

ENSURING

THE HEALTH OF EXPECTANT MOTHER AND BABY

Learn more about the latest research on healthful weight gain and nutrition requirements to help improve pregnancy outcomes.

By Megan Tempest, RD



Ask any pregnant patient whether she's hoping for a boy or girl, and the answer might be "I'd like to have a girl, but it doesn't really matter as long as my pregnancy goes well, and I have a healthy baby." But what ensures the health of a pregnant woman and her developing child?

While numerous elements come in to play, good nutrition is an unequivocal determinant of a healthy pregnancy and baby. In fact, some theorize that good prenatal nutrition is a promising strategy

for preventing chronic disease worldwide.¹ As the female body accomplishes the remarkable feat of growing a human being, the nutritional ramifications are dramatic and far reaching.

For example, adequate intake of folic acid before and during pregnancy may reduce the incidence of devastating neural tube defects such as spina bifida and anencephaly by at least 50% to 70%.² Inadequate weight gain during pregnancy increases a woman's risk of having a low birth weight baby, in turn raising the child's odds of developing numerous health problems

and disabilities.³ Conversely, women who gain too much weight during pregnancy are at higher risk of having large babies, infants with low Apgar scores, cesarean section delivery, and postnatal weight retention.⁴ Long term, a poor diet during pregnancy may put offspring at risk for obesity, insulin resistance, type 2 diabetes mellitus, and cardiovascular disease later in life.⁵

The realm of opportunity is vast for dietitians to make a positive impact on the health of expectant mothers and their developing babies by promoting healthful eating and adequate hydration, the avoidance of certain foods that may threaten the pregnancy, the use of appropriate supplements, and physical activity. In the past year, a wealth of research has been published showcasing the relationship between nutrition, pregnancy outcomes, and fetal health and development. Here we'll discuss a handful of these studies that will help you and other nutrition professionals better counsel pregnant patients.

New Research on Maternal Weight Gain

What defines "healthy" weight gain during pregnancy? In 2009, the Institute of Medicine (IOM) published recommendations for total and rate of weight gain during pregnancy based on a woman's prepregnancy BMI (see sidebar). A statement from the IOM that accompanied those guidelines said, "To improve maternal and child health outcomes, women not only should be within a normal BMI range when they conceive but also should gain within the ranges recommended in the new guidelines. Meeting these challenges means that women will need preconception counseling, which may include plans for weight loss ... For many women, this will mean gaining less weight, which may be particularly challenging for women who are overweight or obese at conception."⁶

In the April issue of the American *Journal of Perinatology*, de la Torre and colleagues reported that weight gain beyond that recommended by the IOM guidelines was associated with an increased rate of pregnancy-related hypertension, a known threat to maternal and fetal health. Likewise, in the April issue of the *Maternal and Child Health Journal*, researchers from the Centers for Disease Control and Prevention (CDC) reported that the IOM weight gain guidelines were associated with a lower risk of having a large-for-gestational-age infant, although they noted there was a higher risk of having a small-for-gestational-age infant.

A woman's prepregnancy weight and subsequent weight gain during pregnancy is a key factor in pregnancy outcomes, according to a recent study by Mamun and colleagues published in September in *BMC Pregnancy and Childbirth*. An assessment of a population-based cohort of more than 6,600 women who gave birth in the early 1980s revealed that women who were obese before becoming pregnant or experienced excessive weight gain during pregnancy had an increased risk of pregnancy complications such as hypertension and gestational diabetes, cesarean delivery, high birth weight babies, and increased length of hospital stay.

IOM'S GUIDELINES FOR PREGNANCY WEIGHT GAIN⁶

- Underweight (BMI less than 18.5): 28 to 40 lbs
- Normal (BMI of 18.5 to 24.9): 25 to 35 lbs
- Overweight (BMI of 25 to 29.9): 15 to 25 lbs
- Obese (BMI equal to or greater than 30): 11 to 20 lbs

In May, Gaillard and colleagues published similar findings in the *Journal of Hypertension*, reporting that maternal obesity (defined as having a BMI of 30 to 34.9) and morbid obesity (having a BMI of 35 or higher) puts women at a higher risk of pregnancy-induced hypertension.

Dietitians undoubtedly have the knowledge, training, and skill set to help women manage healthful pregnancies. In the April issue of *The American Journal of Clinical Nutrition*, Phelan and colleagues published the Fit for Delivery study, revealing that behavioral interventions (in this case one face-to-face visit; mailed educational material promoting healthful weight gain, healthful eating, and exercise; and telephone support) during pregnancy can reduce excessive gestational weight gain and prevent postpartum weight retention.

According to Rosemary Riley, PhD, LD, senior manager of science programs at Abbott Nutrition Health Institute, helping women manage healthful weight gain during pregnancy is an opportunity dietitians have yet to fully maximize. "There's an immediate problem for mother and baby if mom is overweight or if she gains too much during pregnancy."

Riley believes the Fit for Delivery study demonstrates the significant challenge dietitians face in helping women manage weight gain during pregnancy. "[Fit for Delivery] had an excellent program and still had a challenge keeping women's weight gain within the recommended guidelines."

However, Riley applauds the evidence that many of the subjects enrolled in the study returned to their prepregnancy weight, suggesting that the lifestyle interventions in the program assisted women in achieving this goal. "Women who don't lose the weight gained from their first pregnancy are more likely to be overweight or obese going in to their second pregnancy," Riley says.

Focus on Fatty Acids

Just as the evidence demonstrates the need to maintain a healthful weight during pregnancy, there's a growing body of research supporting the critical need for adequate omega-3 fatty acid intake, in particular DHA, to ensure optimal fetal brain and eye development. Consensus guidelines have recommended that pregnant women consume at least 200 mg of DHA per day, which they can achieve by consuming one to two servings of

low-mercury seafood per week, a level of intake consistent with the FDA and Environmental Protection Agency advisory.⁷

Nutrition counseling from dietitians can impact an infant's fatty acid status, a fact evidenced in a recent study by Niini-virta and colleagues published in the July issue of *The Journal of Nutrition*. After analyzing a group of 90 women in the first trimester of pregnancy, the researchers observed that women who received intense dietary counseling had infants with higher serum levels of essential fatty acids.

The Salmon in Pregnancy Study, published in the October issue of *The American Journal of Clinical Nutrition*, sought to determine the effects of omega-3 fatty acid intake from oily fish on both maternal and umbilical cord plasma omega-3 fatty acid status. Women with an habitually low intake of oily fish were instructed to boost their intake to two servings per week of farmed salmon from 20 weeks gestation through delivery. Doing so led to an increase in their plasma levels of omega-3 fatty acids as well as that of their developing fetus.

Boucher and colleagues revealed exciting long-term health benefits of prenatal omega-3 fatty acid intake in their prospective longitudinal study of Inuit children in Arctic Quebec (a fish-eating community) published in the May issue of *The American Journal of Clinical Nutrition*. Children with higher umbilical cord plasma levels of DHA at infancy demonstrated higher memory function later on as school-aged children.

Demonstrating a possible relationship between adequate prenatal DHA and infant morbidity is a randomized controlled trial published in the September issue of *Pediatrics*. Comparing the effects of daily supplementation of 400 mg of DHA or placebo in pregnant women of 18 to 22 weeks gestation through birth, Imhoff-Kunsch and colleagues concluded that DHA may lower the incidence of colds in infants as well as shorten the duration of certain symptoms, such as coughing and fever.

A widely consumed plant-based source of omega-3 fatty acids is flaxseed. However, a recent animal study by Fernandes and colleagues published in the October issue of *Nutrition* revealed that flaxseed consumption during the perinatal (as well as post-weaning) period "improved spatial memory to the detriment of growth" of offspring, as evidenced by lower body mass—which the authors attribute to an imbalance between omega-3 and omega-6 fatty acids in the seed. The authors report a need for caution when encouraging maternal intake of flaxseed during pregnancy and lactation. The level of flaxseed intake that may pose risk during pregnancy is unknown.

Role of Vitamin D

Vitamin D deficiency during pregnancy has been the focus of ongoing research given its suspected link to numerous serious complications, such as preeclampsia, low birth weight, poor postnatal growth, and higher incidence of autoimmune disease in infants.⁸ Currently no safe level of supplemental vitamin D has been established or recommended during pregnancy; however, this topic is the focus of ongoing clinical investigation.

McGowan and colleagues, as reported in the September issue of the *European Journal of Clinical Nutrition*, assessed the adequacy of dietary vitamin D intake among pregnant women and observed that meat, eggs, and breakfast cereals are the most frequent contributors in this group. Despite the fact oily fish is considered the best food source of vitamin D, less than 25% of pregnant subjects consumed it. The findings suggest a need for adequate nutrition education to encourage vitamin D intake from more frequently consumed foods (compared to oily fish). In addition, the study's results question the role of vitamin D supplementation given their subjects' overall inadequate vitamin D intake.

In a 2011 issue of *Canadian Journal of Public Health*, Li and colleagues reported that pregnant women had suboptimal vitamin D levels despite the use of prenatal supplements providing at least 400 IUs/day, noting that "consideration should be given to increasing the amount of vitamin D in prenatal supplements."

Hollis and colleagues published findings of a double-blind randomized clinical trial assessing the safety and effectiveness of vitamin D supplementation during pregnancy in the October issue of the *Journal of Bone and Mineral Research*. Evaluating a group of 350 pregnant women from 12 to 16 weeks gestation through delivery, the team reported that vitamin D supplementation of 4,000 IUs/day is safe and most effective in achieving sufficiency in all women and their neonates regardless of race. A review by Hollis and Wagner, published in the December issue of *Current Opinion in Endocrinology, Diabetes and Obesity*, also concluded that a daily intake of 4,000 IUs of vitamin D₃ is necessary to achieve sufficient serum 25-hydroxyvitamin D levels (defined as 40 to 60 ng/mL).

Michelle Collins, PhD(c), CNM, RNC, an assistant professor of nursing, nursing midwifery specialty, at the Vanderbilt University School of Nursing, believes we'll learn more about vitamin D as time progresses. "The link that vitamin D deficiency may have with conditions like depression, preeclampsia, bacterial vaginosis, and gestational diabetes will be at the forefront in the coming years, I believe." Further research is warranted to establish the need, safety, and efficacy of prenatal vitamin D supplementation.

Counseling Expectant Moms

Given the latest research on weight gain and the nutrients needed for a healthful pregnancy and baby, expectant mothers often need help deciphering the information so they can apply it to their daily lives. Here our experts share their tips and insights for guiding women along a path to a good pregnancy outcome.

• **Strive for balance and variety.** Susanne Trout, RD, LD, IBCLC, a dietitian specializing in maternal nutrition, including women expecting multiples, breast-feeding, and infant nutrition at Texas Children's Hospital, considers the USDA's MyPyramid and MyPlate useful tools in teaching her patients what to eat from each food group. She advises women to ask themselves, "Am I getting all the major nutrients (carbohydrate, protein, and fiber) in each meal and snack? If not, what can I do to make that meal a more complete meal?"

Adrian Porter, RD, a consultant dietitian based in Akron, Ohio, whose specialties include prenatal nutrition, stresses variety as the foundation of a woman's eating plan during pregnancy. "This would include lean proteins such as poultry;" she says, "approximately two servings per week of omega-3 rich, low-mercury fish like salmon, mackerel, or sardines; and nuts and nut butters; whole grains; plenty of fruits and vegetables; and low-fat dairy," adding that women should use caution when eating nuts and nut butters if they have a family history of nut allergies.

• **Junk the junk food.** Porter speaks to the common misconception that pregnant women are free to eat more junk foods. "The reality is, while pregnancy does require more daily calories, it's vital that those calories come from nutrient-dense foods. There's nothing wrong with a treat, but I strongly encourage the consumption of healthful, nutrient-rich foods."

• **Consider supplements.** Are prenatal supplements absolutely necessary for all pregnant women? No, say our experts. According to Collins, the long-held belief that a pregnant woman must take a prenatal vitamin isn't a hard and fast rule. She explains, "The Institute of Medicine and the American College of Obstetricians and Gynecologists state that women with balanced diets don't need routine vitamin supplementation. Consider, though, how poor the diets are of many American women. I'm not sure too many women qualify as having balanced diets."

Trout agrees: "Most people on a day-to-day basis may not follow a healthful, balanced diet. The easiest way to cover for

the nutrients is to take a prenatal multivitamin."

When it comes to folic acid and iron supplementation during pregnancy, both Trout and Collins agree that it's necessary. Current research continues to demonstrate the critical importance of these two nutrients during pregnancy to prevent conditions like iron-deficiency anemia and birth defects.

• **Give clients the facts about weight gain.** Collins emphasizes the importance of achieving a healthful rate of weight gain. "I rarely see a pregnant woman whom I need to counsel about not gaining enough weight," Collins says. "It's all too common to see women who've gained considerably more than the recommended weight gain for pregnancy."

• **Inspire and motivate.** When bombarded with messages of what not to consume during pregnancy, women may benefit best from positive encouragement from healthcare providers and a reminder of what's at stake. Collins reminds her patients, "You have this one really golden opportunity to have a positive influence on how your child is formed. Make every bite count!"

— Megan Tempest, RD, is a freelance writer based in Colorado.

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