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Nutrition In Complementary Care
A Dietetic Practice Group of the American Dietetic Association
Spring 2004 Volume 6, Issue 4

Therapies:
Supplements:
Gluten-Induced Infertility: An Under-Explored Connection

Cindy R. Kaplan MS
Cynthia Kupper RD, CD

Unexplained infertility is a diagnosis often given to couples unable to achieve pregnancy after one year. Reproductive endocrinologists typically use this diagnosis as one of exclusion, assigned only after hormonal and functional abnormalities are ruled out by extensive testing. Treatment by artificial reproductive technologies (ART) is often then recommended to correct the unknown issue. But for 1 in 16 women with unexplained infertility, the problem may be resolved merely by eliminating certain grains from their diet. For this group, undiagnosed gluten intolerance or celiac disease (CD) may well be the source of their fertility struggles, as well as other health complaints.

The Western Perspective
Over the past four years there has been a surge in research demonstrating the surprisingly high prevalence of celiac disease, a genetically-based intolerance to gluten. Affecting 1 in 133 Americans, CD is associated with a wide range of symptoms, from gastrointestinal distress to anemia to gynecological problems. The only treatment for this condition is strict adherence to a gluten-free diet. Women with CD are at increased risk for infertility, delayed menarche, early menopause and difficulty with prolonged breastfeeding. Additionally, it has been suggested that up to 50% of women with untreated CD experience miscarriages or unfavorable pregnancy outcomes, such as intrauterine growth retardation and low birth weight babies. Studies in this area, however, are limited and indicate mixed results.

The most recent research out of Czechoslovakia suggests a 1.67% increase in infertility among women with CD, and 0-2.1% increase in multiple spontaneous abortions. In a study from Italy, 2.7% of the women tested had a confirmed diagnosis of celiac disease. Of these women 2.1% formed part of a group of patients with a positive history of spontaneous abortion. A 1999 Danish study compared pregnancies of 127 celiac women, before and after a gluten-free diet was introduced. Results indicated a three-fold higher risk of interuterine growth...
The NCC Leadership Team knows how to put theory into practice and successfully. Immediately following the ADA's Leadership Institute meeting held in Tucson, AZ, NCC leaders converged in Tucson and held our Spring meeting to map out strategies for a successful program year. We explored new ideas for continuing education opportunities, member benefits, and delivering information. I am confident he will successfully lead NCC to continued prominence as a premier DPG! It's important to note that in just six short years, NCC's volunteer leaders and membership have a vision, mapped out direction, and developed new advanced products. Rick has the unique talent of combining technology with nutrition education and for that we look to him for leadership on developing new advanced products for NCC members and their clients. Rick has also introduced the idea of developing a conference for NCC members where all information presented would be on the topic of complementary nutrition. Because this idea would require an enormous amount of effort to execute, he would need your input as to your level of interest in attending, and suggestions for speakers. Of course, volunteers to help organize such an event would be greatly appreciated!

Further, I'd like to present the new incoming NCC Chair, Rick Hall, who is one of the Founding Members of NCC and has served as the former Web Master for NCC's web site. Rick has the unique talent of combining technology with nutrition education and for that we look to him for leadership on developing new advanced products for NCC members and their clients. Rick has also introduced the idea of developing a conference for NCC members where all information presented would be on the topic of complementary nutrition. Because this idea would require an enormous amount of effort to execute, he would need your input as to your level of interest in attending, and suggestions for speakers. Of course, volunteers to help organize such an event would be greatly appreciated!

Please welcome Rick Hall as he begins his term. I am confident he will successfully lead NCC to continued prominence as a premier DPG.
In the past, medical opinion was divided over the value of multivitamin supplements. But with the recent publication of clinical practice reviews in the *Journal of the American Medical Association* and the *New England Journal of Medicine*, a new consensus seems to be emerging. Many health and nutrition professionals now agree that most people do not consume an optimal amount of vitamins from their diets and, as a result, it may be prudent for all adults to take a multivitamin supplement. And while the rationale for daily multivitamin supplementation may still be to "fill dietary gaps," increasing attention is being paid to who is facing those gaps and to evidence as to why filling those gaps is vitally important.

A session on the topic, "We’re Not Talking About Scurvy Anymore: New Views on Multivitamin Supplementation," was presented at the recent American Dietetic Association Food & Nutrition Conference & Expo (FNCE 2004). The three speakers presented strong evidence that a daily multivitamin supplement may be beneficial for most adults and may also help patients and clients achieve optimal nutrition for the prevention of chronic disease.

According to data presented by Alanna J. Moshefgh, MS, RD, research leader of the Food Surveys Research Group at the United States Department of Agriculture (USDA), Washington, DC, dietary supplement use in the United States is increasing. In 1994-98 (the last year for which USDA data has been analyzed), 46% of Americans were using dietary supplements, up from 34% in 1977-78. The highest percentage of users in 1994-98 was found in women aged 51 to 70 (61%), an increase from 41% in 1977-78. In all age and gender groups, the most commonly used supplement was a multivitamin, although multivitamin with mineral usage tended to increase with age.

In order to determine the contribution supplements make to nutrient intake, Moshefgh looked at the total intake from food and from supplements for three vitamins—vitamin C, vitamin B₉, and vitamin B₁₂—among supplement users and non-users (Figures 1-3). Not surprisingly, the total intake from food plus supplements for all three nutrients was far higher among supplement users. Supplement users also had higher intakes of the nutrients from food than did non-users and supplement non-users were much more likely to fall below the DRIs for the three vitamins. For example, 50% of men 71-years old and above who did not use multivitamins fell below the estimated average requirement (EAR) for vitamin C, while less than 10% of supplement users in the same age and sex groups fell below the EAR.

Jeffrey B. Blumberg, PhD, associate director of the Jean Mayer USDA Human Nutrition

### Usual Intakes for Selected Vitamins and Minerals, 1994-98

#### Vitamin C

<table>
<thead>
<tr>
<th>Non-Supplement users From food</th>
<th>Supplement users From food &amp; supplements</th>
</tr>
</thead>
<tbody>
<tr>
<td>MALES AND FEMALES</td>
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</tr>
<tr>
<td>1-3</td>
<td>0.2</td>
</tr>
<tr>
<td>4-18</td>
<td>0.2</td>
</tr>
<tr>
<td>19-30</td>
<td>0.2</td>
</tr>
<tr>
<td>31-50</td>
<td>0.2</td>
</tr>
<tr>
<td>51-70</td>
<td>0.2</td>
</tr>
<tr>
<td>71+</td>
<td>0.2</td>
</tr>
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</table>

#### Vitamin B₆

<table>
<thead>
<tr>
<th>Non-Supplement users From food</th>
<th>Supplement users From food &amp; supplements</th>
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</thead>
<tbody>
<tr>
<td>MALES AND FEMALES</td>
<td></td>
</tr>
<tr>
<td>1-3</td>
<td>0.6</td>
</tr>
<tr>
<td>4-18</td>
<td>0.6</td>
</tr>
<tr>
<td>19-30</td>
<td>0.6</td>
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<tr>
<td>31-50</td>
<td>0.6</td>
</tr>
<tr>
<td>51-70</td>
<td>0.6</td>
</tr>
<tr>
<td>71+</td>
<td>0.6</td>
</tr>
</tbody>
</table>

Cont. on page 60
Supplements: We’re Not Talking About Scurvy Anymore

Usual Intakes for Selected Vitamins and Minerals, 1994-98

Vitamin B12

<table>
<thead>
<tr>
<th>Supplement users</th>
<th>From food</th>
<th>From food &amp; supplements</th>
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</thead>
<tbody>
<tr>
<td>Male 15.0</td>
<td>3.0</td>
<td>18.0</td>
</tr>
<tr>
<td>Female 12.0</td>
<td>2.0</td>
<td>14.0</td>
</tr>
</tbody>
</table>

Figure 3

Research Center on Aging at Tufts University, Boston, MA, noted that several groups are falling short of their vitamin and mineral intake: women of child-bearing age, people on low calorie or very low fat diets, teenagers with irregular eating habits, patients with chronic diseases that increase nutrient requirements, people taking chronic medication that affect nutrient requirements and people who avoid one or more food groups (including vegetarians). 1

Dr. Blumberg cited research indicating that optimal micronutrient intakes can reduce DNA damage, improve cofactor binding affinity impaired by gene mutations and inhibit age-associated decay of mitochondrial function. 2 He also pointed to evidence that micronutrient inadequacy can lead to DNA damage. For example, deficiency of vitamins B6, B12, C, E, folate and niacin or the minerals iron, selenium and zinc mimic radiation by causing single- and double-strand breaks and/or oxidative lesions. 3 These mutations, in turn, may have implications in cardiovascular disease, cancer, hemolytic anemia, alcohol intolerance and cognitive disorders. 4

As Dr. Blumberg pointed out, several clinical and observational studies have shown a decreased risk of chronic and/or fatal disease with multivitamin supplementation (see Table 1).

Robert H. Fletcher, MD, MSc, professor of ambulatory care and prevention and of epidemiology at Harvard University School of Public Health, Boston, MA, recognized that randomized clinical trials of multivitamins have not been undertaken to explore all of their potential benefits to the promotion of health and prevention of chronic disease, but he suggested that nutrition professionals look at the totality of scientific evidence, which indicates this may now be a reasonable and prudent recommendation.

While Dr. Fletcher acknowledged that some vitamins might be harmful in large doses citing associations such as vitamin A and birth defects and pharmacologic doses of beta-carotene and increased risk for lung cancer, particularly among smokers—he also noted that the doses associated with those effects are significantly higher than those found in most multivitamins. Moshfegh also dispelled some of the concern about consumers getting too much of a single nutrient by looking at the percent of individuals exceeding the upper limits (UL) for two nutrients, calcium and

### Multivitamin Supplementation and Disease

<table>
<thead>
<tr>
<th>Study Title</th>
<th>Diseases/ Conditions Studied</th>
<th>Methodology</th>
<th>Results</th>
</tr>
</thead>
<tbody>
<tr>
<td>Linxian Nutrition Intervention Trial 1</td>
<td>Cerebrovascular disease and hyperension</td>
<td>Supplementation with a multivitamin and mineral supplement for 72 months</td>
<td>Placebo RR = 1.0</td>
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<tr>
<td></td>
<td></td>
<td></td>
<td>Men with MV M = 0.40</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Women with MV M = 0.91</td>
</tr>
<tr>
<td>Stockholm Heart Epidemiology Program</td>
<td>Myocardial infarction</td>
<td>Case-control comparison of multivitamin users vs. nonusers</td>
<td>Male Nonuser RR = 0.7</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Male Users RR = 0.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Female Nonuser RR = 1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Female Users RR = 0.46</td>
</tr>
<tr>
<td>Health Professional Follow-up Study</td>
<td>Peripheral arterial disease risk in men</td>
<td>Comparison of risk with multivitamin intake from food only vs. food &amp; MV</td>
<td>Food Folate RR = 1.9</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Food &amp; MV RR = 0.48</td>
</tr>
<tr>
<td>Nurses Health Study2</td>
<td>Colon cancer</td>
<td>Risk of colon cancer by years of multivitamin use</td>
<td>Relative risk of colon cancer declined with increased years of MV supplementation</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Baringer et al. 5</td>
<td>Infection in Type 2 diabetics</td>
<td>Incidence of infection- and infection-related disease in Type 2 diabetics receiving a multivitamin supplement</td>
<td>Infection incidence: Diabetic RR = 1.0</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Non-diabetic RR = 0.10</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Olshan, et al. 6</td>
<td>Fetal neuplasmosa</td>
<td>Odds ratio for neural tube defects</td>
<td>0.75 (1st trimester OR = 0.7)</td>
</tr>
<tr>
<td></td>
<td></td>
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<td>1st trimester OR = 0.7</td>
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<td>2nd trimester OR = 0.6</td>
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<td></td>
<td>3rd trimester OR = 0.8</td>
</tr>
<tr>
<td></td>
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<td></td>
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</tr>
<tr>
<td>Correa, et al. 7</td>
<td>Diabetes associated non-syndromic birth defects</td>
<td>Odds ratio for diabetes-associated birth defects</td>
<td>Non-diabetic, non MV user OR = 1.0</td>
</tr>
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<td></td>
<td></td>
<td></td>
<td>Non-diabetic, MV user OR = 1.0</td>
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<td></td>
<td>Non-syndromic, non MV user OR = 0.6</td>
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<td></td>
<td>Non-syndromic, MV user OR = 0.6</td>
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zinc. For calcium, the only groups exceeding the UL were men in the 14 to 18, 19 to 30 and 31 to 50 age groups. But the percentage of individuals within those groups that exceeded the UL ranged from less than 1% to no more than 2%. In fact, the group with the most individuals consuming more than the UL was 14 to 18-year olds who did not use supplements. Children aged 1 to 8 were the most likely to exceed their UL for zinc, but Moshfegh said that this may be because the UL for children for that nutrient was extrapolated from that for adults and may have been set too low since we are not seeing children with clinical symptoms of zinc toxicity."

Overall, Dr. Fletcher recommended that nutrition professionals follow these guidelines:
• All adults should take one multivitamin per day
• Consider higher doses of some nutrients for the elderly.
• Be alert for diseases causing unusual requirements for certain nutrients
• Avoid:
  o pharmacologic doses of betacarotene
  o vitamin A levels above the RDA in early pregnancy
  o very high doses of any vitamin

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References

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Of Interest

ADA's 2004 Public Policy Workshop
Rita Batheja, MS, RD, CDN
Reimbursement / Membership Chair

About 400 ADA members attended the Public Policy Workshop (PPW) in Washington, D.C. from March 23 to March 25, 2004. It was a sensational event! NCC's Content Chair, Barbara Ann Hughes, PhD, RD, FADA was the recipient of the legislative award set up by Ann Gallagher for a member of the Consultant Dietitians in Health Care Facilities (CDHCF), another dietetic practice group of ADA.

ADA's mission is to "lead the future of dietetics." One of the primary goals to fulfill this mission is to influence key food, nutrition and health initiatives. No other single ADA event comes close to the PPW in carrying out this aspect of the strategic plan.

PPW stresses grassroots. "You have to do grassroots to do your job as a dietetics professional," said Mike Dunn, keynote speaker. He is the President of a public affairs consulting firm that specializes in developing the political effectiveness of professional and trade associations.

Formerly, Mike was Director of Government Relations with the Public Affairs Council and has served as legislative aide to various members of Congress in both the house and senate. He instructed ADA members on the process of how Bill becomes law. Dunn warned, "If you don't do grassroots, there are plenty of others who will and they will use grassroots to their - not your - advantage."

PPW is one of the focal points of ADA's advocacy programs. ADA members from across the nation interested in the development of Public Policy as well as ADA's elected leadership and legislative network coordinators, state affiliate leaders, DPG liaisons and dietetic students attend PPW. This three day workshop is held annually in Washington D.C. and also raises the profile of ADA as a leader in food, nutrition and health policy. The PPW provides attendees with an understanding of the legislative and regulatory processes, teaches strategies and skills for grassroots successes and creates opportunities for members to meet officials in Washington, members of Congress, leaders of other food and health associations and networks in support of food, nutrition...
Lights, Cam, Action: Putting It Into Practice: Nutrition & Yoga for Weight Management: One Clinician’s Perspective

Annie Kay MS, RD, RYT

If you are a nutrition professional, you know that national data indicates that a whopping 61% of Americans are either overweight or obese. And if you are a nutrition counselor you probably know women who feel just like Mary. Unfortunately being overweight is not just a cosmetic inconvenience. It increases risk for heart disease, high blood pressure, diabetes, cancer, and early death.

The complex reasons for the skyrocketing obesity trends lie in the collision between human biology and modern society. The growth of the processed food industry and the ubiquity of our consumerist, market-driven culture are both at the heart of the epidemic. This conundrum is well described in Marion Nestle’s book *Food Politics: How the Food Industry Influences Nutrition and Health.*

An individual’s biology, mental and emotional landscape, and habitual response to stress are also factors.

Each of us, in our therapeutic practice, must find ways of addressing the tangle of cultural, psychological, environmental, and biological aspects of a person’s weight management. Like many educators working in this area, I draw from my own struggles with weight and eating as well as from my professional experience. In this article, I will share some of my client’s and my experience of combining the science of weight management with the practice of yoga.

I became a yoga practitioner twelve years ago at a time of personal transition and seeking. I was newly single and on my own for the first time in my adult life. Thanks to my yoga practice, for the first time since childhood, I had a positive relationship with my physical body even though it was not picture perfect. Through my years of nutrition and body image training, I was never personally able to feel contentment with my physical body until I became a daily practitioner of yoga which is know for cultivating both clarity and calmness.

I found that looking at nutrition science through the paradigm of yoga worked for me, and I began to introduce it into my practice. My clients responded with relief and enthusiasm. They began to care for themselves more compassionately. They reconnected with their bodies and their passions rather than continuing to bury their emotions under binging and deprivation as they tried to become someone they were not. And they responded by moving toward realistic nutrition goals more easily, becoming healthier and happier.

Yoga seems to provide an additive element that makes the sacrifice of dietary change more palatable. Several years ago I developed a workshop combining these two complimentary sciences. While I have not yet evaluated short and long-term weight loss and maintenance in the many nutrition programs I have conducted, the combination of yoga and nutrition yields the highest client satisfaction by far.

Yoga: An Evolution into Awareness

Yoga is thought to have originated in India as a Hindu spiritual practice over five thousand years ago. It was codified by a sage named Patanjali in a document called the *Yoga Sutras,* a collection of simple phrases whose meanings become more subtle as they are pondered. The word yoga comes from the Sanskrit word “yuj,” which means union, often interpreted as union of the physical, mental, and spiritual selves. (reference?)

The practice of yoga includes the physical exercises that have become increasingly familiar (asana), along with ethical guidelines called “yamas” (restraints) and “niyamas” (observances). Breath work, meditation, inward-focused awareness, and concentration are also part of the whole of yoga. One of the important yamas is “ahimsa” (nonviolence). By contemplating issues, such as violence to the self through overeating, while exploring the physical interplay of strength, will, flexibility, and surrender in one’s own body, a personal and meaningful context is developed. Many of the clients I have counseled had never had the experience of feeling emotion physically in their bodies until they began this contemplative practice. Yoga’s use of the physical body as the starting point for spiritual development makes it a wonder-
Physiological Effects

There are a number of possible explanations for how yoga and other mind-body modalities work. One is that yoga practice helps to fine-tune our sensory systems, which have internal, external, and memory components. These sensory systems include the five senses plus the vestibular, visceral, and kinesthetic systems. On a conscious level we can normally attend to only one of these three components. In yoga, however, we practice the interplay of these components, and begin to develop conscious control over our internal, external and memory realities, thus gaining insight into how events in our lives imprint our sensory system and form our own version of reality.

Meditation is one aspect of yoga practice which is increasingly recognized as having clinical effects. These include a broad spectrum of physical and psychological symptoms and syndromes, including reduced anxiety, pain, and depression, enhanced mood and self-esteem, and decreased stress. Meditation has been studied in persons with fibromyalgia, cancer, hypertension, and psoriasis. Early studies on the physiological impact of meditation suffer from methodological limitations; however, both the quality and the quantity of research is growing. In a recent randomized controlled study by Davidson and Kabat-Zinn, a short program in mindfulness meditation produced demonstrable effects on brain and immune function. In a prospective investigation by Carlson et al, mindfulness-based stress reduction program enrollment was associated with enhanced quality of life and decreased stress symptoms in breast and prostate cancer patients, and resulted in possibly beneficial changes in hormones associated with hypothalamic-pituitary-adrenal (HPA) axis functioning, including improved cortisol profile.

Traditional weight management therapy in combination with yoga and meditation practice may be particularly well suited to interested women with visceral weight accumulation. Research suggests that visceral obesity in women, a risk factor for hypertension, diabetes, and cardiovascular disease, is in part a physiologic adaptation to stress. In one study at Yale University, women with greater abdominal fat who were not otherwise overweight consistently secreted more cortisol in response to stressful tasks than women with extra weight in their hips but not elsewhere, and cortisol levels remained high when stressful tasks were repeated. Cortisol fell in the control group. Yoga is also helpful in defining moderation. Many national health organizations feature moderation in their guidelines, but are light on the how-tos of achieving a moderate lifestyle in our anything-but-moderate culture. In yoga philosophy, moderation is not a passive state, but is more akin to “standing in the fire” between the two beckoning polls of excess and deprivation. The moderate yogini is not a risk-adverse snoozer, but a highly skilled...
and strong-willed warrior.

Current physical activity guidelines may appear hopelessly unattainable for people who are sedentary. While adequate moderate physical activity is always part of sound weight management, gentle yoga practice under skillful guidance can safely reintroduce movement into sedentary lives without the need for performance, exertion, or spandex. Once people begin to move again, regular physical activity often feels less daunting.

The Yoga-Wise Weight Workshop

The workshop is divided into six sections, each of which may take an hour or two depending upon time available. Each teaching session involves the introduction of a concept, exercises and a yoga practice to support and develop the theme, and group discussion. The following is a brief overview of the workshop’s six steps:

**Step 1: Self-discovery**
The first step to success is to draw an accurate picture of where the journey begins. Topics include:
- Food and emotional journaling.
- Simplified portion size awareness.
- Measuring success. (BMI, measurements, perceived energy scales, etc.)
- Eating environment self-evaluation.
- Mindful eating meditation exercises.
- Movement and breath awareness.
- Yogic principles of “saucha” (purity - becoming clear and powerful) and “satya” (truthfulness - honesty toward the self and others).

**Step 2: Awareness**
Awareness culled from the first step is used to begin to develop flexible individual guidelines for nourishing the physical, emotional, and intellectual bodies.

Topics include:
- Developing realistic, achievable goals.
- The pros and cons of popular diets and food trends.
- The physiological benefits of a regular yoga practice and specific recommendations for building a practice customized for oneself.
- Body awareness meditation exercises.

**Step 3: Change**
In this section, the art and science of behavior change are explored and incorporated into individual plans.

Topics include:
- Stages of change and setting behavioral goals to support progress.
- Behavioral strategies including stimulus control, problem solving, contingency management, and cognitive restructuring, simplified with ideas on how to weave these strategies into an individual program.
- The yogic concepts of discretion (distinquishing reality from non-reality), cultivated witness consciousness (clear seeing), “ahimsa” (nonviolence), “asteya” (nonstealing) in relation to food and caring for the body.

**Step 4: Opening**
Participants explore how to distinguish between and satisfy physical and emotional hungers.

Topics include:
- Exercises and yoga for exploring physical and emotional hungers.
- Identifying non-food rewards and comfort and other strategies for overcoming emotional eating.
- Listening to the meaning of cravings.
- Yogic principles of “aparigraha” (non-hoarding or simplification) and “iswara-pranidhana” (tolerance) are discussed in terms of eating and self-care.
- Standing in the fire of moderation - exploring the balance between willful effort and surrender.

**Step 5: Connection**
Transformation is nearly impossible to sustain in a vacuum. Much of the work of adopting a healthy lifestyle is up to the individual. But family, friends, and communities can greatly support successful lasting change.

Topics include:
- When and how to find a therapist, nutrition professional or teacher.
- How to find or build a community.
- Dealing with feeling “stuck.”
- Resistance, the dark side of change. Ways of moving through resistance using self-trust and “tapas” (passion).
- Exercises for opening the heart and practicing the art of “santosha” (contentment).
Step 6: Vibrance
This session provides a bevy of simple strategies for increasing life's zest and maintaining a healthy lifestyle.
Topics include:
- Ideas for enjoying life's fullness.
- The pros and cons of various detoxification practices, including the nutritional critique of fasting.
- The yogic ethics of "swadhyaya" (ongoing study).
- Participants are honored for their work, and plans for home are developed.
- The final yoga practice explores the spice of challenging postures.

Take Home Message
Yoga has become wildly popular over the last decade. That may be because in addition to the benefits of physical activity, it includes the stress-reducing aspects of meditation and in some classes, positive spiritual messages. It seems a tailor-made coping mechanism for our high-stress modern lifestyles.

There are many styles of yoga which vary widely from easy to demanding in both the physical discipline and in the commitment to yoga as a spiritual philosophy. In determining what style of yoga to recommend to an individual, consider a person's level of physical fitness and temperament. This program was developed using Kripalu yoga, which tends to be physically gentle and spiritually inclusive.

Research on the physiology of mind-body therapies is relatively young, and to date there are no clinical data which link yoga with successful weight management. The role of spirituality in health, however, has increasingly been recognized as having a positive physiological impact on some individuals. Evidence of meditation's impact on physiological markers of stress, and growing understanding of the role of stress in body weight gain do suggest a place for this practice as an adjunct to medical nutrition therapy for weight management.

Taking a yogic path toward healthy weight will not work for everyone. But for those interested in taking a holistic and spiritual approach to self-care, the path of awareness may provide a flexible framework for a happier, healthier life.

Annie Kay MS RD RYT is a writer and teacher of nutrition and yoga in private practice on Nantucket Island, MA. Contact Annie at annie@sagehealth.net

References
1. Edited compilation of client comments.
Accessed 9/25/02.
Adapted from and reprinted with permission from the Massachusetts Dietetic Association newsletter Today @ MDA, Winter 2002.
This reference is written in an easy to use format that is detailed enough for use as a professional reference, but informal enough for consumers interested in herbal medicine. It covers herbs and spices from alfalfa to nutmeg to wormwood, providing concise historical information as well as popular and practical uses. Related topics such as the culinary use and nutritional values of herbs and spices, herbs used in wedding celebrations, herbs and pets, and herbal soaps, set this book apart from other guides on the subject. Other sources of information including the American Botanical Council and the American Spice Trade Association are presented so that the reader may seek out additional details on their own. The introduction provides a timeline and discussion of herb and spice trends which help the reader understand, in a snapshot, the importance of botanicals throughout time.

Many botanicals are steeped in folklore and have become fads that have carried on for years, or have met their demise early on. The merits or myths of these fads and folklore are described without bias. Each botanical description also includes facts regarding use and safety. Bibliographies are offered for each topic along with additional information and contact information, where applicable.

A supplementary list of important botanicals is provided in the appendix of the book. This list, rather than additional entries, is provided understandably, because of space limitations. It provides a brief description of their applications, but does not address limitations or precautions. The omission of discussions about several of these botanicals appears to be the only drawback of the book since a number of those listed are commonly seen and used for a variety of conditions. An extensive recommended reading list provides the reader with sources of additional information relative to the history, folklore, and uses of botanicals.

For nutrition professionals who are looking for a reference that provides more than the medical applications of botanicals, this is it. The book appears to reach its goal to concisely integrate a variety of perspectives regarding botanicals—from agriculture to cosmetics to governmental regulation and clinical research. It would be an excellent supplement to any nutrition professional's botanical reference library.
Therapies: Gluten-Induced Infertility: An Underexplored Connection

retardation in the before group, when the women were still consuming gluten. A 2003 British study added to these findings with research showing that pregnant women with CD, who had poor dietary compliance, had low birth weight babies over five times more often than those whose diets were strictly gluten-free. However, a 2004 Italian study suggested that while there is an increased frequency of undiagnosed CD among pregnant women (>1%), the condition is not associated with unfavorable pregnancy outcomes.

The cause of reproductive changes in women with CD is not totally understood, though research suggests it results from a combination of nutrient deficiencies, changes in endocrine function and immune disturbances. For people with CD, consumption of gluten causes blunting of the villi and microvilli of the small intestine. This results in malabsorption and altered digestion of foodstuffs, which combined with poor diet in many patients (digestive distress causes them to limit food intake), often leads to nutritional deficiencies. Vitamins and minerals that are essential to overall health and prenatal development, such as calcium, magnesium, zinc, iron, folic acid, and vitamins D and K, are often found to be deficient in these patients, particularly for those who have gone undiagnosed and untreated for a prolonged period of time.

A Holistic Point-of-View

While the research on gluten intolerance and infertility is limited to populations affected by CD, many practitioners believe that a gluten-free diet can enhance fertility in other patient populations as well. Dr. Judy Fulop, (Naturopathic Doctor), of Northwestern Memorial’s Center for Integrated Medicine in Chicago, IL, recommends at least temporary gluten elimination to many of her patients who present with conception difficulty, even those who do not meet the criteria for CD. She believes that gluten intolerance/sensitivity, not otherwise classified as CD, is prevalent. For these patients, Fulop argues that consumption of wheat and other gluten-containing grains (rye, barley, and possibly oats) interferes with their capacity to absorb critical nutrients and digest larger food molecules. Not only does nutrient deprivation make pregnancy more difficult to achieve, but it can also compromise the long-term health of the offspring. Avoidance of the source of intolerance, says Fulop, “can assist the patient in optimizing her health as she tries to get pregnant, supporting all functions of the body—including the reproductive system.”

Fulop uses the gluten-free diet with discretion, as part of a rotation plan implemented with patients. Candidates for this diet are patients who present with infertility and other symptoms suggestive of gluten intolerance (i.e., fatigue, GI distress, mild depression). For those with hair loss, anemia, osteoporosis and other blatant signs of malabsorption, Fulop is in full communication with the patient's primary physician and refers them for CD testing. Referrals are done before a gluten-free diet is introduced, as gluten elimination may bias test results. As part of her consultation, Fulop also recommends gut permeability tests to monitor progress.

The protocol for non-celiac patients varies by individual but typically requires elimination of gluten from the diet for a period of four weeks. During this time other grains and carbohydrates with comparable nutritional value are substituted for gluten-containing foods. Next, gluten-containing foods are reincorporated into the diet one at a time and the patient is asked to observe her reaction. Depending on the patient’s presentation, dairy and soy are also commonly included as part of the rotation diet for infertile patients. If a patient reports a negative reaction, she will have them stay off gluten containing foods for at least 3-6 months and retest with the gut permeability test at that time. Though Fulop finds that patients can benefit from 90% compliance, she asks for and usually gets 100% from this group because “they are motivated to do everything they can to achieve a healthy pregnancy.”

Though Fulop is a proponent of homeopathy and herbal supplementation, she reserves such treatments only for patients who are not undergoing drug therapy to assist in their fertility, and whose primary care physicians, gynecologists, and reproductive endocrinologists are in alignment with this approach. All of her infertile patients, however, are encouraged to take a prenatal multivitamin as directed by their physician. She prefers capsules over tablets for better absorption, and cautions against supplements that contain gluten in the filler (i.e., wheat starch).
Men Also Affected

Fulop notes that the number of infertile men seeking her services has increased markedly in the past few years. She treats them similarly to their female counterparts with a strong focus on diet. The goal with this demographic group is to achieve optimal health, both generally, and of the sperm specifically.

Research confirms Fulop's experience, demonstrating that men with poorly controlled CD may present with fertility issues resulting from zinc deficiency due to malabsorption creating inferior sperm.  

Take Home Message

In the case of diagnosed CD, strict adherence to the gluten-free diet is necessary not only to achieve a healthy pregnancy, but also to offset increased risk of malnutrition, other autoimmune disorders, and even certain cancers. One study showed that celiac men and women adhering to a gluten-free diet were still at increased risk for low birth weight babies and shortened pregnancies. Much of the research done to date suggests that 6-12 months of strict adherence to the gluten-free diet can significantly improve fertility and pregnancy outcomes.

Women with a history of infertility, miscarriages, low birth weight babies, and unfavorable pregnancy outcomes should investigate the possibility of CD with their obstetricians, gynecologists, perinatologists, and reproductive endocrinologists. Unfortunately many of these physicians are not aware of the relationship between CD and fertility/pregnancy difficulties. Nutrition professionals who see these patients are highly advised to refer them to a gastroenterologist for testing to rule out CD before a gluten-free diet is introduced. Even for those patients who test negative, elimination of gluten is worth considering as part of a rotation diet. Patients should avoid gluten containing foods for four weeks then to ascertain whether they react to the foods they then add a food one at a time and notice whether there is a difference. If they do react to the food (and do not have celiac disease), avoiding gluten containing foods for at least three to six months and retesting with the gut permeability test at that time is recommended. This is particularly true for patients who present with other symptoms commonly associated with CD (Table 1). Pregnant and post-natal patients who complain of these symptoms should also be screened for CD, as pregnancy is thought to be a potential activator of the disease.

While the connection between gluten intolerance and fertility warrants further research and clarification, it is a relationship that is difficult to dismiss. Says Anna Velia Stazi, researcher in CD, "at present, like the other pathologies associated with CD, the possible prevention or treatment of reproductive effects can only be achieved through a life-long maintenance of a gluten-free diet."

Table 1: Common symptoms of celiac disease

<table>
<thead>
<tr>
<th>Gastrointestinal Symptoms</th>
<th>Non-GI Symptoms</th>
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</thead>
<tbody>
<tr>
<td>Diarrhea</td>
<td>Anemia</td>
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<tr>
<td>Constipation</td>
<td>Early bone disease</td>
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<tr>
<td>Gas</td>
<td>Neurological problems</td>
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<tr>
<td>Bloating</td>
<td>Vitamin and mineral deficiencies</td>
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<tr>
<td>Nausea</td>
<td>Migraines</td>
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<tr>
<td>Vomiting</td>
<td>Seizures</td>
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Free resources for nutrition professionals and gluten intolerant patients

"Quick Start Diet Guidelines" Free pamphlets available from the Gluten Intolerance Group or Celiac Disease Foundation (see below)

When I turned 28, my husband and I started planning for a baby-filled future. I went off the birth control pill following several years of use and waited for my period to come. Six months later, when I still had not menstruated, my OB/GYN prescribed medication to trigger ovulation. Nothing happened. When the amenorrhea persisted another six months, I was referred to a reproductive endocrinologist who told me I would likely never ovulate on my own and required fertility treatments for conception. Overwhelmed, I looked to my primary care physician for answers. After a plethora of tests, I learned I had elevated liver enzymes; this was puzzling since I did not take Tylenol, drink alcohol, or meet the criteria for liver disease. At the same time I took a position with Enjoy Life Foods, a food company making gluten- and allergen-free foods and learned for the first time about gluten intolerance. Despite my doctor’s hesitation, I was tested for and finally diagnosed with celiac disease. Suddenly my 20-year struggle with diarrhea and constipation (previously diagnosed as “IBS”), my chronic foggy-headedness, the abnormal liver tests, the disappearing period...now it all made sense. I most likely had lived with CD for years, but the birth control pill masked the problem by making it seem my body was cycling normally.

I immediately eliminated gluten from my diet and six months later re-commenced menses. Though my stomach improved dramatically and my liver enzymes normalized, my periods were irregular and I was unable to conceive over a year’s time. Infertility treatments and in vitro fertilization resulted in two pregnancies that ended in miscarriage.

Unfortunately, there is no research to demonstrate the fertility and miscarriage implications for celiac women who go untreated for a prolonged amount of time. All I know is that eliminating gluten from my diet literally gave me my life back. And even if it takes a little help, my chances of conceiving and sustaining new life is now greater than ever.

Cindy R. Kaplan, MS is Vice President of Enjoy Life Foods and is personally affected by both celiac disease and infertility. Contact Cindy at ckaplan@enjoylifefoods.com or 773-889-5070 x28.

Cynthia Kupper, RD, CD is the Executive director of the Gluten Intolerance Group and chairman of Dietitians in Gluten Intolerance Diseases DPG. Contact Cynthia at Cynthia@gluten.net or 206.246.6652.

References:
7. Greco L, Veneziano A, Di Donato L, et al. Undiagnosed coeliac disease does not appear to be associated with unfavourable outcome of pregnan-

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Folate is a generic term for a family of chemical forms of food compounds that have the biologic activity of folic acid. The common molecular structure of the family is pterolymonoglutamic acid and is the form commonly used in food fortification and vitamin supplements. It is also referred to as folic acid or folacin.

Folate is the naturally occurring form found in foods such as green leafy vegetables, brewer's yeast and rice germ, to name a few. Food folate is much less bioavailable than synthetic folic acid with only about 40 percent of the food source absorbed versus almost 100% of the synthetic form. Folate from food must be converted by enzymes in the body to a more absorbable form before it can be absorbed.

Folic acid is central to the process of rapid cell division, including red and white blood cells, gastrointestinal tract cells, and germinal cells. It is involved in the synthesis of DNA and RNA and is needed for replication and repair of DNA and maintenance of the genome and regulation of gene expression. In recent years the importance of folic acid's role in prevention of neural tube defects (NTDs) and heart disease has been widely researched and reported on. More recently, folate and folic acid deficiency have been implicated in the development of some cancers and Alzheimer's disease. As a result, since January 1998, the Food and Drug Administration (FDA) has required that all cereal grain products, including flour, be fortified with 140 mcg of folic acid per 100 g of product.

Reproduction and Folic Acid

Folic acid supplementation has shown to provide protection against early and spontaneous termination of pregnancy and to prevent neural tube defects including spina bifida and anencephaly. Twenty percent of pregnant women are believed to be folate deficient because of a 5-fold higher than normal daily requirement for folate during gestation. Low folate levels have been associated with recurrent spontaneous abortion. Compared with women with plasma folate levels between 2.20 and 3.95 ng/mL, women with low folate levels of 2.19 ng/mL or less were at nearly a 50 percent increased risk of having a spontaneous abortion. Women whose folate levels were greater than 3.96 ng/mL up to 6.17 ng/mL showed no risk of spontaneous abortion. The normal range for serum folate is 2-10 ng/mL.

Neural tube defects are serious birth defects of the brain and spinal cord, were found to affect approximately 4,000 pregnancies each year in the United States during the years 1985 through 1994. In 1992 the Centers for Disease Control (CDC) recommended that all women of childbearing age in the United States who are capable of becoming pregnant should consume 0.4 mg (400 mcg) of folic acid per day for the purpose of reducing their risk of having a pregnancy affected with spina bifida or other NTDs. Women at increased risk for NTDs should take 4.0 mg (4000 mcg) of folic acid by prescription for one to three months before becoming pregnant.

Before fortification of grain products, only an estimated 29% of US reproductive-aged women were taking a supplement containing 0.4 mg (400 mcg) of folic acid daily. A 19% reduction in NTD birth prevalence occurred following folic acid fortification of the US food supply. This decrease may be due in part to other factors including the recommendation for vitamin supplementation.

Cardiovascular Disease

Folic acid is involved in the demethylation of the amino acid methionine. It is also an intermediate in the synthesis of the amino acid L-cysteine from L-methionine. When serum folate levels are low these reactions slow, plasma homocysteine accumulates, and the risk for coronary, cerebral and peripheral atherosclerosis, and other cardiovascular diseases increases. Elevated plasma homocysteine can increase the risk of cerebrovascular disease by 50 percent, and the risk of coronary heart disease in women by 80 percent. Hyperhomocysteinemia is considered to be an established risk factor for cardiovascular disease. A dosage of folic acid of 0.8 mg/d appears necessary to achieve the maximum reduction in serum homocysteine level across the range of homocysteine levels in the population.

Cancer

Spring 2004 Volume 6, Issue 4
Cancer

Colon Cancer In 2000 in the United States there were 63,907 cases of colon and rectum cancer diagnosed among women. The majority, 55,272, were in White women, 6309 were Black women, and the remainder in Asian/Pacific Island women. Folic acid supplementation has been thought to have a protective effect against the growth of neoplasms associated with ulcerative colitis and colon cancer. The excess risk of colon cancer associated with a family history of the disease appears to be significantly reduced by folic acid supplementation.

Breast Cancer The National Cancer Institute reports that an estimated 1 in 8 women in the United States (approximately 13.3 percent) will develop breast cancer during her lifetime. In 2000 alone, 164,895 women were diagnosed with breast cancer of those 145,090 were White, 14,057 were Black, and 3,705 were Asian/Pacific Islanders. Evidence continues to accumulate regarding the association between low folate levels and breast cancer, especially among women who consume alcohol. Several epidemiological studies, including the Nurse's Health Study, have shown that supplementation with folate reduces the risk of breast cancer incidence in women who consume moderate amounts of alcohol (approximately one alcoholic drink per day).

Ovarian Cancer As with other types of cancers common to women, ovarian cancer affected 20,188 American women during 2000; 17,989 White women, 1352 Black women, and 493 Asian/Pacific Islander women. The association between the intake of folate from food and the incidence of ovarian cancer was studied in the Swedish Mammography Cohort, a population-based prospective cohort of 61084 Swedish women ages 38-76 years. Although the intake of dietary folate was weakly inversely associated with total ovarian cancer risk, there was a strong inverse association between dietary folate intake and ovarian cancer risk in women who consumed moderate amounts of alcohol (approximately one alcoholic drink per day).

It appears from the studies above that the protective level of folic acid supplementation is 0.4 mg (400 mcg) per day. Higher levels of supplementation may be necessary for individuals who are at familial risk for hyperhomocysteinemia or who consume more than two alcoholic drinks per day. Adequate intake may be obtained through a daily multivitamin and supplemented with fortified foods such as breads, cereals, dark green leafy vegetables, brewer's yeast, orange juice, beets, dates, and avocados.

Alzheimer's disease An estimate 4.5 million persons have Alzheimer's disease (AD). The prevalence of AD among those over 60 years is about 5% for men and 6% for women. Sex difference does not seem to play a role in incidence, but more women are diagnosed with Alzheimer's disease because of greater female longevity. Alzheimer's Disease often co-occurs with stroke, of which hyperhomocysteinemia is an independent risk factor for. The relationship could be due to the stroke or to the changes in the vascular structure resulting in disease. In some 111 of 1092 Framingham Heart Study participants who developed dementia over an eight year period, 83 were diagnosed with AD. As plasma homocysteine levels increased, the risk of AD rose as well. The study concluded that an increased plasma homocysteine level is a strong, independent risk factor for the development of dementia and Alzheimer's disease.

Toxicity and Drug-Nutrient Interactions Folic acid is a water soluble vitamin, making toxicity less likely, but still possible. Adverse effects are unlikely in doses up to 10 mg (1000 mcg) per day. Amounts exceeding this may mask symptoms of vitamin B12 deficiency or cause or mask neuropathy in those who are deficient. Amounts from 5 mg (5000 mcg) can result in abdominal cramping, insomnia, diarrhea, rash and numerous other reactions.

Folic acid is known to interact with numerous drugs, either positively or negatively. Certain drugs including some anticonvulsants, long term antibiotic use, oral contraceptive use, some antidepressants, folate antagonists (anticancer and anti-arthritis agents), aspirin, blood sugar lowering agents can all lead to low serum folate concentrations for numerous reasons. Since folic acid requires stomach acid for optimal absorption, H2 blockers and antacids may decrease absorption of folic acid and folate from food.

Take Home Message With its relationship to so many important
metabolic processes in the body as well as the potential for reducing the risk of certain diseases the interest in folic acid has skyrocketed. Although introduced for cereal and grain fortification, with the knowledge we have today about its protective abilities, folic acid may, if it has not already, become the next functional food ingredient.

With the increased popularity of the low carbohydrate diets, this risk for deficiency among women, particularly those of child-bearing age who are following these eating patterns is likely to rise. Avoiding fortified grain products, vegetables, orange juice, and other foods that provide protective nutrients can only lead one to think that we will see a rise in deficiencies and associates risks over time. As nutrition professionals, it is prudent to advise our patients to include a good multivitamin with at least 0.40 mg (400 mcg) of folic acid daily and choose foods that are good sources of folate whenever possible. For some individuals, such as those with a history of hyperhomocysteinemia, NTD, familial colon cancer, and those who consume at least two alcoholic drinks per week, the prudent recommendation may be 0.80 mg (800 mcg) or more per day. For older individuals on multiple medications or who suspected low stomach pH is a concern, additional folic acid may be warranted. As with any supplementation recommendation, each patient should be evaluated individually for potential risk of deficiency and for the potential for nutrient drug interactions.

References
Public Forum Policy

- Reauthorize and Fully Fund the Child Nutrition Act
- Increase Human Nutrition Research
- Pass and Fund the Improved Nutrition and Physical Activity Act (IMPACT) and other health promoting initiatives.

This is only a brief recount of this dynamic process. I highly recommend that anyone who is able attend PPW next year from March 1 to 3, 2005.

“If dietetics is your profession, politics is your business.”

Rita Batheja, MS RD CDN is a registered dietitian and certified nutritionist in private practice in Long Island, NY. She is the Reimbursement / Membership Chair of NCCDPG. Contact Rita at krbat1@iuno.com or 516-868-0605.

Correction to Winter 2004 Issue:

Apologies to the author of the Supplement Article: Dietary Supplement Regulation in the United States. The author’s name is: Marie Whyback, not Marie Whybark.

Congratulations! to the 2004-2005 NCC Executive Committee

Nominating Chair Elect: Susan Allen
Treasurer: Gretchen Forsell
Nominating Committee Elect: Natalie Legomarcino-Ledesma
Nominating Committee Member: Carmen Nochera
External Fundraising Chair: Mary Beth McCue

Congratulations to the following NCC members who were elected to ADA Offices for 2003-2004:

President Elect: Rebecca S. Reeves, DrPH, RD, FADA
BOD Director-At-Large: Cecilia P. Fileti, MS, RD, FADA
HOD Director: Connie Diekman, MEd, RD, LD, FADA
HOD, Professional Issues Delegate (for “Education”): Patricia Giblin Wolman, EdD, RD

NOTE:
The CPE article “Omega-3: Fatty Acids” has been approved for 2 continuing education hours.