



Nutrition & Diet Therapy

Third Stage

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Lecture six : Nutrition for a Lifetime : Pregnancy and Lactation

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Nutrition during pregnancy

Good nutrition during the **38 to 40** weeks of a normal pregnancy is essential for both mother and child. In addition to her normal nutritional requirements, the pregnant woman must provide nutrients and calories for **the fetus (infant in utero)**, **the amniotic fluid (surrounds fetus in the uterus)**, **the placenta (organ in the uterus that links blood supplies of mother and infant)**, and the increased blood volume and breast, uterine, and fat tissue. It is also thought that the woman who consumed a nutritious diet before pregnancy is more apt to bear a healthy infant than one who did not. Malnutrition of the mother is believed to cause decreased growth and **mental retardation (delayed in mental development)** in the fetus. Low-birth-weight infants (less than 5.5 pounds) have a higher mortality (death) rate than those of normal birth weight.

Nutrition during pregnancy

During pregnancy, a woman's body undergoes major physiological changes, such as:

- ▶ increased blood volume.
- ▶ increased breast size, and levels of several hormones.
- ▶ these adaptations enable her body to nourish and maintain the developing embryo/fetus
- ▶ as well as produce milk for her infant after its birth.

Nutrition during pregnancy

- ▶ CHO (ideally, 175 grams or more per day and certainly no less than 135 grams) is necessary to fuel the fetal brain and spare the protein needed for fetal growth.
- ▶ Protein for pregnancy is 25 grams per day higher than for nonpregnant women (animal & plant foods).
- ▶ Fat, the brain contains a substantial amount of lipid material and depends heavily on long chain omega-3 and omega-6 fatty acids for its growth, function, and structure.

Nutrition during pregnancy

- ▶ Vitamin B12 is only slightly increased for pregnant and lactating women. The placenta appears to concentrate vitamin B12 because serum levels in the newborn are about twice the maternal levels.
- ▶ The recommendations of 4 mg of folic acid daily prevented 72% of neural tube defects in infants of women who have already delivered a child afflicted with the defect.
- ▶ Vitamin D and the minerals involved in building the skeleton: calcium, phosphorus, magnesium, and fluoride are in great demand during pregnancy. Insufficient intakes may produce abnormal fetal bone growth and tooth development.

Nutrition during pregnancy

- ▶ The net iron cost of a singleton (one fetus) pregnancy is estimated at 1 gram. Besides supporting the mother's increased blood volume, iron supports the red blood cells in the fetus, placenta, and umbilical cord.
- ▶ As part of thyroid hormones, iodine is essential to the control of metabolism. A pregnant woman's usual need for iodine is met by the use of iodized salt. Severe maternal deficiency can cause cretinism in the newborn.
- ▶ Fluoride crosses the placenta so that the concentration in fetal circulation is one-fourth that of the mother; fluoride is found in fetal bones and teeth.

Nutrition during pregnancy

- ▶ **Vitamin A** excess in pregnant woman has been related to birth defects. Vitamin A as retinol or retinoic acid in excess of 10,000 IU per day or treatment with isotretinoin during the first trimester increases the risk of **retinoic acid syndrome**. The characteristic fetal deformities include the following:
 - ▶ ■ **Small or no ears**
 - ▶ ■ **Abnormal or missing ear canals**
 - ▶ ■ **Brain malformation**
 - ▶ ■ **Heart defects**

Weight Gain during Pregnancy

Weight gain during pregnancy is natural and necessary for the infant to develop normally and the mother to retain her health.

- ▶ The average weight gain during pregnancy is 25 to 35 pounds. During the first trimester (3-months period of pregnancy) of pregnancy, there is an average weight gain of only 2 to 4 pounds. Most of the weight gain occurs during the second and third trimesters
- ▶ A pregnant adolescent (ages of 13 - 20) who is still growing should gain more weight than a mature woman of the same size.
- ▶ Underweight women should gain 28 to 40 pounds.
- ▶ Women of average weight should avoid excessive weight gain and try to stay within the 25- to 35-pound average gain.
- ▶ If the woman is pregnant with twins, then the recommended weight gain is 35 to 45 pounds.
- ▶ Overweight women can afford to gain less than the average woman, but not less than 15 pounds.

TABLE 11-4 Recommended Weight Gains Based on Prepregnancy Weight

Pregpregnancy Weight	Recommended Weight Gain	
	For Single Birth	For Twin Birth
Underweight (BMI <18.5)	28 to 40 lb (12.5 to 18.0 kg)	Insufficient data to make recommendation
Healthy weight (BMI 18.5 to 24.9)	25 to 35 lb (11.5 to 16.0 kg)	37 to 54 lb (17 to 25 kg)
Overweight (BMI 25.0 to 29.9)	15 to 25 lb (7.0 to 11.5 kg)	31 to 50 lb (14 to 23 kg)
Obese (BMI \geq 30)	11 to 20 lb (5 to 9 kg)	25 to 42 lb (11 to 19 kg)

Common Nutrition-Related Signs of Pregnancy

- **Nausea.** This type of nausea is commonly known as morning sickness, but it can occur at any time.
- **Constipation**
- **Heartburn**
- **Pica** which is mean the compulsive ingestion of nonfood items, usually dirt, clay, laundry starch, baking soda, or ice. It is an ancient behavior and a regional practice that is mainly influenced by culture

To Alleviate the Nausea of Pregnancy:

- On waking, arise slowly.
- Eat dry toast or crackers.
- Chew gum or suck hard candies.
- Eat small, frequent meals whenever hunger strikes.
- Avoid foods with offensive odors.
- When nauseated, do not drink citrus juice, water, milk, coffee, or tea.

To Prevent or Alleviate Constipation:

- Eat foods high in fiber.
- Exercise daily.
- Drink at least 8 glasses of liquids a day.
- Respond promptly to the urge to defecate.
- Use laxatives only as prescribed by a physician; avoid mineral oil—it carries needed fat-soluble vitamins out of the body.

To Prevent or Relieve Heartburn:

- Relax and eat slowly.
- Chew food thoroughly.
- Eat small, frequent meals.
- Drink liquids between meals.
- Avoid spicy or greasy foods.
- Sit up while eating.
- Wait an hour after eating before lying down.
- Wait 2 hours after eating before exercising.

❖ **Rapid physical growth characterizes infancy, the life stage that extends from birth to about 2 years of age. During the first 4 to 6 months of life, a healthy baby doubles its birth weight, and by one year of age, an infant's birth weight has tripled. Additionally, an infant's length increases by 50% during its first year of life.**

❖ **Compared to older children, an infant needs more energy and nutrients, per pound of body weight, to support its rapid growth. If an infant's diet lacks adequate energy and nutrients, the baby's growth may slow or even stop.**

Infants Nutrition

Lactation (The Milk Production Process)

- ▶ When an infant suckles, nerves in the mother's nipple signal her brain to release **prolactin** and **oxytocin** into her bloodstream. **Prolactin** stimulates specialized cells in breasts to form milk. These cells carry out the lactation process by synthesizing some nutrients and removing others from the mother's bloodstream and adding them to her milk. **Oxytocin** plays a different role in establishing successful lactation. This hormone signals breast tissue to "let down" milk. The letdown reflex enables milk to travel in several tubes (ducts) to the nipple area. Human milk is uniquely formulated to meet the nutrient needs of a newborn baby.

Colostrum

- **Colostrum** is the first milk that is produced after birth for 3-5 days. It is a yellowish fluid that is rich in antibodies, and it gives the infant his or her first immune boost.
- **Colostrum** also contains a substance that encourages the growth of a type of bacteria, *Lactobacillus bifidus*, in the infant's GI tract. Such biologically active substances help an infant's body fight infections and hasten the maturation of the baby's immune system.

Advantages of Breastfeeding for Infants

- Is free of bacteria as it leaves the breast.
- Supplies antibodies and immune cells.
- Is easily digested.
- Reduces risk of food allergies, especially to proteins in infant formulas and cow's milk.
- Changes in composition over time to meet the changing needs of a growing infant.
- Contains zinc, iron, and other minerals in highly absorbable forms.
- Decreases risks of ear, intestinal, and respiratory infections.
- May reduce the risk of asthma, obesity, and type 1 diabetes in childhood.

Advantages of Breastfeeding for Mothers

- **Reduces uterine bleeding after delivery.**
- **Promotes shrinkage of the uterus to its prepregnancy size.**
- **Decreases the risk of breast cancer (before menopause) and ovarian cancer.**
- **May promote maternal weight loss.**
- **May enhance bonding with the infant.**
- **Is less expensive and more convenient than feeding infant formula.**