Nutrition and dietetic professionals must remain abreast of available evidence amidst the growing concerns about the health impacts of pollutants in our food and water supply. To enable members in providing scientific responses to patient/client questions, the Hunger and Environmental Nutrition (HEN) and the Dietitians in Integrative and Functional Medicine (DIFM) Dietetic Practice Groups (DPGs) partnered in presenting “Food, Water, and the Environment: What’s Women’s Health Got to Do with It?” during the 2013 Food and Nutrition Conference and Expo (FNCE®) in Houston, Texas. The session presenters, Kim Robien, PhD, RD, CSO, FAND and Elizabeth Redmond, PhD, MMSc, RDN, both well-regarded experts in their fields, shared current research findings and strategies for reducing exposure to environmental pollutants.

“Environmental Nutrition and Women’s Health - should we worry about BPA and phthalates?”

Presented by Kim Robien, PhD, RD, CSO, George Washington University

Environmental nutrition is an emerging concept and is defined by Dr. Robien as the intersection between environmental health and nutrition. Although food and water provide essential nutrients, they can also serve as mechanisms for toxin delivery. Food rich in nutrients can decrease the absorption and harm of toxins and aid in their elimination. Yet the most commonly consumed foods—especially in the fast-food laden areas Dr. Robien calls “food swamps”—often lack the nutrient value that is important not only for basic health, but also for protection from harmful chemicals.

Unfortunately, this is not an issue that lends itself to quick and conclusive answers through research. As it is unethical to conduct randomized controlled trials with potentially toxic chemicals on humans, much of the research is focused on animal models. Additionally, testing is expensive, is subject to contamination with plastic collection containers, and has a limited ability to effectively measure low-dose exposure.
Editor’s Corner

I hope this issue of the DIFM newsletter finds you and yours healthy. The flu of varying types seems to be catching more people than ever this year—including me! Unfortunately, no matter how careful people are and how much they take their own healthy advice to eat right, take probiotics and immune supporting supplements, exercise, wash hands, and drink plenty of fluids, sometimes it just cannot be avoided. It is my wish for you and yours that you do not have to experience this illness.

It is hard to believe that FNCE® was over three months ago: it feels like yesterday as I edit the articles from the conference. This issue of the newsletter recaps the presentations that were of particular interest to DIFM members. There was so much excellent and practical information for all members, it is hard to abstract it in a small number of pages. For that reason, the slides from the presentations by Gerard E. Mullin, MD and Kathie Madonna Swift, MS, RDN, LDN and from the DIFM/HEN joint presentation by Kim Robien, PhD, RD, CSO, FAND and Betsy Redmond, PhD, MMSc, RDN will be available on the DIFM website for your reference. Dr. Ron Grabowski who spoke at the DIFM breakfast also gave a webinar that may be accessed on the DIFM website: IntegrativeRD.org. Be sure to check it out after reading the review of the presentation—you will find lots of good practical information about conditions we deal with on a day to day basis.

There are a lot of exciting opportunities planned for DIFM members in 2014-2015 from webinars to the Online Training Certificate that is currently in the development stages. We send out e-blasts periodically to announce upcoming events and the posting of the electronic version of the newsletter; if you do not receive these, then you may be missing out on many CPE opportunities. Please email our Executive Assistant, Amy Jarck, if you have somehow been dropped from the list: info@IntegrativeRD.org.

To leave room for the content for this issue, I will close, but not before reminding members that we always welcome your input and your help with the newsletter or any other DIFM activities. Please email me, peaknut70@gmail.com with your comments, questions, or to volunteer.

Stay Healthy in 2014!

Sarah

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—peaknut70@gmail.com or 970-216-2356—or contact any one of the capable DIFM leaders listed in this newsletter.

Don’t forget to log on to eatright.org and vote for the candidates running for Academy and DIFM offices.
Deadline for voting is February 22, 2014.
Chair’s Corner

It’s been a cold winter. I imagine everyone is spending more time indoors and a great thing to do when you’re stuck inside is learn more about integrative and functional nutrition. Some great options include online DIFM webinars, past DIFM newsletters and the educational offerings from our Network relationships. Links to all of these resources can be found on our website at, www.integrativeRD.org. Just like past newsletters this one brings more great information. In this issue we are recapping the presentations from FNCE that were specific to DIFM. These include the joint DIFM/HEN presentation, Food, Water, and the Environment: What’s Women’s Health Got To Do with It?; the spotlight presentation, Nutritional Approaches to Detoxification: Separating Fact From Fiction; and the member breakfast presentation, Biochemical Individuality—Why We Must Incorporate Laboratory Diagnostics. We hope those of you who were unable to attend will get some pearls that you can use in your practice from these overviews. Additional resources about these can be found on the DIFM website, IntegrativeRD.org.

Stay tuned for our next issue that will be focusing on the hot topic of Genetically Modified Organisms. I think you will enjoy reading the pros and cons from the experts.

Until Spring.

Betsy

DIFM would like to thank Betsy Redmond for her service as chair of DIFM and welcome Mary Beth Augustine, 2013-2014 Chair Elect to the Chair position! Watch for Mary Beth’s first column as Chair in the Spring newsletter.

Continued from page 37

Populations at increased risk of toxicity from BPA and phthalates include neonates, who may be exposed to phthalates from medical equipment, and young children. Young children tend to have greater exposure because of normal activities like crawling, putting objects in their mouths, and consuming higher amounts of foods and beverages per unit of body weight than adults. Additionally, children tend to have less developed hepatic enzyme systems for metabolizing and eliminating toxins. The potential that this early exposure may result in disease later in life adds urgency to the research and understanding of these chemicals on human health.

Additionally, it is suspected that BPA and phthalates may act as environmental obesogens, interfere with female reproductive health, and have an association with breast cancer. After reiterating that research on the effects of BPA and human health is in the early stages, Dr. Robien left nutrition and dietetic professionals with the following tips:

• Be prepared to critically evaluate the research studies as they emerge;
• Consider the sources of information; and
• Synthesize the entire body of literature rather than acting on the results of any single study.

“Environmental Toxins: How Nutrition Can Help”

Presented by Elizabeth Redmond, PhD, MMSc, RDN, Genova Diagnostics

Persistent Organic Pollutants (POPs) are organic pollutants that remain in the environment through bioaccumulation in the food system. POPs are present in the greatest amounts in animal fats, while foods of plant origin have lower levels of POPs.

Studies have identified that those who are overweight or obese likely have greater levels of POPs, given the tendency of POPs to bioaccumulate in fat. However, NHANES data indicates that POPs are found in the serum of the general population, suggesting widespread and continuous exposure. Although research is limited, some authors in the field of public health argue that average exposure to POPs is high enough to lead to the development of metabolic disorders. Additional conditions associated with POPs include thyroid disease, diabetes, fertility issues, impaired pediatric development, reduced skeletal capacity, cardiovascular diseases, and cancer.

Of note is that foods high in animal fats tend to be higher in toxins and lower in antioxidants. This can exacerbate toxin status by increasing overall toxin level and slowing detoxification effects such as oxidation status. Conversely, foods rich in antioxidants and lower in fats aid in overall toxin levels and support detoxification. Thus, nutrition modifications can be a key way to reduce overall toxin levels and the risks associated with these environmental contaminants. Below are recommendations and questions for nutrition and dietetic professionals to use when working with clients or patients. A consumer handout with practical tips is also included in this newsletter.

1. Assess possible level of exposure

For the clinician interested in assessing toxin exposure, questioning the client about products they usually consume and environments they are regularly exposed to is the first step. High body fat may indicate an increased level of stored POPs and can reveal ongoing exposure. Laboratory assessments are available for assessing individual toxins, though what levels cause harm for each person is not currently known. The formula in the slide below offers a
guide for clinicians to asking questions related to exposure.

1. Assess possible level of exposure

CH\textsuperscript{2}OPD

- Community
- Home
- Hobby
- Occupation
- Personal
- Diet
- Drugs

2. Reduce intake of and exposure to toxins

Clinicians can aid clients in reducing their intake of toxins by suggesting that they trim fat from and reduce consumption of high fat meat, as supported by research revealing that vegans and vegetarians have lower serum levels of toxins. It is important to communicate that toxins cannot be washed off, but choosing organic foods may reduce consumption of foods contaminated with toxins. It is also important to guide clients seeking weight loss, because fast and significant weight loss can result in the release of toxins into the blood. Slow and steady weight loss is ideal for reducing exposure to toxins.

3. Increase excretion of fat-soluble persistent toxins

One way to increase excretion of fat-soluble toxins is to bind them within the intestine. Animal studies suggest that green tea, chlorella, and bile acid sequestrants or fat binders, such as olestra, may increase fecal excretion of POPs or decrease their absorption. In addition, some current research is evaluating sweat, either through exercise or saunas, as a potential avenue to toxin excretion.

4. Support detoxification pathways

Nutrition is important for supporting phase I and phase II detoxification pathways. Phase I is dependent on adequate amino acid status. Therefore, nutrition professionals have a role in ensuring their clients are consuming a diet that appropriately supports detoxification.

5. Provide anti-inflammatory support

POPs can increase oxidative stress and endothelial toxicity. Certain nutrients, such as vitamin E, flavonoids, and quercetin, have been used and evaluated for their ability to block pro-inflammatory responses. On the other hand, linoleic acid, an omega-6 fatty acid found in corn oil and some other vegetable oils, may increase inflammation. Nutrition and dietetic professionals can apply appropriate recommendations to reduce inflammation.

Dr. Redmond concluded by discussing the association between aging and polychlorinated biphenyl (PCB) concentrations. This association supports the concepts of bioaccumulation and concern regarding long-term effects of PCBs. The association also emphasizes the importance of further exploration of how nutrition may be useful in moderating or ameliorating environmental toxicity.

Question and Answer

Both presenters provided additional helpful tips in the concluding Question and Answer period. Although it was reiterated that many toxins accumulate in fatty foods and beverages, the concern about plastic water bottles was addressed. The speakers recommended that consumers should avoid plastics with the numbers 3, 6, and 7, and should remain cautious about their use of other plastics. Other plastics, although touted as free of BPA or phthalates, may still contain other toxins that have not yet been adequately studied. The conclusion was that it is best for the health of both consumers and the planet to avoid plastics and choose glass or stainless steel food and water containers and drink water from the tap. When using tap water, running cold water for one minute prior to catching the water for cooking or consumption can reduce metals that may leach into water from pipes. Overall, the conclusion of the session was that chemicals are ubiquitous in the environment but health-conscious consumers can utilize specific steps to reduce their exposure.


Emily Davis Moore, MS, RDN, LD provides counseling in perinatal nutrition, is an instructor at the University of Delaware, and is the Copy Editor for The Integrative RD. She can be reached at emilydavismoore@hotmail.com.

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For the full Executive Committee list and contact information, please see the online version of the newsletter.
Dr. Mullin opened his presentation with a quote attributed to Sushruta Samhita from an ancient Sanskrit text in 6th century BC: “A person whose basic emotional and physical tendencies are in balance, whose digestive power is balanced, whose bodily tissues, elimination functions and activities are in balance, and whose mind, senses and soul are filled with vitality. That person is said to be healthy.” Throughout history, cultures have believed in the burden of consequences of toxins in humans, including Egyptian, Ayurvedic, and Traditional Chinese medicine. Greek, Roman and Persian physicians attributed disease to accumulation of evil “humors”—including bile, phlegm, and blood—and believed that purging these toxins would restore health. Fast forward to modern chronic disease and it has been found that environmental toxin load has an epigenetic effect along with diet, genetic predisposition, and lifestyle.

Basic toxicology begins with exposure to toxins, assimilation, retention, and bioaccumulation. Families of bioaccumulating toxins include: heavy metals, polycyclic aromatic hydrocarbons, phthalates/plasticizers, organochloride pesticides, dioxins, polychlorinated biphenyls (PCBs), polybrominated diphenyl ethers (PDBEs), and polyfluorinated compounds (PFCs). The Agency for Toxic Substances and Disease Registry (ATSDR) compiled a 2011 priority list of 275 hazardous substances that will be the subject of toxicological profiles.

Dr. Mullin continued by presenting data on bioaccumulation of toxins in fat tissue. According to the Environmental Protection Agency (EPA) National Human Adipose Tissue Survey (NHATS), a program that collected toxins in fat tissue from cadavers and elective surgeries from 1970-1987, five of the most toxic chemicals were found in 100% of samples. These were: Octachlorodibenzo-p-dioxin (OCDD), polychlorinated dibenzodioxins, styrene, 1,4-dichlobenzene, xylene and ethylphenol. Nine more chemicals were found in 91 to 98 percent of the samples, including benzene, toluene, ethylbenzene, DDE (a breakdown of DDT, the pesticide banned in the United States since 1972), three dioxins, and one furan. Polychlorinated biphenols (PCBs) were found in 83 percent of the samples. Given the dates for the first identification of bioaccumulation, it appears that the potential for this accumulation has been recognized for quite some time. Dr. Mullin then summarized several more recent studies that also support bioaccumulation in humans; this information is available on the DIFM website at http://integrativerd.org/members-only/learn/archived-newsletters/.

Dr. Mullin explained a basic equation regarding disease risk:

disease risk = toxic potency x cumulative exposure x susceptibility

This is best exemplified with heavy metal toxicity where the synergistic effect of toxic metals is greater than the sum of the parts—such as in an animal study where a dose of mercury salt alone had no effect, and a lead salt alone had no effect, but the two combined killed all the animals.

Individuals can be susceptible either because of age, biotransformation genetics, or elimination capacity. Hepatic detoxification takes place in two phases: Phase I takes a parent compound/toxin and converts it into an activated intermediate, along the way creating free radicals. Nutrients to quench free radicals produced in Phase 1 Power Point slide may be found at http://integrativerd.org/members-only/learn/archived-newsletters/.

Phase I enzymes metabolize cholesterol, steroids, estrogens, drugs, xenobiotics, caffeine, tobacco, and heterocyclic amines in well-done meats. Phase II converts the activated intermediate into a water soluble compound for excretion via the kidneys and urine. Phase II enzymes can be upregulated by dietary vitamins, minerals, antioxidants, and phytonutrients to increase toxin detoxification and elimination. The goal, according to Dr. Mullin is to upregulate Phase II enzyme induction with minimal effects on Phase I (which creates the unstable activated toxin intermediate).

For an overview of Phase II xenobiotic and drug metabolism by substance of dietary or endogenous origin and supportive nutrients for detoxification pathways, the slide power point presentation may be found at http://integrativerd.org/members-only/learn/archived-newsletters/.

Dr. Mullin closed his presentation with recommendations for enhancing hepatic detoxification through diet: 1) provide Phase 1 macronutrients and broad spectrum micronutrient support, 2) provide antioxidants to quench free radicals produced by Phase I reactions, 3) provide Phase II cofactors for conjugation, and 4) provide phytonutrient inducers of Phase II enzymatic reactions. He concluded by describing the harm in some detox practices. For example, fasting is harmful due to induction of Phase I enzymes, leading to the potential overproduction of toxic intermediates, a lack of antioxidants.
to quench free radicals, and a lack of nutrient cofactors for Phase II conjugation reactions. Another harmful detox practice is the use of high colonics, which can lead to complications such as sepsis, intestinal perforation, dehydration, renal failure, and pancreatitis.

Additional practice applications presented by Dr. Mullin can be found in the slides posted on the DIFM website at http://integrativerd.org/members-only/learn/archived-newsletters/. Included are recommendations on minimizing toxin exposure, include eating low mercury wild fish, avoiding consumption of produce with the highest pesticide residue, and considering use of nutraceuticals that enhance Phase II conjugation, antioxidant capacity, and gene expression.

Clinical Application
Kathie Madonna Swift, MS, RDN, LDN

Ms. Swift opened her presentation by inviting the audience to stand and perform a Qigong practice for grounding and centering. The ‘practice’ of integrating breath and gentle movement paralleled the shift in topic from learning about our toxic body burden and toxic environment to application in practice. This gentle practice could easily be incorporated in a clinical setting and in one’s daily life. In explaining that the 21st century RDN needs to understand detoxification practices, Ms. Swift highlighted detox books, journals and magazines, online workshops, and live trainings.

Ms. Swift explained to attendees that the Academy Standards of Practice and Standards of Professional Performance for RDs (Competent, Proficient, and Expert) in Integrative and Functional Medicine (JADA, June 2011) include detoxification for addressing core imbalances (from a systems biology perspective) in the IFMNT Radial. She went on to note many factors that support the application of detoxification in practice, such as the escalating rates of chronic disease associated with bioaccumulation of toxicants, developments in toxicogenomics and epigenetics, healthcare practitioners’ wide-ranging roles in addressing toxic burden in clinical practice, and the complex web of disease and toxic contributors that are amenable to clinical approaches using nutrition and supplements to counter toxic effects—aka detox practices. Addressing environmental health and these contributors to chronic disease has broad implications for improved health of our society.

Ms. Swift discussed the escalating pandemic of sensitivity related illness, the toxicant-induced loss of tolerance (TILT), and that individuals can react to minute doses of diverse environmental triggers that evoke symptoms (MATES). This can result in clinical sequelae with manifestations of myriad health conditions involving diverse organ systems—what we think of as ‘toxicity’. She proposed that sensitivity-related illness will generally abate if underlying toxicant burdens are identified and removed.

She highlighted peer-reviewed literature including a systematic review and meta-analysis of the potential role of the antioxidant and detoxification properties of glutathione in autism spectrum disorders, the role of detox and abstinence in geriatric diabetes and food addiction, and the ongoing UC Davis NIH-funded CHARGE Study: Childhood Autism Risks from Genetics and the Environment.

Ms. Swift presented slides on the detoxification practices used by naturopathic doctors (NDs) that include use of cleansing foods, organic foods, elimination diets and vitamin/mineral/antioxidant supplementation and the HANDS approach to elimination diet for detoxification: History, Anthropometrics and Vital Signs, Nutrition Focused Physical Exam, Diet and Food Habits, and Supporting Clinical Data and self-assessment questionnaires such as the Medical Symptom Questionnaire (MSQ) (non-validated), the Quick Environmental Exposure and Sensitivity Questionnaire (QESQI) (validated), and the CDC Exposure History Form (validated).

In the clinical setting, the RDN can assess symptoms of toxicity by asking patients the following questions:
- Do you commonly experience brain fog, fatigue or drowsiness?
- Do you experience symptoms after exposure to fragrances, exhaust, fumes, or strong odors?
- Do you feel ill after small amounts of alcohol?
- Do you have a strong negative reaction to caffeine or caffeine containing products?
- Do you have an adverse or allergic reaction to certain foods?
- Have you had a history of exposure to herbicides, insecticides, pesticides, or organic solvents

For the patient who answers affirmatively, laboratory testing can be done for objective data—both conventional diagnostic labs as well as functional medicine screening labs that look at toxic body burden and genetic single nucleotide polymorphisms.

Ms. Swift then transitioned from Assessment and Diagnosis, to Intervention, presenting information on the spectrum of detoxification diets from ‘clean eating’ to elimination diets, liquid juice/smoothie cleanses, and fasting. In her own practice and her thirty years of work in integrative and functional medicine clinics/centers she has developed the REBOOT model for detoxification, which includes the following approaches:
- Reduce toxic exposure by eliminating unnecessary chemicals and substances in the diet including unsafe edibles, cookware, storage containers, preparation and cooking methods, highly processed foods, artificial ingredients, hydrogenated oils, pesticide-laden produce, factory-farmed animal foods, preservatives, additives, GMOs, advanced glycation endpoints (AGEs), and plasticizers.
- Eliminate offending food allergens, which may or may not include gluten, dairy, soy, fish, shellfish, eggs, corn, nuts, nightshades, oxalates, salicylates, FODMAPS, and histamine.
- Boost fiber and fluids to reduce absorption of toxicants, facilitate elimination and nourish gut flora.
- Optimize dietary antioxidant defense and detoxifying substances such as glutathione and sulfur-containing foods, B vitamins, and minerals such as Ca, Fe, Zn, Mn, Se, to reduce absorption of heavy metals.
- Optimize fuel sources of macronutrients.
- Tailor diet, dietary supplements, and supportive healing modalities.
Healing modalities to support detoxification and wellness include thermal depuration (sweating through sauna use, steam, exercise), qigong and tai chi, yoga, and mechanotherapy (massage, physical therapy, chiropractic, rolffing).

Ms. Swift concluded her presentation with a summary of clinical challenges to applying detoxification in practice, sharing that approaches to detoxification are highly variable, non-standardized and often controversial, that no comprehensive assessment of clinical detoxification practice in the US has been conducted, that outcomes research is needed to establish safety and efficacy of nutritional approaches to detoxification, and in the interim to use Rakel's Evidence Versus Harm Grading\(^9\) for shared medical decision-making in clinical practice.

Reviewed by Mary Beth Augustine, DIFM Chair Elect. Contact Mary Beth at difmchairelect@gmail.com.

References

1. Division of Toxicology and Human Health Sciences; Agency for Toxic Substance Disease Registry. Available online at: http://www.atsdr.cdc.gov/SPL/index.html.
7. Swift KMS. Nutrition in Practice, Food As Medicine Professional Training Program: HANDS.

Some Clinical Tips for REBOOTING:

- **Eliminate** - there are no well-validated comprehensive testing methods to identify food triggers and chemical antigens. Personalize elimination of food triggers/toxicants via detailed diet history and nutrition assessment. Food triggers/excitants can change depending on frequency and dose. Symptoms may persist if exposed to inhalant or chemical triggers. Avoidance can be challenging emotionally and socially.
- **Boost** – before boosting fiber assess individual tolerance to type and amount of fiber.
- **Optimize fuel sources** - hepatic enzyme production requires dietary protein. A common pitfall of detoxification diets is suboptimal protein intake. With juicing, risks include oxalate nephropathy with excessive intake of oxalate-rich leafy greens.

**A**riana became a student member of DIFM after attending FNCE in Philadelphia in 2012. She is currently a teaching assistant at the University of Delaware where she is completing her undergraduate degree. She is interested in exploring nutritional genomics, the cultural significance of food and nutrition, links between anthropology and nutritional epidemiology, allergies and intolerances, functional foods, herbal medicine, and the Mediterranean diet.

Ariana was introduced to DIFM after expressing interest in becoming more involved in the Academy. She was urged to explore the field of functional medicine owing to the rapidly growing professional and consumer interest in the field. Ariana found that many of the tenets of DIFM aligned with her own interests and priorities and saw it in her best interest as a future practitioner to possess an understanding and appreciation for the field.

Ariana states she has already been able to put her membership to good use. She looks to DIFM as a source of reliable information regarding new findings in functional medicine. Recently, she consulted the Natural Medicines Comprehensive Database for a school assignment and was excited to use resources offered by DIFM, from outside the sphere of the class, to strengthen her paper.

Ariana is already getting her hands into the practice of integrative and functional medicine. This past summer, she had the opportunity to contribute to research on an iron-chelating diet with a neurologist in her community by studying the iron-binding effects of antioxidants such as curcumin and the flavonoid quercetin.

In the future, Ariana would like to better understand the effects of antioxidants and their relationship to neurological function. She also expresses interest in the debate regarding nutrient synergy and would like to further explore whether significant results can be obtained through polyphenolic compounds found in foods. Keep up the great work Ariana!

If you or someone you know would like to be considered for a DIFM Student Spotlight, please contact Olivia Wagner Dietetic Intern/Graduate Student, the Student Committee Chair at oliviawagner28@gmail.com.

DIFM Student Spotlight: Ariana Haidari  
"By Olivia Wagner"
Environmental toxins are everywhere in our environment and some studies suggest that long-term exposure may be harmful to our health. Fortunately, there are dietary and lifestyle practices that can reduce our exposure.

**Tips for reducing your exposure to BPA and phthalates:**
- Prepare food from scratch whenever possible
- Store foods in glass or metal containers rather than plastic
- Never heat foods in plastic containers or dishes
- Do not place plastics in the dishwasher
- Avoid plastics with the recycling codes 3 (contains phthalates), 6 and 7 (contains BPA)
- Avoid leaving plastic water bottles in warm places, such as your car on a hot summer day
- When using tap water, running cold water for 1 minute prior to catching the water for cooking or consumption can reduce the toxins that may leach into water from pipes

**Tips for reducing your exposure to Persistent Organic Pollutants**
- Reduce your intake of fat
  - Reduce intake of higher fat, animal-based foods, such as fish, meat, dairy, and eggs
  - Trim fat and/or opt for low-fat or lean cuts and products
  - Broil, bake, or grill, allowing fat to cook off
- Choose organic when you can and note that washing food cannot reduce toxin levels
- Reduce intake of fish higher in POPs (PcBs):
  - Fish that are bottom feeders, such as catfish
  - Large freshwater fish that are higher up on the food chain
  - If you eat canned fish, purchase it in water not oil
- Choose wild caught fish or sustainably farmed seafood (including fish)
- Support the body’s own detoxification pathways with adequate nutrition
- Increased excretion of contaminants may be augmented with:
  - Sweating from exercise or by sauna
  - Binding toxins with specific products such as green tea, chlorella, or cholesterol/fat reducing agents (animal studies).
  - Increasing fiber intake may bind toxins, decrease fat absorption, and aid in overall GI function.

Seek the expertise of an integrative and functional nutrition professional for an assessment of your environment and to explore detoxification and/or anti-inflammatory pathways.

For more information:
- Health Care Without Harm, PVC and Phthalates resources: http://www.noharm.org/us_canada/issues/toxins/pvc_phthalates/resources.php
The 2013 DIFM member breakfast began with acknowledging the recipients of the 2013 DIFM awards: Excellence in Practice Award 2013, Geri Brewster, MS, RD, CDE; Excellence in Service Award 2013, Rita Kashi Batheja, MS, RD, CDN; and Student Stipend 2013 Award, DeeAnna VanReeken, MS.


After the brief acknowledgements, Dr. Ron Grabowski, who is a practicing Doctor of Chiropractic and a dietitian, presented a continuing education program entitled: Biochemical Individuality—Why We Must Incorporate Laboratory Diagnostics.

Dr. Grabowski began by stating what we as RDNs have come to know, that in the field of nutrition’s early years, everyone was treated the same—the ‘cookie cutter’ approach. We now understand that everyone is different; just as we have different personalities, our biochemical individuality is different as well. We must begin to think outside the box and look outside of our training.

With this he gave examples of how numerous medical conditions have a nutritional relationship; symptoms of clinical and sub-clinical disease often look like some nutritional deficiencies—or may be nutritional deficiencies. Furthermore, in many of these conditions, patients may have normal serum levels of nutrients.

Vitamin B₁₂ deficiencies can manifest as hematologic, neurologic, psychiatric, and or cardiovascular conditions. For example, depression has been found to be related to low blood levels of folate and Vitamin B₁₂. In addition, a poor antidepressant response has been identified in individuals with low blood folate concentrations. A relationship between vitamin B₁₂ and dysfunction of the auditory pathway, specifically tinnitus, has been noted in some patients. It has long been observed that vitamin B₁₂ has a direct relationship with homocysteine levels, however new research shows that there may be a relationship between the vitamin and bone metabolism, bone quality and fracture risk in humans. It has been observed that many patients with subclinical disease have normal vitamin B₁₂ levels.

Peripheral neuropathies have a link to nutritional deficiencies with the visible signs occurring late in malnutrition. Diabetes is an example of where persons with diabetes may have subclinical deficiencies that contribute to neuropathies so common with the disease. Medications commonly used for conditions may predispose persons to conditions that result in deficiencies. For example, proton pump inhibitors may be associated with copper deficiency and the use of statins may have an impact on CoQ-10 levels.

Dr. Grabowski compared the symptoms of Multiple Sclerosis and copper deficiency, revealing them to be identical and raising the question, ‘could a person diagnosed with MS have a copper deficiency rather than the disease?’

Skeleton integrity is dependent not only on calcium and phosphorus, but on magnesium, zinc and vitamin K. At birth, an infant has approximately 20-30 gm of calcium, 16 gm of phosphorus, 750 mg of magnesium and 50 mg of zinc that are found in the skeleton in concentrations of 98%, 80%, 60% and 30% respectively. Beyond bones, calcium and magnesium can play a role in arrhythmias, migraine headaches and myocardial infarctions. Zinc is necessary for bone mineralization. Vitamin K is essential for two vitamin K-dependent proteins—osteocalcin or bone Gla protein and matrix Gla protein. Vitamin K intake decreases with age and the use of certain medications. For example, patients taking warfarin are advised to avoid vitamin K containing foods, thus resulting in further declines in vitamin K levels.

Dr. Grabowski emphasized that subclinical deficiencies are often not identified because they may not be considered when a disease state is diagnosed. He utilized several case studies to illustrate how nutrient deficiencies may be overlooked and how they impact the therapy of patients with a variety of conditions. Testing of patients with symptoms of disease should go beyond serum testing, which only tells the practitioner what is outside the cell, not what is inside. Lymphocytes can provide information up to six months prior to symptom development and red blood cells, due to their long life of 90 to 120 days can provide a view into cellular health. Dr. Grabowski stated that he has not found muscle testing for nutrient deficiencies to be reliable.

Attendees went away from the presentation armed with valuable information to consider when counselling patients in their practice. Patients are individuals with biochemical individuality; understanding the importance of identifying and supporting deficiencies is paramount. Unless RDNs understand the similarities of symptoms of disease and nutritional deficiency and how to identify and use this information, it will be difficult to treat patients effectively. Knowing how subclinical deficiencies can mimic conditions such as peripheral neuropathy or fatigue that are part of major diseases such as diabetes and MS can take a practice to new levels. Do not take diagnoses at face value, but consider all of the options—look outside the box.

To view Dr. Grabowski’s webinar that provides highlights from his breakfast talk, go to the DIFM website, Integrative RD.org, sign in to the Member’s Only site and click on Archived Webinars: “Biochemical Individuality – Why We Must Incorporate Laboratory Diagnostics”

Dr. Ron Grabowski is sponsored by SpectraCell Laboratories.
Compiled by Jacqueline Santora Zimmerman, MS, RDN

Upcoming Conferences and Meetings


• June 5-8, Food as Medicine Professional training program. San Francisco Bay Area http://cmbm.org/professional-trainings/food-as-medicine/

What’s New in Print - Journal Reviews

Intestinal bacteria linked to rheumatoid arthritis

It is well known that rheumatoid arthritis (RA) is caused by genetic and environmental factors, but its etiology remains indefinable. Treatment with antibiotics and steroids has been a beneficial modality in RA for decades. No microbial organism has been shown to be associated with the disease. Scher et al. analyzed fecal microbiota in patients with newly onset RA (NORA), chronic RA (CRA), psoriatic arthritis (PsA) and healthy individuals. RNA gene sequencing was used to classify the microbiota. A total of 114 fecal DNA samples were gathered. 75% of NORA patients and 11.5% of patients with CRA carried the Prevotella copri strain. It is known that Prevotella fail to thrive when there is less inflammation; when mice were evaluated similar results were found. The authors question whether C-reactive protein (CRP) may have microbial modulating properties. CRP levels did not differ significantly between CRA and PsA groups, but is characteristically high in early stages of RA. A high CRP level is not typically seen with other immune diseases (lupus, scleroderma and PsA). The health of the GI tract has known effects on the body. An area of further investigation may be whether or not CRP itself represents a specific response to the presence of Prevotella copri in newly diagnosed RA. Analysis of gut microbiota to diagnose certain immune diseases has potential and should be the subject of future research.


Probiotics for the Mind: A Crossroads of the Microbiome and Mental Health

by James Greenblatt, MD

This free report provides an overview of the gut-brain connection in terms of the gut microbiome’s influence on brain activity and mental health. It also covers how to assess the quality of probiotic supplements. Practitioners are asked to enter basic contact and work information to download this free PDF report. (http://www.integrativepractitioner.com/article.aspx?id=18849 or go to www.IntegrativePractitioner.com > Reports)

Vitamin D and Autoimmune Diseases

Autoimmune diseases are caused by a change to immune homeostasis. Immune regulation relies on regulatory T-cells (Tregs) which have the ability to actively block immune responses, inflammation and tissue damage by suppressing immune cell function. We know that vitamin D insufficiency has been related to poor immune function, but its effect on peripheral Tregs has not been determined. In a double blind placebo controlled study of 57 healthy volunteers, the effect of 12 weeks of high-dose cholecalciferol supplementation (140,000 IU/month or 4,500 IU/day) or placebo (almond oil) on the number and function of Tregs (CD4, CD25, Fox P3 and CD127) was evaluated. Additionally, the effect of cholecalciferol on Tregs in an in vitro experiment was assessed. Participants had blood leukocytes evaluated as well as other necessary calcium and urine analysis at weeks 4, 8 and 12. Initially, 69% of participants had at a minimum insufficient vitamin D levels of <30 ng/ml. Vitamin D levels increased to normal (+ 55 ng/ml) for the supplement group and were significantly reduced for the control group. There was a significant correlation with serum vitamin D and percent (%) of peripheral Tregs. No change in vitamin D level was noted in the control group. The greatest significance was noted after weeks 8 and 12 for the supplement group. High dose vitamin D supplementation did not significantly increase suppressive activity of peripheral Tregs in the ex vivo co-culture experiment. This experiment is the first to show significant influence of a vitamin D supplementation on the percentage of peripheral Tregs in healthy humans. The increase in vitamin D level within this study is considered to reduce the incidence rate of type 1 diabetes, multiple sclerosis and rheumatoid arthritis. It is important to note that this study did
not evaluate changes in tissue cells. Overall, this study shows the potential of a vitamin D supplement to safely support disease modulating therapies. Pietil B, Treiber G, et al. High-dose cholecalciferol supplementation significantly increases peripheral CD4+ Tregs in healthy adults without negatively affecting the frequency of other immune cells. Eur J Nutr. 2013 Sep 3. [Epub ahead of print] (PMID: 23999998)

NIH Director: Whole Genome Testing Coming Soon
Within 3-4 years, NIH Director Francis Collins, MD, PhD anticipates whole genome sequencing will be used in diagnostic tests. http://www.medpagetoday.com/Genetics/GeneticTesting/42570

FDA Sets Standard for Gluten-Free Label
In order to sport a gluten-free label, products must contain fewer than 20 parts per million (ppm) of gluten. This level may be safely consumed by those with celiac disease and gluten sensitivity. All food manufacturers must meet this standard by August 2014 to label their products as gluten-free.

American Botanical Council critique of herbal product contamination study
American Botanical Council (ABC) explains the multiple flaws and inconsistencies within this recent study published in BMC Medicine. ABC maintains that the study authors did not use DNA barcoding appropriately, leading to unreliable, false and confusing results. DNA barcoding for botanical identification is accurate and reliable, but has limitations. Plant extracts cannot be identified with this method. DNA barcoding performed on products containing botanical extracts may show unrelated DNA, including the product’s carrier, filler or possible adulterants. ABC calls for retraction of the paper and urges the authors to address errors and submit it for an expanded peer review, including reviewers with botanical analytics expertise.


U.S. herbal dietary supplement sales up 5.5% in 2012
Cranberry, garlic, saw palmetto, soy and gingko top the list of supplement sales in the Food, Drug and Mass Market Channel; flax (seed or oil), wheat or barley grass, turmeric, aloe vera and spirulina/blue green algae are the top five in the natural and Health Foods Channel in the U.S. for 2012. Supplement sales do not include herbal teas or cosmetics. Trends in the natural channel include drinkable “shots” and whole food supplements, fueled by the increased awareness of “food as medicine.”


Natural products: Predictions and trends
The natural and organic foods sector continues to grow and is expected to overshadow supplements and functional foods. Areas of expected growth include fruits, vegetables and natural coloring agents (primarily derived from plants). Consumer interest continues to increase in foods that are “naturally functional” versus foods with added vitamins, minerals or other added components. Within the supplements and functional foods sectors, growth is predicted in the areas of whole food supplements (particularly those that are organic, non-genetically modified, vegan and local/fair trade), plant-based protein powders, herbs and botanical supplements, sports nutrition and beverages.


Jacqueline Santora Zimmerman, MS, RDN is DIFM Associate Newsletter Editor. Contact Jacqueline at jacq.zimmerman@gmail.com.

HOT Nutritional Genomics Research Publications


Variables affecting obesity are described, including genetics, epigenetics, nutrigenetics and nutrigenomics. To obtain the free PDF, from within PubMed click on the Karger icon in the upper-right corner to download a free PDF (accessed 1 Nov 2013).

The 8th ISNN Congress will be held in Gold Coast, Australia on May 2-3, 2014 (www.ISNN2014.org).


Variables affecting obesity are described, including genetics, epigenetics, nutrigenetics and nutrigenomics. To obtain the free PDF, from within PubMed click on the Karger icon in the upper-right corner to download a free PDF (accessed 1 Nov 2013).


Carrying two copies of the T allele for the rs7903146 variant of the TCF7L2 gene has been associated with a higher risk of type-2 diabetes. When adherence to a Mediterranean diet was low, fasting glucose was higher among TT carriers than among
controls; however, no significant difference was found when adherence to the Mediterranean diet was high. Blood lipid levels were also improved, which suggests that adherence to the Mediterranean diet may likewise help reduce the higher risk of stroke that has also been associated with TT carriers.


A survey of dietitians found that knowledge and confidence is still low with regard to the use of nutritional genomics, leading the authors to suggest that improvement should be pursued.


Older individuals with lower adiponectin levels may benefit from supplementation with fish oils, such as among those in this study who carried two copies of the TT allele of the 45T-G variant (also known as rs2241766) of the adiponectin gene.


Inflammatory bowel diseases such as Crohn disease and ulcerative colitis result from a combination of genetic and environmental factors. Although diet is one of those factors, there is growing evidence that intestinal microbiota also plays an important role.


New evidence is described which suggests that one means by which curcumin (as from turmeric) may help prevent colorectal cancer is by its favorable effect on epigenetic mechanisms involving DNA methylation.


Orange juice was found to reduce inflammation-related gene expression, and discussion is offered regarding the anti-inflammatory properties of flavonoids like hesperidin and naringenin.


The rs11942223 variant of the SLC2A9 gene has been associated with an increased risk for hyperuricemia. Among Caucasians who carry this variant, fructose-containing beverages were found to increase serum urate, which may therefore increase the risk of developing gout among that group.

Inquiries about above nutritional genomics references? Please contact Ron L Martin, MS, President, Nutrigenetics Unlimited, Inc.; ron@nutrigenetics.net. Please check out www.isnn.info/ to learn more about the dietitian membership discount.

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Numen: The Nature of Plants
New Revised Edition
A Film by Terrence Youk and Ann Armbrecht
DVD. $19.97 available at www.numenfilm.com
Montpelier, VT: Brook Hollow Productions, Inc © 2013. 75 minutes

Numen is a film about harnessing the healing power of plants, not as pharmaceuticals or herbal supplements but as food, teas, and extracts, which have all been used as healing aids for ages. Numen is a beautiful visual invitation to explore the benefits of herbalism through a series of interviews with the most prominent voices in the field. Co-producer, Ann Armbrecht is a Harvard trained anthropologist and herbalist specializing in the relationship between culture and the environment. Here she uses plants as the bridge. The main objective is to bring awareness to the areas where conventional medicine has limitations and to show that in nature a healing partner can be found.

Numen captures the viewers’ attention through the use of time-lapse photography imparting an appreciation of the wonder of the natural world. The film progresses through an account of how plants have been used by traditional cultures throughout time, dismissed as antiquated, unscientific remedies by allopathic medicine, and now find resurgence as an ally in today’s healthcare. Herbalists, ethnobotanists, ecologists, medical doctors, naturopaths, and specialists in integrative medicine tell this story, emphasizing the relationship that the human race has always had with the plant species.

A “Food as Medicine” section equates herbalism to the food that is on one’s plate. Several of those interviewed, including Dr. Tieraona Low Dog from the Arizona Center for Integrative Medicine, point out that increasing daily intake of vegetables and using spices in cooking are basic ways to practice herbal medicine. Plants as food provide therapy in a more gentle way than pharmaceuticals. There is healing from contact with plants through preparation versus taking them in the form of pills or capsules. The emphasis here is on Vix Medicatrix Naturae or the healing force of nature, the meditative quality of solitude in nature or the grounding effect of gardening. The late Bill Mitchell, co-founder of Bastyr University, expresses with tearing eyes and a quivering voice the healing experience of plant medicine as “a magical and mystical as well as scientific and logical journey, all married together.” He says he is grateful to the plants and is caught up in the magic and intuitive part of healing from plant medicine.

This film is easy to watch, it holds your attention through the lure of nature and the wise words of the numinaries. It imparts a sense of responsibility for the environment and is a valuable summary of the herbalist’s therapeutic approach. The DVD is available at www.numenfilm.com and can also be purchased with public screening rights.

Reviewed by Dina Ranade RDN.
Newsletter Resource Reviews Editor. Contact Dina at dranade@comcast.net.
W

hy cook? Nowadays it is so easy to order out, drive through, or throw a frozen meal in the microwave. In his new book, *Cooked*, Michael Pollan explores this dying art in four different contexts using the four classical elements, Fire (barbeque), Water (braising), Air (baking) and Earth (fermenting). Within each element, he recounts the history, culture and technique of each cooking method while weaving in his personal experience as he immerses himself in each process.

By exploring cooking and eating through the four elements, Pollan underscores our interconnectedness with the Earth. In Fire, he begins with the most primitive form of cooking, one that simultaneously satisfied both humans and the Gods. Humans eat meat and the Gods eat smoke, a win-win. Pollan spends time with some of the most famous barbeque chefs from the South and contemplates the impact this cooking method has had on American culture. The smoke of a barbeque not only summons the Gods—it summons the people to gather together.

When humans started cooking with water, cultural food identities were born as herbs and spices were added to the liquid. Cooking with liquid produced a much more complex and varied mix of flavors. While cooking with fire lends itself to ceremony and machismo, braising is much more of an introverted and contemplative process.

Humans began mastering food science when they learned to harness air in the baking of bread. Pollan describes various methods of baking from a visit to a Hostess plant to spending time with Zen bakers/philosophers. To cook with air is to invite levity and transcendence into our food.

Pollan brings us back down to Earth with fermentation, a type of “cooking” that utilizes a natural chemical process using organisms that originate in the soil. The contents of our intestinal tract mirror the soil in many ways and foods that nourish healthy soil or compost also nourish a healthy digestive system. A “Post Pasteurian” culture is evolving out of the realization that microbes are essential for health and fermented foods and beverages are the essential link.

Michael Pollan is able to write about seemingly mundane topics such as baking bread, roasting a pig and fermenting vegetables with such enthusiasm and wonderment it is impossible to not be inspired. His stories also have enough science to inform a nutritionist without overwhelming the lay reader.

Michael Pollan is often credited as a founding father of the locavore movement. Although he did not coin the term, his books and articles have helped raise the collective awareness about food quality, food politics and the impact our food choices have on our personal and planetary health.

So to answer the question “why cook?” Pollan offers many good reasons... Improve one’s health, connect with others, support the local economy, delight in one’s accomplishments and creativity, add richness and texture to life, and reclaim a sense of self-sufficiency. All worthy reasons to get back in the kitchen!

Reviewed by Kelly Morrow, MS, RDN DIFM Communications Co-Chair. Contact Kelly at kmorrow@bastyr.edu.
Advocating for Avocados

Mary Purdy, MS, RDN

What is a rich source of folate, vitamin K, vitamin B and potassium? Not to mention healthy monounsaturated fats, fiber and powerful antioxidants. Oh, and have I mentioned the amazing flavor, texture and mouth feel? Throw this all together and you have, yes, you guessed it—the delightfully nutritious avocado!

Known to be a highly anti-inflammatory food due to its healthy fat content, cholesterol-lowering phytosterols and diversity of carotenoids, the avocado has shown great benefits for arthritis and heart health. Studies are also now showing that it may have potential positive effects on blood sugar and cancer risk.

Interestingly enough, the greatest concentration of carotenoids in avocados occurs in the dark green flesh that lies just beneath the skin, so don’t fail to scoop out every last piece of avocado “meat”.

To those who insist that avocados are “fattening”, it can be divulged that one-half an avocado has approximately 150 calories, (less than your average cookie), has a low glycemic load, and boasts a myriad of health benefits.

Once you have opened an avocado, it’s best to store it in a tight container and place in the fridge. Applying a touch of lemon or lime juice will prevent the browning that occurs when exposed to oxygen.

Think avocado is just for guacamole?

Think again. Behold….

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**Raw Chocolate Mousse**

1/2 avocado
3 ice cubes
1/2 t vanilla
pinch salt
3 Tbsp maple syrup
1/4 c unsweetened cocoa powder

Place the above ingredients or mash all of them in a large mixing bowl until creamy.
Feel free to add any other flavors: Mint leaves, cinnamon, etc.
Serve at room temperature or chilled.

Nutrient analysis, entire recipe: Calories – 360; total fat – 17.75 gm; monounsaturated fat – 10.8 gm; polyunsaturated fat – 2.7 gm; fiber – 13.75 gm; potassium – 1000 mg; folate – 81 μg; vitamin K – 21 μg

Love One Today™

The Hass Avocado Board (HAB) recently launched Love One Today, a new science-based food and wellness education program that encourages Americans to include fresh Hass Avocados in everyday healthy-eating plans to help increase fruit and vegetable intake and as a delicious, cholesterol-free, whole-food source of naturally good fats. As part of this program, HAB developed the Love One Today Health Professional Resource Guide, which provides you with avocado nutrition facts, the latest in avocado nutrition research, and tips and tools to help your patients and clients incorporate nutritious and delicious avocados into their healthy-eating plans every day. The following is an excerpt from that guide. Visit LoveOneToday.com/HPResources to download a free complete copy.

Healthy Living Every Day

Longer lifespans and aging baby boomers are contributing to growth in the number of older adults living in the United States. According to the Centers for Disease Control and Prevention (CDC), the number of Americans aged 65 and older will double over the next 25 years; and by 2030, older adults will encompass about 20% of the population. As people live longer, the focus on healthy living, including healthy eating, becomes more important. All Americans at every age can benefit from replacing saturated fat with unsaturated fat in their diets and increasing their intake of fruits and vegetables. And, based on the following studies, avocados or avocado components (i.e., lutein, monounsaturated fat) may contribute to healthy lifestyles and healthy living in a variety of ways.

- Avocados can act as a “nutrient booster” by helping the body better absorb fat-soluble nutrients from foods with which they’re eaten. Research conducted by Ohio State University showed that eating avocado with other foods significantly boosted carotenoid absorption from salad and salsa. This occurrence is attributed primarily to the fats found in avocados.2
- People who eat avocados tend to have higher nutrient intakes than those who do not eat avocados. A recent NHANES analysis published in Nutrition Journal in 2013 showed that, compared to people who didn’t eat avocado, avocado consumers had a better diet quality and beneficial nutrient intakes.3 Additionally, this research showed that those who consumed avocados compared to non-consumers:
  - Had a 50% lower odds ratio for metabolic syndrome.3
  - Had significantly higher HDL-cholesterol (“good”) levels despite having the same caloric intake.3
  - Had a significantly lower intake of added sugars.3
  - Had significantly higher intakes of good fats (18% more monounsaturated and 12% more polyunsaturated) and total fats (11% more).3

As with most analyses of NHANES data, these findings do not indicate a cause and effect relationship between avocado consumption and health measures. However, despite this limitation, incorporating avocados into a healthy diet that focuses on increased fruit and vegetable intake may provide additional nutritional benefits.

- A study by the University of the West Indies indicated that monounsaturated fat intake may be associated with reduced risk of prostate cancer.4,5 In a study by Jackson et al., higher consumption of dietary MUFA was inversely associated with prostate cancer. In this study, participants did not follow a specific diet; however, avocados were the primary source of MUFA.4
- A prospective study indicated that among men with nonmetastatic prostate cancer, there may be a lower risk of dying from all causes when carbohydrates and animal fats are replaced with plant fats. The study looked at the dietary habits of 4,577 health professional men (via Food Frequency questionnaires) who had been diagnosed with nonmetastatic prostate cancer. Researchers were investigating the relationship between risk of lethal prostate cancer and all-cause mortality and consumption of saturated, monounsaturated, polyunsaturated, trans, animal and vegetable fats. The study results show when men replaced 10% of calories from carbohydrates with vegetable fat, they had a 29% lower risk of dying from prostate cancer. Additional studies are needed to examine whether the associations observed were attributable to the fat or other components (e.g., phytochemicals) in these foods or some combination of nutrients/components.5

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<th>Nutrient</th>
<th>Non-Avocado Consumers</th>
<th>Avocado Consumers</th>
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<tr>
<td>Carbohydrate</td>
<td>120%</td>
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<tr>
<td>Dietary Fiber*</td>
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<tr>
<td>Sodium</td>
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</tr>
</tbody>
</table>

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Networking News

The Center for Mind-Body Medicine (CMBM) is now offering to share its monthly newsletter with DIFM members in a more easily accessible way. The newsletter will be available as a link on the DIFM website, http://integrativerd.org. CMBM posts eight blogs each month, available at http://cmbm.org, and publishes four of the most popular blogs in the monthly newsletter. Each blog offers high quality discussions on topics related to mind-body medicine, nutrition and trauma relief as well as self-care tips. Recent newsletter topics include Happily Hungry: Kids with Cancer Cook and Journey of the Breath.

DIFM has partnered with key nonprofit organizations that provide educational opportunities and discount benefits for Integrative Nutrition RDNs. More networking partnerships are currently in the works. Additional information on DIFM member networking benefits is available at http://integrativerd.org/networks-and-sponsors/networks/.

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