



# PRENATAL NUTRITION MODULE

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# Prenatal Nutrition Module

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## About this Module

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### Introduction

The purpose of this module is to provide WIC staff with basic knowledge, attitudes, and skills regarding prenatal nutrition. After completing this module, staff will be more prepared to help pregnant women make healthier choices for themselves and their growing babies. Staff providing client-centered nutrition education or counseling to pregnant participants may complete this module as part of their overall training program.

No two women are alike and, therefore, no two pregnancies are alike. But, one thing is the same: pregnancy has a profound effect on a woman's body. Her metabolism, hormones, body weight, and nutrient needs change dramatically as a few tiny cells in her body divide and develop into a new life.

At WIC, we want to help pregnant women eat a healthy diet, gain the right amount of weight, and make positive lifestyle choices in order to have the healthiest pregnancies possible. This module reviews nutrient needs during pregnancy along with recommendations for gaining weight. It also addresses various lifestyle habits as well as medical risks that can affect a pregnant woman's health and the outcome of her pregnancy.



### Objectives

A woman's daily food choices and eating habits can make a world of difference in her pregnancy and her baby's health. A growing fetus depends totally on its mother to provide all of the essential nutrients for growth and development. Also, the mother needs plenty of nutrients to support the physical changes taking place in her own body.

After reading this part of the module, you'll be able to:

- Identify correct guidelines regarding calories and protein for pregnant women.
- Identify folic acid's main role in prenatal nutrition.
- List sources of folate.
- Identify correct statements regarding vitamin A, vitamin C, calcium, iron, and water recommendations for pregnant women.
- Identify foods especially high in calcium.
- Recognize sources of fiber.
- Identify correct statements about prenatal supplements.
- Define the eating practices of different types of vegetarians.
- Distinguish information about key nutrients for vegetarians during pregnancy.
- List three sources of iron for vegetarians.

## Eating for Two? Extra Calories During Pregnancy

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### Trimester:

A term of approximately 3 months in the prenatal gestation period, with the specific trimesters defined as follows – first trimester: 0 to 13 weeks, second trimester: 14 to 26 weeks, third trimester: 27 to 40 weeks. The first day of the last menstrual period serves as the beginning of the first week of pregnancy.

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A pregnant woman provides for her own nutrient needs as well as the needs of her developing baby, but that doesn't mean she needs twice as much food (National Women's Health Information Center, 2010). In fact, most women can probably get what they need by simply adding a healthy snack or small meal to their daily intake.

In general, calorie needs don't increase until the start of the second **trimester**. At that point, a woman's calorie needs will depend on her pre-pregnancy weight, her rate of weight gain, her physical activity, etc. On average, a pregnant woman needs about 340 extra calories a day during the second trimester, and 450 extra calories a day during the third trimester (Kaiser & Allen, 2008). But these are just estimates, not standard recommendations for every pregnant woman.

It's important to think about where those extra calories come from. Consider, for example, a small order of fries and a 12 ounce soda – about 370 calories total. Sure, this snack would provide extra calories, but it's certainly not a smart choice for a woman trying to nourish herself and a growing fetus. A better option would be a turkey sandwich on whole-grain bread and a glass of milk. The sandwich and milk would have about the same number of calories as the fries and soda, but with more protein, fiber, and other nutrients.

So, while pregnancy is a time when a woman needs to eat a little extra, that doesn't mean the sky is the limit. In general, most women who respond to their appetites without overeating will get the right number of calories they need. And, by choosing a balanced variety of foods and limiting things like sweets, sodas, and fried foods, they'll get the right nutrients, too.



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*Most pregnant women can get the extra calories they need by adding a healthy snack to their day, like a sandwich and milk.*

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## Protein

Protein is important for growth, and a pregnant woman's protein needs steadily increase as the fetus grows and the woman gains weight. The Recommended Dietary Allowance for protein during pregnancy (for all age groups) is 1.1 g/kg/day or an additional 25 grams of protein per day (Institute of Medicine [IOM], 2005).

Americans tend to eat more protein than they need, so a pregnant woman who chooses a variety of foods to supply her extra calories will probably meet her protein needs without much problem.

Table 1.1 lists the amount of protein in different foods. Now, stop and think about the turkey sandwich mentioned earlier. The bread and turkey would have about 20 grams of protein, and a glass of milk would add another 8 grams. That adds up to 28 grams of protein — plenty of extra protein for a pregnant woman. For more specific information on meeting protein needs as well as carbohydrates and fats refer to the Texas WIC *Basic Nutrition Module*.

*Table 1.1 Estimated Protein Content of Various Foods*

Food	Amount	Grams
Dairy	8 ounces milk or 1-1½ ounces cheese	8
Meat, poultry, fish, egg	1 ounce	7
Beans	½ cup	7
Nuts	1 ounce nuts or 1 tablespoon peanut butter	4
Bread	1 slice bread or 1 cup cereal	3
Rice	½ cup	2
Vegetables	½ cup cooked or 1 cup raw	2
Fruits	½ cup cooked or 1 cup raw	0

Note. This data is taken from the “National Nutrient Database for Standard References,” Release 23 by the U.S. Department of Agriculture, Agricultural Research Service, 2010, retrieved from <http://www.nal.usda.gov/fnic/foodcomp/search>.

## Fiber

In 2005, the Food and Nutrition Board of the National Academy of Sciences published its first recommendations for fiber, stating that 28 grams of fiber a day is an adequate intake for a pregnant woman. Many Americans only get around 12–15 grams of fiber a day (IOM, 2005). Fiber adds bulk to the stool, which can reduce constipation during pregnancy. Another plus is that high-fiber foods are generally low in fat.

Fiber is in the walls of plant cells and forms the tough structural parts of plants. So eating more fiber means eating more fruits, vegetables, legumes, and whole-grain breads and cereals. Processing



*Beans are among the best sources of fiber (about 7 grams of fiber in ½ cup). Brown rice, bread, and vegetables add even more fiber to a meal.*

### FOR MORE INFORMATION

See the section on fiber in the Basic Nutrition Module



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*Five servings a day of different fruits and vegetables provide folic acid, vitamin A, vitamin C, and other key nutrients.*

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**Neural-tube defects:**

Serious birth defects involving incomplete development of the brain and spinal column. Specific examples include anencephaly and spina bifida.

Adequate amounts of folic acid at the time of conception and early pregnancy reduce the risk of neural-tube defects.

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**FOR MORE INFORMATION**

See information on folic acid in the Basic Nutrition Module.

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tends to lower the fiber content. For example, apple juice and orange juice have very little fiber compared to whole apples and oranges. Also, foods made with refined white flour are lower in fiber compared to foods made with 100 percent whole-wheat flour or whole grains. Because fiber absorbs water, it's important to drink plenty of fluids when adding fiber to the diet in order to prevent constipation.

## Vitamin Requirements During Pregnancy

During pregnancy, requirements increase for many vitamins, including folate, vitamin A, vitamin C, and most of the B vitamins. A pregnant woman who eats enough fruits, vegetables, and fortified bread and cereal products is usually able to meet her needs for extra levels of vitamins. Also, many physicians prescribe prenatal supplements to help cover vitamin requirements. WIC focuses on three important vitamins during pregnancy: folate, vitamin A, and vitamin C.

**Folate** — The recommendation for folate increases from 400 µg/day before pregnancy to 600 µg/day during pregnancy (American College of Obstetricians and Gynecologists [ACOG], 2010b). Studies suggest that folate can help prevent up to 50 percent of **neural-tube defects**, a group of birth defects involving the brain and spinal column (National Archives and Records Administration, 2011). The neural tube of the fetus develops and closes within the first 30 days of pregnancy, so an adequate intake of folate is especially important just before conception and during the first few weeks of pregnancy.

Excellent sources of naturally occurring folate include romaine lettuce, peas, lentils, beans, spinach, asparagus, and orange juice. Also, folic acid, the synthetic form of this vitamin, is added to enriched cereal and grain products such as breads, pasta, noodles, rice, and hominy grits. Most breakfast cereals contain 100 µg of folic acid per serving, and some supply 400 µg per serving (National Institutes of Health [NIH], 2011) Also, many daily multi-vitamins provide 400 µg of folic acid, while prenatal vitamins often have 1000 µg of folic acid.

To help reduce the risk of neural-tube defects, women of childbearing age should meet their daily folate requirements by choosing sources

of synthetic folic acid (multivitamins, fortified foods) and by eating a diet with foods high in folate.

**Vitamins A and C** — WIC emphasizes getting enough vitamin A and vitamin C, partly because of increased needs during pregnancy, but also because many people simply don't eat enough fruits and vegetables, the main sources of these two vitamins.

The best sources of vitamin A, as beta carotene, are orange and dark green fruits and vegetables, including sweet potatoes, carrots, mangoes, spinach, cantaloupe, and turnip greens. Vitamin C is found in many fruits and vegetables, including guavas, strawberries, kiwis, citrus fruits, broccoli, and bell peppers. Be aware that high temperatures and long cooking times destroy vitamin C, so fresh, uncooked fruits and vegetables generally provide more vitamin C than cooked or canned produce. Also, steaming retains more vitamin C than boiling.

A pregnant woman needs an average daily intake of 770 µg of vitamin A (750 µg for teens) and 85 mg of vitamin C (80 mg for teens) (ACOG, 2010b). By eating at least five servings of fruits and vegetables each day, a woman can meet her needs for these two vitamins, plus she'll take in other important nutrients like folic acid, fiber, and water.

## Mineral Requirements During Pregnancy

As with vitamins, most mineral requirements increase during pregnancy. This is especially true for pregnant teens, who are still growing and have higher requirements for minerals related to growth (i.e. calcium, phosphorus, zinc, and magnesium).

During pregnancy, WIC emphasizes two key minerals: iron and calcium. Not only are these two minerals important in women's health, but many women, both pregnant and non-pregnant, don't get enough of these minerals on a daily basis.

**Iron** — During pregnancy, iron helps both the mother's blood and the baby's blood carry oxygen. A woman's blood volume increases by about 50 percent during her pregnancy, so it's no surprise that the recommendation for iron also increases (from 18 mg/day before pregnancy to 27 mg/day during pregnancy) (ACOG, 2010b). If a woman doesn't get enough iron to meet her needs, her red blood



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*The recommendation for iron increases to 27 mg/day during pregnancy. For many women, it's hard to get that much iron from diet alone.*

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**Iron-deficiency anemia:**

A condition that develops when the body doesn't have enough iron to make adequate amounts of hemoglobin. Without enough hemoglobin, the cells don't get enough oxygen, and the person feels tired, weak, and irritable – symptoms of iron-deficiency anemia.

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**Heme iron:**

The type of iron found in animal foods. Heme iron is present in the hemoglobin and myoglobin of meat.

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**Non-heme iron:**

Iron that is present in plant foods. The body only absorbs about 2 to 20 percent of non-heme iron from foods.

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**FOR MORE INFORMATION**

See the section on iron-deficiency anemia in Part 4 of this module.

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cells can't carry as much oxygen, and over time, **iron-deficiency anemia** can develop (ACOG, 2010b).

Meeting iron needs is hard enough for women who aren't pregnant, so it can be a real challenge during pregnancy. Animal products such as beef, chicken, and pork are good sources of **heme iron**, which is more readily absorbed by the body than **non-heme iron**. Dried beans, tofu, dried fruits, and fortified cereals provide non-heme iron. Foods cooked in cast iron pots are also a source of dietary iron. And during pregnancy, a prenatal supplement can help provide the additional iron that a woman needs. Table 1.2 lists the iron content of various foods.

The body absorbs only a small percentage of iron from foods, so pregnant women should learn about ways to increase iron absorption. Vitamin C helps the body absorb iron, so it's a good idea to enjoy vitamin C-rich foods along with foods that contain iron. Also, eating heme-iron foods during a meal increases the absorption of non-heme iron. Lastly, the tannins in coffee and tea decrease iron absorption, so if a woman's iron stores are low, she should avoid drinking these beverages with high-iron foods (Beth Israel Deaconess Medical Center, 2010).

Be sure to keep vitamin and mineral supplements away from the reach of young children. Accidental iron overdose is one of the leading causes of death in children under the age of 6 (Food and Drug Administration, 1997).

*Table 1.2 Approximate Iron Content of Various Foods*

Food	Amount	Iron (mg)
Total® cereal	¾ cup	18.0
Soybeans, cooked	½ cup	4.4
Blackstrap molasses	1 tablespoon	3.5
Lentils, cooked	½ cup	3.3
Potato, baked with skin	1 medium	2.6
Kidney beans, cooked	½ cup	2.6
Beef, ground, extra lean, cooked	3 ounces	2.4
Garbanzo beans, cooked	½ cup	2.4
Navy beans, cooked	½ cup	2.3

Food	Amount	Iron (mg)
Black-eyed peas, cooked	½ cup	2.2
Northern beans, cooked	½ cup	1.9
Tofu, firm	3 ounces	1.8
Black beans, cooked	½ cup	1.8
Pinto beans, cooked	½ cup	1.8
Almonds	¼ cup	1.5
Figs, dried	¼ cup	1.4
Split peas, cooked	½ cup	1.3
Sesame seeds	1 tablespoon	1.3
Raisins	¼ cup	1.1
Chicken, cooked without skin	3 ounces	1.0
Pork, cooked	3 ounces	0.9
Bread	1 slice	0.8
Apricots	¼ cup	0.7
Turnip greens, cooked	½ cup	0.6
Peanut butter	2 tablespoons	0.6
Mustard greens, cooked	½ cup	0.5
Fish, cooked	3 ounces	0.5
Dried plums (prunes)	5 medium	0.4

Note. This data is taken from the “National Nutrient Database for Standard References,” Release 23 by the U.S. Department of Agriculture, Agricultural Research Service, 2010, retrieved from <http://www.nal.usda.gov/fnic/foodcomp/search>.

**Calcium** — Calcium is crucial for bone health, not only during pregnancy, but also before and after pregnancy. The recommended intake for a woman is 1000 mg per day, regardless of whether she’s pregnant, not pregnant, or breastfeeding. Teens, however, need more calcium since their bones are still growing. The recommendation for teenage girls under age 19 is 1300 mg per day. This applies to pregnant, non-pregnant, and breastfeeding teens (IOM 2005, National Women’s Information Center 2010a).

Many women and teens don’t get enough calcium to meet their needs. Dairy products are rich sources of calcium: an 8 ounce of glass of milk has about 300 mg of calcium, as does 8 ounces of yogurt, or 1½ ounces of cheese. However, many women and teens avoid dairy products in an effort to cut back on fat and calories. Fortunately, there are plenty of low-fat and fat-free dairy products available, as well as various non-dairy sources of calcium, such as calcium-enriched soy milk and tofu. For pregnant women who are lactose



*Yogurt, milk, cheese, and other dairy products are excellent sources of calcium.*

## Part 1

intolerant, suggest consuming lactose-free milk or smaller portions of dairy products to achieve adequate calcium intake.

Table 1.3 lists the approximate calcium content of various foods. The body absorbs calcium better in amounts of 500 mg or less, so it is best to consume calcium-rich foods at different times of the day, instead of all at once.

*Table 1.3 Approximate Calcium Content of Various Food*

Dairy Sources of Calcium	Amount	Calcium (mg)
Cheddar cheese	1½ ounces	305
Low-fat yogurt	1 cup	300
Skim milk	1 cup	300
Ice cream	½ cup	90
Low-fat cottage cheese (2% milkfat)	½ cup	80
Parmesan cheese	2 teaspoons	60
Non-Dairy Sources	Amount	Calcium (mg)
Total® cereal	¾ cup	1000
Calcium-fortified orange juice	1 cup	350
Canned sardines with bones	3 ounces	350
Calcium-enriched soy milk	1 cup	300
Blackstrap molasses	1 tablespoon	170
Pudding, made with milk	½ cup	150
Calcium-fortified bread	1 slice	150
Spinach, cooked	½ cup	120
Tofu, firm, set with calcium sulfate	3 ounces	100
Turnip greens, cooked	½ cup	100
Almonds	¼ cup	90
Sesame seeds	1 tablespoon	90
Soybeans, cooked	½ cup	90
Navy beans, cooked	½ cup	65
Northern beans, cooked	½ cup	60
Figs, dried	¼ cup	60
Okra, sliced, cooked	½ cup	60

Non-Dairy Sources	Amount	Calcium (mg)
Pinto beans, cooked	½ cup	35
Broccoli, cooked	½ cup	30

Note. This data is taken from the “National Nutrient Database for Standard References,” Release 23 by the U.S. Department of Agriculture, Agricultural Research Service, 2010, retrieved from <http://www.nal.usda.gov/fnic/foodcomp/search>.

## Water (Fluids)

Most people don’t think of it as an essential nutrient, but water is necessary for health and survival. Also, drinking water during pregnancy can help reduce constipation. The Institute of Medicine (2005) recommends that pregnant women drink at least eight cups of fluids every day. Factors such as hot temperatures can increase fluid needs. While water should account for most of the fluids women take in, foods and other beverages also add to daily fluid intake.

## Prenatal Vitamin-Mineral Supplements

Many doctors routinely prescribe a prenatal vitamin-mineral supplement during pregnancy. Prenatal supplements are especially helpful for meeting iron needs, since many pregnant women don’t get all the iron they need through diet alone. Likewise, a prenatal vitamin provides extra folic acid during pregnancy, as well as other nutrients. But remember, even though a daily vitamin-mineral pill can help fill in the gaps, it’s not a substitute for a healthy diet.

There are no standards that define what has to be in a supplement in order for it to be called a prenatal supplement. Most varieties have higher levels of iron and folic acid compared to regular multivitamin-mineral pills. Some brands also provide calcium, but usually just a portion of a woman’s daily calcium needs (about 10 to 25 percent). Prescribed prenatal vitamins generally provide safe levels of nutrients for pregnant women. Be aware that other types of nutritional or herbal supplements may contain excessive levels of nutrients or other compounds.

Prenatal supplements are especially important for pregnant women with special nutrient needs. For example, vegetarians who don’t consume any animal products often need a prenatal supplement in order to get enough iron, zinc, and vitamin B12 (Craig & Mangels,



*Compared with regular vitamin-mineral supplements, most brands of prenatal supplements contain higher levels of iron and folic acid.*

### **FOR MORE INFORMATION**

See the section on nutrition and herbal supplements in Part 3 of this module.

2009). Also, women who smoke or who abuse drugs or alcohol during their pregnancy need additional levels of nutrients.

Some women may complain that their prenatal supplement causes constipation or nausea. For constipation, suggest drinking more fluids and adding more fiber to the diet. Moderate exercise may also help relieve constipation. Taking a supplement soon after a meal or before going to bed can help reduce nausea. A woman can also talk to her doctor about trying a different brand of prenatal supplement.

WIC staff should encourage participants to take prenatal vitamins as recommended by their health-care providers. But keep in mind that a prenatal supplement is just what it says it is — a supplement to a healthy diet, not a replacement.

Compared with regular vitamin-mineral supplements, most brands of prenatal supplements contain higher levels of iron and folic acid.

## Vegetarian Diets During Pregnancy

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### Vegetarians:

A general term referring to people who eat a diet based on foods of plant origin. Many vegetarians also consume eggs or dairy products.

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*There are different types of vegetarians. Some eat eggs or dairy products, while others do not.*

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By making careful food choices, **vegetarians** can meet their nutrient needs during pregnancy. The goal is to get enough of the key nutrients typically provided by animal products. A lot depends on how restrictive the diet is. **Vegans** are the most restrictive since they don't eat any animal products at all. **Lacto-vegetarians** include dairy products in their diet, but no other animal products. **Lacto-ovo-vegetarians** consume both eggs and dairy products. Prenatal vitamin-mineral supplements can be especially important in helping pregnant vegetarians meet their needs. Also, fortified foods can make important contributions to nutrient intake, especially for vegans. Here's a brief summary of key nutrients that vegetarians need to consider (Craig & Mangels, 2009):

- **Iron** — Good sources of iron for vegetarians include fortified breakfast cereals, blackstrap molasses, legumes, tofu, dried fruits, and enriched pasta and bread. And remember, eating food rich in vitamin C along with foods high in iron increases iron absorption. Often, a pregnant woman following a vegetarian diet needs supplemental iron to meet her requirements.
- **Vitamin B12** — Lacto-vegetarians and lacto-ovo-vegetarians can get Vitamin B12 from eggs and milk. But vegans need either supplemental B12 or foods fortified with B12, such as breakfast

cereals, soy products, or vegetarian burger products. Also, nutritional yeast provides vitamin B12. Be aware that plant foods aren't reliable sources of B12. For example, seaweed, miso, tempeh, tamari, sauerkraut, spirulina, and algae are often cited as good sources of vitamin B12, but they generally contain an inactive form of the vitamin that the body can't use.

- **Calcium** — Lacto-vegetarians and lacto-ovo-vegetarians can rely on dairy products for calcium, while vegans often choose calcium-enriched soy milk to meet their calcium needs. Other products with added calcium include certain brands of orange juice, grapefruit juice, bread, and cereal. Smaller amounts of calcium are found in soy cheese, blackstrap molasses, sesame seeds, tahini (sesame butter), almonds, almond butter, tempeh, and certain vegetables (e.g. kale; collard, mustard, and turnip greens; broccoli; okra; rutabaga). Supplemental calcium may be necessary if dietary intake is poor.
- **Vitamin D** — Vitamin D is another nutrient that lacto-vegetarians and lacto-ovo-vegetarians can get from eggs or milk. Vegans can get this vitamin from certain brands of soy milk, breakfast cereals, and margarine (check the labels). Also, the human body synthesizes vitamin D through sun exposure. Arkansas experiences sunshine all year round; however, factors such as sunscreen, skin color, smog, and winter temperatures all cut down on exposure to the sun.
- **Zinc** — Zinc is essential for growth and development, and zinc needs are slightly increased during pregnancy. Zinc is most abundant in meat, seafood, and liver, and to a lesser extent in milk and eggs. Vegans can get zinc from legumes, tofu, miso, tempeh, nuts, seeds, wheat germ, and whole grains, although zinc from plant sources is less available to the body.

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**Vegans:**

Vegetarians who eat only foods of plant origin. Vegans do not consume any animal products whatsoever.

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**Lacto-vegetarians:**

Vegetarians who consume dairy products in addition to a plant-based diet (no eggs, meat, poultry, or fish).

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**Lacto-ovo-vegetarians:**

Vegetarians who eat eggs and dairy products in addition to a plant-based diet (no meat, poultry, or fish).

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## The Big Picture: Foods, Not Nutrients

While it's important to learn about specific nutrients, the reality is that pregnant women eat foods, not nutrients. That's something to remember when setting goals during VENA counseling. Sometimes we focus too much on a single vitamin or mineral, talking about why that nutrient is so important.

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*When talking to participants, offer practical tips that focus on food choices, food preparation, and a healthy lifestyle.*

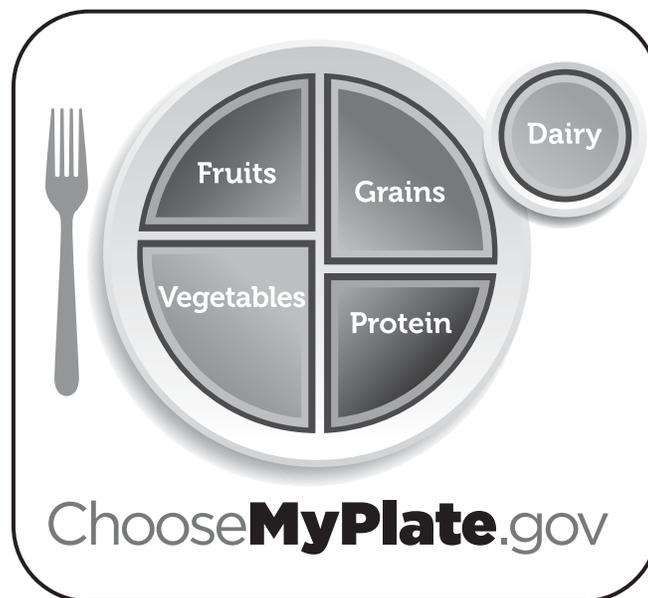
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Instead, it might be better to offer tips about healthy food choices, recipes for delicious and low-fat meals, and ideas for adding new foods to a family's diet. Granted, some participants have specific health risks, so you'll need to talk about a certain nutrient, like iron. But even then, it's helpful to provide practical ideas that will help a participant take in more of that nutrient, while also making healthier food choices overall.

MyPlate is an icon (Figure 1.1) that helps consumers think about building a healthy plate at meal times. MyPlate emphasizes fruit, vegetable, grains, protein, and dairy food groups (U.S. Department of Agriculture, 2011). ChooseMyPlate.gov provides practical tips to help adopt healthy eating habits consistent with the 2010 Dietary Guidelines for Americans. By following this guide and eating a variety of foods, a woman should get the additional nutrients she needs for both herself and her growing baby.

A pregnant woman needs to eat a balanced variety of wholesome foods with plenty of fruits, vegetables, whole grains, protein-containing foods, and low-fat dairy products. For personalized health and nutrition information for pregnant and breastfeeding women, visit [www.ChooseMyPlate.gov/pregnancy-breastfeeding.html](http://www.ChooseMyPlate.gov/pregnancy-breastfeeding.html).

*Figure 1.1 MyPlate*





# Weight Gain for a Healthy Pregnancy

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## Objectives

The amount of weight a woman gains during her pregnancy can have a major effect on both her and the baby's health. In general, women who start out at a normal weight and then gain the recommended amount during pregnancy tend to have healthier pregnancies and healthier infants — plus, they tend to return to a healthier weight postpartum.

So how do you figure out how much weight a pregnant woman should gain? What sort of advice do you give a woman whose weight gain isn't staying on track? After reading this part of the module, you'll be able to:

- Identify correct statements regarding weight gain during pregnancy.
- List three concerns for pregnant women who are overweight or obese.
- State the recommended weight-gain ranges for women based on their BMIs.
- List five components that make up a pregnant woman's weight gain.
- Identify correct statements about maternal fat stores.
- Make suggestions for slowing down the rate of weight gain.



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*Being at an appropriate weight before getting pregnant increases a woman's chances of having a healthy pregnancy and a healthy baby.*

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**Low-birth weight:**

Low-birth weight: Having a birthweight  $\leq 5$  pounds, 8 ounces ( $\leq 2500$  grams).

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**Large for gestational age:**

Large for gestational age: Having a birthweight  $\geq 9$  pounds ( $\geq 4000$  g) or  $\geq 90$ th percentile weight for gestational age at birth, based on a generally accepted intrauterine growth reference. Being large for gestational age may result from maternal diabetes and may lead to obesity in childhood that can extend into adult life.

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## Pre-pregnancy Weight

Before she becomes pregnant, a woman's weight status sets the stage for certain outcomes of her pregnancy. A healthier prepregnancy weight increases the chances of a healthier pregnancy (U.S. Department of Agriculture [USDA] & U.S. Department of Health and Human Services [HHS], 2010). Unfortunately, many women are either underweight or overweight before they get pregnant, meaning they're at greater risk of complications and poor pregnancy outcomes.

Women who are underweight or very short have a higher risk of delivering a **low-birthweight** baby or an infant with restricted growth (Goldenberg et al., 1997). Also, there's a cycle related to low birthweight: baby girls who are born at low birthweights tend to grow up and deliver low-birthweight infants themselves (Sanderson, 1995).

Women today are more likely to be overweight or obese prior to pregnancy and to gain too much weight during pregnancy (Institute of Medicine [IOM], 2009). Overweight and obese women have a different set of risks. First, there's a greater chance that their infants will be **large for gestational age**, and there's a slightly higher risk of birth defects, including neural-tube defects. Also, overweight and obese women have higher rates of gestational diabetes, high blood pressure, cesarean delivery, and inpatient hospitalization during pregnancy (ACOG, 2010b; March of Dimes, 2009b).

Being at an appropriate weight before getting pregnant increases a woman's chances of having a healthy pregnancy and a healthy baby.

## Weight Gain During Pregnancy

The amount of weight gained during pregnancy can also affect pregnancy risks and outcomes. For example, poor weight gain can result in **premature** birth or restricted growth of the infant. And gaining too much weight during pregnancy can lead to postpartum overweight or obesity. Timing is important too — most of a pregnant woman's weight gain should occur during the second and third trimesters.

There's no standard weight-gain recommendation that's right for all women. Instead, the right amount to gain depends on a

woman’s **Body Mass Index (BMI)** before she became pregnant. As of this writing, WIC follows the 2009 Institute of Medicine recommendations for weight gain during pregnancy (see Table 2.1). Healthy-weight women with BMIs from 18.5 through 24.5 should gain 25 to 35 pounds. Thinner women with lower BMIs should gain more weight, and women at higher BMIs should gain less weight. No one, not even women who are obese, should attempt to lose weight during pregnancy. Recommendations for weight gain during a multifetal pregnancy will be presented in Part 4.

Unfortunately, according to the 2009 Pregnancy Nutrition Surveillance, 48 percent of pregnant women gain too much and 21 percent do not gain enough weight (CDC, 2010c). So it’s important for WIC staff to help pregnant women work toward their individual weight-gain goals.

## Rate of Weight Gain

Table 2.1 displays the recommended rate of weight gain by trimester (pounds/week) by prepregnancy BMI (IOM 2009). It is important to chart a woman’s weight gain during pregnancy and share the results with her. At WIC, we track a woman’s weight gain using the Prenatal Weight Gain Grid for Singleton (Figure 2.1) and the Prenatal Weight Gain Grid for Multifetal (Figure 2.2).

These grids are tools that help you to visually compare a woman’s actual weight gain to her recommended weight gain.

Only about a third of pregnant women gain weight according to the recommended ranges. Most women gain too much or too little.

*Table 2.1 Recommendations for Weight Gain During Pregnancy*

Pre-Pregnancy BMI (kg/m <sup>2</sup> )	BMI Category	Total Weight Gain Range (pounds)	Rates of Weight Gain* 2nd and 3rd Trimester (mean range in pound/week)
< 18.5	Underweight	28–40	1 (1 – 1.3)
18.5-24.9	Normal weight	25–35	1 (0.8 – 1)
25.0-29.9	Overweight	15–25	0.6 (0.5 – 0.7)
≥ 30.0	Obese	11-20	0.5 (0.4 – 0.6)

\*Calculations assume a weight gain of 1.1 – 4.4 pounds in the first trimester

Note. Data taken from “Weight gain during pregnancy: Reexamining the guidelines” by the Institute of Medicine, 2009.

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### Premature:

An infant born at ≤ 37 weeks gestation. Also referred to as “preterm.”

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### Body Mass Index:

A tool for indicating weight status. For persons ages 20 years or older, BMI falls into one of these categories: underweight, normal, overweight, or obese. An adult’s BMI is calculated thus: BMI = weight (kilograms) / height (meters)<sup>2</sup>. For children and teens, BMI is plotted on gender- and age-specific charts.

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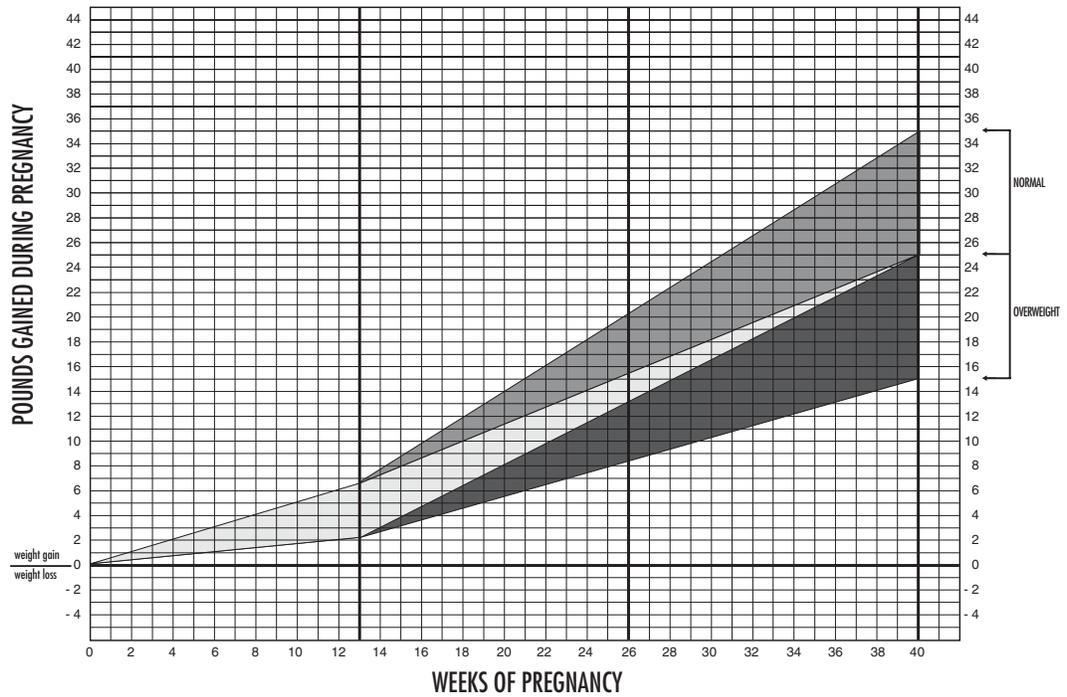
*Only about a third of pregnant women gain weight according to the recommended ranges. Most women gain too much or too little.*

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## Part 2

Figure 2.1 Prenatal Weight Gain Grid – Singleton

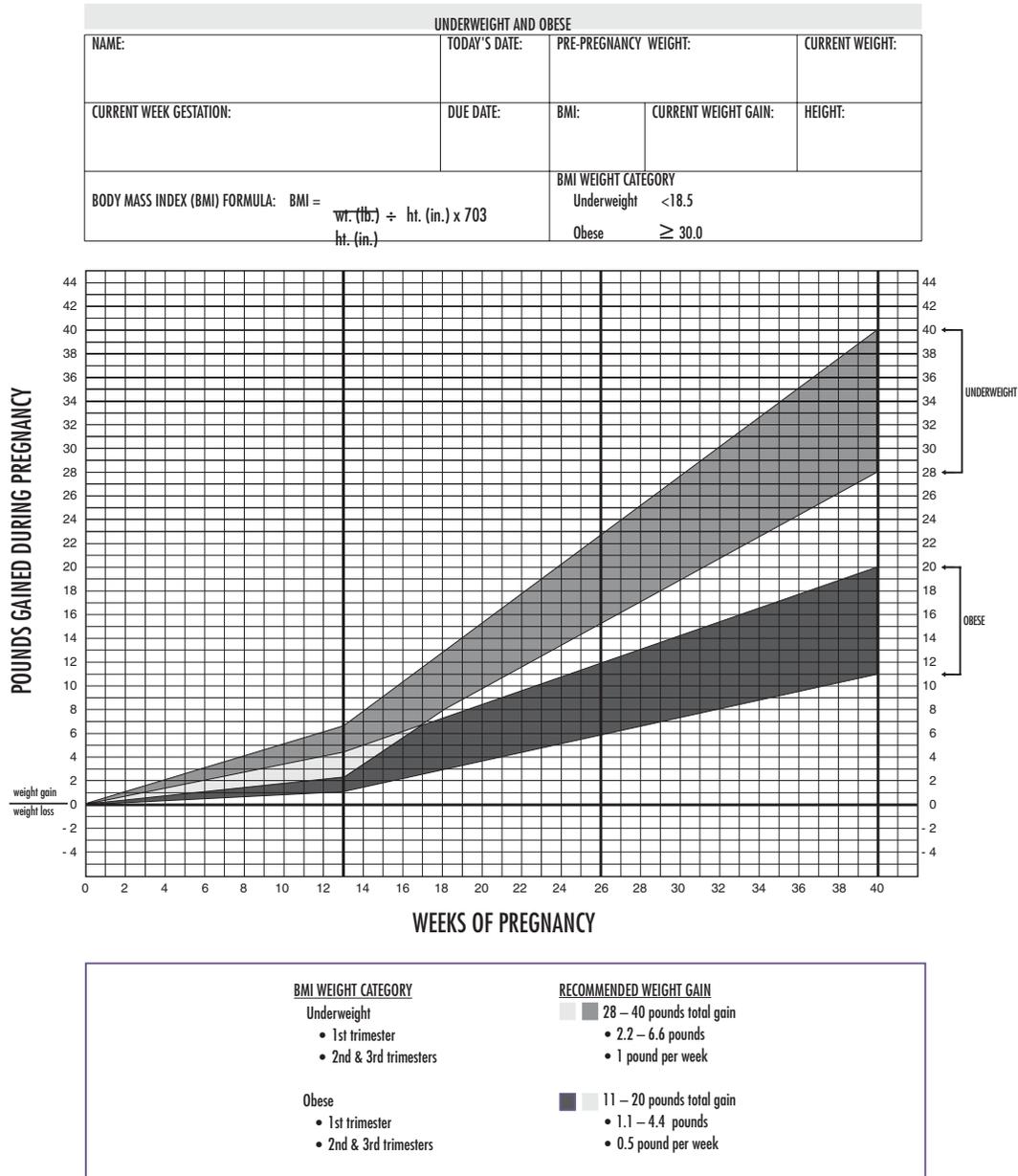
NORMAL WEIGHT AND OVERWEIGHT				
NAME:	TODAY'S DATE:	PRE-PREGNANCY WEIGHT:	CURRENT WEIGHT:	
CURRENT WEEK GESTATION:	DUE DATE:	BMI:	CURRENT WEIGHT GAIN:	HEIGHT:
BODY MASS INDEX (BMI) FORMULA: $BMI = \frac{wt. (lb.)}{ht. (in.)^2} \times 703$		BMI WEIGHT CATEGORY Normal weight 18.5 – 24.9 Overweight 25.0 – 29.9		



BMI WEIGHT CATEGORY	RECOMMENDED WEIGHT GAIN
<b>Normal weight</b> • 1st trimester • 2nd & 3rd trimesters	25 – 35 pounds total gain • 2.2 – 6.6 pounds • 1 pound per week
<b>Overweight</b> • 1st trimester • 2nd & 3rd trimesters	15 – 25 pounds total gain • 2.2 – 6.6 pounds • 0.6 pound per week

Institute of Medicine. 2009. *Weight Gain During Pregnancy Reexamining the Guidelines*. National Academy Press. Washington, D.C.

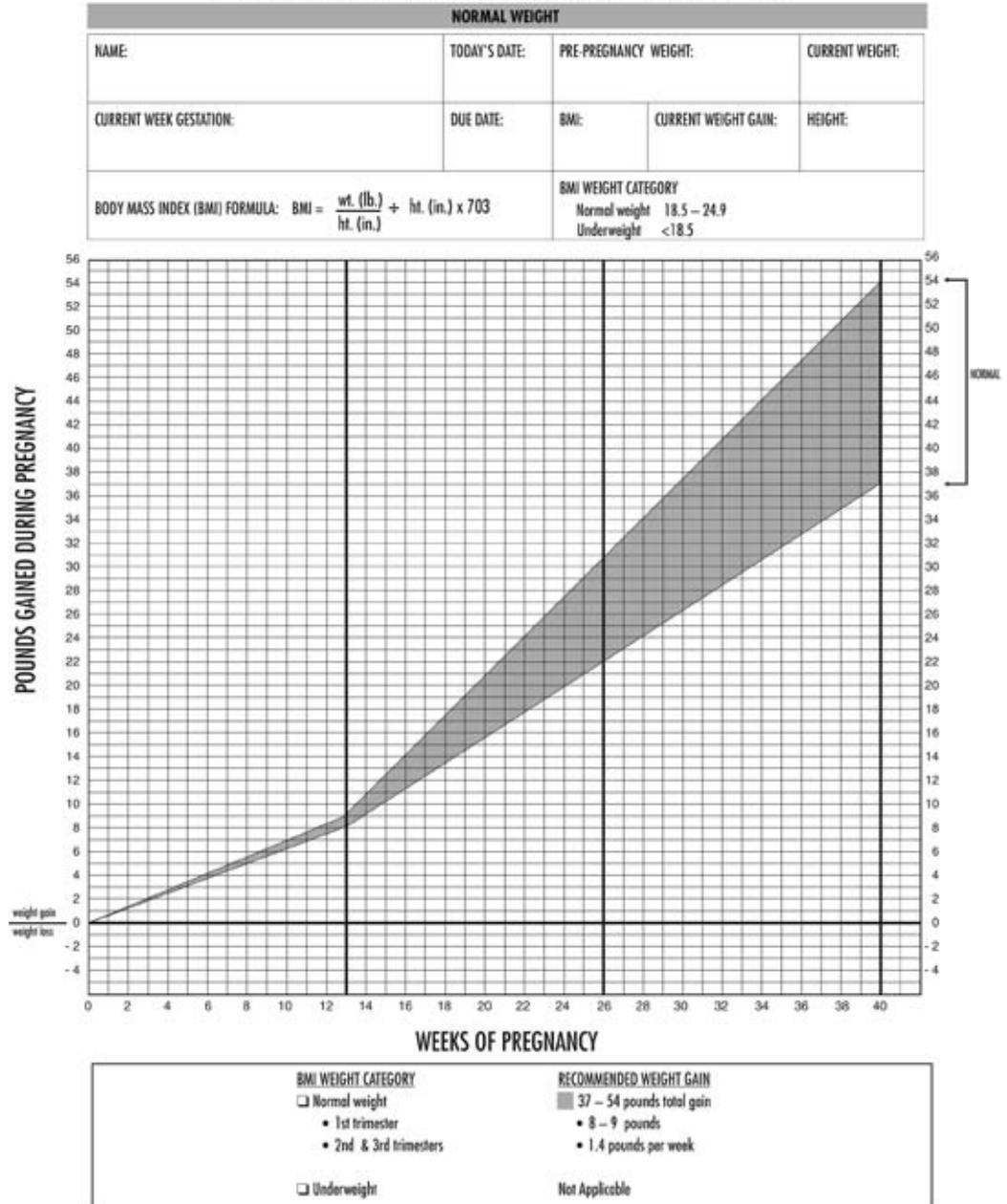
Figure 2.1 Prenatal Weight Gain Grid – Singleton



Institute of Medicine. 2009. *Weight Gain During Pregnancy Reexamining the Guidelines*. National Academy Press. Washington, D.C.

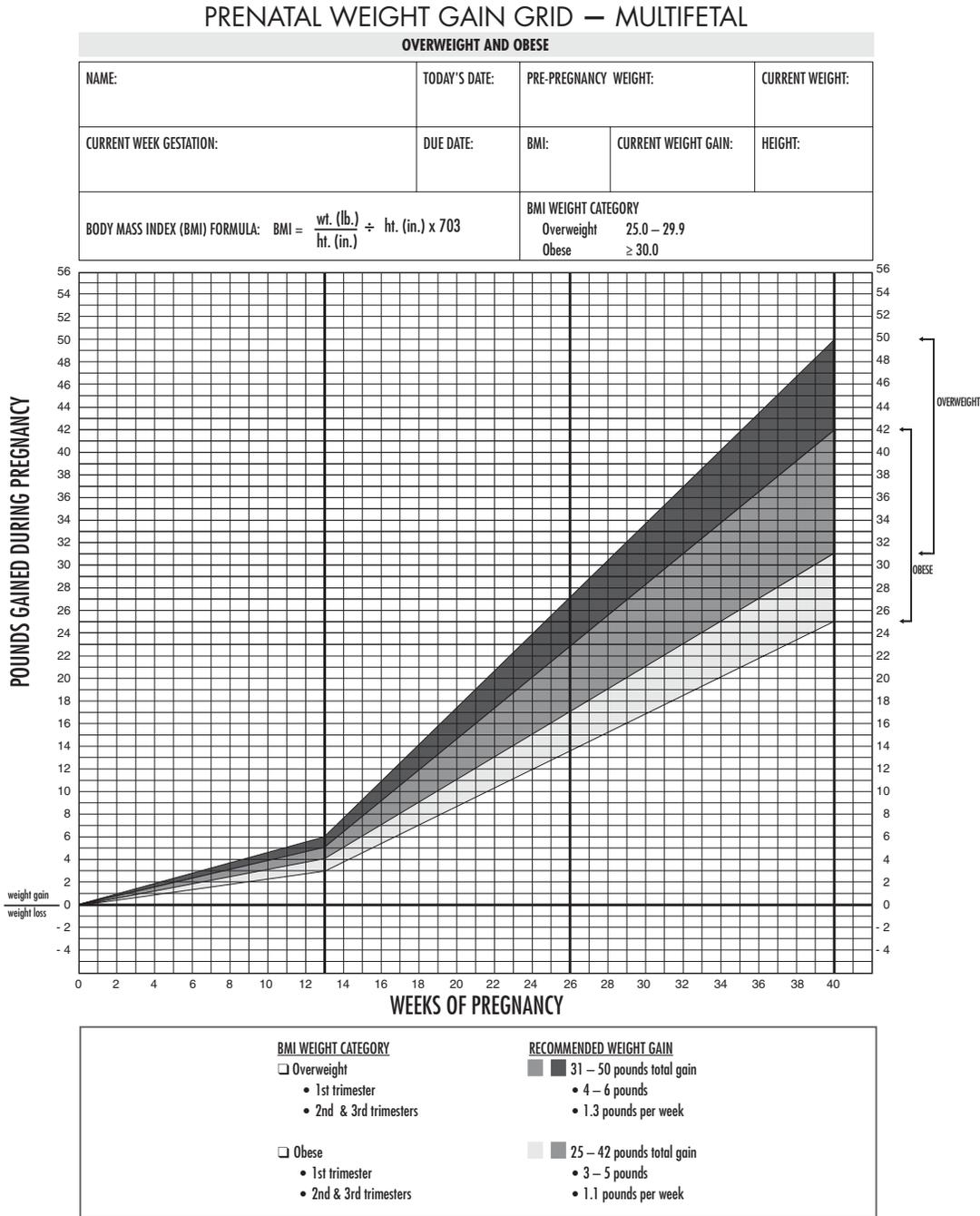
## Part 2

Figure 2.2 Prenatal Weight Gain Grid - Multifetal



Institute of Medicine, 2009. Weight Gain During Pregnancy Reexamining the Guidelines. National Academy Press. Washington, D.C.

Figure 2.2 Prenatal Weight Gain Grid - Multifetal



Institute of Medicine. 2009. *Weight Gain During Pregnancy Reexamining the Guidelines*. National Academy Press. Washington, D.C.

## Components of Weight Gain

If a pregnant woman is hesitant about gaining weight, it helps to explain that she is not just gaining fat. In fact, most of the additional weight is made up of increased blood, fluids, and the baby itself (see Figure 2.3) (APA, 2007a). And, while women do add body fat during pregnancy, a certain amount of fat is important. It helps support the baby's growth, plus stored fat supplies energy during labor, delivery, and breastfeeding.

## Postpartum Weight Loss

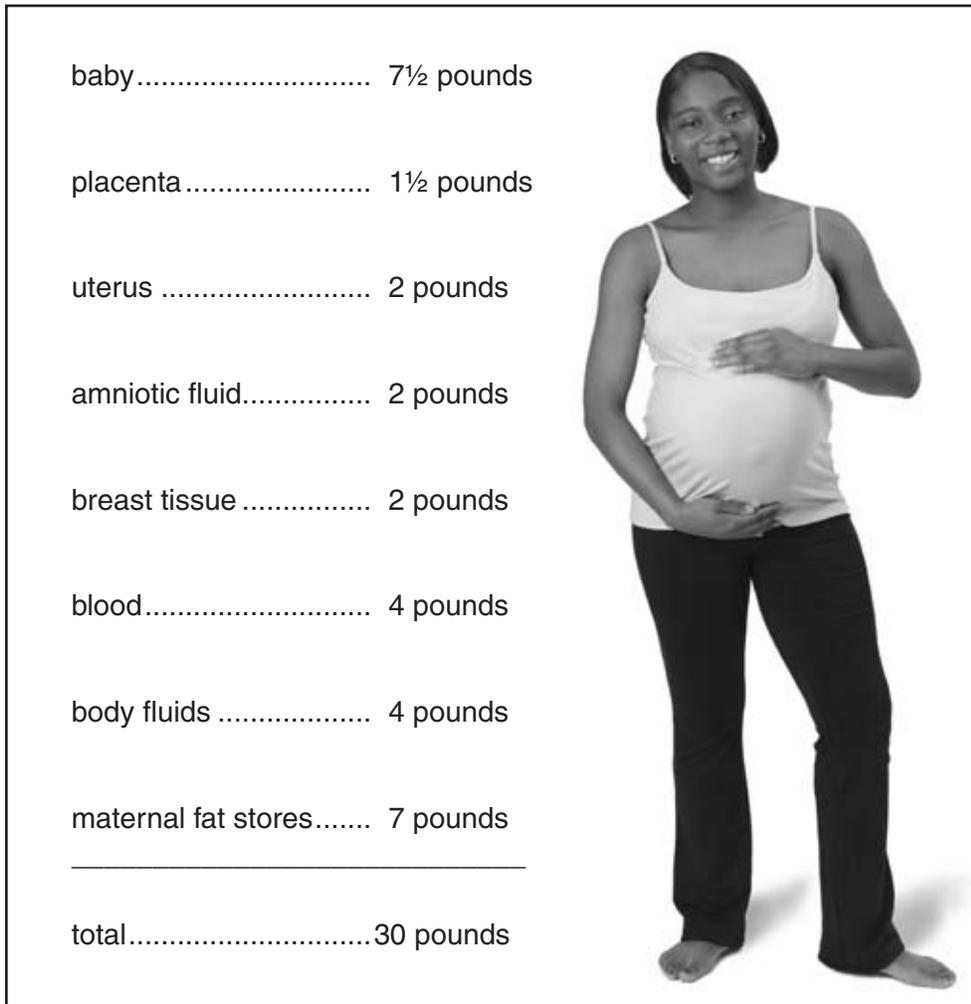
Many pregnant women are anxious to know how quickly they'll lose their extra weight after the baby is born. It's common for new moms to immediately lose 10–13 pounds as a result of delivery. Then, there should be a gradual return to pre-pregnancy weight by about six months postpartum. However, average postpartum weight retention is between 1.1 to 6.6 pounds (0.5 – 3 kg), and excess weight retention is highly prevalent in minority women (Gore, Brown, & West, 2003). A key factor in reaching a healthy postpartum weight is to avoid gaining excess weight during pregnancy. Also, it's important to eat right and stay active after the baby is born.

## Helping Pregnant Women Gain the Right Amount of Weight

The weight gain goal for most pregnant women is to gain “not too much, but not too little.” For some, this may be easier said than done. Here are some practical guidelines and counseling tips to use when talking to a pregnant participant:

- Review her pregnancy weight gain goal, based on her prepregnancy BMI. For example, if she was at a healthy weight status before pregnancy, then she should try to gain somewhere between 25 and 35 pounds by the end of her pregnancy.
- As part of her assessment, her current weight gain ~~on~~ the prenatal weight-gain grid ~~is~~ ~~shown~~ ~~on~~ ~~the~~ ~~grid~~. This grid will show if she's gaining weight too quickly, too slowly, or if she's on track. Then, discuss her current weight gain as it relates to her overall goal. For example, if she was underweight to begin with, and she's not gaining enough weight according to the weight-gain

*Figure 2.3 Typical Distribution for a 30-Pound Weight Gain During Pregnancy*



Note. Information adapted from “About Pregnancy Weight Gain” by the American Pregnancy Association, 2007a.

grid, you’d want to strongly emphasize how gaining weight can make a difference in her baby’s birthweight and health.

- Make sure that you’re familiar with the participant’s health status and be aware of any medical conditions that could impact her diet, weight gain, or pregnancy. WIC staff should reinforce any special dietary instructions from the participant’s health-care provider, and when needed, refer participants to a registered dietitian.

## Part 2



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*WIC staff can help improve pregnancy outcomes by helping pregnant women stay within the recommended weight-gain ranges.*

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### **FOR MORE INFORMATION**

See the section on exercise and physical activity in Part 3 of this module.

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- Ask the participant if she has any concerns about her diet, eating habits, or weight gain. It's important to connect with the participant and address the issues she's most interested in.
- Review the basics of a healthy diet, using the MyPlate icon (see Figure 1.1). You'll want to tailor the discussion to the woman's situation and diet history. Is she underweight? Overweight? Does she eat only fast food and sodas? Discuss appropriate portion sizes, the suggested number of servings from the various food groups and healthy food choices and snack ideas. (Using the above example of an underweight woman with poor weight gain, you could suggest adding nuts, dried fruit, dry milk powder, grated cheese, and other ingredients to foods as a way to increase calories.)

- Consider her activity level and, if appropriate, suggest increasing it with her doctor's approval. Moderate activities or exercises, such as taking a daily walk, can help almost all pregnant women (underweight, normal weight, and overweight), in a number of ways.
- Encourage her to think before she eats.
- Remind her that, over a period of nine months, her food choices can truly make a difference in her health and the health of her baby.

The points listed above are just a general outline of what a WIC staff person might discuss when talking to a participant. The reality is that every participant is different and each woman will have her own questions about medical conditions, food habits, and other factors that influence her pregnancy and her weight gain. Use VENA counseling techniques to help participants identify what's important to them regarding their pregnancy and diet, and then help them come up with specific goals and practical ways to achieve those goals.



### Objectives

Pregnancy is often a time of joy and excitement, but many mothers-to-be also worry about their growing babies and the possibility of birth defects or other complications. A pregnant woman can't control things like her age or specific genetic traits, but she can make conscious decisions about her lifestyle, health habits, and other behaviors that influence the health and development of her baby.

After reading this part of the module, you'll be able to:

- List at least five positive health habits for a healthy pregnancy.
- Recognize appropriate guidelines for physical activity during pregnancy.
- Identify correct statements about periodontal disease in pregnant women.
- List three basic food-safety practices for pregnant women.
- Identify correct statements about caffeine during pregnancy.
- Identify correct statements about smoking during pregnancy.
- Respond to common myths about drinking during pregnancy with factual information.
- Identify correct statements related to illegal drug use during pregnancy.
- Identify correct statements about using medications and supplements during pregnancy.

## Part 3



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*WIC staff play an important role in prenatal care by making referrals and reminding women to keep their prenatal appointments.*

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### **FOR MORE INFORMATION**

See the Appendix for a list and description of various prenatal tests.

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## Prenatal Care

Women who get prenatal care are more likely to have healthier babies and fewer complications during labor and recovery compared to women who don't get prenatal care (Krueger & Scholl, 2000; National Women's Health Information Center [NWHIC], 2009). It's never too early to start. In fact, experts now encourage women to see a doctor before getting pregnant. That way, a woman can take steps toward improving her diet, quitting smoking, and addressing any illnesses or other concerns.

As soon as a woman thinks or knows she is pregnant, she should see a health care provider, such as an obstetrician, family practitioner, or nurse-practitioner. Prenatal care usually starts out as monthly visits that increase to once a week or more towards the end of the pregnancy. At each visit, there are **exams and tests** to check the health of the mother and baby. These include measuring the uterus, listening to the baby's heartbeat, taking the mother's blood pressure and weight, and checking for symptoms such as protein or sugar in the urine, blurred vision, leg cramps, abdominal cramps, or unusual headaches.

The mother may also undergo an ultrasound and genetic tests during the pregnancy (American College of Obstetricians and Gynecologists [ACOG], 2007; NWHIC, 2009).

WIC staff can help participants by encouraging them to keep their prenatal appointments and making referrals for women not receiving regular medical care.

## Exercise and Physical Activity

These days, health professionals recommend 150 minutes (2 1/2 hours) per week of moderate-intensity aerobic activity during and after pregnancy (Centers for Disease Control and Prevention [CDC], 2011c; U.S. Department of Health and Human Services [HHS], 2008), but a woman should always check with her doctor first to make sure that exercise is okay for her. Some women at high risk for complications may need to avoid or restrict physical activity. For most women, being active is a good idea as long as they follow these guidelines:

- **Choose safe activities** — Walking, swimming, riding a stationary bicycle, and joining a prenatal aerobics class are all great choices. Sports such as downhill skiing, rock climbing, horseback riding, and other activities with potential for impact should be avoided. And, after the first trimester, pregnant women should avoid any exercise that requires lying on the back, since that can affect blood circulation.
- **Don't overdo it** — Moderate exercise is the key for staying fit during pregnancy. A pregnant woman should stop exercising if she feels dizzy, faint, overheated, or in pain. Also, it's important to start each session with a slow warm-up and then finish with a cooling-down period. Beginners or women who are not used to being physically active should start slowly and increase the frequency and intensity of exercise gradually.
- **Stay cool** — Overheating in the first trimester may increase the risk of certain birth defects, so pregnant women shouldn't use hot tubs, saunas, or steam rooms, and they should avoid outdoor activities in hot weather.
- **Drink plenty of water** — One suggestion is to drink at least one 8-ounce glass of water for every half hour of exercise. Overall, women should drink at least eight glasses of water or other fluids each day.



*Box 3.1 Benefits of Exercise During Pregnancy*

- Helps reduce backaches, constipation, swelling
- May help prevent / treat gestational diabetes
- Increases your energy
- Improves your mood
- Improves your posture
- Promotes muscle tone, strength, and endurance
- Helps you sleep better

Note. This information is adapted from “Exercise During Pregnancy,” by the American College of Obstetricians and Gynecologists, 2003, retrieved from [http://www.acog.org/publications/patient\\_education/bp119.cfm](http://www.acog.org/publications/patient_education/bp119.cfm).

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**FOR MORE INFORMATION**

See the U.S. Department of Health and Human Services *2008 Physical Activity Guidelines for Americans* for a detailed discussion of exercise during pregnancy.

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*Periodontal disease during pregnancy can be very dangerous for a woman and her fetus, so daily dental care is extremely important.*

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**Periodontal disease (gum disease):**

Inflammation and infection of the tissues around the teeth, which, if left untreated, leads to bone destruction and tooth loss. Gingivitis represents the early stage of periodontal disease.

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## Dental Health

We all know that proper brushing, flossing, and regular dental checkups are key steps to preventing cavities and gum disease. For a pregnant woman, dental health is also important for her growing baby.

**Periodontal disease**, commonly called gum disease, is a bacterial gum infection that, if left untreated, causes gums to pull away from the teeth, eventually destroying the bone and leading to tooth loss. Hormonal changes during pregnancy may also increase risk of developing gum disease (Carrillo-de-Albornoz, Figuero, Herrera, & Bascones-Martinez, 2010; Carrillo-de-Albornoz, Herrera, & Bascones-Martinez, 2010; WebMD Medical Reference, 2009). Periodontal disease in pregnant women does more than just harm the woman’s gums — it can impact the baby’s health, too. As with other infections, the body of a person with gum disease makes certain substances and chemicals to fight the infection. In pregnant women, it appears these substances travel through the body to the uterus, increasing the risk for premature delivery, low birthweight, preeclampsia, and increased dental caries in the infant (Han, 2011; Silk, Douglass, Douglass, & Silk, 2008). **Preeclampsia** will be discussed in Part 4.

It’s extremely important for pregnant women to brush and floss daily and to visit a dentist. This is especially true for women who already have **gingivitis** (inflamed, red, and bleeding gums) — the early signs of periodontal disease. As with other health habits, WIC staff can play a key role by educating pregnant women about the importance of dental health and providing referrals if needed.

## Food Safety

Various bacteria in foods can lead to foodborne illnesses, often causing vomiting, diarrhea, etc. These symptoms are awful for anyone who experiences them, but they can be even more severe for a pregnant woman. In some cases, a pregnant woman can pass a foodborne infection on to her baby.

The good news is that pregnant women can easily avoid common foodborne illnesses at home by following these basic practices (CDC, 2011a):

- Don't eat raw or undercooked eggs, meat, poultry, fish, or shellfish.
- Don't consume raw sprouts or unpasteurized milk, cheese, or juice.
- Thoroughly wash hands, utensils, and kitchen surfaces.
- Keep raw meats and their juices separate from other foods.
- Use a cooking thermometer to ensure thorough cooking.
- Properly chill all leftovers and other foods that should be refrigerated.




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*Thoroughly washing hands before and during food preparation is a key step in keeping foods safe.*

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Playing it safe in the kitchen will prevent most foodborne illnesses, but pregnant women also need to know about other specific food safety concerns, such as *listeriosis*, *toxoplasmosis*, and *methylmercury* in fish.

**Listeriosis** is an illness related to eating unpasteurized soft cheeses and cold deli-style meats and poultry. Symptoms include fever, muscle aches, nausea, or diarrhea. Pregnant women are 20 times more likely than other adults to contract listeriosis (CDC, 2011a). An infected mother can pass the illness on to her fetus, causing premature delivery, miscarriage, stillbirth, or other serious health problems (American Pregnancy Association [APA], 2008b). To prevent listeriosis, pregnant women should not eat soft cheeses such as feta, brie, camembert, or blue-veined or Mexican-style cheeses (queso blanco, queso fresco, queso de hoja, queso de crema, asadero, etc.). It is safe to eat hard cheeses, semi-soft cheeses (such as mozzarella), processed cheeses, cream cheese, cottage cheese, and yogurt. Also, pregnant women should reheat hot dogs, luncheon meats, and cold cuts until steaming hot (APA, 2008b; CDC, 2011a).

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*To avoid listeriosis, pregnant women should not eat soft cheeses such as feta, brie, camembert, or blue-veined or Mexican-style cheeses.*

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**Toxoplasmosis** is caused by a parasite found in cat litter, as well as raw or undercooked meat (especially pork, lamb, and venison). If a pregnant woman becomes infected, her fetus is at risk for severe disease, including blindness and intellectual disabilities. To prevent toxoplasmosis, a pregnant woman should cook all meat thoroughly. Also, she should have someone else change a cat's litter box, or wear gloves if she changes it herself. And, since some cats use gardens and sandboxes as litter boxes, a pregnant woman should wear gloves when gardening or handling soil (CDC, 2010d).

## Part 3

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*To avoid high levels of mercury, pregnant women should not eat shark, swordfish, king mackerel, or tilefish.*

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**Methylmercury** and other substances can be present at high levels in certain fish. In large quantities, these substances can harm a fetus's developing brain and nervous system. In December 2010, the U.S. Department of Agriculture and the U.S. Department of Health and Human Services released the *Dietary Guidelines for Americans, 2010*, which provides the following recommendations for women who are or might become pregnant or breastfeeding women:

- Do not eat shark, swordfish, king mackerel, or tilefish. These fish tend to be high in mercury.
- Consume no more than 8 to 12 ounces (two average meals) a week of a variety of fish and shellfish that are usually low in mercury. Five of the most commonly eaten fish that are low in mercury are shrimp, canned light tuna, salmon, pollock, and catfish.
- Tuna steaks and canned albacore ("white") tuna generally have higher levels of mercury than canned light tuna. When choosing her two meals of fish and shellfish, a woman should limit her intake of albacore or tuna steak to 6 ounces per week (one average meal).

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## Caffeine

**Caffeine** is a stimulant found in coffee, tea, colas, chocolate, cocoa, and some over-the-counter and prescription drugs. Many studies have looked at caffeine intake during pregnancy, but the methods and results are sometimes controversial. For example, some researchers don't account for harmful practices like smoking and alcohol. Also, caffeine levels in coffee vary, so results are hard to compare. Some studies suggest that excessive caffeine intake (> 300 - 400 mg/day) may increase risk of delayed conception, miscarriage, intrauterine growth restriction, or low birth weight; however, the results are not consistent (Higdon & Frei, 2006; Kuczkowski, 2009).

Since caffeine does cross the placenta, most health professionals agree that pregnant women should avoid large amounts of this stimulant. The American Dietetic Association suggests pregnant women avoid taking in more than 300 mg of caffeine a day (Kaiser & Allen, 2008). That's equal to about three 6-ounce cups of coffee or seven 12-ounce cans of caffeinated soda. It is the opinion of the American College of Obstetricians and Gynecologists that moderate caffeine consumption (<200 mg/day) does not appear to be a major factor in miscarriage or preterm birth

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### **Caffeine:**

A substance that acts as both a stimulant and a diuretic. Caffeine is found in coffee, tea, colas, chocolate, cocoa, and some over-the-counter and prescription drugs.

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(ACOG, 2010a). A study by Miles and Foxen (2009) supports this more stringent recommendation of <200 mg/day for pregnant women.

Adults get most of their caffeine from coffee, sodas, and tea. These drinks offer little nutrition, especially for a pregnant woman. What's more, caffeine is a diuretic, which means more frequent urination. Also, coffee and tea (regular and decaffeinated) have substances that reduce iron absorption. So, there are many good reasons to cut back on sodas and coffee during pregnancy.

## Smoking

During pregnancy, smoking interferes with the oxygen supply to the fetus and is linked to prematurity, miscarriage, low birthweight, and numerous other conditions (ACOG, 2008; Floyd et al., 2008). Still, even with these risks, smoking during pregnancy is a major public-health problem. Approximately 10 percent of women continue to smoke throughout their pregnancies, with a range of 2 to 24 percent depending upon age and ethnicity (HHS, 2010b). Even exposure to secondhand smoke increases a pregnant woman's odds of giving birth to a low-birthweight baby by 20 percent (CDC, 2011d).

There is some good news: many women do quit smoking during pregnancy. In fact, the quit rate among pregnant women is much greater than the quitting rate in the general population of women. However, by 6 months postpartum, most of them start smoking again (Levine, Marcus, Kalarchian, Houck, & Cheng, 2010). WIC staff can help by talking to women about the risks of smoking during pregnancy, as well as the dangers of starting up again after delivery.

While the ideal goal is for a woman to quit smoking entirely, she may be unwilling to, or she may say that she's been unable to quit. In those cases, suggest she cut down on the number of cigarettes she smokes per day. Explain that the fewer cigarettes she smokes the less chance there will be of smoking-related problems for her and her baby. Also, if she stops or cuts back significantly before the third trimester, there's a better chance her baby will be born at a normal weight. If a smoker is concerned about gaining too much weight, discuss some ideas for eating right and staying active during her pregnancy. Also, WIC staff can refer participants to the American Cancer Society's "Quitline" toll-free at 1 (877) YES-QUIT.



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*Most health professionals agree that pregnant women should limit their intake of coffee.*

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## Part 3

By calling the Quitline, a participant can receive materials and phone counseling designed specifically for pregnant smokers.

### *Box 3.2 Babies Born to Women Who Smoke During Pregnancy:*

Have 30 percent higher odds of being born premature.  
Are more likely to be born with low birthweight.  
Weigh about 200 grams less than infants of non-smokers.  
Are 1.4 to 3.0 times more likely to die of sudden infant death syndrome.

Note. This information is adapted from "Tobacco Use and Pregnancy," by the Centers for Disease Control and Prevention, January 2011, retrieved from <http://www.cdc.gov/reproductivehealth/tobaccousepregnancy>.

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#### **Fetal alcohol spectrum disorders (FASD):**

An umbrella term describing the range of effects that can occur in an individual whose mother drank during pregnancy. These effects may include physical, mental, behavioral, and/or learning disabilities with possible lifelong implications (Bertrand et al., 2004). FASD includes fetal alcohol syndrome (FAS), alcohol-related neurodevelopmental disorder (ARND), alcohol-related birth defects (ARBD), and fetal alcohol effects (FAE). FASD can be prevented by not drinking during pregnancy.

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## Alcohol

Drinking alcohol during pregnancy can cause a number of problems, including serious birth defects, collectively known as **fetal alcohol spectrum disorders (FASD)**. The term fetal alcohol spectrum disorders is not in itself a clinical diagnosis but describes the full range of disabilities that may result from prenatal alcohol exposure. **Fetal alcohol syndrome (FAS)** is within this spectrum and can be diagnosed if the following three findings are documented: 1) three specific facial abnormalities; 2) growth deficit; and 3) central nervous system abnormalities (Bertrand, Floyd, & Weber, 2005).

FAS is the most frequent preventable cause of mental deficiency in the Western world (HHS, 2005). Alcohol consumption may impair the formation of the neural plate which gives rise to the nervous system. There is no safe amount of alcohol, or safe time, that a woman can drink while pregnant.

Babies born with FAS are usually small and underweight. They typically have many physical, mental, and behavioral problems, and they may be mentally retarded. FAS can't be reversed, but it can be prevented, simply by not drinking during pregnancy (CDC, 2010a).

But many women do drink during their pregnancies. According to the 2006 National Survey on Drug Use and Health (Substance Abuse and Mental Health Administration [SAMHA], 2010), 11.8 percent of pregnant women reported current alcohol use and 2.9 percent reported binge drinking (5 or more drinks on the same occasion)

(Floyd et al., 2008; Washington State Department of Health [WSDH], 2010).

Scientists don't know how much alcohol it takes to harm a fetus. Also, it's not just the amount that matters — frequency, timing, individual tolerances, episodes of binge drinking, and genetics also play a role. No safe level of alcohol consumption during pregnancy has been established (USDA & HHS 2010). Since researchers don't know if there's a minimum amount of alcohol that's safe, the best advice is not to drink any alcohol at all during pregnancy.

Because many pregnancies are unplanned, it's common for a woman to drink alcohol before she knows she is pregnant (WSDH, 2010). Often, women in this situation will stop drinking right away, but some women also become quite distressed and are worried that they've harmed their unborn baby. WIC staff can help by being supportive and explaining to participants that this is a very common concern. Many other women with these same worries have given birth to healthy babies. Also, it helps to assure participants that, because they stopped drinking alcohol as soon as they learned they were pregnant, they're giving their baby a chance to develop and grow normally.

However, some women who know they are pregnant choose to drink anyway. Some mistakenly think that beer, wine, and wine coolers are safe to drink since these beverages don't count as "hard liquor." They need to know drinking any kind of alcohol during pregnancy can be harmful. Some women may say they routinely drank during a previous pregnancy without harming their baby. But every pregnancy is different — alcohol may hurt one baby more than another. And some women think it's okay to drink once they reach the third trimester, assuming the first and second trimesters are more critical. It is true that the first trimester is an especially sensitive time because the baby's organs are forming, but alcohol can damage the fetus at every stage of pregnancy, including the third trimester. So, again, the safest advice is to avoid alcohol completely during pregnancy. WIC staff can help reduce alcohol-related birth defects by promoting this message and teaching women about the risks of drinking during pregnancy.

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**Fetal alcohol syndrome (FAS):**

FAS is within the spectrum of FASD and can be diagnosed if the following three findings are documented: 1) three specific facial abnormalities; 2) growth deficit; and 3) central nervous system abnormalities. Babies with FAS are typically small, have decreased mental functioning, and have certain facial abnormalities, including a small upper jaw; a short, upturned nose; a smooth, thin upper lip; and narrow eyes with skin folds over the inner corners. Other defects, including heart defects and limb abnormalities, may also be present.

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*The sooner a woman stops drinking during pregnancy, the better the chances are that her baby will be born at a normal weight with minimal or no physical harm.*

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## Illegal Drugs

In a national study, 4.5 percent of pregnant women aged 15 to 44 years reported using illicit drugs during the month prior to the survey. This was a much lower rate compared with non-pregnant women in the same age group (10.6 percent). However, about 15.8 percent of pregnant teens reported using illicit drugs, which was similar to the rate for non-pregnant teens (13.0 percent) (SAMHA, 2010).

It's difficult to study how specific drugs affect pregnancy since many women who use illegal drugs also smoke, drink alcohol, or use multiple drugs (March of Dimes, 2008). However, all types of illegal drugs can have devastating effects on a woman and her unborn baby. For example, smoking marijuana, like smoking cigarettes, means less oxygen for the baby. Also, some studies link marijuana to lower birthweights and to attention deficits (Floyd et al., 2008; March of Dimes, 2008). Cocaine has been linked to low birthweight, prematurity, and miscarriages. Both cocaine and heroin can cause the death of the mother or fetus (Floyd et al., 2008; March of Dimes, 2008). After birth, babies exposed to these drugs may experience withdrawal-like symptoms, such as trembling, jitteriness, drowsiness, breathing problems, and excessive crying (March of Dimes, 2008).

Of course, the only safe recommendation is avoiding all illicit drug use during pregnancy. Sometimes being pregnant is the one factor that will motivate a woman to quit a drug habit or seek help. It helps for WIC staff to have a non-judgmental and sincere attitude when talking to participants about drugs and to offer support and referrals when needed.

## Nutritional and Herbal Supplements

While regular prenatal vitamins generally provide safe levels of nutrients for pregnant women, some nutritional supplements supply megadoses of nutrients (levels in excess of 10 times the amount the body needs). Taking excessive amounts of nutrients without medical supervision is dangerous. Depending on the supplement and the dosage, the side effects can include anything from hair loss, fatigue, or gastrointestinal distress to more serious results such as kidney stones, nerve damage, and birth defects. For example, megadoses of

vitamin A from supplements can cause fetal deformities of the face and head such as cleft lip, heart malformations, and brain disorders, or fetal death (HHS 2010a; National Institutes of Health, 2006). In addition, dietary supplements may interact with certain medications.

Likewise, various herbal products can cause problems during pregnancy. A number of supplements, including blue cohosh, juniper, pennyroyal, and sage can promote uterine contractions that, in turn, could increase the chance of miscarriage or premature labor (American Pregnancy Association [APA], 2007b).

Women should be aware that the Food and Drug Administration does not approve over-the-counter vitamins, minerals, or other nutritional supplements before they are sold. The same goes for the hundreds of other diet supplements and herbal preparations commonly available in health-food and grocery stores and on the Internet (NIH, 2009).

When a participant asks about some sort of herbal or nutritional supplement or says she is using one, it's important to find out why. Some women may be treating themselves for a chronic medical condition, or perhaps they're experiencing nausea, vomiting, heartburn, or constipation related to their pregnancy. Also, some cultures commonly use herbal preparations for various purposes.

Scientists are now doing more research on certain types of herbal and nutritional supplements, to help to answer questions about the safety and effectiveness of various products. In the meantime, advise participants to talk with their doctor before taking any type of nutritional or herbal supplement.

## Part 3

### Box 3.3 Herbs Not Safe during Pregnancy



*Pregnant women should always talk to a doctor before taking any over-the-counter medication or supplement. Some can be dangerous.*

Aloe vera	Dong quai	Passion flower
Anise	Ephedra	Pay d'arco
Black cohosh	Ergot	Pennyroyal
Black haw	Feverfew	Raspberry leaf
Blue cohosh	Ginko	Roman chamomille
Borage	Ginseng	Saw palmetto
Buckthorn	Goldenseal	Senna
Comfrey	Juniper	Yohimbe
Cotton root	Kava	
Dandelion leaf	Licorice	

Note. This list is not intended to be a complete list of herbs to avoid during pregnancy. The information from this list was adapted from “Natural Herbs & Vitamins During Pregnancy” by the American Pregnancy Association, 2007b; “Nutrition Through the Lifecycle” 3rd edition by Brown et al. 2008; and “Natural Medicines Used During Pregnancy and Lactation” from the Natural Medicines Comprehensive Database, 2011.

## Medications

As with nutritional supplements, a woman shouldn't take any sort of medication during pregnancy, not even an over-the-counter treatment, unless she checks with her doctor first.

Some drugs are extremely dangerous for a human fetus. For example, Accutane (generic name: isotretinoin) is a drug approved to treat the most serious forms of acne. This drug is a synthetic form of vitamin A that can cause birth defects and even fetal death (March of Dimes, 2010) similar to taking megadoses of vitamin A supplements.

On the other hand, many medications are necessary and helpful during pregnancy. For example, if a woman with diabetes doesn't take her medicine during pregnancy, she increases the odds of miscarriage and stillbirth. So, if a woman is taking medication for diabetes, asthma, high blood pressure, or any other medical condition, she should contact her doctor as soon as she knows she is pregnant to discuss the drugs she's taking (National Women's Health Information Center, 2010b). She shouldn't decide on her own to cut down on the amount of a prescribed medication or stop taking it altogether. Instead, her doctor can recommend a safer medication if needed, and determine the lowest effective dose.



### Objectives

Certain factors such as type 2 diabetes, gestational diabetes, adolescence, or domestic violence can make pregnancy riskier for both the mother-to-be and her fetus. Fortunately, participants who get early and routine prenatal care can learn how to manage medical conditions, deal with certain risk factors, and hopefully avoid complications. After reading this part, you'll be able to:

- Understand the different types of diabetes.
- Recognize various risks of gestational diabetes.
- Identify precautions and risks related to diabetes during pregnancy.
- Identify the ways that the **human immunodeficiency virus** is passed on from person to person.
- Choose correct statements related to hypertension during pregnancy.
- Recognize the signs and symptoms of iron-deficiency anemia.
- Identify correct statements related to anemia and pica during pregnancy.
- Choose correct statements about depression during pregnancy.
- Identify key factors for a healthy multifetal pregnancy.
- List two reasons that teen pregnancies are considered to be high risk.
- Identify significant statements regarding eating disorders during pregnancy.
- Recognize correct statements about domestic violence during pregnancy.

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#### **Human Immunodeficiency Virus (HIV):**

A virus that gradually destroys the immune system, resulting in infections that are hard for the body to fight. An HIV infection in its most advanced stages is known as **AIDS**.

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## Diabetes

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**Diabetes:**

A condition that occurs when the body doesn't produce enough insulin or when the body isn't able to use the insulin it does make. This leads to high levels of glucose in the blood (hyperglycemia).

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**Insulin:**

A hormone that controls the level of sugar (glucose) in the blood by allowing glucose to leave the bloodstream and enter the cells. People who can't make insulin must take insulin every day in the form of medication.

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**Macrosomia:**

Refers to a very large fetus. Women who are obese or have diabetes during their pregnancy are at higher risk of having a very large baby. Very large infants have a higher incidence of birth injuries, congenital anomalies, and developmental and intellectual retardation.

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**Diabetes** occurs when the body doesn't produce enough **insulin**, or when the body isn't able to use the insulin that it does make. As a result, blood levels of glucose get too high. High blood glucose during pregnancy can lead to problems for both the woman and her fetus.

There are different types of diabetes (see Box 4.1). Some women may have either **type 1 diabetes** or **type 2 diabetes** before getting pregnant. Another form of diabetes, called **gestational diabetes**, develops during pregnancy. Gestational diabetes disappears after delivery, but it puts a woman at greater risk of developing type 2 diabetes, and a higher risk of developing gestational diabetes again in a future pregnancy (American Diabetes Association, n.d.). Gestational diabetes occurs in about 2 to 10 percent of all pregnancies (CDC, 2011b). Most women are tested for gestational diabetes between 24 and 28 weeks of gestation (ACOG, 2009b).

For a pregnant woman who has any type of diabetes, the key to avoiding problems is to control her blood sugar. If she keeps her blood sugar within normal range, she has a good chance of having a healthy baby. If she doesn't control her blood sugar, she's more likely to develop high blood pressure, urinary tract infections, or other serious complications. Potential problems for the baby include an increased risk of birth defects, miscarriage, stillbirth, and **macrosomia** (a term that refers to a very large fetus), which increases the chance of c-sections or birth injury/trauma (ACOG, 2009b; U.S. National Library of Medicine, 2010). A pregnant woman with diabetes should follow these steps to help control her blood sugar:

- Visit her doctor on a regular basis to have her glucose levels monitored and get medication if needed.
- Check her own glucose levels regularly and keep a record for her doctor (some women need to check glucose levels several times a day).
- Follow a balanced diet with a wide variety of healthy foods. Generally, these women need smaller meals with snacks throughout the day, including a bedtime snack. A registered dietitian should provide in-depth counseling for women who need nutritional guidance.

- Stay physically active, with her doctor’s approval. Regular exercise can keep blood glucose levels in check.
- If using insulin, take insulin shots on a regular basis as prescribed. Also, it’s important to carefully balance diet and insulin doses in order to avoid very high or very low glucose levels.

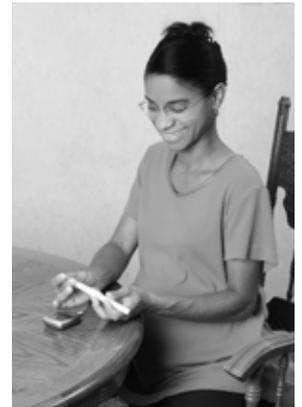
*Box 4.1 Types of Diabetes*

**Type 1 diabetes** — Type 1 diabetes is lifelong disease usually diagnosed in children and accounts for 3 percent of all new cases of diabetes. These patients can’t make their own insulin, so they must take insulin every day in the form of an injection.

**Type 2 diabetes** — This is the most common type of diabetes. It occurs when the cells no longer respond to the insulin that the body makes. The cells become “insulin resistant.” Risk factors include obesity, poor diet, and lack of exercise. It used to be called “adult-onset diabetes,” but these days, many children and teens develop type 2 diabetes.

**Gestational diabetes** — Occurs when a woman can’t make and use all the insulin she needs during pregnancy. It can lead to fetal complications, including macrosomia. It disappears after delivery, but increases a woman’s risk of developing type 2 diabetes, plus puts her at higher risk of gestational diabetes in future pregnancies.

Pregnant women are considered to be at high risk for gestational diabetes if they have one or more of the following factors: obesity, personal history of gestational diabetes, delivery of a large-for-gestational age infant, glycosuria, polycystic ovary syndrome, or a family history of diabetes (Kaiser & Allen, 2008).



*To increase her chances of having a healthy baby, a pregnant woman with diabetes needs to keep her blood sugar within a normal range.*

## HIV and AIDS

The Centers for Disease Control and Prevention estimates that each year about 15,000 women in the United States become infected with HIV (CDC, 2010b). Most of these women are of childbearing age. In 2004, about 70 percent of new infections among women were acquired through heterosexual sex (NIH 2009).

HIV is the virus that causes **AIDS**, or acquired immune deficiency syndrome. Once a person becomes infected, his or her body begins to make antibodies to fight the virus. When a blood test can detect these antibodies, then the person is “HIV positive.” Being HIV positive

### **Acquired Immune Deficiency Syndrome (AIDS):**

A disease caused by infection with the human immunodeficiency virus (HIV). The disease affects the immune system and makes the infected person vulnerable to life-threatening conditions (such as pneumonia). “AIDS” refers to the most advanced stage of an HIV infection. It can take years for an infection to progress to this stage.



doesn't mean a person has AIDS. AIDS refers to the most advanced stages of HIV infection, so it can take many years for the syndrome to develop. People with AIDS can't fight off diseases as healthy people do, and so they're more likely to get infections, cancers, and other life-threatening illnesses.

A person who is HIV positive can pass the virus along to others. This can happen during unprotected sex, by sharing needles, through blood transfusions, by contact with open wounds, or through mother-to-child transmission. A major concern is that many women don't realize they're infected, so a woman can unknowingly pass the virus on to her baby, either during pregnancy, delivery, or breastfeeding (CDC, 2007).

In the United States, approximately 25 percent of pregnant HIV-infected women who do not receive medication pass the virus to their babies. However, when these women get treatment, only about 2 percent transmit the virus to their newborn (CDC, 2007). The problem is that many women either don't acknowledge or don't realize they're practicing behaviors that put them at risk, so they don't get tested to see if they have the virus. That's why groups like the March of Dimes support routine voluntary testing of all pregnant women.

Pregnant WIC participants who have HIV or AIDS may require in-depth nutritional counseling from a registered dietitian. WIC staff can offer general nutrition information that supports instructions from a registered dietitian and from the participant's health-care provider.

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**Hypertension (high blood pressure):**

High blood pressure – defined as a systolic pressure (top number) over 140 mm Hg, or a diastolic blood pressure (bottom number) over 90 mm Hg. Blood pressure is affected by many factors, including the amount of blood being pumped, size and condition of the arteries, amount of water in the body, condition of the kidneys, and hormone levels.

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**Gestational hypertension:**

Elevated blood pressure during pregnancy, diagnosed after 20 weeks gestation, and without protein in the urine. Previously known as pregnancy-induced hypertension, or PIH.

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## High Blood Pressure and Preeclampsia

Simply put, blood pressure is the amount of force that the blood exerts against the arteries as the heart pumps and relaxes. A normal blood-pressure reading is less than 120/80 mm Hg. If the top number is greater than 140 mm Hg or the bottom number is greater than 90 mm Hg, then the person has high blood pressure, or **hypertension**.

Hypertension during pregnancy can be mild, with only a slight rise in blood pressure, or it can be more severe, affecting the mother's kidneys and other organs, and could lead to low birthweight and prematurity (NIH, n.d.).

## Medical Conditions and Other Risk Factors

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Some women have high blood pressure before getting pregnant. This condition is known as “chronic hypertension.” A woman who is taking medication for chronic hypertension should continue doing so during pregnancy, according to her doctor’s instructions. Other women who have no history of high blood pressure develop hypertension during pregnancy. This is known as **gestational hypertension**. Gestational hypertension goes away after the baby is born.

In about 25 percent of cases, hypertension during pregnancy leads to a serious condition called **preeclampsia**. Women with preeclampsia suffer from headaches, swelling in the hands and face, weight gain of about a pound or more per day, blurred vision, abdominal pain, and protein in the urine (U.S. National Library of Medicine, 2009b). Preeclampsia, in turn, can lead to **eclampsia**, which causes seizures in the woman and can lead to coma. Both preeclampsia and eclampsia can be life threatening for the mother and the fetus, so women who develop preeclampsia are closely monitored. Sometimes doctors prescribe bed rest to help control the pressure. The only cure for preeclampsia is delivery of the baby.

Problems related to high blood pressure occur in 6 to 8 percent of all pregnancies in the United States (NIH, n.d.). Women at higher risk include those with chronic hypertension, obese women, women who are pregnant with multiples, and women with diabetes (NIH, n.d.). There’s no sure way to prevent high blood pressure during pregnancy. It used to be a common practice to instruct women to cut back on their salt intake in hopes of preventing gestational hypertension, but studies show that sodium restriction doesn’t help (Delemarre, Steegers, Berendes, & de Jong, 2001; Duley & Henderson-Smart, 2000). The most important thing a woman can do is to get early and regular prenatal care. That way, a health-care provider can routinely check her blood pressure and other health indicators. WIC staff can help by encouraging participants to keep their prenatal appointments.

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### **Preeclampsia:**

A condition during pregnancy that involves elevated blood pressure, protein in the urine, and swelling. Also, headaches, weight gain, abdominal pain, and blurred vision are common. Preeclampsia occurs in about 6 to 8 percent of all pregnancies, and can lead to eclampsia if not treated. Treatment involves bed rest and delivery as soon as possible. The condition disappears after delivery.

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### **Eclampsia:**

Seizures during pregnancy, usually after the 20th week. Eclampsia can be fatal for both the mother and the fetus.

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*Checking blood pressure is a routine part of prenatal care, since hypertension can lead to serious problems during pregnancy.*

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## Iron-Deficiency Anemia



*WIC staff screen pregnant women for anemia by checking the level of hematocrit or hemoglobin in the blood. It is estimated that 30 percent of low-income pregnant women have iron-deficiency anemia (Kaiser & Allen, 2008).*

### **Iron-deficiency anemia:**

A condition that develops when the body doesn't have enough iron to make adequate amounts of hemoglobin. Without enough hemoglobin, the cells don't get enough oxygen, and the person feels tired, weak, and irritable.

### **Hemoglobin:**

A protein in the blood that carries oxygen. A hemoglobin test measures the total amount of hemoglobin in the blood and can be used to assess iron status.

**Iron-deficiency anemia** develops when the body's iron stores get too low. The body needs iron to make **hemoglobin**, a protein that carries oxygen from the lungs to body tissues for energy production. Without enough iron, the level of hemoglobin drops, so less oxygen gets to the body's cells. As a result, a person may feel tired, weak, and irritable — symptoms of iron-deficiency anemia.

In the United States, about 12 percent of women aged 12 to 49 years have iron-deficiency anemia, compared with only 3 percent of adult men (NIH, 2007). The main reason is that women lose blood (and therefore iron) during their monthly periods. But pregnancy also increases a woman's risk for anemia because iron needs are so high during pregnancy.

Pregnant women are usually tested for anemia during their prenatal care. Also, when a pregnant woman is certified for the WIC program, WIC staff screen for anemia by checking either the **hematocrit** or the hemoglobin level in her blood (Table 4.1). If a measurement is low, then staff will refer her to her health-care provider for further tests. Treatment usually involves taking a daily iron supplement, and eating plenty of iron-rich foods.

*Table 4.1 Normal Laboratory Values for Hematocrit and Hemoglobin During Pregnancy*

First trimester	(0 – 13 weeks)	Hct < 33.0% or Hgb < 11.0 g/dL
Second trimester	(14 – 26 weeks)	Hct < 32.0% or Hgb < 10.5 g/dL
Third trimester	(27 – 40 weeks)	Hct < 33.0% or Hgb < 11.0 g/dL

It's generally thought that iron-deficiency anemia doesn't pose a serious threat to a fetus, unless the anemia is severe. However, studies suggest that iron-deficiency anemia in pregnant women may be linked to lower birthweights and prematurity (Ren, Wang, Ye, Li, Liu, & Li, 2007).

## Pica

**Pica** refers to eating nonfood substances like clay, dirt, baking soda, starch, chalk, coffee grounds, cigarette ashes, paint chips, or large quantities of ice. Pica is common among pregnant women, and it probably occurs more often than people realize. It's likely that pica is underreported since it can be embarrassing for women to talk about, plus many health-care professionals don't ask about it.

A study performed in four different Texas WIC clinics showed that out of 281 pregnant women approximately 54 percent ate ice, 15 percent ate freezer frost, and 8 percent ate other substances including baking soda, baking powder, cornstarch, laundry starch, baby powder, clay, or dirt. Women in all three groups had lower hemoglobin levels compared to pregnant women who did not report pica (Rainville, 1998).

The health risks related to pica depend on the substance that's eaten, the amount, and the frequency. Pica can lead to anemia, lead poisoning, small-bowel obstruction, infections from parasites, and other problems (APA, 2007c; Khan & Tisman, 2010). While eating ice might seem like a harmless form of pica, it's still a concern because ice can cause tooth fractures, and large amounts of ice can take the place of nutritious foods in the diet.

Researchers still don't know exactly what causes pica. It's likely that there are a number of factors involved, including psychological, behavioral, physiological, and cultural factors (APA, 2007c; Khan & Tisman, 2010; Young, 2010). Regardless of why it occurs, it's important to ask pregnant women (especially those with anemia) if they eat or crave nonfood substances. For those who do, WIC counselors should take a non-judgmental and sincere approach in discussing the health risks of pica and encourage participants to talk with their doctors about it. The goal is to help these women change their eating patterns and avoid serious problems.

## Depression During Pregnancy

While postpartum depression has gained a lot of attention in recent years, there's been less talk about depression during pregnancy. Yet it is a common problem. Between 14 and 23 percent of pregnant women experience depressive symptoms during pregnancy

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### Hematocrit:

A measurement that indicates the number of red blood cells and the size of red blood cells present in the blood. Hematocrit is used to assess iron status.

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## Part 4

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*Pregnant women of low socioeconomic status are twice as likely to experience depression (Lennon, Blome, & English, 2001; Miranda et al., 2003).*

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(American Psychiatric Association [APA] & ACOG, 2009). More alarmingly, the review estimates that 25 to 28 percent of pregnant women of low socioeconomic status experience depression (Bennett, Einarson, Taddio, Koren, & Einarson, 2004).

Pregnancy is a time of hormonal changes, plus it's a major event that comes just before a huge transformation in a woman's life. Some women have their first episodes of depression during pregnancy, while other women with a history of depression or other mental-health disorders are more likely to have a relapse during pregnancy (HHS, 2009). This is especially true for women who stop taking maintenance antidepressants before trying to conceive or after learning they're pregnant.

Depression can severely impact a woman's job performance, her interactions with family, friends, and health professionals, and her daily routine. Also, depression can endanger the health of both the woman and the fetus through poor self-care, risky behaviors, poor weight gain, and noncompliance with prenatal care, all of which can result in poor pregnancy outcomes (low-birthweight baby, premature birth (Grote et al., 2010; HHS, 2009). What's more, depression during pregnancy often leads to postpartum depression (Mayo Foundation for Medical Education and Research, 2010).

Treatment is a key issue. The first treatment of choice for many women is some form of psychotherapy or behavioral therapy. Therapy alone, without medication, can work for many women, but patients with more severe symptoms may need treatment with antidepressants. No antidepressants are approved by the Food and Drug Administration for use during pregnancy, but there is growing evidence that certain antidepressant drugs can be used safely during pregnancy (Payne & Meltzer-Brody, 2009). Still, the data are limited, especially regarding long-term effects on the infant after birth (APA & ACOG, 2009). Therefore, a doctor and the patient must weigh the risk of fetal exposure against the risk of non-treatment. And regardless of the treatment plan, a pregnant woman with depression (or the risk of relapse) should be followed closely (HHS, 2009).

Keep in mind that depression is an issue for many pregnant women. WIC staff members are not qualified to diagnose depression, but if a participant says she's feeling depressed, staff members can play a key role by referring her to her doctor. Also, WIC staff can be supportive by encouraging positive health habits and nutritious foods.

## Multifetal Pregnancies

**Multifetal pregnancies** are more common these days, mainly because **fertility treatments** are now more common. Being pregnant with more than one fetus increases the risk of complications such as preeclampsia, iron-deficiency anemia, kidney problems, and cesarean delivery (Brown et al., 2008). Infants of a multifetal pregnancy also run a higher risk of problems like low birthweight, prematurity, congenital abnormalities, and cerebral palsy (Brown et al., 2008). With early and regular prenatal care and good nutrition, it is possible for a woman to have a successful multifetal pregnancy without major problems and to give birth to happy, healthy babies.



Weight gain is a key factor for a healthy multifetal pregnancy, since higher weight gains are linked to higher birthweights. It is advisable for women pregnant with multiples to gain a little weight during the first trimester (about 5 pounds), and then gain around 1.5 pounds per week during the second and third trimesters (Klein, 2005). See Table 4.2.

*Table 4.2 Recommendations for Weight Gain During Multifetal Pregnancies*

Healthy Weight	37 – 54 pounds
Overweight	31 – 50 pounds
Obese	25 – 42 pounds
Underweight	No guidelines, lack of data

Note. The data on weight gain are adapted from “Weight Gain During Pregnancy: Reexamining the Guidelines” by the Institute of Medicine, 2009.

To support weight gain, a woman carrying multiples needs extra calories. There’s no specific calorie level that fits all situations, but available research suggests that women get an extra 150 calories per day above what’s needed for a **singleton pregnancy**. Since calorie needs vary, the best way to monitor energy intake is to follow a woman’s weight gain during her pregnancy.

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**Multifetal pregnancy:**

A pregnancy in which the woman is carrying two or more fetuses.

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**Fertility treatments:**

Specialized medical treatments designed to help a couple conceive a child.

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**Singleton pregnancy:**

A pregnancy in which the woman is carrying only one fetus (versus a multifetal pregnancy).

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## Part 4

Of course, it's not just a matter of taking in extra calories. Women pregnant with multiples appear to have higher needs for protein, iron, and calcium, and a number of other nutrients (Klein, 2005). WIC should encourage these women to eat enough servings from each food group, and to include plenty of nutrient-dense foods. Also, pregnant women should be encouraged to take their prenatal supplements as prescribed.



### Teenage Pregnancies

More than 10 percent of all U.S. births in 2006 were to mothers under 20 years old (March of Dimes, 2009a). The teen pregnancy rate in Arkansas far exceeds the national rate. Arkansas ranks eighth (2010 Office of Adolescent Health) highest among U.S. states in incidence of teen pregnancies. From a nutritional standpoint, teenage pregnancy is risky. To begin with, teens are still growing, so they have higher requirements for nutrients related to growth, namely calcium, phosphorus, zinc, and magnesium. Pregnancy increases the daily requirements for most nutrients including iron, zinc, folic acid, vitamin A, vitamin C, and others (Brown et al., 2008; IOM, 2009). In addition, it's likely that there's increased competition for nutrients between the pregnant teen and her fetus (King, 2003).

While nutrition should be a top priority for pregnant teens, teens have a reputation for choosing foods that are low in key vitamins and minerals, and high in fat, saturated fat, and simple sugars (CDC, 2008; Story, Neumark-Sztainer, & French, 2002). Dieting among teens is common, and data from the National Health and Nutrition Examination Survey III revealed that 52 percent of normal-weight adolescent girls considered themselves overweight (CDC, 2008; Larson, Neumark-Sztainer, & Story, 2009).

Teens often engage in risky health behaviors such as having unsafe sex, and experimenting with or using alcohol, drugs, or cigarettes (March of Dimes, 2009a). Also, pregnant teens are less likely to get early and regular prenatal care (ACOG, 2009a; March of Dimes, 2009a).

Therefore, it's no surprise that teens are at higher risk of giving birth to premature or low-birthweight infants, or experiencing placenta previa, pregnancy-induced hypertension, anemia, and toxemia (U.S. National Library of Medicine, 2009a). And, babies of teenage moms

have more health problems, are hospitalized more, and are more likely to experience behavioral and social problems, poor nutrition, abuse, neglect, and inadequate health care (March of Dimes, 2009a).

The WIC counselor may be one of the few people in a pregnant teen's life whom she can talk to without being judged or criticized. WIC encourages the teen mom to get early prenatal care, eat a healthy diet, and breastfeed her baby. WIC agencies in Texas network with programs in middle schools and high schools such as the **Pregnancy Education and Parenting Program**, a state-funded program. These programs work together to provide support groups for pregnant teens, encourage teen moms to continue their education, and train teen breastfeeding moms to become breastfeeding peer counselors to other pregnant and postpartum teens.

## Eating Disorders

Pregnancy can be a time of remission of eating disorders, where symptoms improve as the mother relaxes knowing her body is changing for a good purpose. However, for many mothers-to-be, having to gain weight is frightening and disordered eating behaviors are exacerbated. This may lead to depression and a risk of negative birth outcomes (APA, 2008a; Harris, 2010; National Eating Disorders Association [NEDA], 2005).

**Anorexia nervosa** is characterized by pathological fear of becoming fat, distorted body image, excessive dieting, and emaciation. It usually involves starvation or the use of laxatives to rid the body of calories. Women with anorexia may not gain enough weight during pregnancy and risk having a low-birthweight baby (APA 2008a; NEDA 2005).

**Bulimia** is a condition involving frequent episodes of excessive food intake followed by self-induced vomiting or purging to avoid weight gain. Pregnant women experiencing bulimia will often gain excess weight, putting them at risk for hypertension or gestational diabetes (APA, 2008a; NEDA, 2005). Other complications of eating disorders during pregnancy include premature labor, miscarriage, cesarian birth, delayed fetal growth, and preeclampsia (APA, 2008a).

Be supportive and non-judgemental when working with clients who have eating disorders. Encourage the mother to keep up with

## Part 4



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*During pregnancy, a woman might decide to talk about her abuse since she has more contact with health professionals. WIC staff should be discreet, compassionate, and supportive.*

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### **Domestic violence:**

The threat or use of violence to gain power and control over a spouse, partner, or family member. The violence can be physical, sexual, or emotional. The perpetrator is usually an intimate partner (spouse, partner, boyfriend, or girlfriend), a family member (such as a parent or guardian), or in some cases a more casual acquaintance.

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her prenatal visits and seek treatment from an eating disorders treatment team. If she gains normal weight during pregnancy there should not be any greater risk of complications.

## Domestic Violence

In their lifetimes, as many as one-third of all women are physically assaulted by a partner or an ex-partner. The majority of pregnancy-associated homicides are committed by current or former intimate partners most commonly during the first 3 months of pregnancy (Cheng & Horon, 2010).

During pregnancy, at least 4 to 8 percent of women report violence. However, a great deal of violence goes unreported, and the statistics vary tremendously depending on the methods used and the population studied (CDC, 2009). This suggests that **domestic violence** is a more common risk factor for pregnant women than gestational diabetes, neural-tube defects, or preeclampsia (CDC, 2009). Low-birthweight and preterm births are higher among women exposed to domestic violence (Bailey, 2010; Shah & Shah, 2010). Women who experienced domestic violence at least once in their life have more emotional stress and suicidal thoughts and attempts (Ellsberg, Jansen, Heise, Watts, & Garcia-Moreno, 2008).

Domestic violence can involve sexual, physical, or emotional abuse, or a combination of any of these. Adolescents are at increased risk for violence, and alcohol is strongly linked to increased episodes of violence (CDC, 2009).

Some people wonder why women stay in abusive relationships. In many cases, leaving an abusive situation can be highly dangerous. A woman may be stalked and hurt or killed by her abuser. She can become homeless. She can lose custody of her children. These are all realistic fears (Texas Council on Family Violence, 2010).

However, pregnancy is a time when a woman may be motivated to change her situation in order to protect her child. Pregnancy typically means more contact with health professionals, so it's a chance for women who may have been isolated to talk more openly with someone who can help.

Unfortunately, some doctors don't screen their patients for domestic violence unless they see apparent symptoms or signs of abuse. WIC routinely screens all pregnant women during certification by asking, "Are you afraid that someone you know may injure or harm you?" Simply asking this question can be a key step that sparks a change in a woman's life. Even if an abused woman doesn't reveal any information right away, she'll know that the WIC program will offer support and referrals if she chooses to talk about her abuse in the future (O'Reilly, Beale, & Gillies, 2010). In a 2010 study, recurrent screening throughout pregnancy increased the identification rate of domestic violence (O'Reilly, Beale, & Gillies, 2010).

Trust is a key factor for a victim who wants to talk about her situation, so it's very important for WIC staff to be discreet, compassionate, and sincere. Also, remember that a woman experiencing violence is the best judge of her present situation and of her own safety. It's up to the woman to choose when — or whether — to disclose the violence or to leave an abusive relationship.

During pregnancy, a woman might decide to talk about her abuse since she has more contact with health professionals. WIC staff should be discreet, compassionate, and supportive.

## What to Say and What Not to Say

If a participant says she is being abused, your initial response can be a powerful intervention. Here are some suggestions of what to say:

- "This is not your fault."
- "No one deserves to be treated that way."
- "I'm sorry you've been hurt."
- "Help is available to you."

It's also important to know what not to say. Avoid comments that suggest the woman is at fault or that it would be easy for her to leave her situation. Examples of questions not to ask include:

- "Why don't you just leave?"
- "What did you do to make him so angry?"
- "Why do you keep going back?"

WIC staff should be supportive but should not provide counseling to a woman in an abusive situation. Instead, staff should refer the

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### National Domestic Violence Hotline

In all cases of domestic violence, staff should provide women with the toll-free number for the National Domestic Violence Hotline: 1-800-799-SAFE (7233) or 1-800-787-3224 (TTY). The hot line is staffed 24 hours a day and has bilingual staff available. The hot line can link the caller directly to the nearest shelter or crisis line. WIC clinics can post the hot line's number in restrooms where women can read them discreetly, along with other phone numbers for local shelters and services.

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## Part 4

woman to other agencies and individuals who are trained in dealing with domestic violence. Provide the participant with phone numbers of local shelters, counseling services, and domestic violence advocacy organizations. When possible, give her names of individuals she can ask for when making those phone calls.

### Emergency Situations

In some cases, the woman may be in a very dangerous situation. Find out if the violence or threats of violence have become more frequent or more serious. Also, ask whether there are weapons in the home. If guns are present, if threats to kill have been made, or if violence has become more intense, it is an emergency situation and it's important to form a safety plan before the participant leaves the clinic. Local shelters typically have 24-hour hot lines and staff that can help in such a situation. Also, some clinics have a specially trained nurse, social worker, or health-care worker who can help form a safety plan. Local hospitals can also provide assistance.

By being sensitive, compassionate, and supportive, WIC staff can play a key role in helping pregnant women and other participants who are victims of domestic violence.



## Common Discomforts of Pregnancy

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### Objectives

Pregnant women commonly experience discomforts such as nausea, heartburn, and constipation. Even though these problems are usually not serious, they can be extremely unpleasant and can affect their daily lives. Fortunately, WIC staff can offer suggestions that, in many cases, provide some degree of relief. After reading this part, you'll be able to:

- Identify correct statements about nausea and vomiting during pregnancy.
- List three tips to pass along to women to help them manage nausea and vomiting.
- Identify appropriate suggestions for indigestion or heartburn during pregnancy.
- List three tips for women who have constipation.
- Indicate how WIC staff should advise a pregnant participant who complains of various discomforts.

## Nausea and Vomiting



Researchers aren't sure what causes the nausea and vomiting that pregnant women often experience (Merck Manual's Online Medical Library [MMOML], 2009). Even though it's called "morning sickness," nausea and vomiting related to pregnancy can occur any time of day (WebMD Medical Reference, 2010). And for many women it can last all day. Researchers have found that some women's nausea is similar in intensity to the nausea experienced by chemotherapy patients. While it's a common belief that these symptoms go away by the end of the first trimester, some women continue to experience nausea well into the second trimester. For many pregnant women, nausea, with or without vomiting, interferes with their daily activities and routines, sometimes to the point where they feel like they can't function normally.

Still, most cases of nausea and vomiting are not harmful to the mother or the baby. Oftentimes, women can reduce or avoid certain triggers that make their symptoms worse. Here are tips to pass along:

- Avoid strong, offensive smells. Get plenty of fresh air, especially in the bedroom, kitchen, and eating areas.
- Try eating smaller, more frequent meals.
- Avoid spicy, greasy, or fried foods.
- After waking up, try eating crackers, dry toast, or a handful of dry cereal. Then rest in bed for a while before slowly getting up.
- Drink liquids between meals, not with them. Avoid drinks with caffeine. Try cold, sweet beverages or drinks that are bubbly.
- Find out by trial and error which foods lessen the nausea, and eat those foods to avoid an empty stomach.
- Some women experience nausea when taking prenatal vitamins. If you do, try taking the vitamin at night, or talk to your doctor about switching to another vitamin.
- Never take medicine for nausea without a doctor's approval. Also, talk with a doctor before trying any sort of alternative treatment.

Fewer than 2 percent of pregnant women experience **hyperemesis gravidarum**, or severe nausea and vomiting (Tan & Omar, 2011). These women are typically unable to keep down any foods or fluids.

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**Hyperemesis gravidarum:**

Extremely severe and persistent nausea and vomiting during pregnancy, which often leads to dehydration, acidosis, and weight loss.

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Hyperemesis gravidarum can lead to dehydration, electrolyte imbalances, ketosis, and weight loss (MMOML, 2009). This is a serious condition requiring medical treatment.

### Heartburn and Indigestion

In some women, certain pregnancy hormones relax the valve between the esophagus and the stomach, allowing digestive juices and food from the stomach to rise into the esophagus. This causes **heartburn** — a burning feeling in the chest. Also, hormonal changes can slow the whole digestive process, increasing the time for the stomach to empty (WebMD Medical Reference, 2010). This can cause **indigestion** — a bloated, gassy, full feeling. Here are some suggestions for participants who experience indigestion or heartburn:

- Eat small, low-fat meals and snacks.
- Don't overeat.
- Avoid spicy foods and greasy or fried foods.
- Don't bend over or lie down for one to two hours after eating.
- Wear clothes that are loose around the waist.
- Avoid soft drinks and drinks with caffeine.
- Never take antacids or other medicine for heartburn or indigestion without talking with your doctor first.

### Constipation

Another common pregnancy problem is **constipation** (infrequent bowel movements with hard, dry stools). The slower digestion that occurs during pregnancy may be one cause. In some cases, iron supplements may be the culprit. Also, in late pregnancy, the weight of the baby and the uterus puts more pressure on the rectum, making the problem worse (WebMD Medical Reference, 2010). Here are some tips for women who experience constipation:

- Drink 8 to 10 glasses of water every day.
- Eat whole-grain breads, cereals, and grains.
- Eat plenty of fruits and vegetables.

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**Heartburn:**

A burning feeling in the chest, caused by digestive juices and food from the stomach going up into the esophagus.

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**Indigestion:**

A bloated, gassy, full feeling; abdominal discomfort.

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**Constipation:**

Infrequent bowel movements with hard, dry stools.

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- Eat dried fruit like prunes, apricots, and raisins, or drink prune juice.
- Get plenty of exercise. Walking is best.
- Never take a laxative or home remedy for constipation without your doctor's approval.



### Other Common Problems During Pregnancy

There are many other common discomforts a woman may experience during her pregnancy, including frequent urination, dizziness, varicose veins, hemorrhoids, leg cramps, tender breasts, backache, congestion, nosebleeds, bleeding gums, fatigue, and headaches. Fortunately, most of these problems don't pose a serious health threat for the mother or the fetus, although some can be quite disruptive to day-to-day activities. Also, some symptoms can signal a more serious problem such as gestational diabetes or gum disease. WIC staff should encourage women to talk to their doctor about any discomforts they have.

In general, many expectant mothers learn to take it all in stride, knowing that pregnancy is a unique, wondrous, but sometimes very uncomfortable experience that, fortunately, only lasts for nine months

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# Appendix

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## Common Prenatal Tests

*(American Pregnancy Association, 2011)*

All pregnant women receiving prenatal care have certain routine tests during pregnancy. Also, some women have additional tests depending on medical history, age, family background, exam results, or screening results. This table summarizes some of the more common prenatal tests.

<b>Test</b>	<b>Description</b>
<b>urine test</b>	At almost every doctor visit, a pregnant woman will have her urine tested to check for levels of bacteria, sugar, and protein. High levels of sugar in the urine can indicate diabetes. Protein in the urine can be a sign of a urinary-tract infection or, in later pregnancy, a sign of preeclampsia.
<b>blood test</b>	All pregnant women have their blood tested at least once during the pregnancy to check for things like: <ul data-bbox="630 1150 1192 1476" style="list-style-type: none"><li>• blood type (A, B, AB, or O)</li><li>• antibody screen (Rh positive or negative)</li><li>• anemia</li><li>• a history of rubella (German measles)</li><li>• syphilis</li><li>• hepatitis B</li><li>• HIV (with the woman’s permission)</li></ul>
<b>alphafetoprotein test</b>	Labs used to measure alpha fetoprotein in a stand-alone test, but these days it’s typically included in a combined test called the “multiple marker screening test,” described below.

## Appendix

<b>Test</b>	<b>Description</b>
<b>multiple marker screening test (also called the “triple screen”)</b>	<p>Around the 16th week of pregnancy, most pregnant women typically have this blood test to screen for certain serious birth defects, Down syndrome and neural-tube called the defects. The multiple-marker screening test measures the levels of three substances found in the mother’s blood:</p> <ul style="list-style-type: none"><li>• alpha-fetoprotein — a protein produced by the fetus</li><li>• estriol — an estrogen produced by both the fetus and the placenta</li><li>• human chorionic gonadotropin — a hormone produced in the placenta</li></ul> <p>This is simply a screening test and only reveals the possibility that a problem might exist. If the levels of these substances are abnormal, the doctor will usually recommend doing a diagnostic test — either an ultrasound or an amniocentesis. In most cases, the follow-up test will show that the initial screening test was a false alarm and that the baby is fine.</p>
<b>glucose screening test</b>	<p>Between 24 and 28 weeks of pregnancy, most screening pregnant women take a glucose screening test to check for gestational diabetes. After the woman drinks a special sugar mixture, a health-care provider takes a blood sample to check the level of glucose in the blood. If the blood-sugar level is high, the woman takes a glucose tolerance test. The glucose tolerance test is a similar but longer test, and is used to diagnose gestational diabetes.</p>

## Appendix

Test	Description
<p><b>ultrasound</b></p>	<p>Most pregnant women have their first ultrasound around the 16th week of pregnancy, but it can be done anytime. Sound waves are used to create an image of the fetus, which is displayed on a computer monitor. A doctor can check the size, location, number, and age of fetuses, fetal movement, breathing, and heartbeat. Also, an ultrasound is used to detect Down syndrome, neural-tube defects such as <b>spina bifida</b> and <b>anencephaly</b>, and other birth defects.</p> <hr/> <p>(<b>Note:</b> In March 2008, the Food and Drug Administration reiterated warnings to consumers about businesses that use ultrasound technology to create “keepsake” images. These are three-dimensional images and videos of babies in the womb that simply serve as memorabilia. The FDA views this as an unapproved use of a medical device, and states that performing prenatal ultrasounds without following state and federal guidelines puts a mother and her unborn baby at risk [Food and Drug Administration, 2008].)</p>
<p><b>amniocentesis</b></p>	<p>This test uses amniotic fluid to diagnose chromosomal abnormalities and genetic birth defects, including neural-tube defects. It’s usually offered to women at higher risk of having a baby with certain serious birth defects, typically around 15 to 18 weeks of pregnancy.</p> <p>Using an ultrasound as a guide, a doctor inserts a thin needle through the abdomen and into the amniotic sac. A small amount of amniotic fluid and cells are removed and analyzed. There is a small risk of miscarriage (1 in 200 or less) associated with the procedure.</p>

## Appendix

Test	Description
<p><b>chorionic villus sampling (CVS)</b></p>	<p>This test samples cells that line the placenta (chorionic villus cells) to detect chromosomal abnormalities and genetic birth defects. Since (CVS) this procedure does not collect amniotic fluid, CVS cannot be used to test for neural-tube defects. It's usually offered to women at higher risk of having a baby with certain serious birth defects, and is typically done around 10 to 12 weeks of pregnancy. That means that a woman is able to obtain the results of a CVS earlier compared with an amniocentesis.</p> <p>Using an ultrasound as a guide, a doctor inserts either a thin needle through the abdomen, or a thin plastic tube through the vagina and cervix. A small sample of chorionic villus cells is removed and tested. There may be a slightly higher risk of miscarriage compared to amniocentesis (1 in 100 or less) and there appears to be a very slight risk of birth defects involving missing or shortened fingers or toes (about 1 in 3000).</p>
<p><b>Group B strep test</b></p>	<p>One of every four or five pregnant women is a carrier of Group B streptococcus, a type of bacterium, which can cause life-threatening infections in newborns.</p> <p>The Group B strep test is performed at 35 to 37 weeks of pregnancy, in order to predict whether the mother will have GBS at delivery. A health-care provider takes a swab of the vagina and rectum to see if the woman carries the bacterium. Results take 24 to 48 hours. If she is a carrier, she should be treated with antibiotics at the time of labor and delivery. Likewise, if a woman starting labor has certain risk conditions of GBS and her test results are unknown (or if the test wasn't done), she may be treated with antibiotics.</p>

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# Glossary

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**Acquired Immune Deficiency Syndrome (AIDS)** – A disease caused by infection with the human immunodeficiency virus (HIV). The disease affects the immune system and makes the infected person vulnerable to life-threatening conditions (such as pneumonia). “AIDS” refers to the most advanced stage of an HIV infection. It can take years for an infection to progress to this stage.

**anencephaly** – A defect in which the upper portion of the neural tube doesn’t close during the early stages of fetal development, resulting in the absence of a large part of the brain and skull. Many of these pregnancies spontaneously abort or result in stillbirth. An infant born with anencephaly is usually blind, deaf, unconscious, and unable to feel pain, and the baby usually dies within a few hours or days after birth.

**anorexia nervosa** – A condition characterized by pathological fear of becoming fat, distorted body image, excessive dieting, and emaciation. It usually involves starvation or use of laxative to rid the body of calories.

**body mass index (BMI)** – A tool for indicating weight status. For persons ages 20 years or older, BMI falls into one of these categories: underweight, normal, overweight, or obese. An adult’s BMI is calculated thus:  $BMI = \text{weight (kilograms)} / \text{height (meters)}^2$ . For children and teens, BMI is plotted on gender- and age-specific charts.

**bulimia** – A condition involving frequent episodes of grossly excessive food intake followed by self-induced vomiting or purging to avert weight gain.

**caffeine** – A substance that acts as both a stimulant and a diuretic. Caffeine is found in coffee, tea, colas, chocolate, cocoa, and some over-the-counter and prescription drugs.

**constipation** – Infrequent bowel movements with hard, dry stools.

**diabetes** – A condition that occurs when the body doesn’t produce enough insulin or when the body isn’t able to use the

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insulin it does make. This leads to high levels of glucose in the blood (hyperglycemia). (See also **gestational diabetes**, **type 1 diabetes**, and **type 2 diabetes**.)

**domestic violence** – The threat or use of violence to gain power and control over a spouse, partner, or family member. The violence can be physical, sexual, or emotional. The perpetrator is usually an intimate partner (spouse, partner, boyfriend, or girlfriend), a family member (such as a parent or guardian), or in some cases a more casual acquaintance.

**eclampsia** – Seizures or coma during pregnancy, usually after the 20th week, in a woman with preeclampsia. Eclampsia can be fatal for both the mother and the fetus. (See also **preeclampsia**.)

**fetal alcohol spectrum disorders (FASD)** – An umbrella term describing the range of effects that can occur in an individual whose mother drank during pregnancy. These effects may include physical, mental, behavioral, and learning disabilities with possible lifelong implications (Bertrand et al., 2004). FASD includes fetal alcohol syndrome (FAS), alcohol-related neurodevelopmental disorder (ARND), alcohol-related birth defects (ARBD), and fetal alcohol effects (FAE). FASD can be prevented by not drinking during pregnancy.

**fetal alcohol syndrome (FAS)** – FAS is within the spectrum of FASD and can be diagnosed if the following three findings are documented: 1) three specific facial abnormalities; 2) growth deficit; and 3) central nervous system abnormalities. Babies with FAS are typically small, have decreased mental functioning, and have certain facial abnormalities, including a small upper jaw; a short, upturned nose; a smooth, thin upper lip; and narrow eyes with skin folds over the inner corners. Other defects, including heart defects and limb abnormalities, may also be present.

**fertility treatments** – Specialized medical treatments designed to help a couple conceive a child.

**gestational diabetes** – A high level of blood glucose during pregnancy, which can lead to complications for the fetus, including fetal **macrosomia**, hypoglycemia, and jaundice. Treatment involves controlling blood glucose through diet and, in some cases, medication. Gestational diabetes usually disappears after delivery, but a woman with a history of gestational diabetes has an increased

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risk of developing type 2 diabetes, and she has a higher chance of developing gestational diabetes again in future pregnancies.

**gestational hypertension** – Elevated blood pressure during pregnancy, diagnosed after 20 weeks gestation, and without protein in the urine. Previously known as pregnancy-induced hypertension, or PIH.

**gingivitis** – Red, swollen, and bleeding gums caused by the bacteria in plaque, a sticky film that forms on the teeth. Hormonal changes during pregnancy make women more susceptible to gingivitis during pregnancy. But it is bacteria, not hormones, that causes gingivitis.

**heartburn** – A burning feeling in the chest, caused by digestive juices and food from the stomach going up into the esophagus.

**heme iron** – The type of iron found in animal foods. Heme iron is present in the hemoglobin and myoglobin of meat. (See also **non-heme iron**.)

**hematocrit** – A measurement that indicates the number of red blood cells and the size of red blood cells present in the blood. Used to assess iron status.

**hemoglobin** – A protein in the blood that carries oxygen. A hemoglobin test measures the total amount of hemoglobin in the blood and can be used to assess iron status.

**Human Immunodeficiency Virus (HIV)** – A virus that gradually destroys the immune system, resulting in infections that are hard for the body to fight. An HIV infection in its most advanced stages is known as **AIDS**.

**hyperemesis gravidarum** – Extremely severe and persistent nausea and vomiting during pregnancy, which often leads to dehydration, acidosis, and weight loss.

**hypertension (high blood pressure)** – defined as a systolic pressure (top number) over 140 mm Hg, or a diastolic blood pressure (bottom number) over 90 mm Hg.

Blood pressure is affected by many factors, including the amount of blood being pumped, size and condition of the arteries, amount of water in the body, condition of the kidneys, and hormone levels.

**indigestion** – A bloated, gassy, full feeling; abdominal discomfort.

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**insulin** – A hormone that controls the level of sugar (glucose) in the blood by allowing glucose to leave the bloodstream and enter the cells. People who can't make insulin must take insulin every day in the form of medication.

**iron-deficiency anemia** – A condition that develops when the body doesn't have enough iron to make adequate amounts of **hemoglobin**. Without enough hemoglobin, the cells don't get enough oxygen, and the person feels tired, weak, and irritable – symptoms of iron-deficiency anemia.

**lacto-ovo-vegetarians** – Vegetarians who eat eggs and dairy products in addition to a plant-based diet (no meat, poultry, or fish).

**lacto-vegetarians** – Vegetarians who consume dairy products in addition to a plant-based diet (no eggs, meat, poultry, or fish).

**large for gestational age** – Having a birthweight  $\geq 9$  pounds ( $\geq 4000$  g) or  $\geq 90$ th percentile weight for gestational age at birth, based on a generally accepted intrauterine growth reference. Being large for gestational age may result from maternal diabetes and may lead to obesity in childhood that can extend into adult life.

**listeriosis** – A disease caused by the bacterium *Listeria monocytogenes*. Most infections in humans come from contaminated foods, namely soft cheeses, patés, and unheated deli-style meats and poultry. Pregnant women are 20 times more likely to contract listeriosis compared to other adults, and a woman can pass the infection on to her fetus, causing miscarriage, premature delivery, stillbirth, or other serious problems.

**low-birthweight** – Having a birthweight  $\leq 5$  pounds, 8 ounces ( $\leq 2500$  grams).

**macrosomia** – Refers to a very large fetus. Women who are obese or have diabetes during their pregnancy are at higher risk of having a very large baby. Very large infants have a higher incidence of birth injuries, congenital anomalies, and developmental and intellectual retardation.

**methylmercury** – A form of mercury that is present in the marine food chain as a result of industrial pollution. Larger fish that are higher on the food chain accumulate higher levels of methylmercury. If eaten at high levels, methylmercury can harm a fetus's or child's developing nervous system.

**multifetal pregnancy** – A pregnancy in which the woman is carrying two or more fetuses.

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**neural-tube defects** – Serious birth defects involving incomplete development of the brain and spinal column. Specific examples include anencephaly and spina bifida.

Adequate amounts of folic acid at the time of conception and early pregnancy reduce the risk of neural-tube defects.

**non-heme iron** – Iron that is present in plant foods. The body only absorbs about 2 to 20 percent of non-heme iron from foods. (See also **heme iron**.)

**periodontal disease (gum disease)** – Inflammation and infection of the tissues around the teeth, which, if left untreated, leads to bone destruction and tooth loss. **Gingivitis** represents the early stage of periodontal disease.

**pica** – Eating nonfood substances like clay, dirt, baking soda, starch, ashes, chalk, coffee grounds, cigarette ashes, paint chips, or large quantities of ice.

**preeclampsia** – A condition during pregnancy that involves elevated blood pressure, protein in the urine, swelling, headaches, weight gain, abdominal pain, and blurred vision. Preeclampsia occurs in about 6 to 8 percent of all pregnancies, and can lead to **eclampsia** if not treated. Treatment involves bed rest and delivery as soon as possible. The condition disappears after delivery.

**Pregnancy, Education, and Parenting Program** – A statewide program to help school-age parents to become self-sufficient and to reduce the number of students who drop out of school due to pregnancy or parenthood. The program includes individual and peer counseling; self-help programs; career counseling and job-readiness training; child care; instruction in child development, parenting, and home and family living; and assistance in obtaining services from government agencies or community-service organizations.

**premature** – An infant born at  $\leq 37$  weeks gestation. Also referred to as “preterm.”

**singleton pregnancy** – A pregnancy in which the woman is carrying only one fetus (versus a **multifetal pregnancy**).

**spina bifida** – A type of birth defect that results from incomplete closure of the spine during the first month of fetal development. In some cases, the spinal cord sticks out through the back and is covered by skin or a membrane. These infants have surgery to close

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the back soon after birth. Paralysis and hydrocephalus are common, as well as bowel and bladder dysfunction. Still, with medical treatment now available, most children born with spina bifida survive and reach adulthood.

**toxoplasmosis** – An infection caused by a parasite found in cat litter and in raw or undercooked meat (especially pork, lamb, and venison). Most infected people show no symptoms, but a pregnant woman can pass the infection on to her fetus, which can lead to serious problems, including central-nervous-system disorders, an enlarged spleen and liver, jaundice, anemia, and other serious problems. Pregnant women should cook all meat thoroughly and, if they have a cat, have someone else change its litter box.

**trimester** – A term of approximately 3 months in the prenatal gestation period, with the specific trimesters defined as follows — first trimester: 0–13 weeks, second trimester: 14–26 weeks, third trimester: 27–40 weeks. The first day of the last menstrual period serves as the beginning of the first week of pregnancy.

**type 1 diabetes** – Occurs when the pancreas produces too little insulin to properly control blood sugar levels, resulting in high blood glucose. These patients can't make their own insulin, so they must take insulin every day. Type 1 diabetes is a chronic (lifelong) disease that is typically diagnosed in children; it accounts for 3 percent of all new cases of diabetes each year.

**type 2 diabetes** – Occurs when the body's cells no longer respond to the insulin that the body makes (the cells become "insulin resistant"), resulting in high blood glucose. Type 2 diabetes is the most common form of this disease. Obesity, poor diet, and lack of exercise are associated with the development of type 2 diabetes. It used to be called adult-onset diabetes, but the term no longer applies, since these days many children and adolescents develop type 2 diabetes.

**vegetarian** – A general term referring to people who eat a diet based on foods of plant origin. Many vegetarians also consume eggs or dairy products. (See also **lacto-vegetarians**, **lacto-ovo vegetarians**, and **vegans**.)

**vegans** – Vegetarians who eat only foods of plant origin. They do not consume any animal products whatsoever.

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## References

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- American College of Obstetricians and Gynecologists. (2003). *Exercise during pregnancy* (AP119) [Patient education pamphlet]. Retrieved from [http://www.acog.org/publications/patient\\_education/bp119.cfm](http://www.acog.org/publications/patient_education/bp119.cfm)
- American College of Obstetricians and Gynecologists. (2007, January). *You and your baby prenatal care, labor and delivery, and postpartum care* (AB005) [Patient education pamphlet]. Retrieved from [http://www.acog.org/publications/patient\\_education/ab005.cfm](http://www.acog.org/publications/patient_education/ab005.cfm)
- American College of Obstetricians and Gynecologists. (2008). *Tobacco, alcohol, drugs, and pregnancy* (AP170) [Patient education pamphlet]. Retrieved from [http://www.acog.org/publications/patient\\_education/bp170.cfm](http://www.acog.org/publications/patient_education/bp170.cfm)
- American College of Obstetricians and Gynecologists. (2009a). *Adolescent facts: Pregnancy, birth and STDs*. Retrieved from <http://www.acog.org/departments/adolescentHealthCare/AdolescentFactsPregnancyAndSTDs.pdf>
- American College of Obstetricians and Gynecologists. (2009b, June). *Diabetes and pregnancy*. Retrieved from [http://www.acog.org/publications/patient\\_education/bp051.cfm](http://www.acog.org/publications/patient_education/bp051.cfm)
- American College of Obstetricians and Gynecologists. (2010a, August). ACOG Committee Opinion No.462: Moderate caffeine consumption during pregnancy. *Obstetrics & Gynecology*, 116, 467-468.
- American College of Obstetricians and Gynecologists. (2010b, August). *Nutrition during pregnancy*. Washington, D.C.: American College of Obstetricians and Gynecologists.
- American Diabetes Association. (n.d.). *Gestational diabetes*. Retrieved from [http://www.diabetes.org/diabetes-basics/prevention/checkup-america\\_gdm.html](http://www.diabetes.org/diabetes-basics/prevention/checkup-america_gdm.html)
- American Pregnancy Association. (2007a, November). *About pregnancy weight gain*. Retrieved from <http://www.americanpregnancy.org/pregnancyhealth/aboutpregweightgain.html>

## References

- American Pregnancy Association. (2007b, November). *Natural herbs & vitamins during pregnancy*. Retrieved from <http://www.americanpregnancy.org/pregnancyhealth/naturalherbsvitamins.html>
- American Pregnancy Association. (2007c, March). *Pregnancy and pica: Non-food cravings*. Retrieved from <http://www.americanpregnancy.org/pregnancyhealth/unusualcravingspica.html>
- American Pregnancy Association. (2008a, October). *Eating disorders during pregnancy*. Retrieved from <http://www.americanpregnancy.org/pregnancyhealth/eatingdisorders.html>
- American Pregnancy Association. (2008b, October). *Listeria and pregnancy*. Retrieved from <http://www.americanpregnancy.org/pregnancycomplications/listeria.html>
- American Pregnancy Association. (2011). *Prenatal testing*. Retrieved from <http://www.americanpregnancy.org/prenataltesting>
- American Psychiatric Association & American College of Obstetricians and Gynecologists. (2009, August 21). *Depression during pregnancy: Treatment recommendations. A joint report from APA and ACOG* [ACOG News Release]. Retrieved from [http://www.acog.org/from\\_home/publications/press\\_releases/nr08-21-09-1.cfm](http://www.acog.org/from_home/publications/press_releases/nr08-21-09-1.cfm)
- Bailey, B.A. (2010). Partner violence during pregnancy: Prevalence, effects, screening, and management. *International Journal of Women's Health, 2*, 183-197.
- Bennett, H.A., Einarson, A., Taddio, A., Koren, G., & Einarson, T.R. (2004). Prevalence of depression during pregnancy: Systematic review. *Obstetrics & Gynecology, 103*, 698-709.
- Bertrand, J., Floyd, R.L., & Weber, M.K. (2005). Guidelines for identifying and referring persons with fetal alcohol syndrome. *Morbidity and Mortality Weekly Report, 54*, 1-15.
- Beth Israel Deaconess Medical Center, Obstetrics and Gynecology Department. (2010). *Your nutrition and dietary needs: Vitamin supplements*. Retrieved from <http://www.bidmc.org/CentersandDepartments/DepartmentsObstetricsGynecology/PatientEducationResources/YourPregnancy/YourNutritionandDietaryNeeds/VitaminSupplements.aspx>
- Brown, J.E., Isaacs, J.S., Krinke, U.B., Murtaugh, M.A., Sharbaugh, C., Stang, J., & Wooldridge, N.H. (2008). *Nutrition Through the Life Cycle*. (3rd ed.). Belmont, CA: Thompson Wadsworth.

## References

- Carrillo-de-Albornoz, A., Figuero, E., Herrera, D., & Bascones-Martinez, A. (2010). Gingival changes during pregnancy: II. Influence of hormonal variations on the subgingival biofilm. *Journal of Clinical Periodontology*, 37, 230-240.
- Centers for Disease Control and Prevention. (2007, October). *Mother-to-child (perinatal) HIV transmission and prevention* [Fact sheet]. Retrieved from <http://www.cdc.gov/hiv/topics/perinatal/resources/factsheets/perinatal.htm>
- Centers for Disease Control and Prevention. (2008, November). *Healthy youth! Health topics: Nutrition school health guidelines*. Retrieved from <http://www.cdc.gov/healthyyouth/nutrition/guidelines/summary.htm>
- Centers for Disease Control and Prevention. (2009, June). *Intimate partner violence during pregnancy, a guide for clinicians: Screen show presentation index*. Retrieved from [http://www.cdc.gov/reproductivehealth/violence/intimatepartnerviolence/ipvdp\\_download.htm](http://www.cdc.gov/reproductivehealth/violence/intimatepartnerviolence/ipvdp_download.htm)
- Centers for Disease Control and Prevention. (2010a, October). *Fetal Alcohol Spectrum Disorders (FASDs)*. Retrieved from <http://www.cdc.gov/ncbddd/fasd/facts.html>
- Centers for Disease Control and Prevention. (2010b, July). *HIV in the United States* [Fact sheet]. Retrieved from <http://www.cdc.gov/hiv/resources/factsheets/us.htm>
- Centers for Disease Control and Prevention. (2010c, October). *2009 Pregnancy Nutrition Surveillance*. Retrieved from [http://www.cdc.gov/pednss/pnss\\_tables/pdf/national\\_table2.pdf](http://www.cdc.gov/pednss/pnss_tables/pdf/national_table2.pdf)
- Centers for Disease Control and Prevention. (2010d, April). *Toxoplasmosis and pregnancy*. Retrieved from [http://www.cdc.gov/ncbddd/pregnancy\\_gateway/infections-toxo.html](http://www.cdc.gov/ncbddd/pregnancy_gateway/infections-toxo.html)
- Centers for Disease Control and Prevention. (2011a, April). *Listeriosis*. Retrieved from <http://www.cdc.gov/nczved/divisions/dfbmd/diseases/listeriosis/#what>
- Centers for Disease Control and Prevention. (2011b, January). *National diabetes fact sheet, 2011*. Retrieved from <http://www.cdc.gov/diabetes/pubs/factsheets.htm>
- Centers for Disease Control and Prevention. (2011c, February). *Physical activity for everyone: Healthy pregnant or postpartum women*.

## References

- Retrieved from <http://www.cdc.gov/physicalactivity/everyone/guidelines/pregnancy.html>
- Centers for Disease Control and Prevention. (2011d, January). *Tobacco use and pregnancy*. Retrieved from <http://www.cdc.gov/reproductivehealth/tobaccousepregnancy>
- Cheng, D., & Horon, I.L. (2010). Intimate-partner homicide among pregnant and postpartum women. *Obstetrics & Gynecology*, 115, 1181-1186.
- Craig, W.J., & A.R. Mangels. (2009). Position of the American Dietetic Association: Vegetarian diets. *Journal of the American Dietetic Association*, 109, 1266-1282.
- Delemarre, F.M., Steegers, E.A., Berendes, J.N., & de Jong, P.A. (2001). Eclampsia despite strict dietary sodium restriction. *Gynecologic and Obstetric Investigation*, 51, 64-65.
- Duley, L., & Henderson-Smart, D. (2000). Reduced salt intake compared to normal dietary salt, or high salt intake, in pregnancy. *Cochrane Database Systematic Reviews*, 2, CD001687.
- Ellsberg, M., Jansen, H.A., Heise, L., Watts, C.H., & Garcia-Moreno, C. (2008). Intimate partner violence and women's physical and mental health in the WHO multi-country study on women's health and domestic violence: An observational study. *Lancet*, 371, 1165-1172.
- Figuro, E., Carrillo-de-Albornoz, A., Herrera, D., & Bascones-Martinez, A. (2010). Gingival changes during pregnancy: I. Influence of hormonal variations on clinical and immunological parameters. *Journal of Clinical Periodontology*, 37, 220-229.
- Floyd, R.L., Jack, B.W., Cefalo, R., Atrash, H., Mahoney, J., Herron, A., Husten, C., & Sokol, R.J. (2008). The clinical content of preconception care: Alcohol, tobacco, and illicit drug exposures. *American Journal of Obstetrics & Gynecology*, 199, S333-339.
- Goldenberg, R.L., Cliver, S.P., Neggens, Y., Copper, R.L., DuBard, M.D., Davis, R.O., & Hoffman, H.J. (1997). The relationship between maternal characteristics and fetal and neonatal anthropometric measurements in women delivering at term: A summary. *Acta Obstetrica et Gynecologica Scandinavica*, 165, 8-13.
- Gore, S.A., Brown, D.M., & West, D.S. (2003). The role of postpartum weight retention in obesity among women: A review of the evidence. *Annals of Behavioral Medicine*, 26, 149-159.

## References

- Grote, N.K., Bridge, J.A., Gavin, A.R., Melville, J.L., Iyengar, S., & Katon, W.J. (2010). A meta-analysis of depression during pregnancy and the risk of preterm birth, low birth weight, and intrauterine growth restriction. *Archives of General Psychiatry*, 67, 1012-1024.
- Guttmacher Institute. (2010, January). *U.S. teenage pregnancies, births, and abortions: National and state trends and trends by race and ethnicity*. Retrieved from <http://www.guttmacher.org/pubs/USTPTrends.pdf>
- Han, Y.W. (2011). Oral health and adverse pregnancy outcomes – What’s next? *Journal of Dental Research*, 90, 289-293.
- Harris, A.A. (2010). Practical advice for caring for women with eating disorders during the perinatal period. *Journal of Midwifery Women’s Health*, 55, 579-586.
- Higdon, J.V., & Frei, B. (2006). Coffee and Health: A review of recent human research. *Critical Reviews in Food Science Nutrition*, 46, 101-123.
- Institute of Medicine & National Research Council. (2005). *Dietary Reference Intakes for energy, carbohydrate, fiber, fat, fatty acids, cholesterol, protein, and amino acids*. Washington, D.C.: The National Academies Press.
- Institute of Medicine & National Research Council. (2009). *Weight gain during pregnancy: Reexamining the guidelines*. Washington, DC: The National Academies Press.
- Kaiser, L., & Allen, L.H. (2008). Position of the American Dietetic Association: Nutrition and lifestyle for a healthy pregnancy outcome. *Journal of the American Dietetic Association*, 108, 553-561.
- Khan, Y., & Tisman, G. (2010). Pica in iron deficiency: A case series. *Journal of Medical Case Reports*, 4, 86.
- King, J.C. (2003). The risk of maternal nutritional depletion and poor outcomes increases in early or closely spaced pregnancies. *Journal of Nutrition*, 133, 1732S-1736S.
- Klein, L. (2005). Nutritional recommendations for multiple pregnancy. *Journal of the American Dietetic Association*, 105, 1050-1052.
- Krueger, P.M., & Scholl, T.O. (2000). Adequacy of prenatal care and pregnancy outcome. *The Journal of the American Osteopathic Association*, 100, 485-492.
- Kuczkowski, K.M. (2009). Caffeine in pregnancy. *Archives of Gynecology Obstetrics*, 280, 695-698.

## References

- Larson, N.I., Neumark-Sztainer, D., & Story, M. (2009). Weight control behaviors and dietary intake among adolescents and young adults: Longitudinal findings from Project EAT. *Journal of the American Dietetic Association*, 109, 1869-1877.
- Lennon, M.C., Blome, J., & English, K. National Center for Children in Poverty. (2001, April). *Depression in low-income women*. Retrieved from [http://nccp.org/publications/pub\\_381.html](http://nccp.org/publications/pub_381.html)
- Levine, M.D., Marcus, M.S., Kalarchian, M.A., Houck, P.R., & Cheng, Y. (2010). Weight concerns, mood, and postpartum smoking relapse. *American Journal of Preventive Medicine*, 39, 345-351.
- March of Dimes. (2008, January). *Illicit drug use during pregnancy*. Retrieved from [http://www.marchofdimes.com/pregnancy/alcohol\\_illicitdrug.html](http://www.marchofdimes.com/pregnancy/alcohol_illicitdrug.html)
- March of Dimes. (2009a, November). *Teenage pregnancy*. Retrieved from [http://www.marchofdimes.com/medicalresources\\_teenpregnancy.html](http://www.marchofdimes.com/medicalresources_teenpregnancy.html)
- March of Dimes. (2009b, September). *Your pregnant body. Weight gain during pregnancy*. Retrieved from [http://www.marchofdimes.com/pregnancy/yourbody\\_weightgain.html](http://www.marchofdimes.com/pregnancy/yourbody_weightgain.html).
- March of Dimes. (2010, March). *Accutane and other retinoids*. Retrieved from [http://www.marchofdimes.com/pregnancy/alcohol\\_accutane.html](http://www.marchofdimes.com/pregnancy/alcohol_accutane.html)
- Mayo Foundation for Medical Education and Research. (2010, June). *Postpartum depression: Risk factors*. Retrieved from <http://www.mayoclinic.com/health/postpartum-depression/DS00546/DSECTION=risk-factors>
- The Merck Manual's Online Medical Library. (2009, August). *Nausea and vomiting during early pregnancy*. Retrieved from <http://www.merckmanuals.com/professional/sec18/ch259/ch259d.html>
- Miles, L., & Foxen, R. (2009). New guidelines on caffeine in pregnancy. *Nutrition Bulletin*, 34, 203-206.
- Miranda, J., Chung, J.Y., Green, B.L., Krupnick, J., Siddique, J., Revicki, D.A., & Belin, T. (2003). Treating depression in predominantly low-income young minority women. *Journal of the American Medical Association*, 290, 57-65.
- National Archives and Records Administration. (2011). Electronic Code of Federal Regulations. Title 21: Food and drugs. Part 101: Food labeling. *Health claims: Folate and neural tube defects*. Retrieved from <http://>

## References

- ecfr.gpoaccess.gov/cgi/t/text/text-idx?c=ecfr;rgn=div8;view=text;node=21%3A2.0.1.1.2.5.1.10;idno=21;sid=bb94956ebe3b989219160cdcba1b5337;cc=ecfr
- National Eating Disorders Association. (2005). *Eating disorders & pregnancy: Some facts about the risks*. Retrieved from <http://www.nationaleatingdisorders.org/nedaDir/files/documents/handouts/Pregnant.pdf>
- National Institutes of Health, National Heart Lung and Blood Institute. (n.d.). *High blood pressure in pregnancy*. Retrieved from [http://www.nhlbi.nih.gov/health/public/heart/hbp/hbp\\_preg.htm](http://www.nhlbi.nih.gov/health/public/heart/hbp/hbp_preg.htm)
- National Institutes of Health, Office of Dietary Supplements. (2006, April). *Dietary supplement fact sheet: Vitamin A and carotenoids*. Retrieved from <http://ods.od.nih.gov/factsheets/VitaminA-HealthProfessional>
- National Institutes of Health, Office of Dietary Supplements. (2007, August). *Dietary supplement fact sheet: Iron*. Retrieved from <http://ods.od.nih.gov/factsheets/iron>
- National Institutes of Health, Office of Dietary Supplements. (2009, July). *Dietary supplements: Background information*. Retrieved from <http://ods.od.nih.gov/factsheets/dietarysupplements>
- National Institutes of Health, Office of Dietary Supplements. (2011). *Dietary supplement fact sheet: Folate*. Retrieved from <http://ods.od.nih.gov/factsheets/folate>
- National Institutes of Health, U.S. Department of Health and Human Services. (2009, May). *Answers about HIV vaccine research* [NIH Publication No. 09-6072]. Retrieved from [http://www.niaid.nih.gov/topics/HIVAIDS/Documents/niaid\\_hvad\\_women\\_fs.pdf](http://www.niaid.nih.gov/topics/HIVAIDS/Documents/niaid_hvad_women_fs.pdf)
- National Women's Health Information Center, U.S. Department of Health and Human Services, Office on Women's Health. (2009, March). *Frequently asked questions. Prenatal care*. Retrieved from <http://www.womenshealth.gov/faq/prenatal-care.pdf>
- National Women's Health Information Center, U.S. Department of Health and Human Services, Office on Women's Health. (2010a). *Healthy pregnancy: Staying healthy and safe*. Retrieved from <http://www.womenshealth.gov/pregnancy/you-are-pregnant/staying-healthy-safe.cfm#a>
- National Women's Health Information Center, U.S. Department of Health and Human Services, Office on Women's Health. (2010b, April). *Pregnancy and medicines*. Retrieved from <http://www.womenshealth.gov/faq/pregnancy-medicines.cfm>
- Natural Medicines Comprehensive Database. (2011, March). *Natural medicines used during pregnancy and lactation*. Retrieved from <http://naturaldatabase.therapeuticresearch.com/ce/course.aspx?s=ND&cs=&pc=11%2D102&cec=1&pm=5>
- O'Reilly, R., Beale, B., & Gillies, D. (2010). Screening and intervention for domestic violence during pregnancy care: A systematic review. *Trauma Violence Abuse, 11*, 190-201.
- Payne, J.L., & Meltzer-Brody, S. (2009). Antidepressant use during pregnancy: Current controversies and treatment strategies. *Clinical Obstetrics & Gynecology, 52*, 469-482.

## References

- Rainville, A.J. (1998). Pica practices of pregnant women are associated with lower maternal hemoglobin level at delivery. *Journal of the American Dietetic Association*, 98, 293-296.
- Ren, A., Wang, J., Ye, R.W., Li, S., Liu, J.M., & Li, Z. (2007). Low first-trimester hemoglobin and low birth weight, preterm birth and small for gestational age newborns. *International Journal of Gynaecology and Obstetrics*, 98, 124-128.
- Sanderson, M., Emanuel, I., & Holt, V. L. (1995). The intergenerational relationship between mother's birthweight, infant birthweight and infant mortality in black and white mothers. *Paediatric and Perinatal Epidemiology*, 9, 391-405.
- Shah, P.S., & Shah, J. (2010). Maternal exposure to domestic violence and pregnancy and birth outcomes: A systematic review and meta-analyses. *Journal of Women's Health*, 19, 2017-2031.
- Silk, H., Douglass, A.B., Douglass, J.M., & Silk, L. (2008). Oral health during pregnancy. *American Family Physician*, 77, 1139-1144.
- Story, M., Neumark-Sztainer, D., & French, S. (2002). Individual and environmental influences on adolescent eating behaviors. *Journal of the American Dietetic Association*, 102, S40-S51.
- Substance Abuse and Mental Health Administration, Office of Applied Studies. (2010). *Results from the 2009 National Survey on Drug Use and Health: Volume I. Summary of national findings* (Publication No. SMA 10-4586Findings) [NSDUH Series H-38A]. Retrieved from <http://www.oas.samhsa.gov/NSDUH/2k9NSDUH/2k9ResultsP.pdf>
- Tan, P.C., & Omar, S.Z. (2011). Contemporary approaches to hyperemesis during pregnancy. *Current Opinion in Obstetrics and Gynecology*, 23, 87-93.
- Texas Council on Family Violence. (2009). *Honoring Texas victims: Family violence fatalities in 2009*. Retrieved from <http://www.tcfv.org/pdf/honoring-texas-vicitms.pdf>
- Texas Council on Family Violence. (2010, May). *Battered women: Why don't they leave?* Retrieved from <http://www.tcfv.org/tcfv-content/battered-women-why-dont-they-leave>
- Texas Department of State Health Services. (2005). *A more comfortable pregnancy* [Stock no. 13-172].
- Texas Department of State Health Services, Nutrition Services Section. (2010, October). *Texas clinic assessment manual* [Stock no. 13-06-11842].

## References

- U.S. Department of Agriculture, Agricultural Research Service. (2010). *USDA National nutrient database for standard reference* [Release 23]. Retrieved from <http://www.nal.usda.gov/fnic/foodcomp/search>
- U.S. Department of Agriculture, Office of Communications. (2011). *First Lady, Agriculture Secretary launch MyPlate icon as a new reminder to help consumers to make healthier food choices* [Press release]. Retrieved from <http://www.cnpp.usda.gov/Publications/MyPlate/PressRelease.pdf>
- U.S. Department of Agriculture & U.S. Department of Health and Human Services. (2010, December). *Dietary Guidelines for Americans 2010*. (7th Edition). Washington, DC: U.S. Government Printing Office.
- U.S. Department of Health and Human Services. (2008, October). *2008 Physical activity guidelines for Americans* [ODPHP Publication No. U0036]. Retrieved from <http://www.health.gov/PAGuidelines>
- U.S. Department of Health and Human Services, Center for the Evaluation of Risks to Human Reproduction, National Toxicology Program. (2010a, November). *Common concerns: Vitamin A*. Retrieved from <http://cerhr.niehs.nih.gov/common/vitaminA.html>
- U.S. Department of Health and Human Services, Health Resources and Services Administration. (2010b, October). *Women's Health USA 2010*. Retrieved from <http://mchb.hrsa.gov/whusa10>
- U.S. Department of Health and Human Services, Office of the Surgeon General. (2005, February 21). *Surgeon General's advisory on alcohol use during pregnancy* [News release]. Retrieved from <http://www.surgeongeneral.gov/pressreleases/sg02222005.html>
- U.S. Department of Health and Human Services, Office on Women's Health. (2009, March). *Frequently asked questions: Depression during and after pregnancy*. Retrieved from [http://nccp.org/publications/pub\\_381.html](http://nccp.org/publications/pub_381.html)
- U.S. Food and Drug Administration. (1997). *Iron containing supplements and drugs: Label warning statements and unit-dose packing requirements* [Final rule]. Federal Register, 62 FR 2217 - 2215.
- U.S. Food and Drug Administration, FDA Consumer Health Information. (2008, March). *Avoid fetal "keepsake" images, heartbeat monitors*. Retrieved from <http://www.fda.gov/forconsumers/consumerupdates/ucm095508.htm>

## References

- U.S. National Library of Medicine, National Center for Biotechnology Information, PubMed Health. (2009a, September). *Adolescent pregnancy*. <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0002484>
- U.S. National Library of Medicine, National Center for Biotechnology Information, PubMed Health. (2009b, September). *Preeclampsia*. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001900>
- U.S. National Library of Medicine, National Center for Biotechnology Information, PubMed Health. (2010, September). *Gestational diabetes*. Retrieved from <http://www.ncbi.nlm.nih.gov/pubmedhealth/PMH0001898>
- Washington State Department of Health. (2010, May). *Alcohol use before and during pregnancy* (DOH Pub. No. 160-015) [MCH Data Report]. Retrieved from [http://www.doh.wa.gov/cfh/mch/mch\\_assessment/mchdatareport/2005\\_pdfs/DataChapters/alcusepreg.pdf](http://www.doh.wa.gov/cfh/mch/mch_assessment/mchdatareport/2005_pdfs/DataChapters/alcusepreg.pdf)
- WebMD Medical Reference. (2009, March). *Hormones and oral health*. Retrieved from <http://www.webmd.com/oral-health/guide/hormones-oral-health>
- WebMD Medical Reference. (2010, March). *Common pregnancy pains and their causes*. Retrieved from <http://www.webmd.com/baby/guide/pregnancy-coping-with-discomforts>
- Young, S.L. (2010). Pica in pregnancy: New ideas about an old condition. *Annual Review of Nutrition*, 30, 403-422.



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