Melissa Groves, RDN, LD, is the owner of Avocado Grove Nutrition & Wellness in Portsmouth, NH, where she specializes in women’s health and hormones, with a focus on PCOS and fertility. She is also a contributing author for Healthline and other publications. She is the current DIFM Social Media Chair and is also on her state Academy board as Professional Development Co-Chair. She received her BA in English and Dance from Hofstra University and worked in NYC as an advertising copywriter for 15 years before going back to school to become a dietitian. Melissa can be reached at contact@avocadogrovenutrition.com.

Polycystic Ovary Syndrome (PCOS) is a complex hormonal metabolic syndrome that affects the ovaries, pituitary gland, hypothalamus, and adrenal glands.¹ This condition puts women at increased risk for infertility, diabetes, heart disease, obesity, eating disorders, and certain gynecological cancers.²,³ Depending on the diagnostic criteria used, it is estimated that 5% to 15% of reproductive-aged women have PCOS.⁴

There are several sets of diagnostic criteria for PCOS, however the 2018 International Evidence-based Guideline published by Monash University endorses the Rotterdam Criteria.⁵ According to the Rotterdam Criteria, to be diagnosed with PCOS, a woman must present with two of the following three signs and symptoms: (1) irregular or no ovulation, (2) hyperandrogenism as determined by lab testing or symptoms, or (3) polycystic ovaries as seen on transvaginal ultrasound (as defined by ≥12 follicles in each ovary).⁶

Conventional medical treatment focuses on pharmacologic relief of symptoms with the oral contraceptive pill and anti-androgen therapies, anti-diabetic agents such as metformin, and fertility medications when indicated.⁵ Lifestyle and diet recommendations focus on achieving a 5% to 10% reduction in weight by calorie restriction and state, “In women with PCOS, there is no or limited evidence that any specific energy equivalent diet type is better than another, or that there is any differential response to weight management intervention, compared to women without PCOS.”⁵

From a functional and integrative medicine perspective, treating PCOS means addressing its root causes, which may include any combination of insulin resistance, inflammation, adrenal dysregulation, excess androgens and other sex hormone imbalances, and digestive and/or gut microbiome disturbances. Different women with PCOS may have entirely different presentations, and there may be several phenotypes of the condition.⁷

A functional and integrative dietitian can play an integral role in the healthcare team of a woman diagnosed with PCOS. PCOS requires a personalized, multipronged approach incorporating diet and lifestyle changes as well as targeted supplementation.

Continued on pg. 4
Welcome to the Fall edition! If you’ve attended FNCE® then I expect this will be arriving in your literal mailbox soon after. It takes time to adjust to change; please know that this is the only issue of our four yearly newsletters that we now print. Winter, Spring, and Summer are entirely digital and Fall is print and digital. Just wanted to remind everyone again, as our member survey indicated that many of you are unaware of this 2018 change. Be sure to check your email and follow us on social media to stay more in touch. Our staff and authors strive to work hard and offer fresh content four times per year and we want you to benefit!

Dietitians in Integrative and Functional Medicine is unlike any other DPG. In a sense, it is like a mini-Academy. We do not solely focus on the important categories of cardiovascular health, diabetes, vegetarianism or the environment, but use all patterns of eating and work with the entire span of human health and disease. Our specialty in its essence is really an expansion and deepening of traditional dietetics, or simply, advanced nutrition. At its core and most stripped down, integrative and functional nutrition just throws a wider umbrella over the entire human experience and goes deeper into biochemistry. Thus, when we focus on issues of women’s health, as is done in this issue, we discuss all factors that are at play, and those are many. Understand that research into issues of nutrition and women’s health is in its infancy. It was only in 1990 that the NIH established the Office of Research on Women’s Health and then only in 2001 did the Institute of Medicine issue a report: “Exploring the biological contributions to women’s health: does sex matter?” Only then did they examine female biology at the cellular, organismal, and behavioral levels and recognize that differences do occur and can have important consequences. Amen.

Thank you to our authors who have shared their expertise and touch on some of the most important reproductive health issues facing women today: polycystic ovarian syndrome (cpe article), fertility, and the transition to menopause. A huge thank you to the Women’s Health DPG for allowing us to share their profiles of women in diversity. Instead of toiling in isolation, a few editors and I are hoping to share some of our valuable content, when relevant, across DPG lines.

If you’ve gotten this far, thank you for taking the time to read. Please stay in touch and let us know what topics you’d like to know more about, what you like, don’t like and everything in between. Email me at jenas_mailbox@yahoo.com or find me on Instagram @jenagrd.
Ahh...my favorite season is finally upon us. While I’m excited for the proverbial sweater weather and can do without the obligatory pumpkin spice references, autumn often represents a time for change, a time for celebration of the harvest, and a perfect opportunity to observe and reflect upon nature’s beauty in transition. Nature gives us a roadmap to guide us through the cycle of life. Two of my favorite quotes that inspire me at this time of year are as follows:

“Notice that autumn is more the season of the soul than of nature.” Friedrich Nietzsche

“Autumn is the season to find contentment at home by paying attention to what we already have.” Unknown

What is your favorite season? Does the transition into the autumnal season inspire or energize you?

October has always been my favorite month, especially these past few years, because I love the time and opportunity to gather with the DIFM team at FNCE®. This year, FNCE® was extra special not only because it’s my Chair year, but it also happened to be in my backyard (well, sort of—Lancaster isn’t too far from Philly). And true to DIFM’s style, this year’s activities did not disappoint. Our FNCE® Planning Chair, Sarah Laidlaw, spent months working on the DIFM Member Reception. Sarah and Professional Advancement Chair, Therese Berry, had been hard at work putting together DIFM’s Saturday Symposium “Hot Topics in Integrative and Functional Nutrition.” We were fortunate to have another slate of talented experts: David Wiss, MS, RDN, Sebastion Brandhorst, PhD, Anthony Thomas, PhD, and Amy Howell, PhD. Both programs were a great success—it truly takes a village to pull off these events.

We have numerous exciting projects in the works. DIFM has a new network partnership with the Academy of Integrative Health and Medicine (AIHM) and, thanks to Mary Purdy, we will be having a DIFM booth at AIHM’s annual conference this year. The Diversity Co-Chairs, Fatima Bahary and Michelle Loy, are currently in production of a DIFM-based diversity podcast series—so stay on the lookout for more information. We also are excited about the number of applicants we received for the DIFM Diversity Stipends. Our Marketing Chair, Christa Biegler, is working on a DIFM Speaker’s Bureau and Oliva Neely, Mentoring and Coaching Chair, along with her associate, Kayleigh Gilbert, have been diligently working on updating the DIFM toolkit as well as creating a mentorship database.

Our newsletter team continues to shine under the brilliant direction of Jena Savadsky Griffith; and in this issue, you’ll be treated to informative, stimulating, and useful content on women’s health topics.

The DIFM leadership team works hard to ensure that we empower, enlighten, and energize our members. Please let us know how we are doing. Your feedback is crucial to our programming and planning of events. We want to put your membership dues to good work for you. Don’t forget to take advantage of the resources that are part of your membership.

Lastly, I hope this season finds you inspired too. Please feel free to reach out to me anytime and share your examples of how you are empowered, enlightened, and energized.

In health & wellness,

Dana Elia, DCN-c, MS, RDN, LDN, FAND
PCOS and Insulin Resistance

Insulin resistance (IR) is common in women with PCOS, occurring in 75% of lean women and 95% of overweight women with the condition. IR leads to higher circulating insulin, which stimulates ovarian production of testosterone and inhibits production of hepatic sex hormone binding globulin (SHBG), leading to increased circulating testosterone levels. It is hypothesized that in women with PCOS, the theca cells and the ovaries are particularly sensitive to insulin and overproduce testosterone in response. Elevated androgen levels can result in many of the symptoms commonly associated with PCOS, such as acne, hirsutism, and male pattern hair loss.

IR poses a significant risk to women with PCOS, as they may go on to develop impaired glucose tolerance or type 2 diabetes. IR is also linked to development of non-alcoholic fatty liver disease (NAFLD). Furthermore, elevated insulin levels have been linked to increased body fat and weight gain.

It is generally recommended that IR be evaluated in women with PCOS who have a BMI ≥25. However, other studies have shown that even normal-weight women with PCOS demonstrate IR. The degree of IR may be assessed using an oral glucose tolerance test (OGTT) or fasting glucose and insulin tests using the homeostasis model of insulin resistance (HOMAIR).

PCOS and Inflammation

Inflammation plays a key role in PCOS. Data suggest multiple signaling pathway abnormalities in PCOS, leading to oxidative stress and inflammatory responses. Additionally, adipose tissue releases pro-inflammatory cytokines, contributing to the inflammatory state of PCOS in overweight women with the condition. In women with PCOS, fat tissue acts metabolically different from that of women without the condition and appears to be hyperresponsive to ingestion of glucose and saturated fats.

The link between obesity and inflammation is well established, and it is known that adipose tissue releases inflammatory adipokines including leptin, interleukin (IL-6), tumor necrosis factor-α (TNF-α), and more. Inflammatory markers such as IL-6 and high sensitivity C-reactive protein (hs-CRP) may help shed light on the degree of inflammation present.

While women with PCOS who have higher BMIs have been shown to have higher levels of hs-CRP compared to women with lower BMIs, inflammation may be present in lean women with PCOS as well. In one study, 16 women with PCOS (8 lean, 8 obese) had higher activator protein-1 activation and matrix metalloproteinase-2 (MMP-2)—blood markers for inflammation—compared to women without this condition, after being administered a 75-mg oral dose of glucose.

One strategy to reduce inflammation in women with PCOS is to encourage habits that may result in modest weight loss. In studies in women with PCOS, lifestyle interventions that reduced weight by as little as 5% of total body weight were shown to improve cardiometabolic parameters and have reproductive benefits.

PCOS and Hormone Imbalances

While excess testosterone is the hormone imbalance most commonly associated with PCOS, the condition results in an imbalance in many of the hormones produced in the pituitary gland, ovaries, and adrenal glands. Gonadotrophin-releasing hormone (GnRH), luteinizing hormone (LH), follicle stimulating hormone (FSH), anti-Müllerian hormone (AMH), androgens (testosterone, DHEA, DHT), estrogens, and growth hormones are also disturbed in women with PCOS. Anovulation is common among women with PCOS, with up to 95% experiencing some type of anovulation. This can include oligomenorrhea (less than eight periods per year) or amenorrhea (no period for more than three months). Women with PCOS can and do ovulate spontaneously, but irregularly, making it difficult for those trying to conceive to identify their fertile window.

In a normal menstrual cycle, FSH stimulates follicles within the ovary to grow. LH then surges, causing a mature follicle (oocyte) to be released during ovulation. Estrogen is the dominant hormone during the follicular (pre-ovulation) phase, and progesterone is the dominant hormone during the luteal phase (the time from ovulation until the start of the period), which begins the next cycle. Elevated testosterone levels interfere with normal ovulation. As a result, LH tends to be high, while the body continually tries to ovulate, and AMH is high due to the buildup of immature follicles in the ovary, creating the hallmark “string of pearls” appearance seen on transvaginal ultrasound. Additionally, since there is no ovulation, no progesterone is produced, putting women with anovulation at higher risks from unopposed estrogen, including a four times higher risk for endometrial cancer.

Adrenal androgens are also increased in PCOS. It is estimated that 40% to 60% of women with PCOS have increased levels of DHEA. DHEA is a precursor hormone that can be converted to testosterone and estrogen. In women with PCOS, more than 95% of DHEA is secreted by the adrenal glands, with the remaining 5% being produced by the ovaries. Additionally, women with PCOS may have HPA-axis hyperactivity compared with normal controls, as shown by increased levels of salivary cortisol and cortisone.

PCOS and Gut Issues

Emerging research has suggested a connection between PCOS and digestive issues and gut microbiome disturbances. In one study, women with PCOS were found to be more than four times more likely to have irritable bowel syndrome (IBS) compared with controls (42% vs 10%; p<0.01). In another study, the stool microbiome of women with PCOS was found to show a lower diversity and an altered composition compared to women without PCOS. Additionally women with PCOS showed alterations in some markers of gut barrier function and endotoxemia. The changes in Bacteroidetes and Firmicutes species, in particular, has been linked to metabolic dysregulation.
Additionally, these changes in diversity in the gut microbiome have been negatively correlated with hyperandrogenism, total testosterone, and hirsutism in women with PCOS.²⁹

**Dietary Recommendations for PCOS**

An eating pattern that targets the underlying root causes of PCOS should be implemented. Anti-inflammatory diets such as the Mediterranean diet have been shown to decrease inflammation.³⁰ Furthermore, a diet that is moderate in carbohydrates (approximately 40% of calories from carbohydrates) and low-glycemic may help improve insulin sensitivity in PCOS.³¹,³²

While there is no consensus on the optimal diet for PCOS, the following may support health outcomes in women with PCOS:

- Moderate carbohydrates (approximately 40% of calories or less)³³
- High fiber³³,³⁴
- Ample protein at every meal and snack³⁵
- Moderate fat (approximately 30-40% of calories)³⁶
- Varied antioxidants from fruits, vegetables, and herbs and spices³⁷
- Fish several times a week³⁸
- Legumes, including whole soy³⁹
- Ground flaxseed⁴⁰
- Fermented foods and prebiotic-containing vegetables to support gut health⁴¹
- Green tea and spearmint tea⁴²,⁴³

**Supplements for PCOS**

There are several supplements that may be useful in the treatment of PCOS by improving insulin sensitivity, reducing inflammation, and balancing hormone levels.

**Inositol:** Inositol has been researched in hundreds of studies in PCOS and has been shown in head-to-head studies to be as effective as metformin at improving insulin sensitivity and inducing ovulation.⁴⁴,⁴⁵ Myo-inositol in doses of 2 to 4 grams per day has been shown to improve LH, LG/FSH ratio, free testosterone, and HOMA-IR in women with PCOS.⁴⁶,⁴⁷

**Vitamin D:** Vitamin D deficiency is common in women with PCOS.⁴⁸ Low vitamin D levels have been associated with increased insulin resistance. In one study, 4000 IU of vitamin D significantly decreased total testosterone, free androgen index, hirsutism, and hs-CRP compared to 1000 IU of vitamin D or placebo. In addition, the high-dose vitamin D significantly increased SHBG and total antioxidant capacity.

**Berberine:** Berberine is a plant alkaloid that may help increase glucose uptake into cells. In one study, berberine 400 mg tid for 4 months was found to improve menstrual patterns and ovulation rate in women with PCOS, with higher ovulation rates in the overweight group compared with the normal-weight group (31% vs 22.5%).⁴⁹

**N-acetyl cysteine (NAC):** N-acetyl cysteine (600 mg tid) for 24 weeks improved fasting insulin and testosterone levels in women with PCOS compared to 1500 mg/day of metformin.⁵⁰ NAC may also lower fasting glucose, insulin, and HOMA-IR and result in weight loss.⁵¹

**Other supplements:** Other supplements that may be of use in the treatment of PCOS include blood sugar and insulin-regulating substances such as chromium, cinnamon, and alpha lipoic acid.⁵²-⁵⁴ Herbal supplements with preliminary research in PCOS include Vitex agnus-castus (chaste tree berry), glycyrrhiza spp. (licorice), Paeonia lactiflora (peony), and Cinnamomum cassia (cinnamon); however, more studies are needed.⁵⁵

**Lifestyle Recommendations for PCOS**

Functional medicine practitioners take a holistic approach to wellness and often counsel patients on the importance of lifestyle changes for a whole-body approach to health. In the case of PCOS, sleep, exercise, and stress management are key.

**Sleep:** Women with PCOS are at an increased risk for insomnia, daytime sleepiness, and obstructive sleep apnea, regardless of weight.⁵⁶ Women with PCOS who slept less than 6 hours a night had higher fasting insulin levels and were at increased risk for insulin resistance.⁵⁷ Encouraging proper sleep hygiene such as avoiding electronics or stimulation before bed, sleeping in a cool, dark room, and utilizing sleep-promoting strategies such as chamomile tea or melatonin may help women with PCOS get better quality sleep.

**Exercise:** The effects of exercise on insulin sensitivity have been well studied. For women with PCOS, regular exercise may help improve insulin resistance and fertility parameters, boost mood, and improve weight. In one study, women with PCOS who performed 45 to 60 minutes of cardio 3 times per week lost 2.3% body fat over 12 weeks.⁵⁸ In another study, resistance training 3 times a week for 4 months was linked to improvements in testosterone and fasting glucose.⁵⁹ Additionally, exercise may improve ovulation rates, menstrual regularity, and pregnancy in women with PCOS.⁶⁰

**Stress management:** Since adrenal hormones can play a major role in the symptoms of PCOS, efforts should be taken to reduce stress. While studies in PCOS are limited, encouraging stress management techniques that have been studied in other chronic conditions such as type 2 diabetes, such as meditation, deep breathing, yoga, time in nature, and behavioral therapy may be effective.

**Conclusion**

PCOS is a complex hormonal metabolic syndrome affecting 5% to 15% of women. Conventional medical therapy focuses on weight loss and symptom management through the use of pharmaceutical drugs. Women with the condition are at an increased risk for several serious sequelae, including infertility, diabetes, heart disease, obesity, eating disorders, and certain gynecological cancers. A functional medicine dietitian can play an integral role in the treatment team of a women with PCOS by addressing its root causes: insulin resistance, inflammation, adrenal dysregulation, excess androgens and other sex hormone imbalances, and digestive and/or gut microbiome disturbances. Since no two cases of PCOS are alike, treatment requires a personalized, multipronged approach incorporating diet and lifestyle changes as well as targeted supplementation.
syndrome have intrinsic insulin resistance
Hum Reprod
doi:10.1093/humrep/dex294
30. Kazemi M, Mcbrearty LE, Chizen DR, Pierson RA, Chillibeck PD, Zello GA. Nutrients. A comparison of a pulse-based diet and...
the therapeutic lifestyle changes diet in combination with exercise and health counselling on the cardio-metabolic risk profile in women with polycystic ovary syndrome: A randomized controlled trial. 2018;10(10):1387. doi:10.3390/nut10101387


43. Grant P. Phytother Res. Spearmint herbal tea has significant anti-androgen effects in polycystic ovarian syndrome. A randomized controlled trial. 2010;24(2):186-188. doi:10.1002/tr.2900


47. Genazzani AD, Lanconi C, Ricchieri F, Jannson VM. J Clin Endocrinol Metab. Myo-inositol administration positively affects hyperinsulinemia and hormonal parameters in overweight patients with polycystic ovary syndrome. 2008;24(3):139-144. doi:10.1080/09513590801893232


CPE Reporting Form

Expiration Date: October 9, 2022
Please print or type
Name: __________________________________________________________________________________
Address: __________________________________________________________________________________
Academy Membership #: __________________________________ Phone: _____________________________
Email Address: _____________________________________________________________________________
DIFM Member:  ☐ Yes  ☐ No  Date Test Completed: ____/____/____

Instructions for Completing the CPE Activity for Credit

1) Read the Continuing Professional Education article and answer the associated quiz questions. For each question, select the one best response. Compare your answers to the answer key on this page.
2) Send your completed quiz and application for CPE credit by email or mail to:

Staci Belcher, MS, RDN
stacibelcher5@gmail.com

This activity has been approved for 1.0 hours of CPE credit. You will be notified if hours are not approved.
Suggested Learning Needs Codes: 9020, 5000, 4180, and 3000.
Suggested Performance Indicators: 8.1.5, 6.3.11, and 8.3.1

Questions:

1. The root causes of PCOS may include which of the following?
   A. Hyperandrogenism and anovulation
   B. Inflammation and insulin resistance
   C. Obesity and amenorrhea
   D. Vitamin D and chromium deficiencies

2. In women with PCOS, insulin resistance can result in which of the following?
   A. High circulating testosterone levels
   B. Increase production of hepatic sex hormone binding globulin
   C. Release of pro-inflammatory cytokines
   D. Decreased levels of DHEA

3. In the absence of ovulation, which of the following hormones does not get produced?
   A. Estrogen
   B. Luteinizing hormone
   C. Progesterone
   D. Follicle stimulating hormone

4. Which of the following dietary supplements has been shown to be as effective as metformin at improving insulin sensitivity and inducing ovulation?
   A. Berberine
   B. Vitamin D
   C. Inositol
   D. N-acetyl cysteine

5. Which of the following dietary patterns would be most appropriate for addressing the root causes of PCOS?
   A. Low fat
   B. Vegan
   C. Paleo
   D. Mediterranean

Answer Key: 1. b; 2. a; 3. c; 4. c; 5. d
A Functional Medicine Approach to Polycystic Ovarian Syndrome

Activity Number: 151623 (Expires 10/09/2022)
Date Completed: ___________ Number of CPEUs Awarded: ___________

*Suggested Learning Need Code(s): ________________________________
*Suggested Performance Indicator(s): ________________________________

Provider Signature

*Refer to your Professional Development Portfolio Guide For LNCs or Pls
A woman’s reproductive phase of life begins with menarche at onset of menstruation and ends with loss of ovarian follicular activity. Menopause, the cessation of menstruation, is considered permanent after 12 consecutive months of amenorrhea. Both menarche and menopause are surrounded by transitional years characterized by hormonal shifts that lead to these culminating events. The series of physical, emotional, and social changes—as well known as puberty in adolescence—becomes clouded with ovarian activity decline as this period lacks single globally accepted terminology.¹

The complete menopausal transitional period encompasses three distinct phases: perimenopause, menopause, and post-menopause. This natural process is not itself a health problem but is often accompanied by uncomfortable menopausal symptoms, cognitive changes, and increased risk of osteoporosis and/or coronary artery disease.²

The hormonal shifts may trigger physiological changes and can be a difficult adjustment. Symptoms can be categorized as vasomotor including excessive sweating, hot flashes, and heart palpitations; emotional including fatigue, anxiety, depression, insomnia, and decreased libido; and urogenital including vaginal dryness, incontinence, and increased cystitis. Hot flashes, the most common symptom, may occur in 75% of women.³ Vasomotor symptoms associated with estrogen decline, such as hot flashes, are not completely understood and are unique to each woman. Hot flashes may range from periodic and unpredictable to occurring like clockwork and may last for a second or several minutes. Vasodilation is controlled by the thermoregulator nucleus of the hypothalamus, and women may become sensitive to even the smallest changes in core temperature which triggers sweating as a cooling mechanism. Hot flashes are another way to disperse heat in body. Decline in estrogen alters the feedback loop to the brain to increase norepinephrine and serotonin release that causes thermoregulatory change to increase peripheral circulation. Nervines can help to balance norepinephrine and serotonin levels.⁴

The unique expression of specific symptomatic problems lends itself to the tonic support that a botanical formula can offer for the reproductive system, as well as the endocrine, nervous, uterine, cardiovascular, and musculoskeletal systems. Choosing a specific remedy from the vast range of possible botanicals to match individual concerns need not be daunting. However, decisions do not parallel western medicine’s diagnosis-based “this for that” selection approach. Effective herbal practice matches a particular herb to each individual person considering the specific symptoms they are having. In this way, herbalism more closely parallels the tenets of personalized nutrition practices and individual diet suggestions.

Instead of labeling a botanical as a “menopause herb,” herbal selection is best tailored to the individual expression of menopausal symptoms unique to each woman. After complete clinical assessment, herbs can be individually chosen based on their action, chemical constituents, organ affinity, and specific indications. Choose herbs based on symptom patterns, energetic presentation, and holistic or functional approach rather than based on a particular diagnosis, condition, or disease. Chosen botanicals can then be combined in a formula to address multiple concerns. The term “specific indication” details exacting symptoms for which individual herbs are best used. Artful combinations of herbs can blend into a formula that address multiple symptoms or menopausal discomforts. For example, a woman may be experiencing night sweating that interferes with sleep and leads to mood swings.
### Table. Botanicals to Support Menopausal Transition³,⁶

<table>
<thead>
<tr>
<th>Plant</th>
<th>Botanical Name</th>
<th>Part Used</th>
<th>Major Constituents</th>
<th>Specific Indications</th>
<th>Mechanism of Action</th>
<th>Preparation &amp; Dosage</th>
<th>Safety (see notes below)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Black Cohosh</td>
<td>Actaea racemosa</td>
<td>Root, rhizome</td>
<td>Cimigoside, cimifugine, cimicifugic acid racemoside, actein, salicylic acid</td>
<td>Hormonal anxiety, insomnia &amp; depression, hot flashes</td>
<td>Serotonergic &amp; dopaminergic activity, antispasmodic, sedative, analgesic, antidepressant</td>
<td>Tea: 4oz 2 times/day Tincture: 0.5-1ml 3 times/day Tablet: 20mg 2 times/day*</td>
<td>Class 2b, 2c A</td>
</tr>
<tr>
<td>Chaste Tree Berry</td>
<td>Vitex agnus-castus</td>
<td>Fruit</td>
<td>Agnuside, aucubin, vitexalactone, vitextrifolin, vitexin, apigenin</td>
<td>Hot flashes, night sweating, anxiety, agitation, vaginal dryness</td>
<td>Prolactin inhibitor, dopaminergic, antioxidant</td>
<td>Tea: 1-2c/day Tincture: 3-4ml 1-2 times/day Capsule: 175mg/day**</td>
<td>Class 2b  A</td>
</tr>
<tr>
<td>Motherwort</td>
<td>Leonurus cardiaca</td>
<td>Leaf</td>
<td>Apigenin, hyperoside, leonturine, ursolic acid, quercetin</td>
<td>Anxiety (hormonally induced), heart palpitations</td>
<td>Anxiolytic, antispasmodic, nervous, sedative, hypotensive</td>
<td>Tea: 4oz 2-4 times/day (bitter) Tincture: 2.5-4ml 3-4 times/day Capsule: (00) 2 times/day</td>
<td>Class 2b  A</td>
</tr>
<tr>
<td>Red Clover</td>
<td>Trifolium pretense</td>
<td>Flower</td>
<td>Isoflavones: bichanin a, formononetin, trifolin, pectlinarin, coumestrol</td>
<td>Hot flashes, night sweating, vaginal dryness</td>
<td>Phytoestrogen nutritive, cooling, demulcent</td>
<td>Tea: 2-4c/day Tincture: 3-5ml 4 times/day</td>
<td>Class 1  A</td>
</tr>
<tr>
<td>Sage</td>
<td>Salvia officinalis</td>
<td>Leaf</td>
<td>Salviatannin, camosol, thujone, rosmanol, cineole</td>
<td>Excessive sweating, hot flashes</td>
<td>Astringent, cooling, drying, antioxidant</td>
<td>Tea: 2-3c/day Tincture: 1-2ml 3-4 times/day</td>
<td>Class 2b, 2d***  A</td>
</tr>
</tbody>
</table>

*Black Cohosh tablet – standardized to actein  
**Chaste Tree Berry capsule – standardized to 0.6 agnuside  
***Sage 2d specific use restriction: do not exceed recommended dose

What makes herbalism a wonderful partner to nutrition is that plants offer a contrast to pharmaceuticals standardized to a single active compound. Plants are comprised of vitamins, minerals, enzymes, and phytonutrients which allow them to nourish and protect, as well as support, organ function. The above table includes a sampling of botanicals that are well-loved as support for the menopausal transition period.

Each herb is classified into one or more Safety Class as well as an Interaction Class:

**Safety Classes:**
- Class 1: Herbs that can be safely consumed when used appropriately
- Class 2: Herbs for which restrictions apply, unless otherwise directed by a qualified healthcare practitioner
  - 2a: For external use only
  - 2b: Not to be used during pregnancy
  - 2c: Not to be used while nursing
  - 2d: Specific use restrictions noted for herb
- Class 3: Herbs to be used only under supervision of a qualified healthcare practitioner

**Interaction Classes:**
- **Class A:** Herbs for which no clinically relevant interactions are expected
- **Class B:** Herbs for which clinically relevant interactions are biologically plausible
- **Class C:** Herbs for which clinically relevant interactions are known to occur

**References**
DIFM Launches Podcast called The EmpoweRD Nutritionist: DIFM Strength in Diversity

As RDNs, we know that a lack of cross-cultural understanding can prevent us from guiding our clients to their goals. Exhibiting cultural competency can assist us in establishing rapport during those first encounters when clients feel the most tense. Whether from outside the US, or a different part of our country, demonstrating empathy can alleviate some of that tension. They come to us with certain goals in mind, and it is our job to help them; and in doing so, we need to understand the ins and outs of their behavior—or lack thereof. It’s important that clients feel comfortable enough to lower their guard and be vulnerable—this can be achieved when they are reassured that their values and beliefs will not be judged. With this initiative in mind, DIFM will be launching a podcast called “The EmpoweRD Nutritionist: DIFM Strength in Diversity”, focused on raising awareness and promoting diversity within the field of nutrition and dietetics. Dietitians from diverse backgrounds will be interviewed about food habits and practices common to their culture. The interviewee will also provide some practical tips that can be used when working with that specific population. The podcast is set to air mid-November! Further, to celebrate this topic, we’re excited to include diverse perspectives from the special RDNs below.

Profiles of Diversity in Women’s Health

Printed with permission from the Women’s Health Dietetic Practice Group, Academy of Nutrition and Dietetics

Egondu M. Onuoha, MS, RDN, CDN, IBCLC, RLC, CDE, GPC, FAND

What are your areas of expertise within the field of nutrition?

As an international board-certified lactation consultant, my expertise is in women’s health and pediatrics. I am also a certified diabetes educator. I have completed the certificate of training in weight management for both adults and children/adolescents.

How did you become interested in dietetics and women’s health?

My mom was a nurse midwife, so the health field was an area of interest growing up. I have always been interested in healthy eating, so nutrition and dietetics was an easy choice.

As a practitioner, I realized after venturing into a variety of specialties that I really enjoyed women’s health and pediatrics. Community and public health have also become a passion. The WIC program provides me the everyday joy of working with women, infants and children.

Briefly describe your training, nutrition-related jobs and current role.

I have a bachelor’s degree in nutrition and dietetics and a master’s degree in food science and technology. I am a registered dietitian, a certified diabetes educator, a Fellow of the Academy of Nutrition and Dietetics, and Grant Professional Certified (GPC).

I have worked as a clinical dietitian in various settings – hospital, healthcare centers and nursing homes. I have also worked in food service and more recently in public health.

Please expand upon your work in an administrative role.

I have been at the Brooklyn Hospital Center in New York City for over 18 years and have been the administrator/director of several programs and/or departments during this time. My responsibilities for the past years have been overseeing the prenatal care assistance program (PCAP) at seven sites – two hospitals and five clinics. I have also been the Administrator for the Nurse-Family Partnership (NFP) – a home visiting program that utilizes registered nurses and nurse midwives to provide education to low-income, first-time pregnant mothers. I have also been in charge of the Diabetes Program overseeing multiple grants for diabetes management. I currently oversee the WIC program at several sites with a caseload of 24,000 participants monthly.

My administrative role has given me the honor of overseeing multidisciplinary teams as well as the opportunity to hire a large number of nutritionists and registered dietitians.

How do you add diversity within the field of dietetics?

I was born in Nigeria and working in NYC has provided me with a huge opportunity to work with diverse groups of people with multilingual, multicultural backgrounds and diverse socioeconomic statuses. Having clinics in various communities in Brooklyn has helped me incorporate diversity in staffing so that our hiring practices require that we engage dietitians and nutritionists who reflect the diversity, culture and languages of the communities we serve.

Through advocacy and volunteering, I encourage diversity in the field and encourage students from diverse backgrounds to consider a career in nutrition and dietetics. Through mentorships, we provide opportunities for young practitioners to expand their knowledge and skills so they can move up the career ladder in the field.

We create open communication that is accessible across different generations (traditionalists, baby boomers, generations X, Y, and Z). Fostering an environment of inclusion where employees can connect and collaborate has helped increase our engagement of diverse staff.

What differences do you see in women’s approaches to their healthcare? Does this differ by ethnicity or generation?

Briefly, there are differences that apply to women based on socioeconomic status – lower
income women are at higher risk of obesity, heart disease and diabetes. Older women are vulnerable due to age-associated changes and sometimes economic disadvantages. Older women face certain barriers that include lack of transportation, low literacy levels and inadequate income to pay for medications. Younger women are more likely to research their options and interact more with their physicians.

What do you see as the biggest challenges and opportunities for future RDNs who want to work in this field?

Some of the challenges RDNs will face in the future will be appropriate salary/compensation and reimbursement.

The biggest opportunities will be in areas of nutrition beyond clinical nutrition. RDNs must acknowledge the important roles and opportunities that exist in the areas of public health, global health, risk management, quality and healthcare management, wellness and prevention, and technology and population health. These are the emerging areas that will provide RDNs with the appropriate skills, flexibility and vision to make a significant impact in the world.

What advice would you give students and RDNs interested in pursuing a career in women’s health?

Have an open mind and be flexible, creative and adventurous. Do not be afraid to take on new challenges even in areas that are not directly in the field of nutrition. Be willing to work hard and be committed. Above all, do your part to make the world a better place. Embrace servant leadership, and do not think “clinical nutrition” only.

Padmini Balagopal, PhD, RDN, CDE, IBCLC

What are your areas of expertise within the field of nutrition?

I am a certified diabetes educator and an international board-certified lactation consultant. I practice medical nutrition therapy in the areas of wellness, preventive health, and disease management with a holistic and functional approach that also includes yoga, exercise, and meditation.

How did you become interested in dietetics and women’s health?

I studied food and nutrition as part of my postgraduate studies and decided I wanted to work in the field to help prevent and manage disease through diet. I wanted to become involved in women’s health specifically, as I saw an increase in breast cancer and other cancers related to women. I wanted to know whether chronic and devastating diseases could be prevented and/or managed with lifestyle choices and if so, how.

Please briefly describe your training, nutrition-related jobs and current role.

In my current role as a clinical nutritionist with additional training in diabetes and lactation, I work with clients of all ages, from kids in the early intervention program, to adults with weight issues or metabolic problems, as well as pregnant women and postpartum women with breastfeeding issues. I enjoy the wide variety of conditions and ages, as they bring their own challenges.

Please expand upon your work with the diabetic population and in India.

I was born in India, where type 2 diabetes and hypertension are on the rise. As part of my doctoral research, I conducted a study on the effectiveness of a non-pharmacological educational program on a rural community population. This program studied the effects of a structured lifestyle intervention, including diet and physical activity, on risk factors for type 2 diabetes and hypertension using metabolic parameters as indicators before and after. Parameters for diabetes and hypertension improved as a result of the three-month educational intervention. It was designed for one particular segment of the Indian population but was successful in reaching all segments and ages as was shown by the improvement in risk factors at the end of the study. It further showed that educational interventions were effective in bringing about meaningful lifestyle changes.

What differences do you see in women’s approaches to their healthcare in India? Does this differ by ethnicity or generation?

In India, prenatal care is costly and not always available or utilized. As a result, women can have a multitude of problems rooted in habits, customs, misinformation and poor nutrition—and not know how to address them. These problems can include hyperemesis, swelling of feet, hyperglycemia, constipation, inadequate intakes of critical nutrients like protein, iron, and folic acid, and excess intake of refined carbohydrates. Such problems, if uncorrected, can affect the health of both the fetus and the mother.

Furthermore, for the postpartum mother and baby dyad, breastfeeding initiation and subsequent support are sorely needed and are not as readily available as they should be. Cultural customs, including diet, greatly influence postpartum care and can impact breastfeeding practices. For example, colostrum, which has now been shown to promote immunological health of the newborn and successful breastfeeding, used to be discarded.

Other cultural factors like multi-generational family dynamics, wherein some older family members wield a domineering influence on the decisions a new mother can make, may need review and educational intervention, especially if the dynamics negatively impact health and wellness.

Generational differences are also becoming more prevalent in another area. The younger generations are increasingly adopting a Westernized, highly processed, high-fat diet and a more sedentary lifestyle. They often abandon the age-old traditions of yoga, emphasis on a plant-based diet, attention to health and wellness, and simple, mindful living.

What advice would you give students and RDNs interested in pursuing a career in women’s health?

I strongly recommend that anyone interested in becoming an RDN do field work in nutrition before applying for a dietetic internship. This experience will give them a big-picture view of the areas that most need qualified help, in addition to helping them identify their own areas of interest and passion.
Dawn Ballossingh, RD, LMNT, MPA

What are your areas of expertise within the field of nutrition?

My specialty areas are maternal and infant nutrition, community nutrition, and public policy and administration.

How did you become interested in dietetics and women’s health?

My parents were pastors in a rural area of my country, and feeding the poor was part of their purpose. Additionally, my mother Selma Ballossingh (my icon and hero) has been recognized by the UN for her work with women’s issues in many countries at a time when women’s roles were still growing and evolving. My father worked as a pastor, a public administrator, and human resources and industrial relations officer and was a brilliant visionary and strategist.

Please briefly describe your training, nutrition-related jobs and current role.

I received my education at the Miami-Dade Community College before transferring to University of Nebraska for a degree in human resources and family sciences with a dietetic emphasis, followed by my dietetic internship and master’s in public administration. I began with the OneWorld Community Health Center as a WIC dietitian, then returned to Florida for a position with Kids Connected By Design. There, I developed a community nutrition intervention program that embedded RDNs in obstetricians’ offices to facilitate “soft handoffs” of nutrition intervention program that embedded RDNs in obstetricians’ offices to facilitate “soft handoffs”

As a WIC Clinic Manager, I manage the contract for the OneWorld Community Health Center clinics, collaborate with the local health department and contribute to the vision and strategy to meet the program’s desired population health outcomes. I manage a 12-person staff and have developed the budget for the contract. I also write the departmental strategic plan, as well as grants.

As a representative for the program and the health center, I advocate at both local and national legislative levels. I have delivered presentations to lawmakers on the program, women’s and population health issues, and the objectives and importance of the role of the RDN in health benefits for the lower SES population and for the fiscal solvency of state budgets and safety net programs.

Why is diversity within the field of dietetics important?

Ethnic diversity is crucial for connecting with the client and the community. Diversity helps ensure familiarity with both dietary and cultural practices for a more customized approach to patient care. Likewise, professional diversity is also crucial. Dietitians with second languages, administration skills, marketing skills, early childhood education and other such skills can evolve their practices to meet patient needs and maintain sustainable practices and incomes.

What is your country of birth?

Trinidad and Tobago (twin islands, one state)

What are the differences you see in women’s approaches to their healthcare?

Women in the islands are typically not as proactive in their own healthcare due to issues of wait time and cost. Thus, many women access care as they need it. Likewise, the Carnival season provides the beauty and cathartic release of the parades but also high incidence of post-Carnival unplanned pregnancies, high STIs, and sex trafficking. This is further complicated by poor political will and management that leaves vulnerable groups like the poor and elderly seeking alternative health options or living with chronic disease. The food culture is multiethnic and delicious but high in processed and starchy foods, like white-flour roti (an Indian flat bread). This leaves the population susceptible to heart disease and obesity-related comorbidities.

Does this differ by ethnicity or generation?

The younger generation tends to be more focused on healthy eating and exercise, but there are multivariate factors in regard to ethnicity and preferred body image as well as SES and outside influences.

What do you see as the biggest challenges for future RDNs who want to work in this field?

One of the biggest challenges is marketing. In this digital age, people are inundated with information, making it challenging for them to determine what is evidenced based and healthy, versus what is trending. Likewise, mixed messaging is an issue: evidence-based information is sometimes coupled with information that is anecdotal or unproven. This is where our profession must come together and message with one voice.

What do you see as the biggest opportunities?

I believe the move towards personalized nutrition and nutrigenomics will impact the future of nutrition therapy.

What advice would you give incoming RDNs who are interested in pursuing a career in women’s health?

Think big and think outside the box. From environmental factors to mitochondrial make up, the impact of maternal health on the lifespan is great, and impactors are varied depending on where people live. See the big picture, but also focus on the immediate need where you can make a difference. A small intervention taken to its global potential can help women of all ages in all parts of the world.
power through your workout

Find out how the polyphenols found in pomegranate juice may help fuel your exercise goals. Exciting research examined the potential impact of 100% pomegranate juice on post-workout muscle strength.

MAKE POM YOUR WORKOUT PARTNER.

Certain types of polyphenol antioxidants, like those found in pomegranate juice, may help increase nitric oxide bioavailability by protecting it from breaking down in the body. Nitric oxide helps your body get the oxygen and nutrients it needs during exercise.

POM Wonderful 100% Pomegranate Juice is known for its polyphenol antioxidants. An in vitro study at UCLA found that each serving has more antioxidant capacity, on average, than red wine and green tea. Every athlete should stock the fridge with POM.

DRINK POM AND CARRY ON, AND ON, AND ON.

A 2011 study conducted at UT at Austin on 17 athletic men found preliminary but promising results for muscle strength. Those who drank two servings (about 8oz each) of pomegranate juice per day for about two weeks maintained more of their post-exercise arm strength versus the placebo group. The men followed their normal diet and weight-training routine. On the eighth day, the men completed specific strength exercises at maximum capacity, and drank an additional serving of pomegranate juice immediately after exercising. A similar trend was seen in the knee though it did not reach statistical significance.

On day four of the eight-day trial, they completed a defined exercise regimen, and isometric muscle strength in the arm and leg was measured over the following four days.

Although the research reported is promising, additional clinical research is needed to establish causation and the potential impact of pomegranate polyphenols on exercise.

And if all that isn’t enough, POM Wonderful 100% Pomegranate Juice is a good source of potassium, an electrolyte key to muscle function—which makes POM the new top banana. Begin your daily workout with a bottle of POM today.

In a preliminary 2014 UT study on 45 recreationally active young men, the post-exercise arm and leg strength was significantly higher in men drinking 8oz of pomegranate juice daily compared to the placebo group.

Contains 3x the antioxidants, on average, of green tea.

Pick up POM in the produce section of your store or order now from Amazon.
Yoga for Fertility and Women’s Health

Kendra Tolbert, MS, RDN, RYT

In 2017, 14.3% of US adults reported practicing yoga in the previous 12 months, making yoga one of the most popular mind-body modalities.1 According to data from the National Health Institute Survey (NHIS), the majority of yoga practitioners are women. They are more than twice as likely as men to practice yoga.1 Most turn to yoga for general wellbeing rather than to treat a specific disease.2 That could soon change thanks to the growing evidence and evidence supports the use of yoga to manage women’s health concerns including infertility, Polycystic Ovary Syndrome (PCOS), menopausal symptoms, and other endocrine-related health concerns.

Many of yoga’s health benefits are attributed to its effects on the Hypothalamic-Pituitary-Adrenal (HPA) axis.3 The HPA axis is activated by internal and external stressors.4 In response to stress, the hypothalamus secretes corticotropin-releasing hormone (CRH). This prompts the pituitary gland to release adrenocorticotropic hormone (ACTH). ACTH, by acting on the adrenal glands, results in the release of corticosteroids. This cascade of events is often referred to as the “flight or fight” response. It leads to the following:

- reduced blood flow to the reproductive and digestive organs5
- impaired gonadotropin-releasing hormone (GnRH) activity4
- the release of glycogen, raising blood sugar levels5
- the release of insulin, lowering blood sugar levels6

With acute stress, these effects are short-lived. Therefore, they are not likely to impose long-term negative impacts on health. But with chronic stress, they can lead to a host of issues, including hormonal disturbances, diminished reproductive function, and insulin resistance.4

Yoga counters these effects by down-regulating the HPA axis and activating the parasympathetic nervous system (PNS). The actions of the PNS are commonly referred to as the “rest and digest” or “feed and breed” response. They are the exact opposite of the effects of the stress response and include:

- blood flow directed to the internal organs5
- normalized GnRH activity4
- return of blood sugar to normal levels5

This impact on GnRH activity and blood sugar levels may be why yoga was found to be beneficial for those with PCOS.4,5 PCOS is the most common endocrine disorder in women of reproductive age.3 It affects an estimated 10% of women.10 Despite what its name suggests, it impacts more than a woman’s ovaries. It increases her risk of depression, anxiety, sleep apnea, endometrial cancer, type 2 diabetes, gestational diabetes, miscarriage, preeclampsia, and infertility.10 Successfully managing the signs and symptoms of PCOS, as well as the root causes of those signs and symptoms, can greatly reduce a woman’s risk of developing these comorbid diseases.

In 2012, researchers set out to determine which was better at improving many of the endocrine, psychological, and metabolic changes associated with PCOS: yoga or conventional exercise.4,6 For 12 weeks, a group of adolescent girls with PCOS were led through an hour-long yoga sequence or practiced a conventional exercise routine. One half practiced yoga. The other half exercised. At the end of the 12 weeks, yoga was found to be more effective at improving many of the symptoms than conventional exercise regardless of the participants’ starting weight or waist circumference. The positive effects were seen independent of body size changes during the intervention.

The 12-week intervention resulted in the following outcomes:

- reduction of anti-müllerian hormone (AMH) by 2.51 ng/mL8
- more frequent menstruation, from an average of 1.49 menstrual cycles to 2.38 over the course of 90 days8
- 12-point reduction in state anxiety (temporary anxiety in response to a threatening situation) and 14.97-point reduction in trait anxiety (anxiety as a characteristic of one’s personality) on the state-trait anxiety inventory (STAI)6
- 14.9% decrease in fasting insulin7
- 5.5% decrease in fasting blood glucose7
- 22.49% decrease in Homeostasis Model Assessment, insulin resistance (HOMA-IR)7

Additionally, yoga has the potential to improve conception rates and the quality of life for those with an infertility diagnosis.11,12 Practicing yoga can mitigate the depression and anxiety that often accompany infertility.12 Research shows people experiencing infertility have rates of depression and anxiety similar to those of people facing a cancer diagnosis.13 Yoga provides a way for those having difficulty conceiving to manage stress, build resilience, and process difficult emotions. Meditation and breathing exercises (pranayama) acquired and developed during yoga classes can be used off the mat.

Dr Alice Domar, one of the leading fertility psychology researchers, has conducted studies to test the effect of mind-body practices on infertility. In one ten-week study, participants were split into three groups. The mind-body group received information and training on nutrition, exercise, relaxation (including yoga), and cognitive restructuring. The second group met for a support group which included discussions about how infertility was affecting other aspects of the participants’ lives. The third group concentrated on diet and exercise.

In that study, the mind-body group showed the most improvement in measures of psychological, social, spiritual, and metabolic health. Dr Domar explained that the mind-body group’s success was due to the combination and balance of activities, including education, relaxation, and the development of a support network. This approach was effective in reducing anxiety, improving sleep, and increasing energy levels. The group also reported an increase in overall well-being, which contributed to their improved conception rates.11,12

These findings highlight the potential benefits of yoga and mind-body practices in improving fertility outcomes. By addressing the physical, emotional, and psychological aspects of fertility, yoga and mind-body practices can help women achieve their reproductive goals. As women turn to yoga as a way of managing their fertility issues, it is essential to understand the potential benefits and to encourage the use of mind-body practices in conjunction with conventional treatments. This approach can help women experiencing infertility improve their overall health and well-being, leading to better fertility outcomes.
lives. And the third group, the control group, received no intervention. Study subjects in the mind-body group had higher rates of pregnancy than those in the control group. Of those in the mind-body group, 55% conceived compared to 20% of those in the control group.

The potential benefits of yoga for women’s health do not end when a woman’s reproductive years come to a close. Yoga has also been studied as a complementary approach for dampening the symptoms of menopause. Menopause is the permanent cessation of menstruation with amenorrhea for one year or more without an underlying pathological cause. It is often accompanied by vasomotor (hot flashes and night sweats), psychological, and physical symptoms. While pharmaceutical drugs are an effective remedy for many symptoms, they’re not without side effects. The desire to avoid these side effects makes complementary remedies, including yoga, an attractive alternative to many women experiencing menopausal symptoms.

One study found yoga improved sleep quality in women experiencing menopause-related sleep disturbances. A recent review showed yoga was associated with an improvement across a range of menopausal symptoms including vasomotor, psychological, somatic, and urogenital disturbances. Additionally, there are few adverse effects associated with yoga.

Though more research is needed, the studies and anecdotal evidence currently available support the recommendation of the practice of yoga for women’s health. That said, the varied protocols used in each study makes it difficult to recommend a specific duration and number of sessions. This points to the flexibility with which yoga can be practiced. There is no singular way to reap the benefits.

The precise style of yoga that would be most beneficial is also not clear based on the current data. Clinical judgment and data from other scientific studies on exercise can be used in the development of basic guidelines.

Because excessive exercise is associated with subfertility and hormone imbalance, it would be wise to encourage clients to limit strenuous and heated forms of yoga when trying to conceive or managing a disease rooted in and characterized by endocrine imbalances. Clients can be counseled to look for slow flow, beginners, gentle, yin, and restorative classes. Online videos are another option for clients interested in experiencing the benefits of yoga.

As a self-care modality, yoga can be a powerful tool for women to explore. Dietitians can guide clients to create a well-rounded lifestyle, including mind-body practices like yoga, which supports their reproductive and overall health.

References
Coffee and its Role in Protecting Against Non-Alcoholic Fatty Liver Disease
Andrew Salisbury, CEO & Co-Founder, Purity Coffee

The benefits of coffee on the liver were first recognized in people suffering from liver cirrhosis, which is a disease that mostly develops as a result of alcoholic liver damage. Studies by Klatsky et al, as well as others, recognized a correlation between coffee intake and decrease in elevated liver enzymes, overall hospitalizations, and mortality of people with liver cirrhosis.\(^1\) It appeared that, for alcoholic liver disease, coffee could potentially make a major difference in how fast the disease progressed and may even work to reduce damage.

Most people are aware that alcohol consumption is a major risk factor for liver disease, but not everyone is aware that there are other risk factors too. It is possible to develop non-alcoholic fatty liver disease (NAFLD) without ever touching a drop of liquor, wine, or beer. NAFLD begins to affect the body in a similar way to alcoholic liver disease, with fat deposits distributed throughout the liver causing scarring, inflammation, and stiffness. Since the liver acts as a filter for everything that one consumes, the condition decreases its functional capacity, causes downstream effects, and may lead to cancer. While alcoholic liver disease can have more initial symptoms, NAFLD usually doesn’t produce as much swelling initially and can therefore take longer for a patient to discover.

Coffee’s protective effects on the liver act similarly whether against non-alcoholic or alcoholic liver disease. Saab et al defined several component parts of coffee that have liver-protecting effects. Caffeine has inhibitory actions that work as antifibrotic, anticancer, and anti-inflammatory. They also noted that other chemicals in coffee, specifically cafestol and kahweol, act as protectants and have anticancer effects that include the generation of detoxifying enzymes in the liver.\(^2\) Possibly the most useful substances in the fight against liver disease are polyphenols such as chlorogenic acids which demonstrated a decrease in immune and inflammatory markers in Saab’s study.\(^2\)

As is often the case, caffeine’s health effects are surpassed by polyphenols when it comes to coffee’s beneficial effects on the liver. Chen et al’s 2014 meta-analysis in the Journal of Gastroenterology and Hepatology noted that even though caffeine had the functional potential to fight liver disease, actual ground coffee was the only thing that really made a measurable difference. When comparing groups that took in caffeine through soda and tea (“total caffeine”) to groups that specifically drank coffee (“regular coffee caffeine”), the “regular coffee caffeine” group showed an inverse correlation with NAFLD fibrosis while the “total caffeine” group did not.\(^3\) This suggests that despite caffeine’s theoretical effects, coffee’s antioxidant effects may have been responsible.

NAFLD can be caused by multiple factors, but one of the greatest risk factors is metabolic syndrome. In 2010, Catalano et al released a study that aimed to specifically evaluate coffee’s effects on NAFLD using ultrasound bright liver score (BLS) as a measurement. The BLS is a non-invasive ultrasound technique used to evaluate liver health through visualization. It found that there was an inverse correlation between coffee drinking and severe BLS scores.\(^4\) Catalano’s study also drew attention to the association of coffee consumption with less severe BLS in people showing multiple symptoms of metabolic syndrome. According to Dr Sanjiv Chopra, published author, former faculty dean for continuing medical education at Harvard Medical School, and Purity Coffee advisory board member,

Non-Alcoholic Fatty Liver Disease is the dominant chronic liver disease in the USA, affecting an estimated 40 million Americans. It can progress to cirrhosis and all its complications including primary cancer of the liver. The majority of such patients, but not all, have metabolic syndrome. The major treatment for NAFLD is weight loss. An effective and safe treatment is being sought and currently about 250 trials are in progress. Of note, patients with NAFLD (which encompasses fatty liver, non-alcoholic steatohepatitis and cirrhosis) who drink coffee have less fibrosis, scarring of the liver, compared to non-coffee drinkers.

To enjoy the protective benefits of coffee, whether it be protection from metabolic syndrome or liver damage, it is important to make sure you are getting the most health benefits out of your coffee. When you also drink pure brewed coffee that is free from any contaminants like pesticides and mycotoxins, you may be maximizing the healthful effects of the polyphenols the coffee contains. The easiest, best thing you can do for your liver health at both the primary prevention and damage control levels, is to choose Purity Coffee, the only coffee that is selected and roasted purely with health in mind.

Purity invites registered health professionals to join their Coffee Council to receive free or 50% off monthly coffee subscription and receive emails regarding the latest coffee-and-health studies and access to educational materials. To get in touch with Purity Coffee to learn more about how their coffee is healthy, please reach out by phone (844-787-4892) or email (hello@puritycoffee.com).

References
Congratulations to this year’s DIFM DPG Award Winners!

To learn more about these deserving recipients go to: https://integrativerd.org/award-winners/

VISIONARY AWARD
Dr. Sheila Dean, DSc, RDN, LDN, CCN, IFMCP

EXCELLENCE IN PRACTICE
Kelly Morrow, MS, RDN, FAND

EXCELLENCE IN SERVICE
Sarah Harding Laidlaw, MS, RDN, MPA, CDE

OUTSTANDING STUDENT
Hillary Nason
News You Can Use

Electronic Mailing List (EML) Recent Topics Review

Note: Yahoo is ending their group listservs. Be sure to download any content you would like to save by December 14, 2019. We are actively building an alternative platform. Please follow us on social media and check your email to stay informed!

- LEAP/MRT therapy was recommended for a teen with acne.
- It was suggested that a patient with Postural Orthostatic Tachycardia Syndrome (POTS) who was suffering from food aversion, anxiety, and weight loss might benefit from a micronutrient deficiency test, labs to rule out hemochromatosis or Lyme disease, and addressing his vitamin D and B12 labs with supplementation.
- For those wishing to pursue more education in integrative and functional nutrition, the Integrative and Functional Nutrition Academy, Next Level Functional Nutrition with Susan Allen, University of Western States Masters in Nutrition and Functional Medicine, Saybrook University’s Programs in Integrative and Functional Nutrition were recommended.
- Integrative approaches to healing Crohn’s include LEAP/MRT therapy; an elimination diet; supplementing with colostrum, fish oil, and vitamin D; trying out the Specific Carbohydrate Diet; improving oral hygiene; and utilizing the “5R” program for gut healing, which involves the following steps: (1) removing the trigger for flare-ups, (2) replacing digestive enzymes and other factors that play a role in digestion, (3) reinoculating the gut, (4) repairing the gut with supplementation and diet, and (5) rebalancing the body with sleep and stress management.
- A woman with GI impairment and a history of gastritis was taking a large amount of Betaine HCl supplements (11 per meal). It was suggested to discontinue anything with HCl, as it is contraindicated for someone with gastritis, or, at the very least, to reduce the dosage. Others recommended taking a break from any supplements to give the gut a rest before putting the patient on antimicrobials. Another RD suggested that the patient may have autoimmune gastritis, the precursor condition to pernicious anemia. It was recommended to test anti-parietal cells, ferritin, anti-intrinsic factor antibodies, B12, MMA, and homocysteine to determine if that is the case. The patient will likely need a B12 supplement.
- For a patient recently diagnosed with ALS, a high-fat, high-protein diet was recommended with modifications for swallowing issues.
- Supplementation with lysine can help with low ferritin and iron levels, after ensuring there isn’t a GI bleed causing the low stores.

What’s New - Journal Reviews and Resources

Effects of dairy intake on blood pressure in overweight middle-aged adults

This randomized crossover study consisted of 52 healthy, overweight Dutch men and postmenopausal women (BMIs averaged 28.0 ± 1.9) aged 58.6 ± 4.8 years old. Of these, 22 participants had hypertension going into the study, with 3 using blood pressure–lowering medication throughout the study. The subjects participated in consuming either a low-dairy diet (consisting of ≤1 dairy portions each day) during a 6-week interval. After a 4-week washout period, at which point the participants returned to their normal diets, the amount of dairy was switched and another 6-week interval commenced. The two diets were isocaloric to minimize any weight loss or gain during the study. For the sake of the study, a portion of dairy consisted of 200 grams of semi-skimmed yogurt, 30 grams (1 slice) of reduced-fat cheese, or 250 mL of semi-skimmed milk or buttermilk. When on the high dairy diet, the subjects were instructed to eat 1-2 slices of cheese and 2 portions of yogurt per day, and then to complement their diet with the previously mentioned dairy products. No other types of dairy were allowed. After completing the high-dairy diet, the study found that the participants’ systolic and diastolic blood pressures were lower when compared to the low-dairy diet (127.5 vs 132.1 mm Hg, and 78.8 vs 81.8 mm Hg, respectively). The authors of the study theorized that ingredients found in dairy, such as cysteine, may have an effect on lowering blood pressure.


Risks of ischaemic heart disease and stroke in meat eaters, fish eaters, and vegetarians over 18 years of follow-up

The EPIC-Oxford prospective cohort study followed about 65,000 men and women in the United Kingdom between 1993 and 2001. This particular analysis, which studied the correlation between diet and risk of cardiac events, included about 48,000 participants. Using diet information gathered from food frequency questionnaires, the study separated those who refrained from eating meat (vegans, vegetarians, and pescatarians) from those who did eat meat. The participants answered surveys about their socioeconomic status, lifestyle (such as smoking, physical activity, alcohol consumption, and use of dietary supplements), and medical history to provide a more complete picture of their health. Broadly speaking, the vegetarians were younger and had a lower socioeconomic status than meat eaters. However, the vegetarians were better educated, smoked less, drank less alcohol, were more physically active, and had lower blood pressure, total cholesterol, and fewer incidences of diabetes. More specifically, those who didn’t eat meat did eat more fruits and vegetables, beans and nuts, and dietary fiber. They also ate less saturated fat and sodium than meat eaters. This study looked at specific health conditions,
such as ischaemic heart disease, acute myocardial infarction, and strokes (including ischaemic and hemorrhagic stroke) and their correlations with diet. It found that vegetarians and pescatarians had lower risk of ischaemic heart disease than those who ate meat, although vegetarians had higher incidences of strokes. More research needs to be done to determine a possible causal relationship.

Risks of ischaemic heart disease and stroke in meat eaters, fish eaters, and vegetarians over 18 years of follow-up: results from the prospective EPIC-Oxford study. BMJ. 2019;366:l4897. doi:10.1136/bmj.i4897

**Smartphone app reveals erratic diurnal eating patterns in humans that can be modulated for health benefits**

This is a current, ongoing study from researchers from the Salk Institute. A cell phone application (“app”) called myCircadianClock is being used to measure how and when humans eat throughout the day. Participants using the app take a picture of their food every time they eat or drink something, but they may also note food or drinks with text input. The app randomly sends out push notifications throughout the day to prompt the user to log any food he or she may have recently had to minimize the risk of missing mealtimes. At this time, findings show that although the app users self-identified as having 3 meals a day, the average intake was actually between 4-15 meals a day. The average meal duration was about 14 minutes and 36 seconds, with 25% of the meals taking place within less than an hour and a half of the previous meal. The majority of calories are consumed between 6 and 9 p.m. On the weekends, mealtimes varied greatly, with 25% of the meals taking place later in the morning than on weekdays. The median daily eating duration was 14 hours and 45 minutes. The app creators recruited 8 users (5 men, 3 women with BMIs >25) to participate in a small 16-week pilot study to see if there was any correlation between span of eating duration, erratic eating behaviors, and BMI. The users were asked to reduce their eating duration to between 10 and 12 hours a day on both weekends and weekdays. After the study, the users had an average weight loss of 3.27 kg (7.2 pounds) and BMI reduction of 1.15. As a result of reducing the time allowed for eating each day, the users had reduced the amount of calories they consumed, potentially leading to weight loss. The users also assessed higher sleep satisfaction and increased energy levels, as well as maintaining weight loss after 36 weeks. The app is available to both IOS and Android users. To participate in the study, visit [http://mycircadianclock.org/](http://mycircadianclock.org/).


**Nutritional Genomics Research Publications – July 15, 2019**


Nutrition-relevant genetic testing was found to be helpful, although practitioner-led intervention was even more effective. The authors conclude by suggesting that these findings will help with the further refinement of nutrigenomics education and practice.


The following nutrients are discussed with regard to the emerging evidence for their possible roles in cancer prevention and treatments: ascorbic acid, vitamin A, vitamin D, vitamin E, folic acid, selenium, polyunsaturated fatty acids (including omega-3), prebiotics, probiotics, and dietary fiber.


Although some concerns were expressed by French Canadians, such as genetic privacy, awareness of potential advantages for health and prevention was also identified. Overall, there was optimism regarding the usefulness of nutritional genomics, with general preference for diettarians to be involved with providing DNA-relevant dietary advice.


Epigenetic changes that increase cancer risks are potential reversible. DNA methylation, histone modifications, and noncoding RNAs are discussed. Table 1 lists a number of diet-related items with DNA methyltransferase (DNMT) inhibition activity, Table 2 lists items with histone deacetylase (HDAC) inhibition activity, and Table 3 lists dietary items which can affect microRNAs (miRNA).


These conference proceedings discuss nutritional genomics, along with the lifestyle and environmental factors (including intestinal microbiota) which can influence gene expression. Examples of the wide variety of potential applications are given. It concludes by encouraging further education and genetics-related literacy, which will allow professionals to properly counsel and advise their patients.
Environment, lifestyle, and Parkinson’s disease: implications for prevention in the next decade. 

A wide variety of potential factors affecting risk of Parkinson’s disease is discussed, including traumatic brain injury (TBI), pesticides, organic solvents, stress, exercise, smoking, coffee, caffeine, vitamin D, and the Mediterranean diet. The following genes are also mentioned: ABCB1, GRIN2A, GSTT1, PON1, and SNCA among others.

**Nutrigenomics of vitamin D.** 

Vitamin D affects the expression of a wide range of genes, with this review focusing on vitamin D and the immune system.


This review covers lifestyle variables like physical activity/exercise and nutrition (especially omega-3 fatty acids) that can affect the risk of the ApoE ε4 genetic variant in relation to Alzheimer’s disease and cardiovascular disease.
**Pressure Cooker: Why Home Cooking Won’t Solve Our Problems and What We Can Do About It**

By Sarah Bowen, Joslyn Brenton, and Sinikka Elliott

Oxford University Press, 2019

Pressure Cooker: Why Home Cooking Won’t Solve Our Problems and What We Can Do About It is a valuable book for anyone who cares about food. The book provides a perspective that is often missing—that of the women who struggle under the pressure to feed their families in the “right” way. The book illustrates the disconnect between our society’s food ideals and the reality of people’s daily lives. It may seem helpful to encourage people to cook more, make time for family dinners, shop smarter, and be conscious about where their food comes from. However, these suggestions can be an unachievable burden for people (most often women) who are already working very hard to feed their families. Instead, the authors argue that policy and societal changes are needed to better support families and create a healthier food system.

Pressure Cooker is the product of a research project in which mothers of young children were interviewed about what it means to feed their families. One hundred and sixty-eight women were interviewed, most of them low-income. The researchers then chose 12 of the women for more involved observations, in which they spent time with the women’s families and observed food-related events such as grocery shopping, meals, holidays, WIC visits, and more.

One common link between the women profiled in this book is that they all care deeply about feeding their families well. They are also well aware of our society’s food values, such as having family meals and eating fresh, “healthy” foods. However, these values can be impossible to live up to, especially when faced with poverty, lack of access to functioning kitchens, and other challenges. In one family, the parents work fast-food jobs with long and unpredictable hours, have low incomes, and do not have reliable transportation. They would like to have family dinners, but their situation makes it nearly impossible. Yet, food still brings them together, as in a touching scene where the mother helps her young daughters make birthday cupcakes for their cousin, who was recently released from prison and is staying on their couch.

The authors of Pressure Cooker argue that the focus on individual responsibility distracts from the broader societal forces that impact what and how we eat. Even though the title promises to address “What We Can Do About It,” those looking for easy solutions may be disappointed. This section of the book is a single chapter, and the ideas suggested can seem inaccessible in their scope. Some of their suggestions are policy ideas to reduce poverty, such as raising the minimum wage and subsidized child care. Other suggestions are community-based, such as having schools or churches serve as food prep centers that could provide affordable meals for families to pick up and reheat. Vitally, the authors point out the importance of truly listening to people, rather than assuming we know what people need and imposing solutions from the outside.

The book is written in an academic style, with plenty of footnotes and citations. At times the style can feel dry, but the intimate stories of the families keep the pages turning. If you care deeply about food, this book may at first trigger feelings of defensiveness. It can feel as if the authors are minimizing the importance of food; but actually, they are showing how exceptionally important food is. Against steep odds, the women in this book value food and are feeding their families in the best way they can. The authors do not argue that our food ideals should be cast aside. On the contrary, they argue that we need big, societal changes to make our ideals a reality. Rather than providing easy answers, the authors provide a new perspective and understanding of the lives of Americans and a grand vision of how our society could be different.
Thank You to our SPONSORS!

Executive Committee Members

Chair 2019-2020
- Dana Elia, DCN-c, MS, RDN, LDN, FAND
  Dana.eliardn@gmail.com

Chair-Elect 2018-2019
- Kory DeAngelo, MS, RDN
  Kory.deangelo@gmail.com

Past Chair 2018-2019
- Danielle Omar, MS, RDN
  2eatwell@gmail.com

Secretary 2019-2021
- Miho Hatanaka, RD
  mihohtnk@gmail.com

Treasurer 2018-2020
- Ryan Whitcomb, MS, RDN, CLT
  DIFMTreasurer@gmail.com

DPG Delegate 2019-2022
- Mary Beth Augustine, RDN, CDN, FAND
  DelegateDIFM@gmail.com

Nominating Committee Chair 2019-2020
- Alicia Galvin, MEd, RD, LD, CLT
  Agalvin09@gmail.com