

Women's Health *REPORT*

A QUARTERLY PUBLICATION OF WOMEN'S HEALTH DIETETIC PRACTICE GROUP

WOMEN'S HEALTH, PRENATAL NUTRITION AND INFANT OUTCOMES: A Public Health Perspective

By **Jamie Stang**, PhD, MPH, RDN, and **Helene Kent**, MPH, RDN

This article is approved for 1 CPEU by the Commission on Dietetic Registration, the credentialing agency of the Academy of Nutrition and Dietetics. Upon reading this article, please take the quiz at <http://bit.ly/1Sn6Xnv>.



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in Public Health, which are HRSA-funded public health training centers. During her tenure as Chair of the Public Health Nutrition Program at the University of Minnesota, Dr. Stang developed two new programs: a Peace Corps Master's International program, which combines graduate studies and research in global public health nutrition with a 24-month Peace Corps experience; and a Coordinated Master's Program in Public Health Nutrition which combines coursework, research and field experiences for the MPH degree along with the 1200+ hours of supervised experience required to be eligible to take the RD examination.



Helene Kent, MPH, RDN is a public health nutritionist with many years of experience in maternal and child health (MCH). HM Kent Consulting began in 2002 and clients include: national and state non-profits, foundations and government organizations. Previous experience includes the Association of State Public Health Nutritionists, Association of Maternal and Child Health Professionals (AMCHP) and 20 years at the Colorado Department of Public Health and Environment working in nutrition and MCH positions. Academy of Nutrition and Dietetic experiences include many years' experience with legislative activities at the state and national level. Helene served as Colorado Dietetic Association President, Colorado Public Health Association President, Chair of the Public Health and Community Nutrition Dietetic Practice Group, and Area 4 Coordinator to the HOD. She is currently Chair of the Committee for Public Health/Community Nutrition.

The following article is adapted from the 2015 FNCE® presentation sponsored by the Women's Health DPG. It was developed based upon two Association of State Public Health Nutritionists (ASPHN) resources: *The Role of Nutrition in Infant Mortality: A Public Health Perspective*, MCH Council, Winter 2013 and the soon to released *Preconception Care: The Role of Nutrition*. Helene Kent was the lead author for both documents. Additional information was included that represents the authors' expert opinions.

Nutrition is an important aspect of women's health with far-reaching influences. According to the Fetal Origins of Disease (aka Barker) Hypothesis, a woman's health and nutrition status throughout her lifetime may affect the health of her own offspring, as well as the health of the offspring born to her offspring^{1,2}. Health conditions shown to be affected by nutritional status via fetal origins of disease include cardiovascular disease, hypertension, obesity, insulin resistance, metabolic syndrome, personal perception of health, and depression and other mental health issues. These generational effects of nutrition are not well understood or quantified, but a growing body of research is beginning to provide evidence to guide practice in women's health.

This article will provide a brief overview of important aspects of nutrition and dietetics at three critical periods of the lifecycle: preconception (care provided prior to a pregnancy), prenatal (care provided during pregnancy) and interconception/postpartum (care provided from the birth of one child to the birth of the next).

Preconception Care and Nutrition

Preconception care is an area of nutrition and dietetics that has not been well delineated. Given that about half of all pregnancies in the US are unplanned³, it is not surprising that few women seek preconception/interconception care. Yet, nutrition can play an important role in reducing risk factors for poor maternal and fetal outcomes and in improving immediate postpartum as well as long-term health among women. Obesity is a major concern for RDNs when counseling women in the preconception/interconception period, as evidence continues to accumulate regarding the negative influence of obesity on pregnancy outcomes. Preconception care topics include the importance of folic acid, dietary quality and entering pregnancy at a healthy weight. Medical nutrition therapy (MNT) is offered as part of services to control chronic health conditions known to affect pregnancy such as diabetes. RDNs and other health care providers of reproductive aged women should include nutrition counseling in preventive care and other health care services. **Continued on page 3**

in this issue

From the Chair	2
Committee for Public Health/Community Nutrition	6
Preconception Nutrition	8
Book Review	9
Research Brief	10
Asking the Right Question	12
WH DPG 2015-16 Leaders	15

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FROM THE CHAIR Heather A. Goesch, MPH, RDN, LDN

I hope you had a Happy National Nutrition Month®! This year's theme, Savor the Flavor of Eating Right, focused on mindful eating and encouraged experimentation with new flavors and cooking techniques as part of a healthy diet and lifestyle. Even as this year's celebration ends, you can continue to spread the good nutrition word to family, friends, clients and the community and share the many resources available from the Academy.

You may recall that WH is supporting an Academy Evidence Analysis Library (EAL) project on Malnutrition in Pregnancy. Initiated during the 2012-13 Membership Year the intent of the project is to improve the quality of nutrition care through the development of evidence-based professional resources. I'm pleased to share an update that the workgroup is in the question development phase, conducting preliminary literature searches and reviewing abstracts. More information will be available as the EAL project progresses.

The feature article for this issue highlights the WH 2015 FNCE® Spotlight Session "Women's Health, Prenatal Nutrition and Infant Outcomes: A Public Health Perspective." Co-presenters Jamie Stang, PhD, MPH, RDN and Helene Kent, MPH, RDN provide a comprehensive follow-up to their successful presentation with key nutrition counseling pieces helpful to anyone in this area of dietetics. In addition to the session summary, we're sharing several photos from the conference, plus an accompanying overview piece on obesity and preconception nutrition.

Elsewhere in these pages we dive into new research that links magnesium and gestational diabetes, and offer a review of "The Virtual Breastfeeding Culture" by I ara Audelo, CI EC. You will also find information on the Academy's Committee for Public Health/Community Nutrition and guidance for using the Academy's Dietetics Based Research Network. And last but certainly not least a salute to three WH members who've helped make the Academy great for more than 50 years!

We hope you enjoy this issue. Keep in touch!



FROM THE EDITOR Kathleen Pellechia, RD

Happy Spring! As someone who works well into the evening on my many projects and initiatives, I am happy for all this extra sunlight! Plus I can squeeze in some outside play and walking with my kids after dinner! This issue is the follow up to FNCE® 2015 and it has become a tradition for us to share an article based on our spotlight session. This year's session, "Women's Health, Prenatal Nutrition and Infant Outcomes: A Public Health Perspective" was enjoyed by all who attended, and we hope you find this summary to be helpful. A big thank you to the presenters and our feature authors, Helene Kent, MPH, RDN and Jamie Stang, PhD, MPH, RDN.

This article is approved for 1 CPEU and this is also a good time to remind that you can purchase on-demand access to past FNCE® sessions at <http://www.starlibraries.com/fnce>. I would also like to take the opportunity to thank our wonderful panel of CPEU reviewers who as members of our DPG volunteer their time to make it possible for us to offer credit for our newsletter feature articles.

As a public health dietitian, I am pleased to include in this issue an interview with Helene about her role as Chair of the Academy's Committee for Public Health/Community Nutrition. I know many of you work in the area of public health nutrition and it is exciting to see this new committee at work in the Academy.

I hope you enjoy this issue and I would love to hear from you via email at publications@womenshealthdpg.org.

Key nutrition counseling messages for women contemplating pregnancy:

- Consume a diet high in polyphenols and other antioxidant compounds, including 2-4 servings of fruit and 3-5 servings of vegetables daily. Consume dark yellow or leafy green vegetables at least 2-3 times per week.
- Choose lean protein sources that are high in eicosapentanoic acid (EPA) and docosahexanoic acid (DHA) such as salmon, herring, trout, swordfish, anchovy and mackerel. Include nuts, seeds and oils (in moderation) which provide alpha-linolenic acid, including flaxseed, chia seeds, walnuts, soybeans, wheat germ, almonds, pecans, and soybean- or nut-based oils.
- Supplement a well-balanced diet with at least 400 mcg of folic acid each day. Individuals living in northern latitudes and those with darkly pigmented skin may benefit from daily supplementation with vitamin D at 1000-2000 IU per day. Women with a family history of neural tube defects may benefit from a higher level of folic acid supplementation (up to 4 mg per day). Inadequate intake of folic acid before and during early pregnancy is associated with an increased risk of spina bifida, anencephaly, and other neural tube defects. Folic acid also has a protective effect against heart defects.
- Choose lean protein sources and fortified grains that are high in iron. Examples include whole-grain breads and cereals, lean poultry, lean beef or pork, legumes, oysters, clams, mussels, salmon, halibut, haddock, perch, tuna, and sardines.
- Consume moderate portions of foods using mindful eating techniques such as eating at a slow pace, taking time to savor the taste and texture of each bite, and eating in a non-distracted environment (e.g., cellphones, televisions and tablets removed from the eating area or turned off).
- Participate in moderate to vigorous physical activity for 30-60 minutes each day. This activity can be broken up into several short (10-15 minutes) intervals rather than one long session.
- Maintain a healthy body weight - one that is not too low or too high. Weight at either extreme can be related to lower fertility and difficulty in maintaining a pregnancy. Maternal obesity is associated with increased risk for congenital heart defects, the most common type of birth defect, as well as increased risk for gestational diabetes, gestational hypertension, pre-eclampsia, preterm delivery, assisted delivery and Cesarean section.

FINDS

A useful acronym for defining the five key priority areas for preconception health is FINDS: Family violence, Infections, Nutrition, Depression and Stress⁴. Nutrition and dietetics services are considered an important part of clinical care for women of reproductive age under this model. Optimal preconception nutrition services include messages around healthy eating, as well as MNT to address existing health concerns such as hypertension, diabetes

and pre-diabetes, metabolic syndrome, polycystic ovarian syndrome, and overweight or obesity. General dietary interventions that may benefit women prior to pregnancy include increasing consumption of foods such as fatty fish and nuts that are high in omega-3 fatty acids and docosahexanoic acid, the use of folic acid and vitamin D supplements, and reducing the consumption of added sugars. Nutrition counseling may be appropriate in stress reduction and depression treatment programs, as food may be used as a coping mechanism, leading to overeating or eating foods with high caloric density and low nutrient density.

Nutrition and Prenatal Health

During the prenatal period, counseling is focused on weight gain, dietary quality, food access, food preparation, food security, referrals to WIC and other programs for women with limited resources, and anticipatory guidance related to breastfeeding. Medical nutrition therapy is offered as needed to address chronic conditions that began before or begin during pregnancy such as hypertension and diabetes. Women at high risk for preterm delivery or congenital anomalies may also benefit from nutrition counseling, as these are significant risk factors for infant mortality. Dietary assessment and intervention may be warranted in the case of excessive gestational weight gain.

Nutrition and Infant Mortality

Infant mortality refers to deaths that occur during the first year of life after a live birth and is measured in deaths per 1,000 live births. Unfortunately, according to the Centers for Disease Control and Prevention⁵, about 23,000 infants died in 2014 in the United States. The United States' Infant Mortality Rate (IMR) is higher than rates found in many western European and east Asian countries. Most recent data⁶ (2010) from the Organization for Economic Cooperation and Development ranks the United States at 26th in the world. This rate is 2.2 times higher than Sweden (the reference country).

In the United States, the overall infant mortality rate⁷ is 5.96/1,000 births (2013). The US IMR varies by racial and ethnic group, with infants born to black mothers (11.11/1,000) dying at twice the rate of those born to white mothers (5.06/1,000). A number of maternal demographic characteristics, including race, education, and age, may directly or indirectly influence the IMR. The rate may also be affected by health and health system characteristics such as the mother's health behaviors and whether or not she receives prenatal care⁸.

A complex variety of known and unknown factors affect infant mortality. Nutrition and weight (both maternal and fetal) are well established factors that influence infant mortality. The four leading causes of infant mortality in the United States are birth defects, low birth weight, Sudden Infant Death Syndrome (SIDS), and maternal complications during pregnancy, including preeclampsia, anemia, infection or inflammation⁹. Nutrition counseling can play a critical role in decreasing infant mortality rates with at least five nutrition-related areas to be addressed: dietary quality, healthy weight entering pregnancy, appropriate weight gain during pregnancy, MNT for chronic conditions, and breastfeeding. Thus, nutrition is an integral component of infant mortality reduction efforts.

Continued on page 4

Key nutrition counseling topics for the prenatal period:

- Some nutritional excesses such as vitamin A, as well as deficiencies in B vitamins, vitamin K, magnesium, copper, and zinc are linked to birth defects. A prenatal vitamin and mineral supplement should be consumed daily to provide iron, folic acid, zinc, vitamin D and other nutrients in levels appropriate for pregnancy.
- Maternal diabetes is the second most frequently reported medical risk factor during pregnancy. If poorly controlled, it can cause fetal death, congenital anomalies, preterm birth, macrosomia, newborn hypoglycemia, and hyperbilirubinemia. In women with pregestational diabetes, poor dietary control of blood sugar during critical periods of organogenesis significantly increases the risk of birth defects, particularly cardiac and neural tube defects. Early and aggressive MNT is warranted for all women with diabetes during pregnancy. Screening for GDM in the first trimester is recommended for women who are obese or those with a previous history of GDM.
- Congenital malformations are reduced among women with phenylketonuria (PKU) if they comply with dietary restrictions during pregnancy, which includes special metabolic formula consumption.
- While preterm delivery is still not fully understood, factors associated with low birth weight include low maternal pre-pregnancy weight, insufficient pregnancy weight gain, maternal obesity, and poor nutrition, hypertension or diabetes during pregnancy. Low prepregnancy body mass index and poor gestational weight gain are also associated with greater risk for fetal growth restriction.
- Iron-deficiency and anemia during pregnancy are associated with an increased risk for preterm birth, maternal/fetal death and obstetrical hemorrhage. They also result in poor iron status for both the postpartum woman and her infant, which may affect infant bonding and cognitive development.
- Maternal nutrition may exacerbate inflammation, which may lead to spontaneous preterm birth. Deficiencies of vitamin A, zinc, omega-3 polyunsaturated fatty acids and other micro nutrients likely play a contributing role in maternal infections. Antioxidants may play a major role in modulating inflammation and oxidative stress from maternal infections.
- Obesity among pregnant women is associated with increased risk for multiple pregnancy complications, including gestational diabetes, preeclampsia, chorioamnionitis (bacterial infection of membranes and fluid surrounding fetus) and postpartum hemorrhage. Women who gain more weight than the recommended Institute of Medicine (IOM) guidelines have increased risks of adverse pregnancy outcomes, including gestational diabetes, prolonged labor, preeclampsia, and Cesarean birth¹⁰. Also, weight gain during pregnancy predicts postpartum weight retention, which may have implications for the woman's long-term health and future pregnancies¹¹.

Postpartum Period

A series of health promotion messages appropriate for all postpartum women has been identified. These messages, known as BBEEFF¹², include Breastfeeding promotion, Back to sleep, Exercise, Exposures (alcohol, tobacco, illicit substances), Family planning and Folic acid⁶. Thus, comprehensive postpartum care should include nutrition and dietetics services to encourage women to breastfeed for at least six months, to get adequate physical activity, and to consume a nutrient-dense diet. Dietary quality and access to foods remain topics of importance during this period of the lifecycle. Strategies to improve iron status may be beneficial for women between pregnancies to restore iron transferred to the fetus and lost during labor and delivery. Returning to a healthy weight in a reasonable time frame of approximately six months¹³ is important given the increasing evidence regarding postpartum weight retention and the impact of weight status on subsequent pregnancies.

An overall focus on the woman's wellbeing and her overall health is important. Since the woman is often the gate keeper for family health, advice and support for her role is key. Referral to and assistance in finding resources to avoid food and nutrition insecurity such as WIC and other services is needed for families with limited resources.

Key nutrition counseling topics during the postpartum period:

- The risk of SIDS and overall post natal death is 56 percent higher among infants who have never been breastfed¹⁴.
- Exclusive breastfeeding reduces infant mortality from common childhood illnesses such as diarrhea or pneumonia and helps promote a faster recovery from illness. It is associated with the development of a preterm infant's immature host defense¹⁵.
- Women should resume moderate to vigorous physical activity based on their method of delivery and required time of recovery. A total of 60 minutes of activity is recommended, and can be achieved through multiple short sessions of at least 10 minutes, or longer sessions, depending upon what their daily schedule allows.
- Women should consume a multivitamin-mineral supplement in addition to consuming a healthy diet to assure replenishment of lost nutrient stores and adequate nutrient intake to support lactation.
- General prenatal dietary advice (as outlined above) should be recommended to help women achieve and maintain a healthy diet and healthy weight.

Expanding the Role of Nutrition in Preconception and Interconception Care

It is critical that nutrition and dietetics professionals who address women's health strive to integrate nutrition into existing programs and services. Clinical and public health nutrition efforts are both vital in reducing birth defects and low birth weight

increasing breastfeeding rates and duration and minimizing maternal complications. Clinical interventions include working as part of the health care team to assist a woman in controlling her diabetes, hypertension, or other chronic conditions prior to and during pregnancy. Some efforts such as supporting use of folic acid prior to conception and achieving and maintaining a healthy body weight may be accomplished in both clinical and public health settings.

Public health nutrition professionals also participate in activities that support community and environmental change strategies, such as campaigns to educate professionals and women about the 2009 IOM weight gain guidelines or creating environments where healthy eating is the easy choice. Preventing infant mortality requires a systems approach that removes critical barriers to pregnant women receiving adequate nutrition. These barriers include access to health care, access to healthy foods, professional training and education, strengthening of referral and care coordination systems, and an overall integration of nutrition into a life course perspective within health and public health systems.

The Association of State Public Health Nutritionists' brief *The Role of Nutrition in Infant Mortality: A Public Health Perspective* served as the basis for some of the information presented in this article and was used with permission.

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FNCE® 2015 HIGHLIGHTS
Clockwise: Welcome address from Academy President: Dr. Evelyn F. Crayton; WH DPG Treasurer Dawn Ballosingh at the DPG/MIG Showcase; Spotlight Session Speakers: Jamie Stang and Helene Kent; Spotlight Session Speaker: Jamie Stang; WH DPG Nominating Committee Chair Maria Bournas, WH DPG Mentoring Coordinator Judy Simon and WH DPG Report Book Review Author, Carrie Dennett at the DPG/MIG Showcase.



COMMITTEE FOR PUBLIC HEALTH/COMMUNITY NUTRITION: Interview with Chair, Helene Kent, MPH, RDN

The Committee for Public Health/Community Nutrition, in collaboration with other Academy organizational units, will promote and support issues and activities related to public health nutrition and community nutrition that impact the profession and the Academy. The committee is comprised of eight appointed Academy members with expertise in public health nutrition and community nutrition, e.g., food and nutrition security, environmental change, health equity, cultural competence and academia.

One member of the Board will serve as communication link with the House of Delegates (HOD) and Board of Directors (BOD). Two members will serve as liaisons to the Public Health and Community Nutrition DPG (PHCNDPG) and Hunger and Environmental Nutrition (HEN) DPG. One member will have less than seven years' practice in one of the aforementioned practice areas. All members will be appointed for staggered three-year terms.

Functions

Oversee the HOD and BOD Action Plan for public health nutrition and community nutrition, and collaborate with Academy organizational units and external organizations to achieve the desired outcomes for the profession and the Academy.

Seek input and feedback from relevant Academy organizational units and external organizations on issues related to public health nutrition and community nutrition.

Provide direction to the profession for pursuing job opportunities in public health nutrition and community nutrition and dietetics.

Questions for Helene:

Can you tell us about the Academy's Committee for Public Health/Community Nutrition and when/why it was established?

This area of practice has long been an important discipline among members and is reflected in many of our Dietetic Practice Groups, including Women's Health. The Committee for Public Health/Community Nutrition (Committee) was created by the Academy BOD and HOD due to a recognized need to strengthen the focus in public health and community nutrition due to various external factors, such as the Affordable Care Act, the aging of the population, the escalation of food insecurity, and the surge in nutrition-related chronic diseases. The Committee works to provide relevant information and resources Academy-wide, and offers a formal mechanism to integrate a public health/community nutrition perspective into all Academy initiatives and activities.

The Academy BOD initially appointed a taskforce in fall 2011 to examine ways to increase the Academy's knowledge of public health/community nutrition practice. The Public Health/Community Nutrition Task Force (Task Force) first met officially in January 2012, and developed an action plan approved by the BOD in March of that year. The Task Force then submitted a proposal to the Academy's HOD for a mega-issue on public health/com-munity nutrition. This proposal was also approved and a session titled Public Health: It's Every Member's Business was held at the HOD meeting on October 16, 2012. The HOD leadership Team appointed another task force to address the outcomes of this meeting. As a result, a second plan focusing on enhanced public health knowledge and skills among the

membership was developed, which was approved by the HOD leadership Team at the 2013 meeting. Shortly thereafter the two action plans were merged and a proposal was submitted to the BOD to approve a standing Public Health/Community Nutrition Committee. The proposal was approved, and the Committee became effective in June 2014.

Please describe for us your role with the Committee and how your background made you a good fit for the role?

I am Chair this year – my second year as part of the Committee, and am fortunate to have a group of talented fellow Committee members plus great Academy staff support. I was a member of the planning groups that came about because of the initial HOD and BOD actions, and served as Chair-Elect in the Committee's first year.

I have always worked in public health, focusing on the areas of maternal and child health. As a consultant over the last 14 years, I have had the pleasure to work with a variety of clients that deepened my knowledge of public health and nutrition. As an Academy member, I have served as a DPG Chair, an Affiliate President and an HOD Area Coordinator, as well as my state's public health association President. All of these experiences helped make me a good fit for this role.

What are the current goals of the Committee?

- Work with other Academy units to promote and support issues and activities related to public health/community nutrition that impact the profession and the Academy.
- Work with DPGs, MIGs, and Academy organizational units to better integrate public health /community nutrition philosophies and focus into the Academy.
- Strengthen partnerships and work with external public health nutrition to support the profession and advocate for positions with public health nutrition and community nutrition expertise.
- Make information and resources available so that interested Academy members may strengthen their public health/community nutrition skills.

The Committee has an ambitious work plan:

- Develop a website and resource toolkit, including key readings and links to other information and materials developed by the Academy and others.
- Provide oversight to the implementation of the HOD, Food and Nutrition Security Action Plan.
- Promote the new SOP/SOPP for public health/community nutrition.
- Explore the feasibility of a specialty certificate in prevention.
- Participate in discussion with leaders at the US Health & Human Services and Health Resources Services Administration about how better to include RDNs in Bureaus of Health Workforce and Primary Healthcare Programs.
- Develop resources to describe the role and interests of public health/community nutritionists.

[Continued on page 7](#)

How can the Women's Health DPG and its members be involved with the Committee or help further its goals?

The Food and Nutrition Security Implementation Plan Task Force is mobilizing members in their communities to take action on food and nutrition security. We encourage all Academy members to participate in these activities on behalf of their DPGs and/or state affiliates.

Additionally, we encourage DPG leaders to send thoughts and ideas about how to strengthen public health/community nutrition activities within the Academy. The Committee is working closely with your DPG to make a difference.

Is there anything else you would like to share with us about the Committee and/or the Academy's vision for dietitians working in public health?

It is an exciting time to be involved in public health and community nutrition. Nutrition and food are receiving greater attention than ever before, and more opportunities to be engaged and proactive are emerging every day. I look to community and clinical partnerships, affordable care organizations and the strong focus on accountability to provide new opportunities for you and the profession.

50 YEAR MEMBERS

The Women's Health DPG would like to honor the following members who hold 51+ years of Academy membership!

Frances E. Eversen; member since 9/15/1965

Marilyn C. Holsipple, EdD, LDN; member since 6/1/1965

Bettie C. Stanislao, PhD, RDN, LN; member since 9/22/1960

Thank you for your longstanding dedication and involvement, and for helping lay the groundwork for the innovations and advances of nutrition and dietetics today.

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Brittany is a graduate public health student and Maternal and Child Health nutrition trainee at the University of Minnesota. She recently completed her field experience practicum with the Division of Maternal and Child Health Workforce Development and is passionate about improving health disparities within MCH populations.

Research suggests that nutrition before conception plays an important role in lifelong health and minimizes health risks to both mothers and their future infants.¹ Despite this knowledge, many women wait until after becoming pregnant to improve their diet and overall health. Due to the importance of optimizing a woman's nutritional lifestyle prior to conception, both clinical and environmental factors should target all women of childbearing age who might become pregnant in the future. Specifically, all women should have access to routine clinical preconception health care and a healthy environment that promotes dietary adequacy, supports achieving and maintaining a healthy weight, and incorporates nutrition as part of existing health care conditions.¹

Dietary adequacy is one important factor that influences positive fetal and maternal outcomes, and a varied, healthful diet before pregnancy is essential in ensuring a balanced diet throughout a mother's entire pregnancy.¹ Women of childbearing age should focus on eating nutrient-dense foods and beverages as recommended in the Dietary Guidelines for Americans, consuming adequate fruits and vegetables, calcium-rich foods, protein-containing foods, iron-rich or fortified foods, and folic-acid rich foods.² Specific nutrients women of childbearing age should pay particular attention to include:

- **Calcium:** Recommend supplementation if calcium-rich foods are not regularly consumed.³
- **Essential Fatty Acids:** Incorporate omega-3 and omega-6 fatty acids into the diet, for example 8-12 ounces of seafood weekly (no more than 6 ounces canned albacore tuna per week).³
- **Folic Acid:** All women of childbearing age are advised to consume 400 mcg of folic acid daily from fortified foods, supplements, or both to prevent serious birth defects that occur early in pregnancy when many mothers are not yet aware that they are pregnant.⁴
- **Iodine:** Recommend 150 µg daily of dietary iodine intake during preconception.³
- **Iron:** Screen all women at a preconception visit for iron-deficiency anemia in order to improve maternal-fetal outcomes.³

Achieving and maintaining a healthy weight also has a positive influence on maternal-fetal outcomes. A mother's prepregnancy weight impacts the risk of complications for both mom and baby during pregnancy and delivery. Research suggests that having an overweight or obese prepregnancy BMI increases risk for gestational hypertension, gestational diabetes, and large for gestational age infants. Therefore, preconception and interconception weight counseling should be provided by healthcare professionals to address risks of obesity during pregnancy and encourage

safe weight-reduction before pregnancy occurs.⁶ Weight loss discussions and counseling should be provided to all overweight or obese women and include both a focus on nutrition and promotion of appropriate physical activity.⁶

Nutrition also plays an important role in preconception clinical care of existing health conditions such as diabetes, hypertension and metabolic syndrome.¹ It is important that healthcare providers address nutritional components of these conditions in order to promote optimal health of both the mother and her future baby. Women of childbearing age with existing health conditions may require specialized dietary recommendations to ensure they are consuming adequate nutrients to support the proper growth of a fetus and limit complications in pregnancy.

Overall, nutrition is an extremely important component of preconception health that should be considered by all women of childbearing age whether or not they plan to become pregnant. About half of all pregnancies in the United States are unplanned, which gives further importance to the aim for all women to consume an adequate diet, strive to attain and maintain a healthy weight, and pay close attention to nutritional components of any existing health conditions in order to optimize health outcomes in future pregnancies.

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The Virtual Breastfeeding Culture: Seeking Mother-to-Mother Support in the Digital Age, by Lara Audelo, CLEC

Breastmilk is the best first food for babies. Support is vitally important for all new mothers and breastfeeding mothers who are supported by family, friends, and their community are better able to meet their breastfeeding goals. Yet, where can a new breastfeeding mother turn for support if family or close friends aren't an option for her? What if a woman is the first in her family to breastfeed for generations – or ever? What if her friends opted to offer formula – by choice or due to their own lack of breastfeeding support?

Other women have access to lactation consultants as resources, but again, it's no guarantee. A new mother may find herself receiving conflicting or non-evidence-based advice from a variety of hospital staff during her stay, or feel pressured to choose formula over breastfeeding. More and more women are turning to the Internet for health advice, so perhaps it's no surprise that many find breastfeeding support through websites, online forums and social media.

Lara Audelo personally benefitted from the support of her sister when she chose to breastfeed her first child, but found herself seeking online support a few months later after relocating to a new city. Soon she was offering her own learned advice to other mothers, which led to her to become a certified lactation education counselor (CLEC), and ultimately to write this book.

Most of her book, *The Virtual Breastfeeding Culture: Seeking Mother-to-Mother Support in the Digital Age*, is presented in the form of breastfeeding stories directly from mothers, detailing how internet and social media resources contributed to their successes. While the book is aimed at healthcare professionals, its writing style and information is also approachable for non-professionals. The first few chapters address commonly experienced breastfeeding obstacles, including lack of prior exposure to breastfeeding and pumping while working (especially when the workplace isn't supportive). Where the book excels is in the chapters that give an up-close look at less-common barriers.

The chapter "Breastfeeding After Losing A Child" addresses experiencing a miscarriage while still breastfeeding a previous child, donating milk after the death of an infant, and breastfeeding two children of different ages (tandem nursing). "Breastfeeding Premies in the NICU" covers the stress and emotional toll of delivering a premature infant, as well as the particular value of breastmilk for premature infants. And "Food Sensitivities" discusses the frustrations of trying to keep a detailed food log during an elimination diet designed to find foods in the mother's diet that might trigger sensitivities in her infant via breastmilk.

When is breastfeeding not breastfeeding? The chapter "Exclusive Pumpers" offers stories of women who feed their infants breastmilk – but not directly from the breast. Mothers might exclusively pump because of physiological barriers, inability to successfully breastfeed in the crucial post-partum window, or for personal beliefs. No matter the reason, it's often hard for these mothers to find other women they can relate to in the non-digital world. Similarly, women who share their breastmilk find themselves in sensitive territory because of societal reservations about women donating to other women's infants. The "Milk Donors" chapter presents the viewpoints of one mother who accepted donated milk, and of another mother who donated her excess milk.

Physiological obstacles can stop breastfeeding in its tracks without adequate support. "Too Little, Too Much: IGT and BFAR" looks at the difficulties of breastfeeding in women who have trouble producing enough milk due to breast reduction (breastfeeding after reduction, or BFAR) or the condition known as Insufficient Glandular Tissue (IGT). On the other hand, it can be the infant who has a physiological barrier. The chapter "All Tied Up: Tongue Tie and Lip Tie" looks at babies with these conditions who can't latch properly, usually resulting in sore, cracked and bleeding nipples for their mothers, and sometimes in poor weight gain for the infants.

A woman's mental and physical health plays an important role in her ability to breastfeed, and the book offers real-life perspectives on two common issues in "Breastfeeding with Depression or Mood Disorders." This chapter provides insight into how post-partum depression or mood swings can impact a mother's ability to nurse or even bond with her infant. "The Unexpected While Pregnant" presents the perspective of women whose pregnancies did not go as expected or hoped due to hyperemesis gravidarum, extended bedrest, or pre-term delivery.

The Virtual Breastfeeding Culture: Seeking Mother-to-Mother Support in the Digital Age wraps up with a chapter on why social media is necessary for today's lactation consultants, with tips for getting started and a list of digital, print and organizational resources. This book will be a valuable resource for RDNs who work with expecting or new mothers. Not only will it expand knowledge and understanding of obstacles to breastfeeding, it will help RDNs guide patients/clients to reliable online resources.

Asemi Z, Karamali M, Jamilian M, Foroozanfard F, Bahmani F, Heidarzadeh Z, Benisi-Kohansal S, Surkan PJ, Esmailzadeh A. Magnesium supplementation affects metabolic status and pregnancy outcomes in gestational diabetes: a randomized, double-blind, placebo-controlled trial. *Am J Clin Nutr.* 2015;102(1):222-229.

In the US, gestational diabetes mellitus (GDM) affects up to 9.2% of pregnant women.¹ GDM poses important health risks to both the mother and her fetus and infant.² Pregnancy induces a general state of inflammation as a result of hormones that are elevated in pregnancy. These hormones can induce the glucose intolerance and insulin resistance that is indicative of GDM as well as hyperlipidemia. Magnesium is a known cofactor for enzymes that control blood glucose, and hypomagnesemia has been shown to trigger low-grade systemic inflammation, which in turn is also associated with decreased insulin sensitivity.³ Epidemiological studies have shown that higher magnesium intake decreases risk of type 2 diabetes, but clinical trials are limited and magnesium supplementation in GDM had not previously been explored.³ The study conducted by Asemi, et al.,⁴ highlighted in this issue's Research Brief, examines the effect of magnesium supplementation among Iranian women with GDM on their metabolic profiles and pregnancy outcomes.

Researchers enrolled pregnant women in Kashan, Iran to participate in a double-blind, randomized, placebo-controlled trial. To be eligible, women had to be between 18 and 40 years old at 24-28 weeks gestation, and diagnosed with GDM by a "one-step" 2-hour 75-gram oral glucose tolerance test. Sample size calculations determined a need for 35 women per group (70 total), which would allow for up to 5 dropouts per group.

Participating women were randomized to receive tablets daily containing either 250 mg magnesium (magnesium oxide) or a placebo for six weeks. All women in the study consumed 400 µg/day of folic acid and 60 mg/day of iron (ferrous sulfate), continued any supplements previously started in the pregnancy, and were instructed not to consume additional supplements. Participants received daily cell phone reminders to take their supplements to encourage compliance. Compliance was checked by measuring serum magnesium concentrations, and by collecting and counting remaining tablets. Furthermore, participants were instructed not to alter their routine physical activity or usual diet during the course of the study. Dietary recalls and physical activity records were provided by participants at weeks 2, 4, and 6 of the intervention to verify compliance.

Fasting blood samples were collected from each participant at baseline and at the study's end to measure serum magnesium, glucose, insulin, lipid profiles, high-sensitivity C-reactive protein (hs-CRP), and several other biomarkers of oxidative stress. Insulin resistance and sensitivity was measured using 3 different indices: homeostatic model assessment for insulin resistance (HOMA-IR), homeostasis model of assessment-estimated β -cell function (HOMA-B), and the quantitative insulin sensitivity check index (QUICKI). Although the intervention lasted only 6 weeks, women were followed to delivery to collect information about pregnancy outcomes and health of the newborn, including presence of hyperbilirubinemia.

Statistical analyses were completed on an intention-to-treat basis. Mixed-model, repeated-measures ANOVA was used to examine the effects of magnesium supplementation on maternal metabolic markers. Maternal baseline values of age and weight were controlled for in these analyses. Chi-squared tests were used to assess the effect of magnesium supplementation on pregnancy outcomes.

Seventy women were enrolled in the study, with 35 randomized to each group. In total 6 participants (3 from each group) dropped out due to personal reasons, hospitalization, and/or starting insulin therapy. However, consistent with intention-to-treat methods, all participants were included in analyses. Participants had a mean age of 29.3 years, and prepregnancy weight and BMI of 70.1 kg (154.5 lb) and 27.2 kg/m², respectively. The only difference between the two groups at baseline was for serum magnesium concentration – the magnesium group had a lower concentration (1.32 mg/dl in magnesium group vs. 1.62 in placebo group). No differences were observed between the two groups in dietary intakes of energy, carbohydrates, proteins, fats, fiber, or magnesium from foods throughout the study. There was a high rate of compliance, with 100% of tablets consumed in both groups.

After the 6-week intervention, the magnesium group had a statistically significant increase in serum magnesium compared to the placebo group. Additionally, the magnesium group had a significant improvement (decrease) in fasting plasma glucose, serum insulin, HOMA-IR, HOMA-B, and an improvement (increase) in QUICKI scores compared to the placebo group. Furthermore, detrimental changes to serum triglycerides, VLDL, and hs-CRP were blunted in the magnesium group compared to the placebo group; although no other blood lipids differed between groups. Controlling for baseline magnesium concentrations did not result in substantial changes in these results.

Two infant outcomes were statistically different between the groups: infants of mothers in the magnesium group had a lower incidence of newborn hyperbilirubinemia, and also a lower newborn hospitalization rate. No other pregnancy outcomes differed, including maternal need for insulin therapy, cesarean rate, gestational age, and newborn hypoglycemia.

The strengths of this study included an adequate sample size and blinding of participants and researchers. However, there are some limitations. Serum magnesium concentrations are not accurate in reflecting magnesium intake. Erythrocyte or intracellular magnesium concentrations are considered better markers of magnesium status. Additionally, multiple comparisons in analyses were also not accounted for, which may have inflated type I error.

Based on serum magnesium concentrations, all of the women in the study were magnesium deficient at both the study's baseline and end, which must be taken into account in interpreting results and considering generalizability. It is unknown whether magnesium supplementation may have similar effects in magnesium replete women. In the US, NHANES data showed that 46% of pregnant women had magnesium intakes below the estimated

Continued on page 11

average requirements (255 mg for 19-30 years, 265 for 31-50 years).⁵ However, many pregnant US women take prenatal vitamins that contain magnesium. Thus, further studies are needed to understand the effect of magnesium supplementation on women with GDM in the US or similar contexts.

In conclusion, the findings of this study indicated that in magnesium-deficient women with GDM, magnesium supplementation for 6 weeks resulted in improved markers of carbohydrate metabolism (improved insulin sensitivity), improved serum triglyceride and VLDL concentrations, and was associated with decreases in newborn hyperbilirubinemia and hospitalizations.

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MENTORING PROGRAM

Women's Health DPG membership includes dietitians with amazing depth of knowledge and experience in all areas of women's health in a variety of health care and public health settings. We hope you are interested in sharing your expertise with a member who is looking for a mentor. Your participation as a mentor or mentee can provide you with an opportunity to expand your career expertise and satisfaction.

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What is a mentee? An inquisitive member who seeks guidance and advice from a mentor.

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Asking the Right Question: Finding Answers with the Academy's Dietetics Practice Based Research Network

As the nutrition experts, the public depends on Registered Dietitian Nutritionists (RDNs) for answers that impact their health and well-being. On any given day, you may answer a variety of nutrition questions from your patients, colleagues, or even from your own family and friends. Some questions are likely easy for you to address given your training and experience, but other queries may send you searching for answers. Nutrition is an evolving and dynamic field where new research is constantly required to advance our profession. Sometimes you can find the answers to your questions by accessing resources such as the Academy of Nutrition and Dietetics' Evidence Analysis Library, but sometimes the answers don't yet exist.

The Dietetics Practice Based Research Network (DPBRN) has three different pathways to help you find answers to the questions important to your professional practice. Learn about the pathways below to find the option that fits your question. Then find out about pathway projects made possible by members like you.

Pathway 1: Submit a Question

"I have a question that I would like someone else to take the lead in answering"

The DPBRN recognizes that practitioners know the important and relevant questions to their work, but may not always have the time or the expertise to take a research project from start to finish. The DPBRN wants to know what research questions you think we should answer. You can submit your question to us [here](#). It can be helpful to create your research question using the PICOTS format (see text box).

P-Population	<u>Original Question:</u> Is a MyPlate promotion or a local food promotion better at encouraging children to eat fruits and vegetables?
I-Intervention	
C- Comparison	<u>PICOTS Format:</u>
O-Outcome	Are elementary age children (P) exposed to local food identification signs (I) versus those exposed to MyPlate signs (C) more likely to have increased fruit and vegetable consumption (O) over a one month long (T) point-of-sale school cafeteria (S) intervention?
T-Time	
S-Setting	

Depending on the status of existing projects and the group's priorities, the DPBRN may follow up by suggesting the question to a student for investigation or designing a study to answer the question.

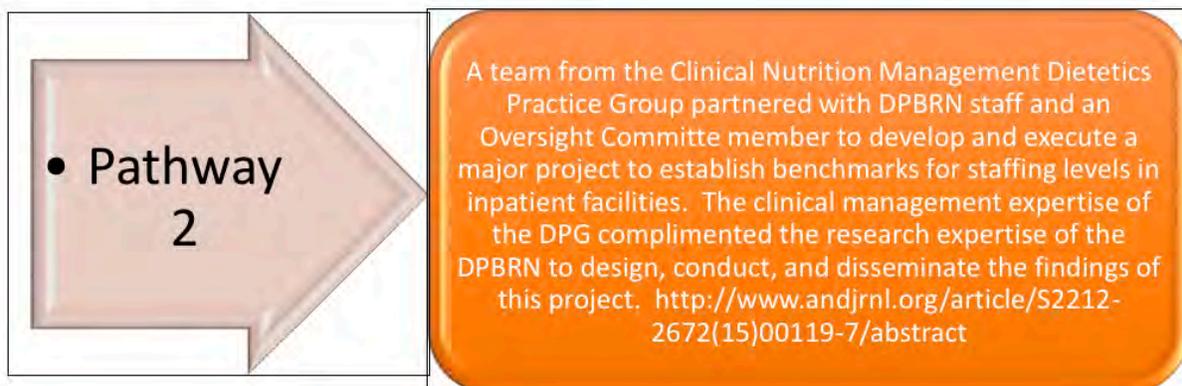
Pathway 1 is a means of generating a list of meaningful, important research questions. For more immediate answers to practice-based questions, Academy members can consider contacting the [Academy's Knowledge Center](#).



Pathway 2: In Depth Network Planning Participation

"I have an idea and I'm interested in the possibility of collaborating with DPBRN to answer the question"

Contact a DPBRN staff member at DPBRN@eatright.org to discuss the possibility of collaborating with the network on your project. To begin the discussion, consider defining your research question in PICOTS format and preparing a list of goals to provide an outline for the conversation. Don't let lack of funding hold you back. Although your project must be funded to be executed, the DPBRN can assist with the grant application process. After your initial phone call, if you and the network staff agree your project is a good match to the DPBRN's goals and expertise you will be asked to [complete and submit this form](#) to formally begin a collaboration. This form will be reviewed by the DPBRN Oversight Committee and if approved, a planning committee will be formed to develop a project plan.



Pathway 3: Rapid Review

"I have a fully developed research proposal, funding and access to an IRB; I need DPBRN help with one or two aspects of the project"

The DPBRN offers a variety of services to researchers including protocol development, RDN recruitment and training, project management, and publication. Please [complete and submit this form](#) to request DPBRN services. Your application will be considered by the DPBRN Oversight Committee based on your project's goals, design, alignment with the [mission of the network](#), and potential impact. If approved, the network will provide the services for an agreed upon fee.

For more information, visit <http://www.eatrightpro.org/resource/research/evidence-based-resources/dpbrn/submit-a-project-idea-to-the-dpbrn>.

For research updates and resources please consider joining DPBRN. Simply email DPBRN@eatright.org with your Academy member number to request membership. You will receive monthly email updates of the DPBRN and notifications when there are new projects looking for participation by RDNs and students.

 <p>• Pathway 3</p>	<p>An individual RDN and nutrition researcher completed a study with the DPBRN on the research outcome expectations of pre-professional students, DPBRN members and dietetics researchers in order to better understand motivators for research involvement. The RDN worked with the DPBRN staff to create a data collection tool and recruit participants. IRB oversight was provided by the Investigator's university. A publication is pending.</p>
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