

Nutrition and Medicine, 2006
Tufts University School of Medicine
Pregnancy and Lactation:
Learning Objectives

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1. Identify the five most important nutrients that need to be increased in pregnant woman and the rationale for their importance.
2. Define the recommended weight gain for normal, underweight, and overweight women during pregnancy and the importance of each trimester of pregnancy.
3. Identify the body components that increase in weight during pregnancy.
4. List the practical points to emphasize in the dietary counseling of pregnant women.
5. Identify the important nutrients that are administered or monitored to the newborn in the first few months of life and why they are critical.
6. Identify the specific benefits of breast feeding including the specific immunological benefits. List how health professionals can promote breast feeding.
7. Define the adverse effects of smoking, alcohol, and drugs on pregnancy outcome.
8. Outline the components of a “therapeutic alliance” with your patient.
9. What are the practical points about dietary intake that you should make to your pregnant patients?

Pregnancy and Lactation: Answers to Learning Objectives

- 1. Identify the five most important nutrients that need to be increased in pregnant woman and the rationale for their importance.**
 - a. Calories:** Necessary for adequate weight gain, especially in the 2nd and 3rd trimesters. Mother's weight gain is strongly associated with birth weight of infant, which is the strongest indicator of survival in the first two years of life. (Caloric requirement +300/d.)
 - b. Protein:** Most of the weight gain of fetus is in muscle mass and visceral organs, which are mainly protein. Therefore, adequate protein intake is essential. In addition to the protein needs of the fetus, there is an increase in the mother of tissues such as the uterus, blood, placenta, and amniotic fluid, which have a high percent of protein. (Protein requirement +10 grams/d.)
 - c. Calcium:** The bone growth of the fetus depends on adequate calcium. In this case the fetus will get what it needs at the expense of the mother. If the mother's intake of calcium (and vitamin D) is consistently low, she will have bone loss and may have some changes in the jaws and teeth. (Calcium requirement = 1000 mg/day, which is the same for a woman of child-bearing years.)
 - d. Folate:** Folate is critical in the first trimester to prevent neural tube defects. Folate seems to be the most important within the first few weeks of pregnancy, when many women are unaware that they are pregnant. (Over 70% of pregnancies are unplanned.) It is, therefore, important that women in their childbearing years maintain adequate levels of this nutrient. According to nutrition surveys, most women in the U.S. do not meet the DRI for folate. Flour is now supplemented with folate, but follow-up studies on folate status in the female population since supplementation have not been carried out. (Folate requirement during pregnancy +200 ug/d to 600 ug/d.)
 - e. Iron:** Adequate iron intake is crucial to meet the increased needs of the mother during pregnancy and to maintain adequate iron stores. During the last trimester of pregnancy, the mother's iron stores are transferred to the fetus. This reserve serves the infant to about 6 months of age and prevents iron-deficiency anemia. This is important because breast milk is low in iron. The higher the iron stores in the mother, the more adequate the transfer and the infant stores. (Iron requirement during pregnancy +9 mg/d to 27 mg/d which is most adequately met by iron supplementation in prenatal supplements.)

Also Important:

- f. Vitamin B₆:** Low levels may result in increased nausea and vomiting during pregnancy and is associated with low APGAR Score at birth (health of baby). (B₆ requirement during pregnancy +.6 mg/d to 1.9 mg/d.)
- g. Zinc:** Low levels are associated with increased risk of toxemia (high blood pressure of pregnancy) and decreased cell mediated immunity. (Zinc requirement during pregnancy +3-5 mg/d to 11-13 mg/d.)

2. Define the recommended weight gain for normal, underweight and overweight women during pregnancy and the importance of each trimester of pregnancy.

- a.) Normal weight women (BMI of 18.5-24.9) should gain 25-35 lbs.
- b.) Underweight women (BMI <18.5) should gain 28-40 lbs.
- c.) Overweight women (BMI > 25) should gain 15-25 lbs.
- d.) Weight gain is most critical in the 2nd and 3rd trimesters when the mother should gain one pound per week, on average. Lack of weight gain or loss of weight at these times can result in significant risk to the fetus. (Brain development occurs in last trimester.)

3. Identify the body components that increase in weight during pregnancy.

The proportion of the total weight gain during pregnancy can be attributed to each of the following components:

- a.) **Fetus:** 25-27%
- b.) **Placenta:** 5%
- c.) **Amniotic Fluid:** 6%
- d.) **Expanded blood volume:** 10%
- e.) **Growth of uterus and breast:** 11%
- f.) **Increased extra-cellular fluid:** 13%
- g.) **Increased material fat stores:** 25-27%

4. List the practical points to emphasize in the dietary counseling of pregnant women.

- a.) The importance of weight gain and pattern of weight gain on the health outcome of the baby. It's important to eat enough calories from nutritious foods to attain this weight gain (1.5-3 lb first trimester, rate of .8 lb weekly during second and third trimesters.)
- b.) Do not try to reduce weight during pregnancy.
- c.) The importance of a high quality diet to meet the needs of the infant, especially for protein, calcium, folate, and iron. This means choosing foods from each of the food groups -- fruits, vegetables, milk products, adequate protein, and starchy foods. Whole grains and cereals are important for iron, trace minerals, and fiber. (Constipation is common during pregnancy.)
- d.) Avoid skipping meals, especially breakfast.
- e.) Adjust food habits as necessary to minimize discomfort associated with eating, but don't let this interfere with recommended nutrient and caloric intake.
- f.) Drink generous amounts of fluid.
- g.) Counsel against use of alcohol, drugs, unnecessary medication -- check with physician.
- h.) Do not smoke.
- i.) Take nutrient supplements as prescribed.

5. Identify the important nutrients that are administered or monitored to the newborn in the first few months of life and why they are critical.

- a.) **Vitamin K:** at birth to guard against hemorrhagic disease
- b.) **Vitamin D:** supplement started in the first month after birth

6. Identify the specific benefits of breast feeding including the specific immunological benefits. List how health professionals can promote breast feeding.

Benefits of breast feeding:

- a.) Breast milk is nutritionally superior to any alternative.
- b.) Breast milk is bacteriologically safe and always fresh.
- c.) Breast milk contains a variety of anti-infectious factors and immune cells:
 - Contains immunoglobulins, IgA, IgM, IgG
 - Contains lysozymes and other enzymes including lactoferrin
 - Contains immunoregulatory substances
 - Contains macrophages which contain IgA, lysozymes, and lactoferrin
 - Provides immunity to agents that developed antibodies in the mother, which are transferred to the infant
- d.) Breast milk is more readily digestible for the infant.
 - It increases the development of beneficial intestinal bacteria, especially bifidobacteria due to the presence of the bifido factor in milk
- e.) Breast-fed babies are least likely to be overfed.
- f.) It is more economical.
- g.) It is more convenient.
- h.) It improves mother-child bond.
- i.) Helps develop the sucking pattern which promotes development of the infant's mouth and jaw.
- j.) Provides the important omega-3 fatty acids.
- k.) Breast-feeding triggers the release of hormones which help the mother's internal organs return to their original state.

What a professional can do:

- a.) Become knowledgeable about the benefits of breast feeding.
- b.) Talk to your pregnant patients early about breast feeding.
- c.) Provide support to the patient.
- d.) Learn how to help women successfully breast-feed.
- e.) Help your hospital provide a supportive atmosphere for breast-feeding.
- f.) Know which medications are not safe during lactation.
- g.) Help patients begin breast-feeding within one hour of delivery.

7. Define the adverse effects of smoking, alcohol, and drugs on pregnancy outcome.

- a.) **Smoking:** Results in low birth weight babies, which is an indicator of increased risk of morbidity and mortality in the first two years. It also increases risk of abortion and prematurity. May increase infant sudden death, especially when parents smoke in the presence of the infant.
- b.) **Alcohol:** Can result in low birth weight and increased risk. Also can result in fetal alcohol syndrome with growth retardation, decreased muscle coordination, and mental retardation. Even small amounts of alcohol can result in some of these outcomes.
- c.) **Drugs:** Have variable effects depending on the drug, but all increase risk to the fetus. The most damaging is cocaine and crack cocaine. Growth retardation is common, as well as spontaneous abortion and premature labor.

- 8. Outline the components of a “therapeutic alliance” with your patient.**
- a.) Be a good listener.
 - b.) Be supportive.
 - c.) Ask open-ended questions. Respond to her concerns with information and follow-up.
- 9. What are the practical points about dietary intake that you should make to pregnant patients?**
- a.) Increase your total **Calorie** intake mainly by increasing high quality **Protein** foods such as chicken, fish, lean meats, low fat cheese, cottage cheese and regular yogurt.
 - b.) Increase **Calcium** rich foods such as low fat dairy products (milk, yogurt and cheese), and green leafy vegetables.
 - c.) Increase **Folate** intake by increasing intake of green leafy vegetables, oranges and strawberries. A diet high in these foods is most important prior to becoming pregnant.
 - d.) Increase **Iron** intake by increasing lean red meats, legumes, and prunes or prune juice.
 - e.) Remember to consume a **High Quality Nutrient Dense Diet**.

Useful Website:

Women, Infants and Children: Information on Breastfeeding and Promotion:

<http://www.fns.usda.gov/wic/Breastfeeding/breastfeedingmainpage.HTM>