor.

Congratulations

Correction to CPE Article Fall 2008 Q & A

Organic Foods: Are They a Safer, Healthier Alternative?

On p. 38, under CPE Objectives and Questions, the fourth question is a true-or-false that states: “There is an association between pesticide exposure and incidence of chronic diseases such as cancer, autism spectrum disorders, obesity, and insulin resistance.” The answer to this was given as False. On p. 29, a link between pesticide exposure and autism spectrum disorders as well as insulin resistance was described. While some studies don’t find a correlation between pesticide exposure and certain cancers, other studies do. So, False as a categorical answer to question 4 is incorrect, and the answer should be TRUE.

We regret any confusion this may have created. Thanks to the members who pointed this out!
Yoga can strengthen not only the body balance helps build muscle, burn fat, and plays a role in maintaining the endocrine system function optimally and decreases inflammation and helps the immune system.

Exercise is another lifestyle factor; it helps build muscle, burn fat, and plays a role in increasing growth hormone levels, ultimately enhancing overall hormonal balance and decrease insulin resistance. Yoga can strengthen not only the body but also the respiratory and nervous systems. Yoga has also been shown to improve overall flexibility, the development of the glandular system, the ability to concentrate, and control over breathing.

Typically, Integrative MNT combines nutrition therapy with mind-body-spirit modalities such as yoga. For nutrition and healthcare professionals interested in Integrative MNT, Kundalini yoga is a good choice as it provides gentle techniques, relatively quiet effects on stress-reduction, and has positive effects on the glandular system.

Introduction

Anu Kaur, MS, RD

In the last 10 to 15 years, the evidence indicating yoga may offer certain improvements in clinical indices and overall well-being has grown exponentially. Yoga therapy combined with medical nutrition therapy (MNT) may improve overall nutrition status and well-being.

This article will focus on Kundalini yoga, as an example of how yoga can be part of the Integrative MNT model, and will familiarize clinicians with basic scientific foundations of yoga. The goal is to help nutrition and healthcare professionals become more knowledgeable about yoga science and the possible benefits of yoga as a complementary therapy to nutrition counseling. The integrative approach of taking an evidence-based complementary treatment, such as yoga, and combining it with conventional nutrition diagnosis, education, and intervention, will hopefully further enhance our clients’ health and quality of life through the synergy of both approaches.

Why should nutrition and healthcare professionals be interested?

As early as our twenties, our metabolism begins to slow down and our endocrine system begins to wear out due to general use and the stress response. To diminish endocrine decline and help maintain a healthy weight and lifestyle, several factors have been shown to be helpful. For example, a nutrient-dense diet low in saturated fat is associated with decreased inflammation and helps the endocrine system function optimally and decrease insulin resistance.

Exercise is another lifestyle factor; it helps build muscle, burn fat, and plays a role in increasing growth hormone levels, ultimately enhancing overall hormonal balance and decrease insulin resistance. Yoga can strengthen not only the body but also the respiratory and nervous systems. Yoga has also been shown to improve overall flexibility, the development of the glandular system, the ability to concentrate, and control over breathing.

Typically, Integrative MNT combines nutrition therapy with mind-body-spirit modalities such as yoga. For nutrition and healthcare professionals interested in Integrative MNT, Kundalini yoga is a good choice as it provides gentle techniques, relatively quiet effects on stress-reduction, and has positive effects on the glandular system.

The basic concept of Kundalini yoga

Kundalini yoga was described in written script in India as early as 5000 BCE and parallels modern science. It uses symbolic language to describe the body in terms of chakras (energy centers), nadis (nonphysical energy conduits), and tattwas (basic primal elements seen in all personalities), which are terms not commonly used in western/allopathic medicine.

As with most schools of yoga, Kundalini practice is based on several main elements. One component common to all yoga is pranayama, which refers to different breathing techniques. Kundalini yoga also focuses on:

- Mudras, gestures
- Asanas, sustained physical postures
- Mantras, basic vibratory sound syllables
- Bandhas, muscular contractions to move energy around and through the body

Kundalini yoga combines kriyas, which is a sequence of exercises and meditation (relaxation response), that can affect the endocrine glands and hormones associated with the hypothalamic-pituitary-adrenal (HPA) axis; the result is a healing effect on the body. The other key mechanism or pathway believed to be utilized in yoga is the direct stimulation of the vagus nerve leading to parasympathetic activation. Both a decrease in the HPA axis, which governs the endocrine system, and the reactivity of the sympathoadrenal system may work to improve individuals overall well-being and perceived stress. Kundalini yoga has hundreds of different combinations of these main components that make up different kriya sets aimed at helping specific disorders.

Kundalini yoga’s purpose is to move energy from the base of the spine, what is called the lower chakras or energy centers, to higher chakras. Chakras are considered the nonphysical ethereal components of our physical nerve plexuses, organs, and glands (see Table 1). The movement removes blocked energy so that people can live fuller physical, mental, and spiritual lives.

Therapeutic evidence associated with yoga

When yoga was introduced to the West in the 1800’s, many Americans viewed yoga as a discipline associated with magic and mysticism. This was the case for Kundalini (Kriya) yoga, in particular, because the techniques allow for energy movement. As more Americans have become interested in disease prevention and have taken charge of their overall health, a biomedical approach towards yoga has been seen in healthcare.

A review of eligible studies from Western and Indian databases indicate that yoga has been studied mostly in relationship to cardiovascular disease, insulin resistance, and cancer. Insulin sensitivity, glucose tolerance, lipid profiles, blood pressure, immune function, and oxidative stress are some of the reported clinical indices that have been observed to change positively with yoga.

Many variations of yoga have been shown to improve mood, overall psychosocial well-being, quality of life, and sleep.

Yoga’s association with a decreased stress response is physiologically indicated by the reduction of a neuroendocrine outcome, such as salivary cortisol. Although cortisol levels have not been consistently significant in yoga studies, the shifts in the cortisol patterns...
observed indicate a healthier hypothalamic-pituitary-adrenal (HPA) axis, which is congruous with a decreased stress response.\textsuperscript{1,7,9,12,15} Carlson et al. were one of the first to have results indicating an anti-inflammatory shift in cancer patients practicing a mindful modality such as yoga. Their findings indicate decreased cortisol levels and the reduction of Th1 (pro-inflammatory) cytokines, both associated with less stress and overall improved well-being.\textsuperscript{11}

There have been at least 23 different outcomes studied with nutrition and yoga, ranging from body composition to diet habits.\textsuperscript{2} There is some evidence that the mindfulness of yoga may influence various dietary changes such as adopting a lower-fat diet, lower-calorie diet, plant-based diet, and reduction in caffeine intake.\textsuperscript{13,15}

Saxe et al. conducted a prospective pilot study with prostate cancer patients (n=10). The intervention treatment was Mindfulness-Based Stress Reduction (MBRS) practice, including yoga, combined with a plant-based, high fiber, and low saturated fat diet. Weight loss was observed along with increased fiber intake, increased exercise, decreased calorie intake, and a significant decrease in prostate specific antigen (PSA).\textsuperscript{15} Despite the small sample size and methodological issues, the results raise the question of whether yoga can increase overall well-being and possibly play a role in changing eating behaviors.

Yoga as a therapeutic modality is complicated to study. Even in randomized controlled clinical trials (RTC), there is a lack of standardization of yoga techniques. The control treatment remains an issue. Although many recent studies have been conducted on yoga therapy and different medical conditions, the quality of research still remains an issue.\textsuperscript{2,7,16}

**What to consider when recommending yoga**

As a nutrition and healthcare professional, I have many clients who are considering adding yoga to their exercise regimen for weight loss or to cope with cancer, polycystic ovary syndrome (PCOS), diabetes, cardiovascular disease, or other health conditions. These clients can benefit from our feedback on an appropriate yoga class and the potential benefits.

Finding the right yoga instructor is of utmost importance, especially if it is the client’s first yoga experience. Individuals who are new to yoga and meditation techniques may feel uncomfortable with some symptoms associated with blocked chakras.\textsuperscript{5} Hence, the benefit of an experienced yoga teacher cannot be underestimated. Certain medical conditions warrant a physician’s approval prior to starting yoga, which may include the following\textsuperscript{17}:

- ear problems
- fluctuating blood pressure
- glaucoma
- severe osteoporosis

Health professionals’ attitudes towards yoga as an adjunct therapy can affect a client’s overall experience and beneficial outcomes. Patients’ expectations of the effectiveness of a complementary therapy can influence their yoga practice.\textsuperscript{18} For example, in the case of Kundalini yoga, if health professionals

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**Table 1. The Chakras***:

<table>
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<tr>
<th>Number of Chakra</th>
<th>Location of Chakra</th>
<th>Associated Element (Tattwa)</th>
<th>Associated Nervous System Structure</th>
<th>Associated Endocrine Structure</th>
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<tbody>
<tr>
<td>First Chakra</td>
<td>Base of spine</td>
<td>Earth</td>
<td>Coccygeal plexus</td>
<td>Gonads</td>
</tr>
<tr>
<td>Second Chakra</td>
<td>Behind lower abdomen</td>
<td>Water</td>
<td>Sacral plexus</td>
<td>Leydig Cells</td>
</tr>
<tr>
<td>Third Chakra</td>
<td>Behind the navel</td>
<td>Fire</td>
<td>Solar plexus</td>
<td>Adrenal gland</td>
</tr>
<tr>
<td>Fourth Chakra</td>
<td>Behind the heart</td>
<td>Air</td>
<td>Cardiac plexus</td>
<td>Thymus</td>
</tr>
<tr>
<td>Fifth Chakra</td>
<td>Throat</td>
<td>Ether</td>
<td>Laryngeal plexus</td>
<td>Thyroid</td>
</tr>
<tr>
<td>Sixth Chakra</td>
<td>Center of forehead or third eye point</td>
<td>Brain</td>
<td>Pituitary gland</td>
<td></td>
</tr>
<tr>
<td>Seventh Chakra</td>
<td>Top of head</td>
<td>Brain</td>
<td></td>
<td>Pineal gland</td>
</tr>
<tr>
<td>Eighth Chakra</td>
<td>Aura</td>
<td>Biomedical Field</td>
<td></td>
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</tr>
</tbody>
</table>

Kundalini Yoga

explain ahead of time, that a client will hold their hands up in certain positions and breath in a certain method according to yogic science, then they may feel more prepared in doing unfamiliar yoga techniques.

Take home message

The National Center for Complementary and Alternative Medicine (NCCAM) states that, in general, yoga is a safe practice if followed properly by “healthy” individuals. Yoga is a systematic modality with specific techniques that put the body in harmony with itself and the greater universe. The experience of yoga can be an avenue for providing new insights to individuals undergoing nutrition counseling.

Perhaps yoga can help patients make better lifestyle choices and sustain those choices. Yoga may be a useful tool in managing stress and possibly in encouraging healthy eating habits for cancer patients or others dealing with chronic diseases to manage stress, immune function, and quality of life across the continuum of care.

Methodological weaknesses such as a lack of standardization in yoga techniques, and in some cases lack of control groups, makes it hard to interpret even positive findings. Although no strong claims can be made, new therapeutic evidence is promising for yoga as an adjunct therapy. Hopefully future studies will shed light on the frequency, duration, and intensity of the minimal required dose necessary to affect changes.

Anu Kaur, MS, RD is a speaker, author, and wellness coach who is owner of Kaur & Singh, Inc., A Nu Healthy You. She practices Integrative Medicine in her private practice. Contact Anu at anu@anuhealthyyou.com or www.ANuHealthyYou.com.

References


IMPORTANT PROFESSIONAL ADVANCEMENT OPPORTUNITY
NCC IFM Webinar Series 2009-2010

We are pleased to announce a cutting-edge, continuing education webinar series for NCC DPG members in association with the Institute for Functional Medicine (IFM) on “functional nutrition therapy” to advance your practice skills in the growing field of integrative and functional medicine. *These webinars are very popular so register early as space is limited.* The webinars are archived so that once registered you can access them at your convenience and they will be available for viewing and credits until the end of the year.

Special Offer: Three Webinars for $99 with 3 CPEU’s; One Webinar for $39.99 with 1 CPEU

Functional Nutrition Therapy (FNT) is an emerging specialty in the management of chronic disease and each webinar in this 2009 series presents the use of FNT protocols that you will find invaluable in practice.

**Objectives:**
1. Demonstrate Functional Nutrition Therapy Protocols for three major chronic diseases.
2. Assess nutritional imbalances common to food intolerances and allergies, and then prescribe and monitor four functional nutrition therapy interventions of diet and supplementation to improve client outcomes.
3. Be able to assess for nutritional insufficiencies and deficiencies in chronic fatigue immune deficiency syndrome (CFIDS), fibromyalgia, and diabetes and prescribe diet and nutritional supplementation to correct those imbalances.

**Webinar 1 of 3:**
-Diana Noland, MPH, RD, CCN
“A Functional Nutrition Therapy Approach for Food Intolerances and Allergies”
In this webinar, Diana Noland addresses the pathophysiology of food intolerances and allergies, assessment of nutritional imbalances associated with these conditions, interventions with whole foods, elimination diets and supplementation, if needed, and monitoring guidelines to help promote more successful outcomes for each client.
CPEU: 1 hour

**Webinar 2 of 3:**
-Tuesday, Sept 29, 2009, 5 pm PST / 8 pm EST
-Sheila Dean, MS, RD, CCN, CDE
“A Functional Nutrition Therapy Approach for Type 2 Diabetes”
Type 2 Diabetes, which afflicts 8% of the American population, manifests itself as a progressive disorder produced by the dysfunctional interaction of an individual’s genes with their diet, lifestyle, and environmental exposure. Being able to recognize signs of impending diabetes in the form of slight imbalances in blood sugars and dysfunctional insulin signaling before the disease becomes diagnosable and chronic is critical for prevention. This webinar addresses the Functional Nutritional Therapy (FNT) protocols to identify underlying root nutritional imbalances and underlying pathophysiologic mechanisms involved in Type 2 diabetes. Once identified, interventions can be developed that will help improve therapeutic outcomes.
CPEU: 1 hour

**Webinar 3 of 3:**
-Tuesday, November 10, 2009, 5 pm PST / 8 pm EST
-Kathleen Mahan, MS, RD, CDE, and Coco Newton, MPH, RD, CCN
“A Functional Nutrition Therapy Approach for Fibromyalgia and Other Pain and Fatigue Syndromes”
During this seminar you will hear two advanced functional nutrition practitioners discuss their clinical experiences applying the functional nutrition therapy approach to the nutritional assessment and management of pain and chronic fatigue syndromes like fibromyalgia, as well as review the research in this area. It is difficult to see improvement in outcomes with disorders like fibromyalgia and chronic fatigue syndrome using conventional treatments. In this webinar, you will learn a new, broader and more effective nutritional approach to these patients with these frustrating and chronic disorders. Functional Nutritional Therapy (FNT) can offer guidelines to identify nutritional imbalances which promote inflammation common to these conditions and help develop intervention plans to relieve associated symptoms.
CPEU: 1 hour
Contact Sheila Dean, NCC DPG Professional Advancement Director at sdeanrd@aol.com for questions or further information about these webinars.

**Registration Details:**
You can register for the NCC IFM webinars with the following link:
You can also register at www.functionalmedicine.org and click on Educational Programs and Publications, then Webinars.
EATING FOR AUTISM: The 10-Step Nutrition Plan to Help Treat your Child’s Autism, Aspergers, or ADHD

Elizabeth Strickland, MS, RD, LD

As a mother to a child with autism and a nutrition and healthcare professional this book is an especially valuable resource. The author has practiced in the field of nutrition for 25 years, has been focusing on Autism Spectrum Disorder for the past 15 years, and spoke of her work in autism at FNCE in 2008. Understanding the Autism-Nutrition Connection begins with the introduction in which the author gives reference to the importance of working with a (Registered Dietitian) RD when treating someone who is on the autism spectrum. She references the American Dietetic Association, local dietetic associations and Nutrition in Complementary Care DPG as credible places to find an RD.

The author developed and practices a 10 step approach to treating autism. The steps are individualized to the client, as the author states: “there is no cookie cutter approach” to treatment with a person on the autism spectrum. The steps are explained in detail with a rationale behind each step. Since each step builds on the next, it is important to follow the steps in sequence. The book provides case scenarios in each chapter and goes into detail about various elimination diets. The author reviews the use of vitamins, minerals and other supplements including herbs and nutraceuticals for the nutritional treatment of autism. She explains why and why not to use certain treatments. Suggested trial response time frames for various supplements are also provided. Her book includes terrific recipes to assist in compliance to the gluten free-casein free elimination diet. Gluten free -casein free recipes for beverages, bread and muffins, meals, cakes, cookies and desserts, condiments and sauces are included.

The appendix section is very complete including steps to choose an RD. The best dietary sources for protein, fiber and calcium, details on the Recommended Dietary Allowance (RDA) or Adequate Intake (AI) and Upper Intake Levels (UL) for vitamins and minerals are listed. Individualized Education Program (IEP) nutrition goals and objectives, data collection forms, nutrition detoxification plans, and laboratory tests are other resources. The book also includes a complete glossary of terms that readers may not be familiar with along with a list of resources such as nutritional supplements, professional referrals/organizations, food allergy resources, product sources for gluten free-casein free diets, and helpful web sites. The comprehensive index makes it quick to locate specific information found in the book.

This well written book contains information for the layman as well as the professional on nutritional approaches to treating autism. It is a must have tool for all RD’s and Dietetic Technician, Registered (DTR)’s who work with patients on the autism spectrum. It is also a valuable resource for any parent or medical professional and educators, who treat clients diagnosed with autism. Katherine L. Bernard, MS, RD, CDN is the Executive Assistant for the NCC DPG. Kathy’s first born son was diagnosed with Pervasive Developmental Disorder Not Otherwise Specified (PDD-NOS) on the autism spectrum and she has been very active in ensuring his and her family’s optimal well being. Kathy can be reached at: NCCAdmin@optonline.net or at 800-279-6880.
The following chronicle is about the healing journey of the children of Sylvia Escott-Stump, a registered dietitian (RD) who teaches at East Carolina University in Greenville, NC, and is the author of Nutrition and Diagnosis-Related Care and co-editor of Krause’s Food and Nutrition Therapy. More than six years ago, she and her family identified behavioral changes in their son, JG (initials are changed for confidentiality). A few years later, her 16-year old daughter was diagnosed with inflammatory bowel disease (IBD). Her children have given permission for their stories to be shared for the education of dietitians and other health professionals. Interestingly, both schizophrenia and inflammatory bowel disease (IBD) can have a link with elevated homocysteine levels. Are there common genetic factors?

JG’s initial symptoms and course of treatment

About age 16, JG became very irritable and frequently annoyed with his younger sister and entire family. He spent more time alone in his room, disinterested in school, friends, or any type of socialization. After months of psychotherapy and a trial with several prescription medications, including Seroquel® (quetiapine), Zyprexa® (olanzapine), and Wellbutrin® (bupropion), JG was diagnosed with schizophrenia. Over the next few years, on various psychotropic medications and anti-depressants, JG experienced weight gain, little relief, and continuation of his dysthymia. He was hospitalized twice, the second requiring a three-week stay. A new, third generation antipsychotic medication, Abilify® (aripiprazole), finally worked to control his daily mood swings and insomnia. However, JG continued to experience social anxiety, occasional generalized anxiety, and a flat affect.

Connection to JG’s sister’s IBD

When JG’s sister, MK, turned 16, she was diagnosed with inflammatory bowel disease. As a dietitian, Sylvia searched PubMed regularly for the etiologies of both schizophrenia and IBD, since doctors had advised that both conditions had a genetic origin. The common factor jumped out in that elevated homocysteine levels can occur in both disorders. This finding implied a nutritional relevance for folate acid, vitamin B6, and vitamin B12. Literature searches continued to solidify folate acid and vitamin B12 as keys for DNA methylation and neurological functioning. Figure 1 shows the intricate complexity of these pathways.

Serotonin is an important product of the folate pathway (see Figure 1). Since both JG and MK are missing the capacity to produce serotonin, it elucidates the relationship between the brain and the gut. The gut makes 70% of the serotonin used by the body. With insufficient methyltetrahydrofolate reductase (MTHFR), serotonin levels will not be produced. It is not clear if IBD is only related to the MTHFR allele, but methylated folate supports a healthy immune system, as shown in Figure 1. Many articles link colon cancer with insufficient folic acid levels; more research is indicated using L-methylfolate in the population at risk for intestinal disorders.

The sum of these genetic deficits is likely to occur throughout a lifetime. The newly formed Human Variome Project indicates how complex these genetic alleles are with regard to disorders afflicting individuals and populations (http://www.humanvariomeproject.org/). While both JG and MK had MTHFR alterations, their homocysteine levels were normal. Further review of the implications suggest that the altered allele, A>C, is...
less likely to cause cardiac disease and elevated homocysteine levels, whereas the C>T allele often does contribute. Individuals with the MTHFR alleles are more likely to have pediatric stroke and thrombotic events.2,3

What is the chosen approach to treatment?

With the implication that folic acid enzymes play such an important role, it was fascinating to find that folic acid enzymes are often genetically altered at birth. In fact, a significant number of Caucasians (10%) have altered alleles (allele is one of the variant forms of a gene along a chromosome) with a base change within the DNA structure. Common changes include thymidine instead of cytosine (C>T) and cytosine instead of adenine (A>C). Because many disorders have now been linked with genetic origins, it is possible to have some individual testing done.4

What tests were utilized to evaluate symptoms?

Sylvia had her homocysteine levels tested and her levels were normal. However, she requested that her doctor also test her MTHFR levels. Methyl-tetrahydrofolate is an enzyme that promotes the production of several neurotransmitters (serotonin, dopamine, norepinephrine). Through methylation, folic acid and vitamin B12 act to make melatonin (for daytime awakeng and nighttime sleep), and to convert homocysteine into cysteine. Without proper methylation, homocysteine levels build up and cause potential problems, including heart attacks, hypertension, and strokes.5

MTHFR test results

The results of this test identified that Sylvia had one copy of the A>C allele. She also had her mother, age 90, tested, who also had one copy of this allele (making each of them heterozygous). When JG and MK were tested, they had two copies of the same A>C allele, which means they are homozygous.

Dietitians may be more familiar with phenylketonuria (PKU), where each parent must pass on a gene that leads to the disorder in their homozygous offspring. At this time, PKU is tested at birth. Genetic alterations such as MTHFR alleles are not currently tested at birth. It is the author's opinion that health professionals should advocate for such testing as there are multiple conditions impacted by MTHFR defects. Spina bifida, cardiac diseases, pediatric stroke, some types of cancer, bipolar disorder, schizophrenia, and even Alzheimer's may be related to these alleles.6

Insurance coverage for testing

All of the family members had medical insurance, which covered the cost of the homocysteine and MTHFR tests. The report from the lab about MTHFR suggested genetic counseling be offered for each affected member. Labs that provide testing for MTHFR can be found at: http://www.genetests.org/query?testid=3023

Implications of ineffective MTHFR enzymes

With a relatively ineffective MTHFR enzyme, neurotransmitter levels, along with their functioning, are low. Without the enzyme, folic acid is not broken down to the useful form, L-methylfolate. Serotonin is known to be one of the "feel good" neurotransmitters. Without sufficient production in the brain, serotonin levels drop in the serum as well. The body actually produces serotonin in other organs, including 70% from the gut. Dietary folic acid competes with the bioavailable form of methylated folic acid at the blood brain barrier. This is why treatment with the appropriate form of folate is essential.

Several forms of L-methylfolate are on the market. Metagenics (ActiFolate®; 800 mcg L-5-methyltetrahydrofolate, 5-formyltetrahydrofolate) and Pamlab's (Deplin®; 7.5 mg L-methylfolate) are two companies that have methylated folate available. Because both JG's and MK's tests showed two alleles of the MTHFR enzyme, Sylvia requested that her family physician prescribe Deplin® for the family (Deplin® is available only by a doctor's prescription). Deplin® 7.5 mg L-methylfolate is a higher dose than the Dietary Reference Intake (DRI) for folic acid because of competition at the blood brain barrier (BBB). Deplin® was selected due to a study at Chicago's Rush University Hospital, indicating that the competition between folic acid and L-methylfolate at the BBB is overcome with a larger dose of the latter. The effectiveness of these products will require additional clinical trials (Davis et al, 2004.)

Results of the interventions

JG has taken one Deplin® daily for 15 months. Within two weeks of initiation of the L-methylfolate (Deplin®), he showed a more normal emotional affect and outlook. Within six months, he returned to college, selecting physics as a major. Today he feels better. With this motivation, he has added daily exercise to his life pattern, and eats a healthier diet. Indeed, his motivation and school performance are so much improved that he has brought up his grades to a 4.0 for the last 4 semesters, while taking chemistry, physics, economics, and calculus courses.

MK also leads a healthy lifestyle, and avoids excesses of dietary fat. While she does not take Deplin® regularly, she takes it with reminders and is aware of the benefits of the L-methylfolate. It is not clear if MK's remission of IBD relates to the use of Deplin® at this time, but she has not had an IBD flare-up in the past 1.5 years. She is also in college, studying special education. Working in the Assistive Technology Lab, she helps students with autism learn through computers.

Take home message

Nutrition and healthcare professionals should study the current genetic research for underlying etiologies of common disorders. Some of the answers to the unsolved puzzles may come from nutrition. More information can be found at the following websites:
Center for Disease Control:  
http://www.cdc.gov/genomics/hugenet/file/print/reviews/mthfr.pdf  
http://www.cdc.gov/genomics/hugenet/reviews/MTHFRpsych.htm  
Human Genome Variation Society (HGVS):  http://www.hgvs.org  
Nature – Genetics:  http://www.nature.com/genetics/index.html  
Pamlab (Deplin®):  http://www.pamlab.com/  
Women’s Health – Folic Acid:  http://www.womenshealth.gov/faq/folic-acid.cfm  

Cautionary notes:  
It is important to use the appropriate form of folate in the population with these alleles, because the body may be unable to make 5-methyl tetrahydrofolate due to pathway deficiencies. Close monitoring by a trained healthcare professional is imperative, since excess folate can lead to other imbalances in B vitamins.

MTHFR is considered to be a predictive risk form of testing, meaning that it only identifies a risk for developing a problem. There are other pieces to the puzzle such as environmental factors that may contribute to full expression of a problem.

Conversely, as an example, PKU indicates what may result from deterministic testing, where the information clearly defines the presence of a condition. Once individuals have been found to have the MTHFR mutation, they may select to have a broad panel of testing done to evaluate other single nucleotide polymorphisms (SNPS) related to vitamin B metabolism. MTHFR testing can be accomplished through blood work or by a buccal (cheek) swab.  

Sylvia Escott-Stump is Director of the Dietetic Internship at East Carolina University in Greenville, North Carolina, is an international speaker, author of numerous articles and texts, and consults as the owner of Nutritional Balance. She presented the 2008 Lenna Frances Cooper lecture at FNCE in Chicago and has received awards including the ADA Medallion. Contact Sylvia at:  
ESCOTTSTUMP@ecu.edu or 252-328-1352.  

References  
Biofactors. 35:120, 2009.  
7. Davis SR, Stacpoole PW, Williamson J, et al. Tracer-derived total and folate-dependent homocysteine remethylation and synthesis rates in humans indicate that serine is the main one-carbon donor.  
8. Personal communication with Coleen Fogarty Draper, M.S.,R.D.: 03/02/09.  

If you have a healing story to share (yours or a client you treated), e-mail a brief summary to Marie Fasano Ruggles FamFoodNet@aol.com. Put “my story” in the subject.
Congratulations

Dr. Gerard E. Mullin, MD, MHS, CNS, CNSP, FACN, FACP, AGAF, AGHM, is a recipient of the American Dietary Association’s ADA Honorary Member Award.

Dr. Mullin is the Director of Gastrointestinal Integrative Nutrition Services at the John Hopkins University School of Medicine. He is the only physician in the country that holds three board certifications in the field of nutrition. Because of his vision he has made it possible for dietitians to write therapeutic diet orders nationally in the hospital setting. He has edited three text books for healthcare practitioners, which features dietitians. He has been Chair of numerous symposia and chapter president of the American Society of Parenteral and Enteral Nutrition of Long Island from 2003 to 2004 and Maryland from 2008 to 2009. He has been instrumental in collaborating among physicians, dietitians, nurses, and allied healthcare practitioners along with alternative care providers including acupuncturists, and herbalists to educate, write policies, and perform research.

He is committed to the field of nutrition as a researcher, educator, editor of the Nutrition in Clinical Practice Journal, and board member of the American Board of Physician Nutrition Specialist. He is the spokesperson to the media and press.

Kudos to Dr. Gerard Mullin! Please come to cheer for him on Monday, October 19th, 2009 from 10:00 am to 11:30 am, during the Member Showcase at Wells Fargo Theater in Colorado Convention Center.
## FNCE 2009 NCC DPG Member Calendar of Events

### Saturday, October 17, 2009

**NCC DPG Pre-FNCE Conference**
Achieving Hormone Balance: An Endocrine Dance of Environment, Genes, Diet and Detoxification Registration is now open: [http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/7540_22518_ENU_HTML.htm](http://www.eatright.org/cps/rde/xchg/ada/hs.xsl/7540_22518_ENU_HTML.htm)
8:00 am – 3:00 pm
Location: Colorado Convention Center Room, Four Seasons Ballroom 4
Investment: Member $99; Non-member $129
*Hot Beverage service available through lunch; lunch included
Sponsored by Pharmavite*

**NCC DPG Yoga Session** (in partnership with the ADA Foundation)
6:30 – 7:30 pm
Location: Hyatt Regency Denver, Mineral FG

### Sunday, October 18, 2009

**NCC DPG Yoga Session** (in partnership with the ADA Foundation)
6:00 – 7:00 am
Location: Hyatt Regency Denver, Mineral FG

**Product Market Place**
8:00 am – 4:00 pm
Location: Colorado Convention Center, Booth 36

**NCC DPG Yoga Session** (in partnership with the ADA Foundation)
5:30 – 6:30 pm
Location: Hyatt Regency Denver, Quartz AB

**Functional Food Tasting** – NCC DPG and Vegetarian Nutrition DPG
6:00 – 9:00 pm
Location: Panzano (2 blocks from the Colorado Convention Center Room, Lower Level of Restaurant)
We invite you to join us for a culinary feast of foods that are not only easy to incorporate into recipes and snacks, but bring real nutritional value to consumers. It will also be a great time to mix and mingle with Registered Dietitians and Dietetic Technicians, Registered, who continue to assist consumers in translating the science into creative and delicious ways to add functional foods into their meal plans.
*Reservations required prior to FNCE – look for details in the upcoming weeks.*

### Monday, October 19, 2009

**NCC DPG Yoga Session** (in partnership with the ADA Foundation)
6:00 – 7:00 am
Location: Hyatt Regency Denver, Mineral FG

**Presentation of ADA Honorary Member Award** (submitted by NCC DPG)
Gerard E. Mullin, MD, MHS, CNS, CNSP, FACN, FACP, AGAF, AGHM
10:00 to 11:30 am
Location: Wells Fargo Theater during Member Showcase
*Please consider attending to show your support.*

**DPG Showcase**
10:30 am – 1:00 pm
Location: Colorado Convention Center, Booth 29

**OPEN FORUM**
Integrative & Functional Medicine: Are RD’s Ready? Speakers: Kathie Swift, MS,RD,LDN, NCC DPG Chair; Colleen Fogarty Draper, MS,RD,LDN, NCC DPG Nutritional Genomics Director; and Elizabeth Redmond, PhD, RD
3:00 to 4:30 pm
Location: TBD

**NCC DPG Yoga Session** (in partnership with the ADA Foundation)
5:30 – 6:30 pm
Location: Hyatt Regency Denver, Mineral FG

### Tuesday, October 20, 2009

**NCC DPG Yoga Session** (in partnership with the ADA Foundation)
6:00 – 7:00 am
Location: Hyatt Regency Denver, Quartz AB

**NCC DPG Member Breakfast**
7:00 – 9:00 am
Location: Hyatt Regency Denver at Colorado Convention Center Room, Centennial Ballroom F, G, and H
*Sponsored by Lipton Institute of Tea, Speaker and Topic TBD
RSVP requested prior to FNCE – available in the next couple weeks.*

**Vitamin C Supplements: An Objective View of the Clinical Evidence**
Speaker: NCC DPG member Leslie Kay, MS, RD, CCN
Moderator: Deborah Ford, MS, RD, CCN, NCC Chair-Elect
9:45 – 11:15 am
Location: TBD

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**VOLUNTEERS NEEDED DURING FNCE**
If you are interested in volunteering for 1 to 1.5 hours during the pre-fnce symposium, Product Marketplace, DPG Showcase, Functional Food Tasting, or Member Breakfast, contact Rita Batheja at krbat1@juno.com or 516-698-8822.
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Consider that much of our training in genetics has been centered on a deterministic association with our genes. For example, you have the gene mutation associated with phenylketonuria (PKU) and therefore you have PKU. Therefore, all sources of phenylalanine need to be removed from the diet to ensure the brain can develop and the body can function. However, predictive genetics is focused on understanding your unique genetic and biochemical susceptibilities. By understanding your own gene variants, you can make decisions about which aspects of your diet and lifestyle are most important to prevent dysfunction and disease. For example, if you have a genetic tendency toward decreased MTHFR enzyme activity, folate, riboflavin and B12 are particularly important in your diet and insufficient intakes are more likely to result in GI cancers, mood disorders, neural tube defects, inflammation, DNA dysfunction and damage and possibly, heart disease. For more information, check out the NCC DPG website at www.complementarynutrition.org

ANNOUNCING:
Omega 3- Learning Consortium
NCC is pleased to announce a new networking relationship with The Omega-3 Learning Consortium, led by Dr. Bruce Watkins PhD FACN of Purdue University. The mission of the Consortium is to facilitate learning by consumers and healthcare professionals about omega-3 acids in food, nutrition, and medicine and to advance education concerning technologies for broadening the food applications for these nutrients that benefit humans and companion animals. The Consortium will provide evidenced-based scientific research to NCC through webinars, quarterly newsletter updates, eblasts, podcasts and other resource materials. Some of these benefits will provide continuing professional education credits to NCC RD’s. There are currently several RD’s on the Executive Board including Penny M. Kris-Etherton PhD RD, Gretchen Vannice MS RD, Heather Hutchins MS RD, and Bernhard Hennig PhD RD.

New in Review Hits the Web
The Journal of the American Dietetic Association’s New in Review section is moving online! New in Review, a monthly Journal of the American Dietetic Association feature bringing dietetics-related abstracts and citations from scientific and professional publications to ADA members, along with reviews of books and Web sites of interest to food and nutrition professionals, will make the jump to the Web in July 2009. July will also mark the last appearance of New in Review in the print Journal, as it will now appear exclusively at www.eatright.org/newinreview. All ADA members will receive a monthly e-mail with highlights from that month’s installment and a link to the New in Review page at eatright.org, which will feature convenient links to other journals and Web sites and an archive of previous installments of New in Review for the past year. And New in Review will continue to be prepared by the Journal’s Qualitative Research editor, Judith Beto, PhD, RD, FADA, with the Sites in Review section written by Eileen Vincent, MS, RD, so you’ll get the same quality and variety of content you’re used to getting in the Journal, but now it will all be just a click away.
Those of you who would like to contribute an article or have topics that you would like to see in future issues, please feel free to drop me an email or give me a call – peaknut@cascadeaccess.com or 702-346-7968 – or contact any one of the capable NCC leaders listed on the back of the newsletter.

### 10 Most Common CAM Therapies Among Adults—2007

Percentage of adults in 2007 who used the 10 most common complementary and alternative medicine (CAM) therapies. The most commonly used CAM therapy among adults in 2007 was nonvitamin, nonmineral natural products. Box shows therapies with significant increases in use between 2002 and 2007: deep breathing, meditation, massage, and yoga.


Credit: National Center for Complementary and Alternative Medicine, NIH, DHHS