

## Life Cycle Nutrition of WIC Participants

### Module 3: Pregnancy Nutrition Needs and Outcomes



#### Audio

Welcome to Module 3 of the New York State WIC Program's "Life Cycle Nutrition of WIC Participants" e-course course, "Pregnancy Nutrition Needs and Outcomes." When you are ready to begin, click on the right arrow.

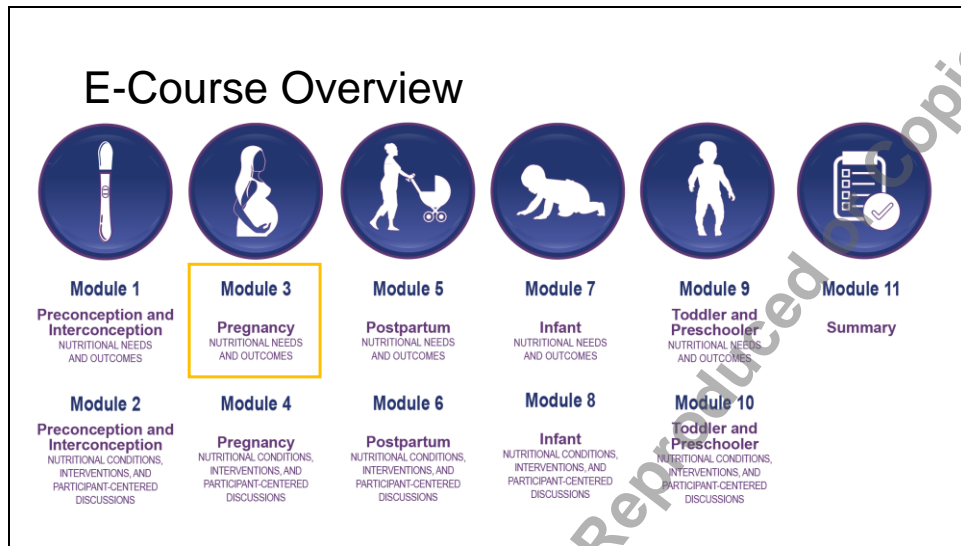
#### Developer's Notes

#### Graphics

iStock image ID: 488093196

<http://www.istockphoto.com/photo/pregnant-woman-with-bag-of-food-at-street-market-gm488093196-73965165>

#### References



### Audio

Module 3 is part of the set of *Pregnancy* modules for the “Life Cycle Nutrition of WIC Participants” e-course. In this module, you will focus on pregnancy outcomes and maternal nutritional needs to support the growth of a healthy fetus. Other health factors and food safety considerations that impact pregnancy will also be explored.

### Graphics

iStock image ID: 467422600

<http://www.istockphoto.com/vector/stock-vector-illustration-pregnancy-icons-gm467422600-60559748>

iStock image ID: 520804368

<http://www.istockphoto.com/vector/pregnancy-icons-obstetrics-gynecology-birth-medicine-symbol-gm520804368-91121917>

iStock image ID: 187826035

<http://www.istockphoto.com/vector/black-icons-related-to-preschool-gm187826035-23967504>

### Developer's Notes

Highlight Module 3 cell at the beginning of the audio.

For the Menu---make this section (up to the module 3 screen) be called “E-Course Overview”

## Module Objectives

**By the end of this module, learners will be able to:**

- List examples of a healthy diet pattern to meet the nutritional needs during pregnancy
- Identify factors that influence dietary intake during pregnancy
- Describe the importance of food safety for pregnant women



### Audio

By the end of this module, learners will be able to:

- List examples of a healthy diet pattern to meet the nutritional needs during pregnancy,
- Identify factors that influence dietary intake during pregnancy, and
- Describe the importance of food safety for pregnant women

### Developer's Notes

Have each learning objective appear in sync with audio

### Graphics

iStock image ID: 525033368

<http://www.istockphoto.com/photo/smiling-pregnant-woman-in-a-park-gm525033368-92330071>

### References



## Section 1: Maternal and Fetal Health During Pregnancy

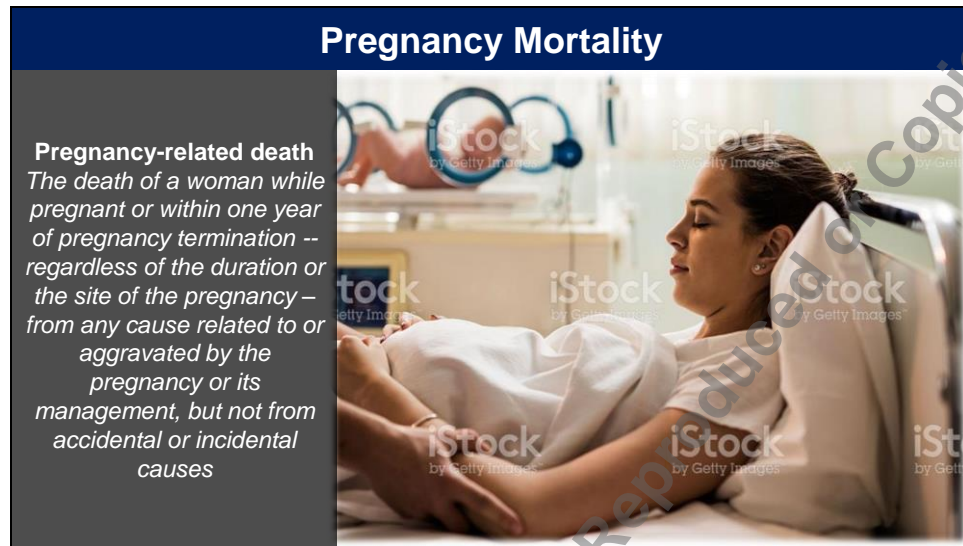
### Audio

Healthy pregnancies lead to healthy babies. WIC's dietary intervention and food supplementation has helped low income women have successful and healthy pregnancies by decreasing preterm births, low birth weight infants, and infant deaths, while increasing the nutrition status of expecting mothers. This module will discuss nutrient needs and dietary patterns of expecting mothers and review commonly seen nutrition-related problems during pregnancy.

### Developer's Notes

### Graphics

### References



## Pregnancy Mortality

### **Pregnancy-related death**

*The death of a woman while pregnant or within one year of pregnancy termination -- regardless of the duration or the site of the pregnancy -- from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes*

### Audio

In 1986, the CDC initiated national surveillance of pregnancy-related deaths to obtain more clinical information about the causes of maternal death. A pregnancy-related death is defined as, "the death of a woman while pregnant or within one year of pregnancy termination – regardless of the duration or the site of the pregnancy – from any cause related to or aggravated by the pregnancy or its management, but not from accidental or incidental causes." It was found that the number of reported pregnancy-related deaths in the United States gradually increased from 7.2 deaths per 100,000 live births in 1987 to a high of 17.8 deaths per 100,000 live births in 2009 and 2011.

The overall increase in pregnancy-related mortality is unclear. It may be attributed to the use of computerized data linkages, changes in how causes of death are coded, and/or the addition of a pregnancy checkbox to death certificates in many states. Studies have shown that there is an increasing number of pregnant women in the United States with chronic health conditions such as hypertension, diabetes, and chronic heart disease which may increase the risk of pregnancy complications.

There are significant racial disparities in pregnancy-related mortality. Between 2011 and 2013, the ratios for pregnancy-related mortality were the following:

- 12.1 deaths per 100,000 live births for white women
- 40.4 deaths per 100,000 live births for black women
- 16.4 deaths per 100,00 live births for women of other races

### Developer's Notes

Sync audio with on-screen text and images (see next few slides on how this should appear)

- At audio cue, "A pregnancy-related death is defined as...", the black textbox with the definition of a pregnancy-related death should appear  
At audio cue, "It was found that the number of reported..." the text in the black textbox should change to, "

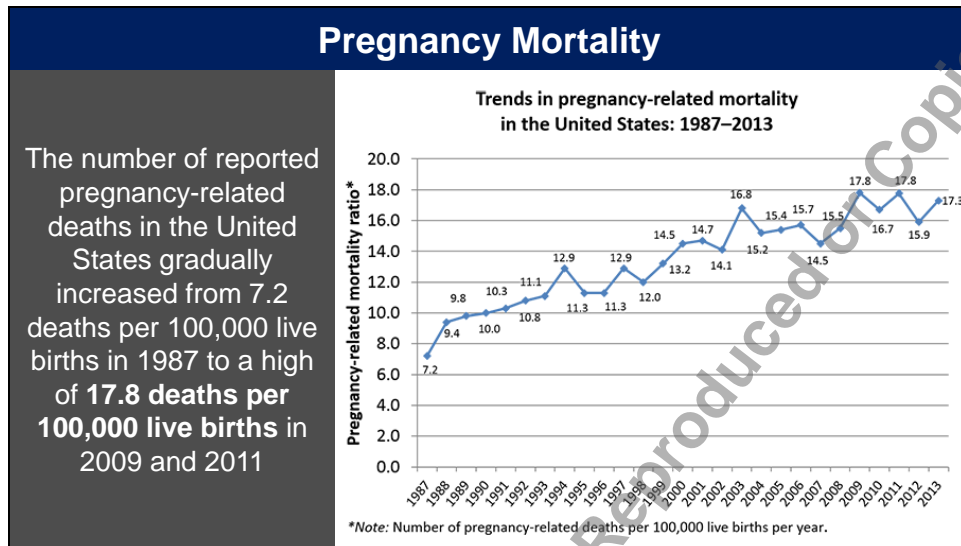
### Graphics

iStock image ID: 626385724

<http://www.istockphoto.com/photo/young-mother-resting-in-maternity-room-after-childbirth-gm626385724-110582437>

### References

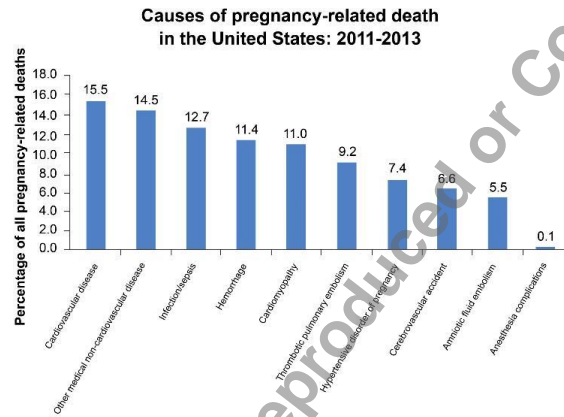
Centers for Disease Control and Prevention. (n.d.) *Pregnancy mortality surveillance system*. Retrieved from <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pmss.html>



\*\*At audio cue, “It was found that the number of reported...” the text in the black textbox should change to, “

## Pregnancy Mortality

The number of reported pregnancy-related deaths in the United States gradually increased from 7.2 deaths per 100,000 live births in 1987 to a high of **17.8 deaths per 100,000 live births** in 2009 and 2011

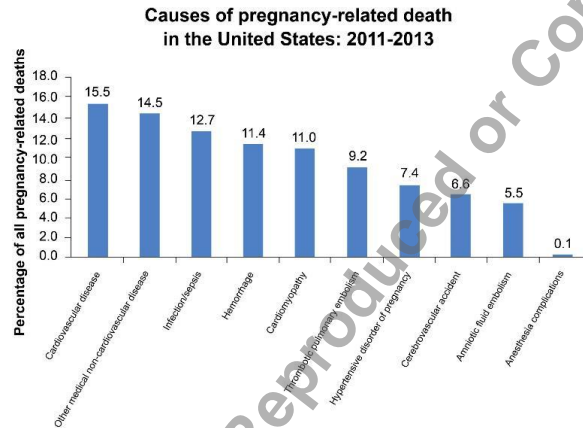


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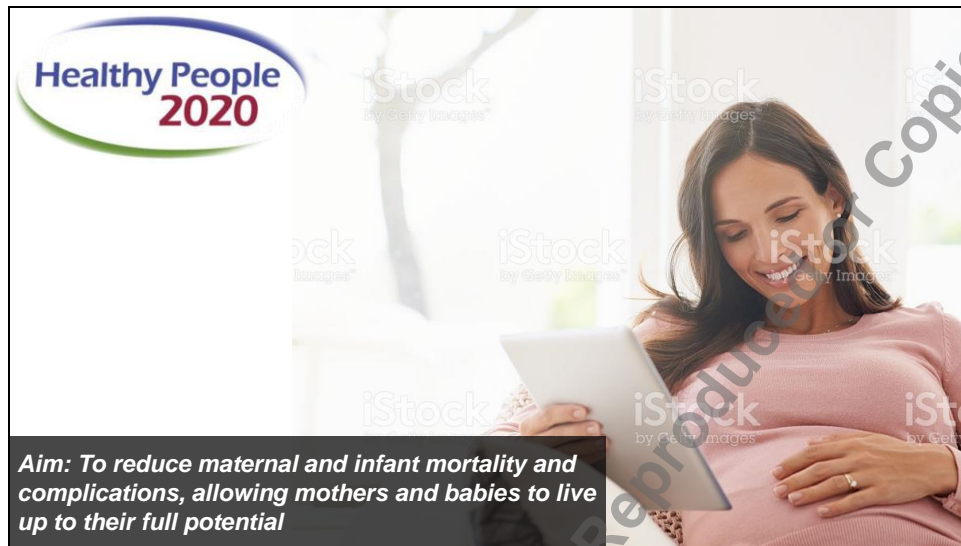
## Pregnancy Mortality

Between 2011 and 2013, the ratios for pregnancy-related mortality were the following:

- 12.1 deaths per 100,000 live births for white women
- 40.4 deaths per 100,000 live births for black women
- 16.4 deaths per 100,000 live births for women of other races



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**Aim: To reduce maternal and infant mortality and complications, allowing mothers and babies to live up to their full potential**

### Audio

*Healthy People* is a set of national objectives aimed at improving the health of all Americans. Developed through a collaboration of several federal agencies, the target goals are updated every 10 years. The aim of the maternal health goal is to reduce maternal and infant mortality and complications, and allow mothers and babies to live up to their full potential. WIC staff have a role in helping achieve these goals.

*Healthy People 2020* objectives related to nutrition and pregnancy are:

- Reduce the rate of fetal and infant deaths,
- Reduce low birth weight (LBW) and very low birth weight (VLBW),
- Reduce preterm births,
- Increase abstinence from alcohol, cigarettes, and illicit drugs among pregnant women, and,
- Increase the proportion of mothers who achieve a recommended weight gain during their pregnancies

### Developer's Notes

At the start of the audio, only have the Healthy People 2020 logo and the image of the pregnant woman on the screen. Have the other elements appear in sync with the audio.

- At audio cue, "Their aim is to reduce maternal...", the black translucent box containing the aim of *Healthy People 2020* for maternal and child health should appear.
- At audio cue, "The objectives related to nutrition and pregnancy are...", the image of the pregnant woman should gray out. Next, each objective should appear, one at a time in a translucent box, in sync with the audio. Each one should fade out when the next one is introduced (see next slide on how this should appear).

### Graphics

iStock image ID: 603256568

<http://www.istockphoto.com/photo/as-her-baby-grows-so-does-her-happiness-gm603256568-103609921>

### References

Office of Disease Prevention and Health Promotion. (2017). *Maternal, infant, and child health*. Retrieved from <https://www.healthypeople.gov/2020/topics-objectives/topic/maternal-infant-and-child-health/objectives>

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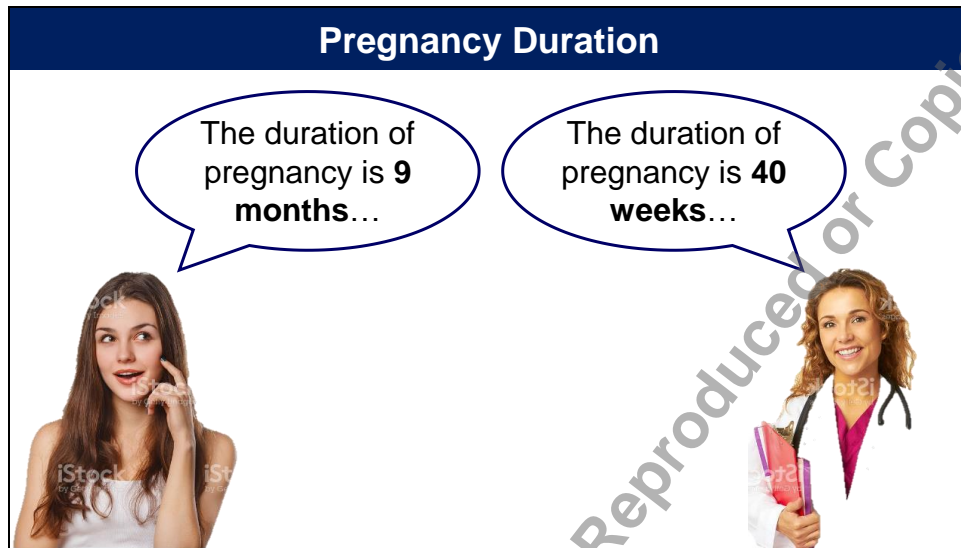


Reduce the rate of fetal and infant deaths

*Aim: To reduce maternal and infant mortality and complications, allowing babies to live up to their full potential*



**\*\*Example of how each objective should appear on-screen\*\***



#### Audio

Although pregnancies are commonly referred to as 9 months in duration, medical professionals measure a pregnancy in weeks, starting with the first day of the last menstrual period, and ending with the estimated due date, for a total of 40 weeks. Because ovulation does not occur until about 14 days after the start of menstruation, the 40 weeks includes 2 non-pregnant weeks at the beginning. Although a specific date is given as a due date, the end of pregnancy is more properly thought of as a window of time when labor and delivery may happen.

#### Developer's Notes

Have image of woman and speech bubble that says, "The duration of pregnancy is nine months..." appear at the beginning of the audio.

Have image of doctor and speech bubble that says, "The duration of pregnancy is 40 weeks..." appear at audio cue, "...for a total of 40 weeks."

#### Graphics

iStock image (women): 544483192

<http://www.istockphoto.com/photo/beautiful-woman-thinking-looking-to-the-side-at-copy-space-gm544483192-97873653>

iStock image (doctor):


<http://www.istockphoto.com/photo/beautiful-confident-female-doctor-holding-clipboard-smiling-gm162327049-21656000>

### References


The American College of Obstetricians and Gynecologists Committee on Obstetric Practice Society for Maternal-Fetal Medicine. (2013). Definition of term pregnancy. *Committee Opinion*. Retrieved from <http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Definition-of-Term-Pregnancy>

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### Pregnancy Duration



A **term** is the period from 3 weeks before until 2 weeks after the estimate date of delivery



A **term** can be designated as **early term**, **full term**, **late term**, and **post term**.

Classification of Deliveries From 37 Weeks of Gestation	
Early term	37 0/7 weeks through 38 and 6/7 weeks
Full term	39 0/7 weeks through 40 6/7 weeks
Late term	41 0/7 weeks through 41 weeks
Post term	42 0/7 weeks and beyond

#### Audio

The time frame from 3 weeks before until 2 weeks after the estimated date of delivery was considered “term” in the past. It was expected that neonatal outcomes from deliveries in this time frame were uniform and good. However, research has shown that neonatal outcomes, especially lung function, can vary depending on the timing of delivery within this 5-week gestational range. Thus, the label “term” has been further specified:

- “Early term” indicates 37 weeks and 0 out of 7 days’ gestation through 38 weeks and 6 out of 7 days’ gestation,
- “Full term” indicates 39 weeks and 0 out of 7 days’ gestation through 40 weeks and 6 out of 7 days’ gestation,
- “Late term” indicates 41 weeks and 0 out of 7 days’ gestation through 41 weeks and 6 out of 7 days’ gestation, and,
- “Post term” indicates 42 weeks and 0 out of 7 days’ gestation and beyond

These terms more accurately describe deliveries occurring at or beyond 37 weeks and 0 out of 7 days’ gestation.

#### Developer’s Notes

Have image of woman and speech bubble that says, “A term is the period from 3 weeks...” appear at the beginning of the audio.

Have image of doctor and speech bubble that says, “A term can be designated...” appear at audio cue, “Thus, the label ‘term’ has been replaced with...”

Have each row of the table appear in sync with the audio bullet points

### Graphics

iStock image (women): 544483192

<http://www.istockphoto.com/photo/beautiful-woman-thinking-looking-to-the-side-at-copy-space-gm544483192-97873653>

iStock image (doctor):

<http://www.istockphoto.com/photo/beautiful-confident-female-doctor-holding-clipboard-smiling-gm162327049-21656000>

### References

The American College of Obstetricians and Gynecologists Committee on Obstetric Practice Society for Maternal-Fetal Medicine. (2013). Definition of term pregnancy. *Committee Opinion*. Retrieved from <http://www.acog.org/Resources-And-Publications/Committee-Opinions/Committee-on-Obstetric-Practice/Definition-of-Term-Pregnancy>

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### Audio

Pregnancies are usually referred to in terms of trimesters. Each trimester is about three months long. Let's say that a pregnancy starts on the first day of the year. According to the American Congress of Obstetrics and Gynecology, the first trimester is 0 to 13 weeks, the second trimester is 14 to 27 weeks, and the third trimester is 28 to 40 weeks<sup>1</sup>. Infants born before 37 weeks are considered preterm.

### Developer's Notes

Please see next slide for how this should be programmed.

When the audio goes through the different lengths of each trimester, highlight the weeks on the calendar starting with the yellow boxes (audio cue, "The first trimester..."), then the blue boxes (audio cue, "...the second trimester..."), and finally the red boxes (audio cue, "...and the third trimester...").

At audio cue, "Infants born before 37 weeks...", have the solid black line on the calendar and the rectangular speech bubble appear.

### Graphics

iStock image ID: 604347792

<http://www.istockphoto.com/vector/2017-calendar-template-gm604347792-103768769>

## References

*Prenatal development: How your baby grows.* (2015). Retrieved from <https://www.acog.org/Patients/FAQs/Prenatal-Development-How-Your-Baby-Grows-During-Pregnancy>

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

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**\*\*Appearance of how the previous slide should look once programmed\*\***

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Maternal Physiology				
Click on the tabs to learn what increases and what decreases in the body system when a woman is pregnant				
	Plasma Volume	Nutrient Stores	Respiration	Gastrointestinal Tract
↑ Increase				
↓ Decrease				

### Audio

Pregnancy is a time of enormous physiological change for both the mother and the baby. Changes in the mother happen in many major body systems over the duration of the pregnancy all to support the growing embryo and fetus. Good nutrition status throughout pregnancy is key to healthy infant development. Changes in the different body systems include increase in plasma volume, increase in nutrient stores, changes in respiration, and changes in the gastrointestinal tract.

Click on the tabs above to learn what increases and what decreases in the body system when a woman is pregnant.

[Clicking the “Plasma Volume” tab]

The water content of a woman’s body increases by more than 40% during pregnancy. This water is distributed around the body to create new blood plasma, more extracellular fluid, and amniotic fluid. Body water increases from about 7 to 10 quarts over the course of a pregnancy.

[Clicking the “Nutrient Stores” tab]

Rapid increase in the volume of blood leads to hemodilution, or an apparent decrease of blood levels of vitamins and minerals. Notably, iron levels may appear to decrease around mid-pregnancy.

In addition, blood lipid levels and blood glucose levels also increase during pregnancy. Blood levels of cholesterol and triglycerides elevate as well as insulin and glucose.

[Clicking the “Respiration” tab]

Women will experience decreased blood pressure in the first half of pregnancy. There will also be an increased heart rate and volume per stroke to more efficiently carry nutrients around the body.

[Clicking the “Gastrointestinal Tract” tab]

In addition to increased appetite and sensitivities to certain foods and odors, the pregnancy hormone progesterone relaxes muscles in the body, including those that control the GI tract. The relaxed muscle tone in the GI tract can lead to:

- Increased intestinal transit time,
- Heartburn, and,
- Constipation

#### Developer’s Notes



Clicking on each of the tabs should trigger some audio (see above) and on-screen text below the tab. See next slide on how this should appear.

After the learner has selected all of the tabs, the module should proceed.

#### Graphics

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

Maternal Physiology				
Click on the tabs to learn what increases and what decreases in the body system when a woman is pregnant				
	Plasma Volume	Nutrient Stores	Respiration	Gastrointestinal Tract
 Increase	<b>Water Content</b> <ul style="list-style-type: none"> <li>Blood plasma</li> <li>Extracellular fluid</li> <li>Amniotic fluid</li> </ul> <b>Blood Volume</b>	<ul style="list-style-type: none"> <li>Cholesterol</li> <li>Triglycerides</li> <li>Insulin</li> <li>Glucose</li> </ul>	<ul style="list-style-type: none"> <li>Heart rate</li> <li>Volume per stroke</li> </ul>	<ul style="list-style-type: none"> <li>Appetite</li> <li>Sensitivities to certain foods</li> <li>Intestinal transit time</li> <li>Heartburn</li> <li>Constipation</li> </ul>
 Decrease		<ul style="list-style-type: none"> <li>Blood levels of vitamins and minerals (hemodilution)</li> <li>Iron levels</li> </ul>	<ul style="list-style-type: none"> <li>Blood pressure</li> </ul>	

\*\*How the slide should appear once all of the tabs have been selected.

Changes in Nutrient Metabolism	
Carbohydrates	Protein
<ul style="list-style-type: none"> <li>First half of pregnancy: Hormones promote the storage of glycogen and fat in the mother</li> <li>Second half of pregnancy: Hormones prioritize sending glucose to the fetus</li> </ul>	<ul style="list-style-type: none"> <li>Needed to create fetal and other maternal tissues</li> <li>Approximately two pounds of protein is accumulated during pregnancy</li> </ul>
Fat	Fasting
<ul style="list-style-type: none"> <li>Allows the mother to accumulate fat stores in the first half of pregnancy and draw from them in the second half of pregnancy</li> <li>Blood triglyceride and cholesterol levels increase substantially</li> <li>Used by the placenta to manufacture estrogen and progesterone and by the fetus for nerves and cell membranes</li> </ul>	<ul style="list-style-type: none"> <li>Fat oxidation and production of ketones is seen much sooner in pregnant women than non-pregnant women when fasting</li> <li>Allows the mother to draw on fat stores for energy, leaving glucose available for the fetus</li> </ul>

### Audio

Macronutrients are metabolized differently in order to maximize energy for the developing fetus. The fetus is fueled primarily by glucose. Most changes result in directing glucose to the fetus and allowing the mother to draw on other energy reserves.

**Carbohydrate Metabolism:** In the first half of the pregnancy, hormones promote the storage of glycogen and fat in the mother. In the second half, when fetal energy needs have increased, hormones prioritize sending glucose to the fetus and draw the mother's energy from maternal fat stores instead.

**Protein Metabolism:** Protein is needed to create fetal and maternal tissues. Approximately 2 pounds of protein are accumulated during pregnancy. The protein comes from a combination of dietary protein and reduced protein excretion by the mother.

**Fat Metabolism:** Changes in fat metabolism allow the mother to accumulate fat stores, especially in the first half of the pregnancy, and to draw energy from them in the second half of pregnancy. Blood triglyceride and cholesterol levels also increase substantially during pregnancy. This extra cholesterol is used by the placenta to manufacture the steroid hormones estrogen and progesterone, and by the fetus for cell membrane and nerve development. Blood lipids in the mother return to normal after delivery. Because of this normal and temporary change in blood lipids, cholesterol screening is not recommended during pregnancy.

**Fasting Metabolism:** Fat oxidation and production of ketones is seen much sooner in pregnant women than non-pregnant women when fasting. This allows the mother to draw on fat stores for energy, leaving glucose available for the fetus. While this is beneficial in the short-term, uncontrolled diabetes or weight loss during pregnancy may leave the fetus getting too much energy from ketones, which may result in reduced growth and impaired intellectual development.

#### Developer's Notes

Have each box appear in sync with audio

#### Graphics

#### References


Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

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### The Placenta

- Serves as a gateway between the mother and the fetus
- Produces hormones and enzymes
- Exchanges nutrients and gas between the mother and the fetus
- Removes waste products from the fetus

Nutrients are generally prioritized to support the mother first, then the placenta itself



The diagram shows a pregnant woman from the side. A blue box labeled 'Placenta' has an arrow pointing to the placenta, which is shown as a reddish, fleshy organ attached to the uterine wall. The fetus is visible in the uterus, connected to the placenta by a cord. The entire slide content is enclosed in a black border.

#### Audio

The **placenta** is an organ specific to pregnancy that serves as a gateway between the mother and the fetus. It has several functions:

- Produces hormones and enzymes,
- Exchanges nutrients and gas between the mother and the fetus, and,
- Removes waste products from the fetus

The fetus depends on the placenta to deliver nutrients and oxygen from the mother and to send waste products back to the mother's blood for excretion. Water and most nutrients travel back and forth through passive diffusion, moving from areas of higher concentration to areas of lower concentration.

There are limitations to the exchange between mother and fetus. The fetus cannot simply take nutrients at the expense of maternal nutritional status. Nutrients are generally prioritized to support the mother first, then the placenta itself. Due to this system of prioritizing the mother, the fetus may suffer from lower birth weight or nutrient deficiencies, even if there is no sign of deficiencies in the mother. This is especially important to note in the case of pregnant teens or women who were underweight prior to pregnancy. If their bodies still need nutrients for their own growth, nutrients will be used by the mother's body first.

#### Developer's Notes

Have blue box with placenta and arrow appear with the audio "placenta" bolded

Sync bullet points and text box with audio

Graphics

Stock photo ID:483255636


References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.


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### Embryonic and Fetal Growth and Development

- **Critical periods** are periods when cells differentiate and establish their long-term functions
- Changes that happen during critical periods are set in stone and cannot be reversed
- Since different organs develop at different times, the timing of nutrient deficiencies determines which organs are impacted



Click and drag the slider to see different critical periods for fetal growth and development.



#### Audio

Fetal growth and development in the first two months in utero is dramatic and has several *critical periods*, or periods when cells differentiate and establish their long-term functions. It is especially important to establish good nutrition and habits early in pregnancy as the changes that happen during critical periods are set in stone and cannot be reversed. Any adverse events during these periods will have permanent and serious consequences. Since different organs develop at different times, the timing of nutrient deficiencies determines which organs are impacted. For example, the neural tube develops 3-4 weeks after conception. Folate deficiencies during this time period can result in neural tube defects.

Click and drag the slider to see different critical periods for fetal growth and development.

[Slider moves to the first node]:

Zygote: Single cell combination of egg and sperm

[Slider moves to the second node]:

Embryo: The early stages of cellular multiplication, usually from the zygote state to week 9

[Slider moves to the third node]:

Fetus: From 9 weeks after implantation to birth

#### Developer's Notes

There should be a slider that shows different images and triggers on-screen text (see next three

slides on how this should appear).

#### Graphics

iStock image ID (fetus in womb): 183875109

<http://www.istockphoto.com/photo/7-month-fetus-in-womb-gm183875109-16437508>

iStock image ID (zygote): 24887212

<http://www.istockphoto.com/photo/3d-illustration-of-an-artificial-insemination-of-an-egg-cell-gm624887212-109929279>

iStock image ID (embryo): 92170585

<http://www.istockphoto.com/photo/human-embryo-gm92170585-7743702>

iStock image ID (fetus): 464805655

<http://www.istockphoto.com/photo/fetus-9-weeks-gm464805655-32977296>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

Zygote: Single cell combination of egg and sperm

#### Developer's Notes

There should be a slider that shows different images and triggers on-screen text

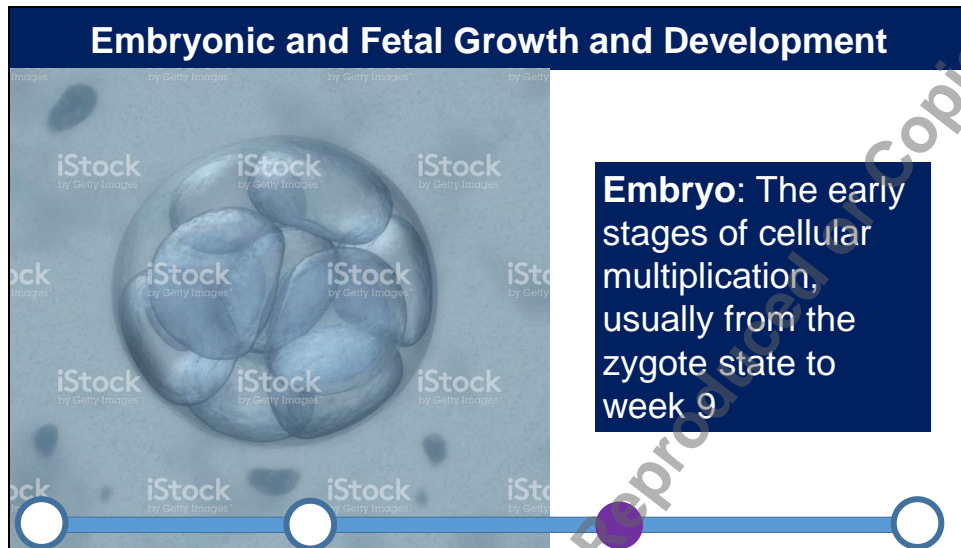
#### Graphics

iStock image ID (zygote): 24887212

<http://www.istockphoto.com/photo/3d-illustration-of-an-artificial-insemination-of-an-egg-cell-gm624887212-109929279>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

Embryo: The early stages of cellular multiplication and implantation, or attachment to the uterine linings usually from the zygote state to week 9.

#### Developer's Notes

There should be a slider that shows different images and triggers on-screen text

#### Graphics

iStock image ID (embryo): 92170585

<http://www.istockphoto.com/photo/human-embryo-gm92170585-7743702>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



Audio

Fetus: From 9 weeks after implantation to birth

Developer's Notes

There should be a slider that shows different images and triggers on-screen text

Graphics

iStock image ID (fetus): 464805655

<http://www.istockphoto.com/photo/fetus-9-weeks-gm464805655-32977296>

References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

## Nutrition and Miscarriage

Over 30% of pregnancies end in miscarriage (loss before 20 weeks' gestation)



**Generally attributed to:**

- Genetic abnormalities
- Hormonal abnormalities
- Factors outside the mother's control

### Audio

Over 30% of pregnancies end in miscarriage (loss before 20 weeks' gestation). Miscarriage is generally attributed to genetic abnormalities, hormonal abnormalities, or other factors outside the mother's control.

### Developer's Notes

Sync appearance of on-screen text to audio. Note that the on-screen text changes in sync with audio (see next slide for how this should appear).

### Graphics

iStock image ID: 126010463

<http://www.istockphoto.com/photo/doctor-and-pregnant-woman-in-doctors-office-gm126010463-17383881>

### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

## Nutrition and Miscarriage

*Over 30% of pregnancies end in miscarriage (loss before 20 weeks' gestation)*



**Correlation between being underweight at the time of conception and increased risk of miscarriage**

**Women with...**

- High blood cholesterol
- High triglycerides
- High markers of inflammation at the time of conception

**...are at a higher risk of miscarriage**

### Audio

However, there is a correlation between being underweight at the time of conception and increased risk of miscarriage. Additionally, women with high blood cholesterol, high triglycerides, and high markers of inflammation at conception are at higher risk of miscarriage.

### Developer's Notes

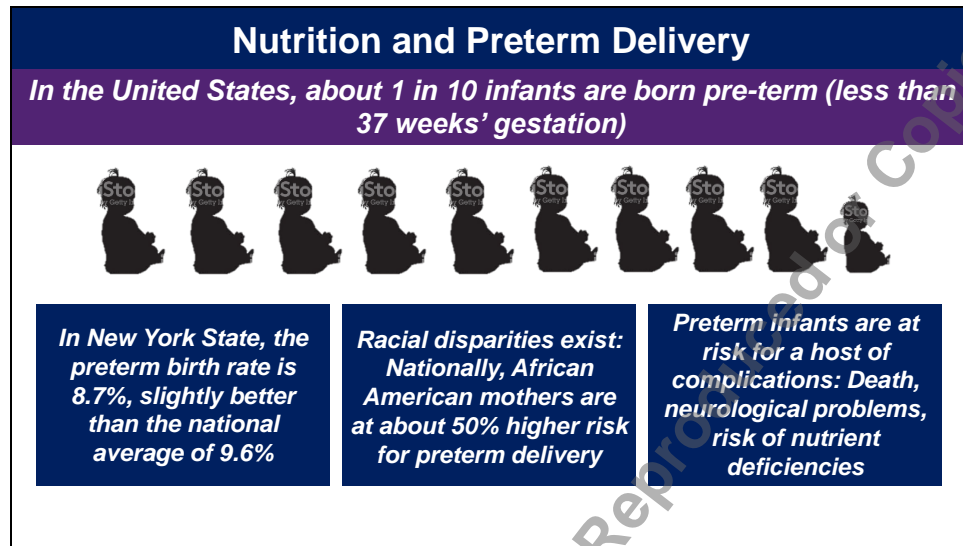
### Graphics

iStock image ID: 126010463

<http://www.istockphoto.com/photo/doctor-and-pregnant-woman-in-doctors-office-gm126010463-17383881>

### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

In the United States, about 1 in 10 infants are born preterm, or less than 37 weeks' gestation. In New York State, the preterm birth rate is 8.7%, slightly lower than the national average of 9.6%. It is also important to note that racial disparities exist: Nationally, African American mothers are at about 50% higher risk for preterm delivery.

Preterm infants are at risk for a host of complications, including death and neurological problems. Since fetal nutrient stores, or fat, protein, and minerals are built up rapidly in the last month of pregnancy, preterm infants also suffer from greater risk of nutrient deficiencies. The earlier the birth, the greater the risk for complications.

#### Developer's Notes

Sync appearance of on-screen text with audio. On-screen text will change as audio progresses. See next slide for how this should appear.

#### Graphics

iStock image ID: 531035505

<http://www.istockphoto.com/vector/various-views-of-baby-girl-gm531035505-55194258>

#### References

CDC. (2016). *Preterm birth*. Retrieved from


<https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm>

March of Dimes. (2016). *2016 premature birth report card*. [Fact Sheet]. Retrieved from

<http://www.marchofdimes.org/materials/premature-birth-report-card-united-states.pdf>

**Nutrition and Preterm Delivery**

*Women are at a higher risk for preterm delivery if they:*



- Are underweight before conception
- Have inadequate weight gain
- Are obese
- Had higher than average cholesterol, triglycerides, markers of inflammation, and oxidative stress before pregnancy
- Had a previous preterm delivery

**Prenatal vitamin use and regular exercise during pregnancy can reduce the risk of preterm delivery**

#### Audio

The underlying mechanism of preterm delivery is unclear; however, some risk factors are known. Women are at higher risk for preterm delivery if they:

- Are underweight before conception,
- Have inadequate weight gain,
- Are obese,
- Had higher than average cholesterol, triglycerides, markers of inflammation, and oxidative stress before pregnancy, and/or,
- Had a previous preterm delivery

Prenatal vitamin use and regular exercise during pregnancy can reduce the risk of preterm delivery.

#### Developer's Notes

Sync appearance of on-screen text with audio.

#### Graphics

iStock image ID: 531035505

<http://www.istockphoto.com/vector/various-views-of-baby-girl-gm531035505-55194258>


#### References

CDC. (2016). *Preterm birth*. Retrieved from

<https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm>

March of Dimes. (2016). *2016 premature birth report card*. [Fact Sheet]. Retrieved from

<http://www.marchofdimes.org/materials/premature-birth-report-card-united-states.pdf>

Nutrition and Adolescent Pregnancy	
<i>The adolescent birth rate in the United States is about 24.2 for every 1,000 adolescent females</i>	
	Infants born to teens are at a higher risk of: <ul style="list-style-type: none"><li>• LBW</li><li>• Preeclampsia</li><li>• Iron-deficiency anemia</li><li>• Stillbirth or neonatal death</li></ul>
	Adolescent mothers are still growing and energy and nutrients consumed by the mother will be prioritized to support the mother first, then the placenta, and finally sent to the fetus
	Dietary recommendations for pregnant teens: <ul style="list-style-type: none"><li>• Similar to dietary recommendations for all women</li><li>• Have a balance of nutrient-dense foods from all food groups</li><li>• Additional 300 mg of calcium/day</li></ul>

#### Audio

The adolescent birth rate in the United States is about 24.2 for every 1,000 adolescent females. Although the US still has a relatively high rate of teen pregnancy, the trend has been decreasing for the past 20 years.

Infants born to teens are at higher risk of:

- Low birth weight,
- Preeclampsia,
- Iron-deficiency anemia, and,
- Stillbirth or neonatal death

Part of the reason that infants of adolescents have higher incidence of low birth weight is that the mothers are still growing themselves. Recall that the energy and nutrients consumed by the mother will be prioritized to support the mother first, then the placenta, and finally sent to the fetus. If calories and nutrients are insufficient to meet all these needs, the fetus may be smaller than average. Teens may also make poorer lifestyle decisions, and may not get the right amount of calories, nutrients, or exercise.

Dietary recommendations for pregnant teens are similar to dietary recommendations for all women. Special attention should be paid to consuming a balance of nutrient-dense foods from all the food groups, with calories sufficient to support appropriate weight gain. Pregnant adolescents also require an additional 300 mg of calcium/day.

### Developer's Notes

When the learner proceeds to the next slide, it should go back to slide 28 since the learner should have to select each button once before proceeding with the module.

### Graphics

iStock image ID: 155152221


<http://www.istockphoto.com/photo/happy-pregnant-woman-on-white-background-gm155152221-18519498>

### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

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### Exercise and Pregnancy Outcome



For the mother, exercise can reduce the risk of:

- Gestational diabetes
- Pregnancy-induced hypertension
- Lower back pain
- Excessive weight gain
- Blood clots

For the fetus, exercise improves placental function, as well as greater weight and length at birth

Aim: 150 minutes of moderate physical activity per week

Should not engage in contact sports or activities with a high risk of falling or injury and avoid lying on the back during the last trimester

#### Audio

Exercise during pregnancy benefits both the mother and the fetus. A shorter labor may be one effect of regular physical activity during pregnancy. For the mother, exercise can reduce the risk of:

- Gestational diabetes,
- Pregnancy-induced hypertension,
- Lower back pain,
- Excessive weight gain, and,
- Blood clots

For the fetus, exercise improves placental function, as well as greater weight and length at birth.

Unless there is a condition that contraindicates it, women are encouraged to exercise during pregnancy. Pregnant women should aim to meet the physical activity recommendations set for the general public: 150 minutes of moderate physical activity per week. Women who were active before pregnancy should continue and women who were not active should start slowly, and gradually aim for 150 minutes of physical activity per week. Physical activity during pregnancy does not increase the risk of miscarriage.

During pregnancy, women should not engage in contact sports or activities with a high risk of falling or injury (e.g. downhill skiing, horseback riding, etc.) and avoid lying on the back during the last trimester.

### Developer's Notes

Have each row in the table appear in sync with the audio

### Graphics

iStock image ID: 468133238

<http://www.istockphoto.com/photo/beautiful-pregnant-woman-jogging-along-the-coast-to-stay-fit-gm468133238-61532110>

### References

American Congress of Obstetricians and Gynecologists. (2016). *Exercise during pregnancy*. Retrieved from <http://www.acog.org/Patients/FAQs/Exercise-During-Pregnancy>

Office of Disease Prevention and Health Promotion. (2008). *2008 physical activity guidelines for Americans*. Retrieved from <https://health.gov/paguidelines/pdf/paguide.pdf>

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### Pregnancy Weight Gain

*Appropriate weight gain during pregnancy is important because it is directly related to birth weight*



- Weight gain can also be used as an indicator of general nutritional status
- Weight gain recommendations are expressed as a range and vary depending on prepregnancy weight status

#### Audio

Appropriate weight gain during pregnancy is important because it is directly related to birth weight. Weight gain can also be used as an indicator of general nutritional status.

Mothers who gain too little weight tend to have low birth weight infants, and there is significant research that points to a general consensus: Appropriate weight gain is likely to result in healthy birth weights. Weight gain recommendations are expressed as a range, and vary depending on prepregnancy weight status. Women who were underweight before pregnancy need to gain extra weight for both their own needs and the needs of the fetus; women who were obese before pregnancy need to gain less, as they have existing energy stores.

#### Developer's Notes

Sync appearance of on-screen text and textboxes with audio

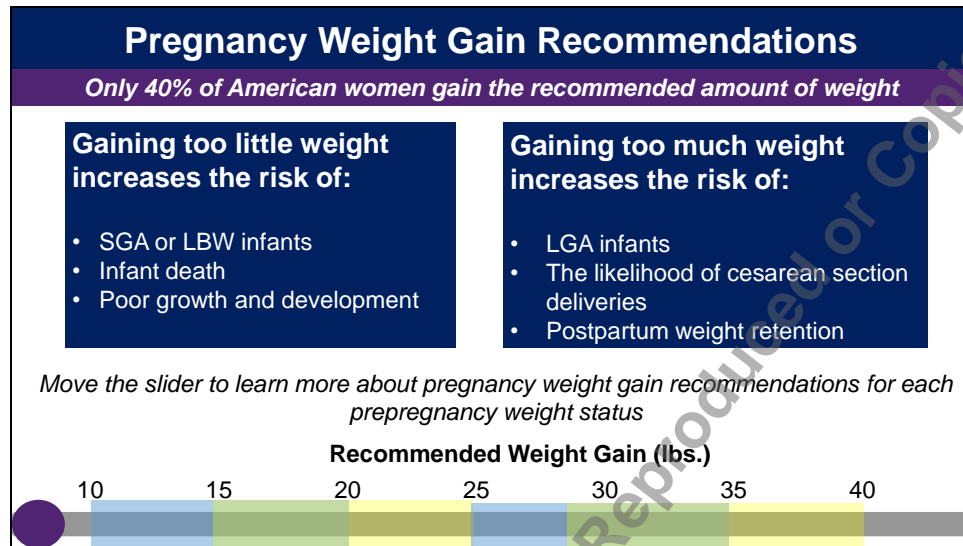
#### Graphics

iStock image ID: 484126512

<http://www.istockphoto.com/photo/pregnant-woman-weighing-herself-on-a-bathroom-scale-gm484126512-70939895>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

Weight gain recommendations are expressed as a range, and vary depending on prepregnancy weight status. These ranges of weight gain are associated with appropriate birth weights and healthy birth outcomes. However, only 40% of American women gain the recommended amount of weight. Gaining too little weight increases the risk of small for gestational age (SGA) or low birthweight (LBW) infants, increased infant death, and poor growth and development. Gaining too much weight increases the risk of large for gestational age (LGA) infants, the likelihood of cesarean section deliveries, and the risk of postpartum weight retention.

Move the slider to learn more about pregnancy weight gain recommendations for each prepregnancy weight status.

#### Developer's Notes

Sync appearance of on-screen textboxes with audio

Pronounce "SGA" as "S.G.A.", "LBW" as "L.B.W.", and "LGA" as "L.G.A."

Moving the slider should trigger audio and the appearance of on-screen text. This should be triggered when the button for the slider is moved within a certain range on the slider, as follows:

- Slider is moved in the **11-20** range: Trigger on-screen textboxes and audio for **obese** prepregnancy weight status (see slide 33)

- Slider is moved in the **15-25** range: Trigger on-screen textboxes and audio for **overweight** prepregnancy weight status (see slide 34)
- Slider is moved in the **25-35** range: Trigger on-screen textboxes and audio for **normal weight** prepregnancy weight status (see slide 35)
- Slider is moved in the **28-40** range: Trigger on-screen textboxes and audio for **underweight** prepregnancy weight status (see slide 36)

The appearance of both the blue and yellow boxes on the scale should not appear in the final product; they are merely there for reference on the ranges on the scale.

### Graphics

### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

#### Developer's Notes

This slide should appear when the slider is moved in the 11-20 pounds range

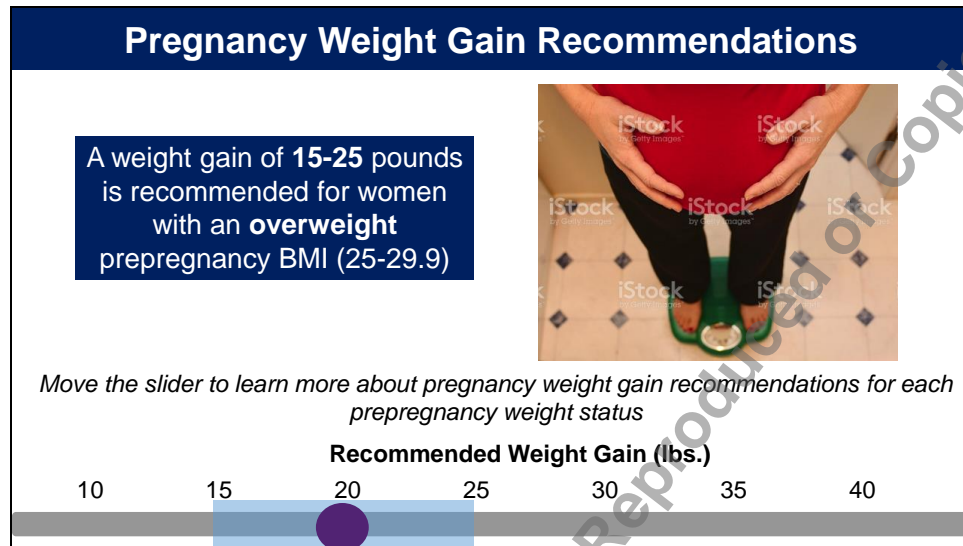
#### Graphics

iStock image ID: 626099776

<http://www.istockphoto.com/photo/pregnancy-pregnant-woman-health-care-gm626099776-110439703>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

#### Developer's Notes

This slide should appear when the slider is moved in the **15-25 pounds** range

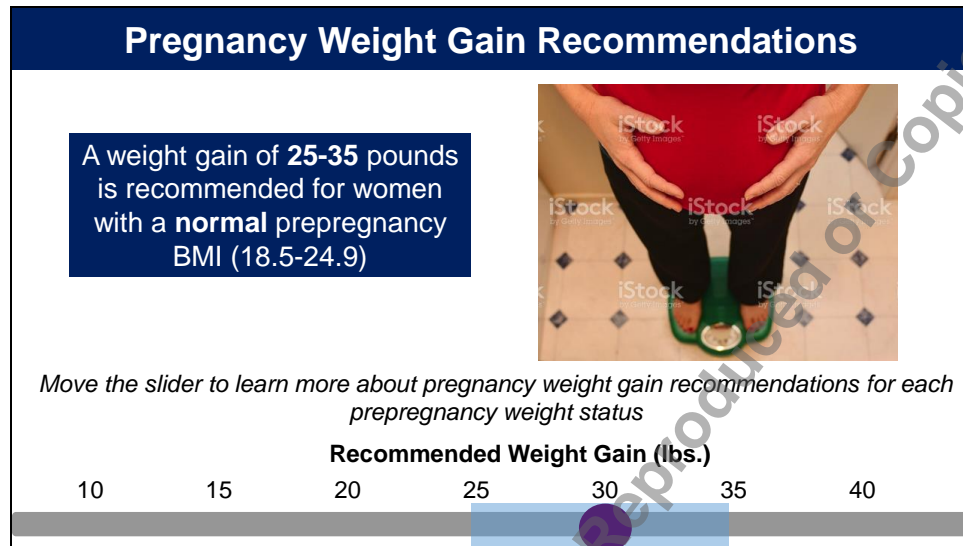
#### Graphics

iStock image ID: 626099776

<http://www.istockphoto.com/photo/pregnancy-pregnant-woman-health-care-gm626099776-110439703>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

#### Developer's Notes

This slide should appear when the slider is moved in the 15-25 pounds range

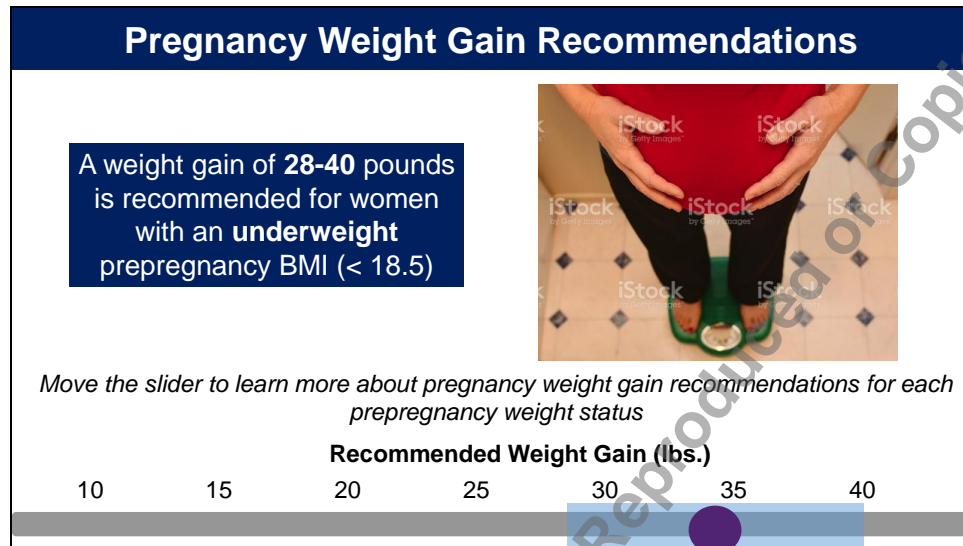
#### Graphics

iStock image ID: 626099776

<http://www.istockphoto.com/photo/pregnancy-pregnant-woman-health-care-gm626099776-110439703>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

#### Developer's Notes

This slide should appear when the slider is moved in the 28-40 pounds range

#### Graphics

iStock image ID: 626099776

<http://www.istockphoto.com/photo/pregnancy-pregnant-woman-health-care-gm626099776-110439703>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

For women with twin pregnancies, the weight gain recommendations for twin pregnancies is higher than for a singleton pregnancy.

Move the slider to learn more about pregnancy weight gain recommendations for a twin pregnancy for each prepregnancy weight status

#### Developer's Notes

Moving the slider should trigger audio and the appearance of on-screen text. This should be triggered when the button for the slider is moved within a certain range on the slider, as follows:

- Slider is moved in the **25-42** range: Trigger on-screen textboxes and audio for **obese** prepregnancy weight status (see slide 38)
- Slider is moved in the **31-50** range: Trigger on-screen textboxes and audio for **overweight** prepregnancy weight status (see slide 39)
- Slider is moved in the **37-54** range: Trigger on-screen textboxes and audio for **normal weight** prepregnancy weight status (see slide 40)
- Slider is moved in the **50-62** range: Trigger on-screen textboxes and audio for **underweight** prepregnancy weight status (see slide 41)

The appearance of both the blue and yellow boxes on the scale should not appear in the final product; they are merely there for reference on the ranges on the scale.

### Graphics

iStock image ID: 506482640

<http://www.istockphoto.com/photo/looking-down-at-very-pregnant-woman-standing-on-bathroom-scales-gm506482640-84238665>

### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

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#### Audio

#### Developer's Notes

This slide should appear when the slider is moved in the 25-42 pounds range

#### Graphics

iStock image ID: 626099776

<http://www.istockphoto.com/photo/pregnancy-pregnant-woman-health-care-gm626099776-110439703>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

#### Developer's Notes

This slide should appear when the slider is moved in the 31-50 pounds range

#### Graphics

iStock image ID: 626099776

<http://www.istockphoto.com/photo/pregnancy-pregnant-woman-health-care-gm626099776-110439703>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

#### Developer's Notes

This slide should appear when the slider is moved in the **37-54 pounds** range

#### Graphics

iStock image ID: 626099776

<http://www.istockphoto.com/photo/pregnancy-pregnant-woman-health-care-gm626099776-110439703>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

#### Developer's Notes

This slide should appear when the slider is moved in the 50-62 pounds range

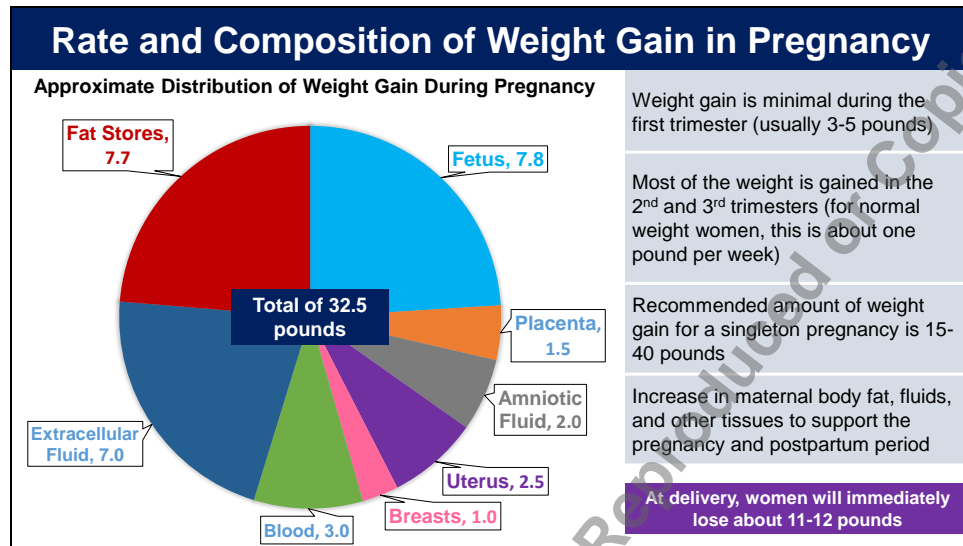
#### Graphics

iStock image ID: 626099776

<http://www.istockphoto.com/photo/pregnancy-pregnant-woman-health-care-gm626099776-110439703>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

Weight gain is minimal during the first trimester, usually 3-5 pounds. Most of the weight is gained in the 2<sup>nd</sup> and 3<sup>rd</sup> trimesters; for normal weight women, this is about one pound per week. The last few weeks of pregnancy often see a slowing in the rate of weight gain, but weight loss should not occur.

The recommended amount of weight gain for a single pregnancy is anywhere from 15-40 pounds, significantly more than the weight of an average newborn. So, where does all the extra weight go? There is an increase in maternal body fat, fluids (including blood and amniotic fluid), and other tissues that support the pregnancy and postpartum period.

The approximate distribution of weight gain during pregnancy is as follows:

- Fetus 7.8 pounds
- Placenta: 1.5 pounds
- Amniotic Fluid: 2.0 pounds
- Uterus: 2.5 pounds
- Breasts: 1.0 pounds
- Blood: 3.0 pounds
- Extracellular Fluid: 7.0 pounds
- Fat Stores: 7.7 pounds

This adds up to a total of 32.5 pounds. At delivery, women will immediately lose around 11-12 pounds (fetus, amniotic fluid, and placenta). The rest of the weight may be lost slowly over the

following months. Increased weight after pregnancy is especially common in women who gained more than the recommended amount and are not physically active. Weight retention is less likely in women who breastfeed for at least 6 months after delivery.

#### Developer's Notes

Have each box of on-screen text appear in sync with audio. Introduce approximate distribution of weight gain during pregnancy pie chart in sync with audio. Each piece of the pie should appear in sync with audio, one at a time. Textbox that says, "Total of 32.5 pounds" should appear at audio cue, "This adds up to..."

Textbox that says, "At delivery, women will immediately lose about 11-12 pounds" should appear in sync with audio.

#### Graphics

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

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A blue pen and a spiral notebook are positioned in the top right corner of the slide. The pen is blue with a silver clip and is lying diagonally. The notebook is blue with a silver spiral binding and is also lying diagonally, partially overlapping the pen.

## Section 2: Check Your Understanding

### Audio

Let's briefly check your understanding of the material covered so far.

### Developer's Notes

### Graphics

### References

### Check Your Understanding

Use the drop-down menu to fill in the blanks. Note that there are more words in the drop-down menu than you need. Hit submit when you are done.

1. Infants born before \_\_\_\_\_ are considered preterm.
2. The fetus is fueled primarily by \_\_\_\_\_ while the mother draws on other energy reserves.
3. Increases in a mother's \_\_\_\_\_ content during pregnancy helps create more blood plasma, extracellular fluid, and amniotic fluid.
4. About two pounds of \_\_\_\_\_ are needed for the creation of fetal and other maternal tissues.
5. Changes in \_\_\_\_\_ metabolism allow the mother to accumulate stores in the first half of pregnancy and draw energy from them in the second half of pregnancy.
6. There is a correlation between women who are underweight at the time of conception and a \_\_\_\_\_ risk of miscarriage.

Submit

#### Audio

Let's quickly check your understanding of the material covered so far. Use the drop-down menu to fill in the blanks. Note that there are more words in the drop-down menu than you need. Hit submit when you are done.

#### Developer's Notes

Program this exercise to have a drop-down menu for each blank. The following should be listed in the drop-down menu (and not necessarily in this particular order):

- 37 weeks
- 5 months
- Glucose
- Protein
- Overweight
- Higher
- Water
- Fat
- Carbohydrate
- Cholesterol

Answers to the exercise are:

- Infants born before **37 weeks** are considered preterm.

- The fetus is fueled primarily by **glucose** while the mother draws on other energy reserves.
- Increases in a mother's **water** content during pregnancy helps create more blood plasma, extracellular fluid, and amniotic fluid.
- About two pounds of **protein** are needed for the creation of fetal and other maternal tissues.
- Changes in **fat** metabolism allow the mother to accumulate stores in the first half of pregnancy and draw energy from them in the second half of pregnancy.
- There is a correlation between women who are underweight at the time of conception and a **higher** risk of miscarriage.

Feedback after hitting submit:

- If all the answers are correct: Nice work! Let's continue to check your understanding of the material.
- If one or more of the answers are incorrect: Sorry, one or more of your answers is incorrect. Try again.

### Graphics

### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.


CDC. (2016). *Preterm birth*. Retrieved from <https://www.cdc.gov/reproductivehealth/maternalinfanthealth/pretermbirth.htm>

### Check Your Understanding

*Use the slider to indicate the healthy weight gain recommendations for each prepregnancy weight status. Set the purple button to the minimum recommended weight gain, and the light blue button to the maximum recommended weight gain.*


**Prepregnancy Weight Status:**

Normal Weight (BMI: 18.5-24.9)



**Recommended Weight Gain (lbs.)**

10   15   20   25   30   35   40   45   50   55   60   65



#### Audio

An indicator of a healthy diet pattern to meet the nutritional needs during pregnancy is the ability to maintain a healthy weight throughout pregnancy. Use the slider to indicate the range of healthy weight gain recommendations for each prepregnancy weight status. Click and slide the purple button to the minimum recommended weight gain, and the light blue button to the maximum recommended weight gain.

[When learner completes the exercise]

Nice work! Now, let's continue the module with nutrient needs during pregnancy.

#### Developer's Notes

Program the slider to have two buttons that can be set to different nodes on the slider. The learner needs to set the purple button to the minimum recommended weight gain and the light blue button to the maximum recommended weight gain. The learner should be able to move the sliders back and forth as many times as possible until they get it right. The correct answer should appear on the slide when the learner correctly places the buttons on the slider. The prepregnancy weight status should change each time that the learner gets a correct answer.

Answers:

**Normal Weight (BMI 18.5-24.9):** 25-35 lbs.

**Obese (BMI  $\geq 30$ ):** 11-20 lbs.

**Underweight (BMI  $< 18.5$ ):** 28-40 lbs.

**Overweight (BMI 25-29.9):** 15-25 lbs.

**Normal Weight (BMI: 18.5-24.9) WITH TWINS:** 37-54 lbs.

Play feedback audio when the learner completes the exercise.

Graphics

iStock image ID: 509482764

<http://www.istockphoto.com/photo/weight-check-gm509482764-85801423>

References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

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## Section 3: Nutrient Needs During Pregnancy

### Audio

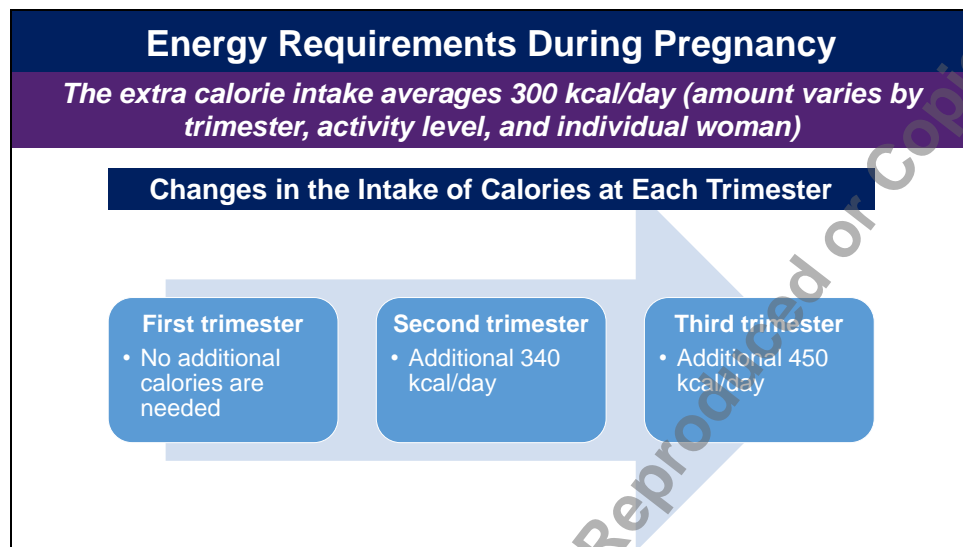
There is an abundance of research highlighting the effects of diet on pregnancy outcomes. While balanced diet is not the only predictor of healthy pregnancies and infants, it is important and can lead to healthier habits after pregnancy. In general, nutrient needs can be met by eating a balanced and healthful diet that aligns with the 2015-2020 Dietary Guidelines for Americans.

### Developer's Notes

### Graphics

### References

The American College of Obstetricians and Gynecologists. (2016). *Your pregnancy and childbirth*. Retrieved from <http://www.acog.org/-/media/Womens-Health/nutrition-in-pregnancy.pdf?dmc=1&ts=20170427T0200052740>



#### Audio

Energy requirements increase during pregnancy due to fetal growth and development of extra maternal tissues. The extra calorie intake averages 300 kcal/day, however this amount varies by trimester, activity level, and the individual woman. Let's go over the changes in the intake of calories at each trimester.

Since weight gain in the first trimester is minimal, usually no additional calories are needed. The Dietary Reference Intake (DRI) for energy intake during the second trimester is an additional 340 kcal/day. In the third trimester when the fetus is growing rapidly and gaining up to 1 ounce per day, the DRI for energy is an additional 450 kilocalorie per day (kcal/day).

These calorie targets are estimates and actual needs vary widely. Women who were underweight prepregnancy require more than these targets and women who were overweight prepregnancy require less than these targets. Rather than calorie counting, the best way to gauge appropriate calorie intake is by tracking weight gain.

#### Developer's Notes

Have textbox titled "Changes in the Intake of Calories at Each Trimester" appear at audio cue, "Let's go over the changes..."

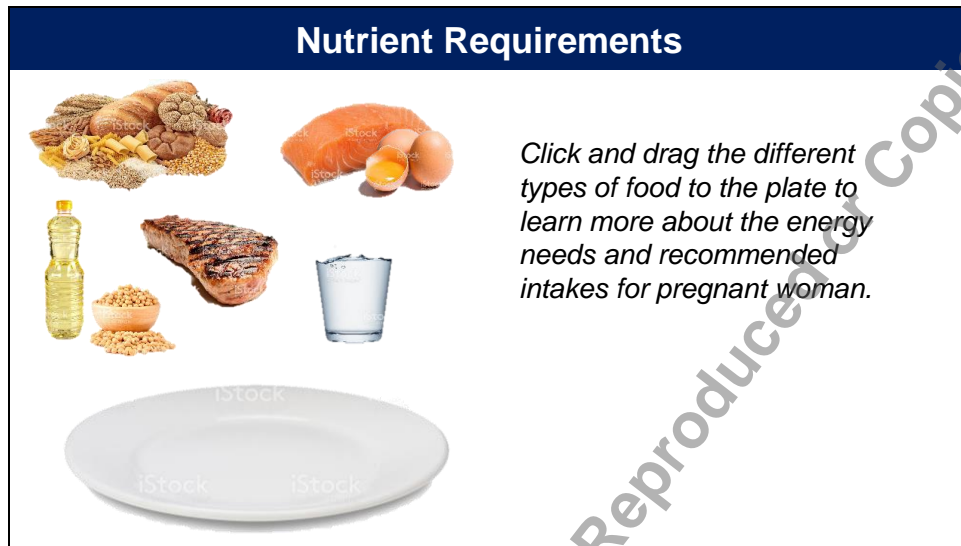
Have arrow appear and each blue text box appear at the following audio cues:

- “First trimester” textbox should appear at audio cue, “Since weight gain in the first trimester...”
- “Second trimester” textbox should appear at audio cue, “The Dietary Reference Intake (DRI)...”
- “Third trimester” textbox should appear at audio cue, “In the third trimester...”

#### Graphics

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

Click and drag the different types of food to the plate to learn more about the energy needs and recommended intakes for pregnant woman.

#### Developer's Notes

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to this slide to click and drag a new food item. See next 5 slides to see how this should appear.

Group image of fish and eggs together as one clickable object.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 53.

#### Graphics

iStock image ID (plate): 184276935

<http://www.istockphoto.com/photo/empty-plate-on-white-gm184276935-17095484>

iStock image ID (carbohydrates): 149162559

<http://www.istockphoto.com/photo/foods-high-in-carbohydrate-gm149162559-19290880>

iStock image ID (protein): 610883320

<http://www.istockphoto.com/photo/grilled-new-york-steak-isolated-on-white-gm610883320-105002007>

iStock image ID (fat):

<http://www.istockphoto.com/photo/oil-beans-on-the-white-background-gm509678132-85909069>

iStock image ID (salmon): 157641208

<http://www.istockphoto.com/photo/a-large-pink-salmon-fillet-isolated-on-a-white-background-gm157641208-13708633>

iStock image ID (eggs): 173234780

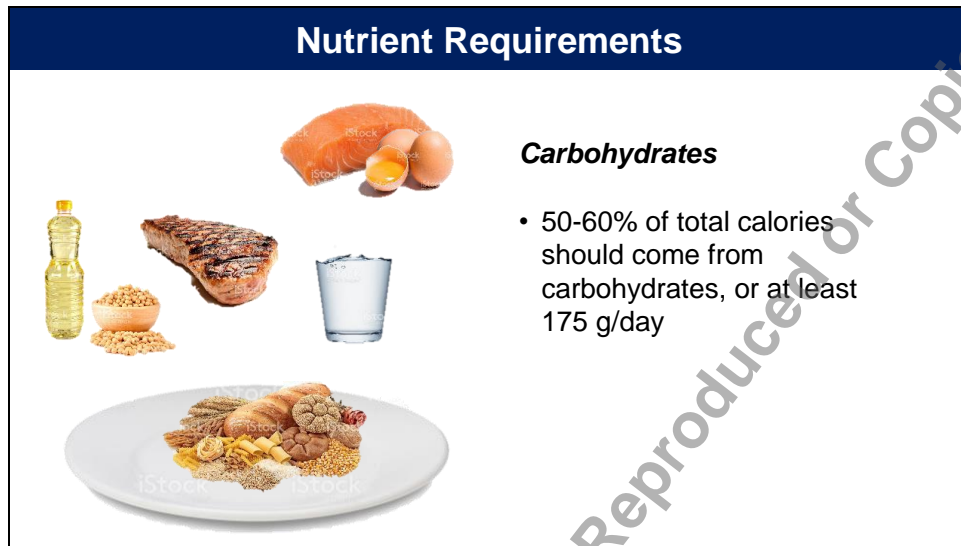
<http://www.istockphoto.com/photo/group-of-brown-raw-eggs-one-is-broken-isolated-white-gm173234780-20938628>

iStock image ID (water): 183858622

<http://www.istockphoto.com/photo/glass-of-water-isolated-on-white-gm183858622-16269160>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



#### Audio

Carbohydrates: During pregnancy, 50-60% of total calories should come from carbohydrates, or at least 175 g/day.

#### Developer's Notes

Sync appearance of on-screen text with audio

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 47 to click and drag a new food item.

Group image of fish and eggs together as one clickable object.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 50.

#### Graphics

iStock image ID (plate): 184276935

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iStock image ID (carbohydrates): 149162559

<http://www.istockphoto.com/photo/foods-high-in-carbohydrate-gm149162559-19290880>

iStock image ID (protein): 610883320

<http://www.istockphoto.com/photo/grilled-new-york-steak-isolated-on-white-gm610883320-105002007>

iStock image ID (fat):

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<http://www.istockphoto.com/photo/a-large-pink-salmon-fillet-isolated-on-a-white-background-gm157641208-13708633>

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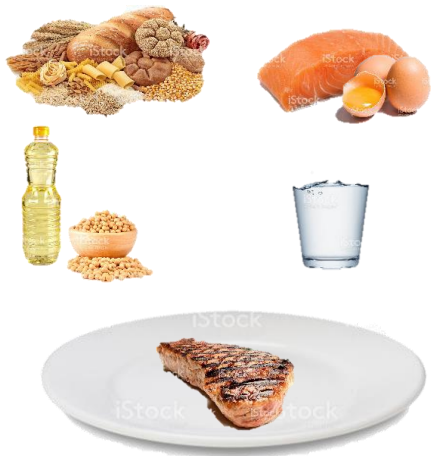
iStock image ID (water): 183858622

<http://www.istockphoto.com/photo/glass-of-water-isolated-on-white-gm183858622-16269160>

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### Nutrient Requirements



**Protein**

- Need about 71 grams of protein/day, or 1.1 g/kg of body weight
- Protein deficiencies are not common
- Vegetarian and vegan diets can meet protein needs during pregnancy as long as careful food choices are made

#### Audio

Protein: Pregnant women need about 71 grams of protein/day or 1.1 grams of protein per kilogram of body weight. The average pregnant American woman consumes just over this amount, so protein deficiencies are not common. Vegetarian and vegan diets can meet protein needs during pregnancy as long as careful food choices are made.

#### Developer's Notes

Sync appearance of on-screen text with audio

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 44 to click and drag a new food item.

Group image of fish and eggs together as one clickable object.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 50.

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### Nutrient Requirements



**Fat**

- Source of energy, fat-soluble vitamins, and essential fatty acids
- Recommendation: 13 g/day of the essential fatty acid **linoleic acid** and 1.4 g/day of **alpha-linolenic acid**
- Critical to fetal development, making up parts of cell membranes and the myelin sheath coating of nerves

#### Audio

Consumption of fat is essential during pregnancy, as it is a source of energy, fat-soluble vitamins, and essential fatty acids. Emphasis should be placed on healthy unsaturated fats from plant sources. For pregnant women, 13 g/day of the essential fatty acid linoleic acid, and 1.4 g/day of alpha-linolenic acid is recommended.

Both linoleic and alpha-linolenic are polyunsaturated fatty acids. They are critical to fetal development, making up parts of cell membranes and the myelin sheath coating of nerves.

Linoleic acid is the primary omega-6 fatty acid. Dietary sources include:

- Safflower oil,
- Corn oil,
- Sunflower oil, and,
- Soybean oil

Alpha-linolenic acid is the primary omega-3 fatty acid, and can be changed into the fatty acids EPA and DHA by the liver. Dietary sources include:

- Flaxseed,
- Walnuts,
- Soybeans,
- Canola oil, and,
- Leafy green vegetables

### Developer's Notes

Sync appearance of on-screen text with audio. At audio cue, "Both linoleic and alpha-linolenic...", the current set of on-screen text should disappear to make room for the next set of on-screen text (featured off-screen to the right of the PowerPoint slide).

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 44 to click and drag a new food item.

Group image of fish and eggs together as one clickable object.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 50.

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### Nutrient Requirements



#### ***Omega-3 Fatty Acids EPA and DHA***

- Consumed directly from food sources
- Women who consume sufficient EPA and DHA during pregnancy tend to have infants with:
  - More mature nervous systems
  - Better vision
  - Lower risk of preterm delivery
- Recommendation: 250-500 mg/day

#### Audio

Omega-3 Fatty Acids EPA and DHA: Two kinds of omega-3 fatty acids, eicosapentaenoic acid (EPA) and docosahexaenoic acid (DHA) are especially important during pregnancy. While EPA and DHA can be made in the body from alpha-linolenic acid, the quantities are limited. It is recommended that EPA and DHA be consumed directly from food sources. Women who consume sufficient EPA and DHA during pregnancy tend to have infants with more mature nervous systems and better vision, and have a lower risk of preterm delivery than those that consume low amounts of EPA and DHA.

There is no official DRI for EPA and DHA, but a recommendation has been put forth that all people get 250-500 mg/day. Most American women do not get this amount, and vegans are at very high risk for consuming inadequate EPA and DHA.

Good sources of EPA and DHA:

- Seafood and fish oils
- Egg yolk (DHA)
- Fortified foods
- Supplements with DHA and EPA

The FDA recommends that women consume 2-3, 4-oz servings of low mercury fish per week in order to get the benefits of EPA and DHA. These include flounder, salmon, sardines, or tilapia.

### Developer's Notes

Sync appearance of on-screen text with audio (note change of on-screen text about halfway through the audio)

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 47 to click and drag a new food item.

Group image of fish and eggs together as one clickable object.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 53.

Pronunciation: ei·co·sa·pen·ta·e·no·ic acid

To listen: <https://www.merriam-webster.com/dictionary/eicosapentaenoic%20acid>

do·co·sa·hex·a·e·no·ic acid

To listen: <https://www.merriam-webster.com/dictionary/docosahexaenoic%20acid>

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iStock image ID (water): 183858622

<http://www.istockphoto.com/photo/glass-of-water-isolated-on-white-gm183858622-16269160>

### References


Harris, W.S. et al. (2009). Towards establishing dietary reference intakes for eicosapentaenoic and docosahexaenoic acids. *J Nutr*, 139(4). 804S-819S.

<https://www.ncbi.nlm.nih.gov/pubmed/19244379>

United States Food & Drug Administration and Environmental Protection Agency. (2017). *Advice about eating fish: What pregnant women & parents should know*. [Fact Sheet]. Retrieved from <https://www.fda.gov/food/foodborneillnesscontaminants/metals/ucm393070.htm>

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### Nutrient Requirements



**Water**

- Water needs increase during pregnancy to create:
  - Extra blood
  - Amniotic fluid
  - Other tissues
- Women should gauge appropriate water consumption by checking that urine is light colored

#### Audio

Water needs increase during pregnancy to create:

- Extra blood,
- Amniotic fluid, and,
- Other tissues.

Women should gauge appropriate water consumption by checking that urine is light colored.

#### Developer's Notes

Sync appearance of on-screen text with audio

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 47 to click and drag a new food item.

Group image of fish and eggs together as one clickable object.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 53.

### Graphics

iStock image ID (plate): 184276935

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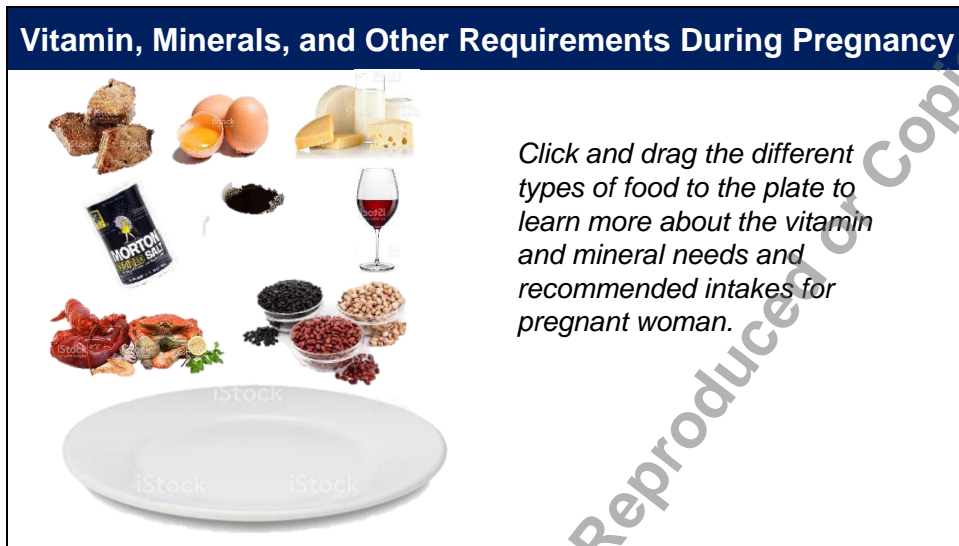
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#### Audio

Click and drag the different types of food to the plate to learn more about the vitamin and mineral needs and recommended intakes for pregnant woman.

#### Developer's Notes

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to this slide to click and drag a new food item. See next 9 slides to see how this should appear.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 63.

#### Graphics

iStock image ID (plate): 184276935

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iStock image ID (liver): 98397247

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iStock image ID (wine): 532520347

<http://www.istockphoto.com/photo/wine-glass-set-gm532520347-55873420>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

## ***Folate***

- Necessary to:
  - Prevent anemia during pregnancy
  - Ensure fetal growth
  - Improve birth outcomes
- Especially important during preconception and very early pregnancy to prevent neural tube defects

## Audio

Folate is necessary to prevent anemia during pregnancy, to ensure fetal growth, and to improve birth outcomes. Folate is especially important during preconception and very early pregnancy to prevent neural tube defects.

The RDA for folate during pregnancy is 600 µg/day from food sources and folic acid supplementation.

Good sources of folate include:

- Beef liver,
- Spinach,
- Broccoli,
- Fortified cereal and grains, and,
- Brussels sprouts

Click the button below to get more information on folate, folic acid, and neural tube defects on the National Institutes of Health Office of Dietary Supplements' website.

## Developer's Notes

Sync appearance of on-screen text with audio (note change in on-screen text about halfway through the audio)

Button should link to the following: <https://ods.od.nih.gov/factsheets/Folate-HealthProfessional/>.

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 53 to click and drag a new food item.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 63.

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### References

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### Vitamin, Minerals, and Other Requirements During Pregnancy



#### **Choline**

- Serves as a component of cell membranes
- Average intake of choline is only about half the requirement
- Recommendation: 450 mg/day
- Good sources of choline:
  - Eggs
  - Meat
  - Seafood

#### Audio

Choline serves as a component of cell membranes, so needs are higher during pregnancy. Average intake of choline is only about half the requirement. The recommended dietary allowance for choline during pregnancy is 450 mg/day.

Good sources of choline include:

- Eggs,
- Meat, and,
- Seafood

#### Developer's Notes

Sync appearance of on-screen text with audio

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 53 to click and drag a new food item.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 63.

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National Institutes of Health, Office of Dietary Supplements. (2017). *Choline: Fact sheet for health professionals*. Retrieved from <https://ods.od.nih.gov/factsheets/Choline-HealthProfessional/#h2>

### Vitamin, Minerals, and Other Requirements During Pregnancy



#### ***Vitamin D***

- Supports growth, especially in bones, teeth, and enamel formation
- Recommendation: 600 IU/day
- Good sources of vitamin D:
  - Fortified milk
  - Seafood
  - Exposure to UV rays in sunlight

#### Audio

Vitamin D supports growth, especially in bones, teeth, and enamel formation. Vitamin D deficiency can lead to poor bone development and dental caries in infancy and later childhood. Poor vitamin D status is common, and both vegans and obese women may be at increased risk of low vitamin D status.

The recommended dietary allowance for vitamin D during pregnancy is 600 IU/day.

Good sources of vitamin D include:

- Fortified milk,
- Seafood, and,
- Exposure to UV rays in sunlight

The primary dietary sources of vitamin D include fortified milk and other fortified foods. While exposure to UV rays in sunlight also stimulates vitamin D production, no guidelines for sun exposure exist, as the amount ranges based on cloud cover, duration of exposure, time of day, sunscreen usage, and amount of melanin in the skin. Women should aim to get vitamin D through food or supplements, especially where there is limited exposure to sunlight.

#### Developer's Notes

Sync appearance of on-screen text with audio

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 53 to click and drag a new food item.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 63.

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### References

National Institutes of Health, Office of Dietary Supplements. (2016). *Vitamin D: Fact sheet for health professionals*. Retrieved from <https://ods.od.nih.gov/factsheets/VitaminD-HealthProfessional/#h3>

### Vitamin, Minerals, and Other Requirements During Pregnancy



#### Calcium

- Requirements increase especially in the third trimester of pregnancy
- Recommendation during pregnancy: 1,000 mg/day; for pregnant teens: 1,300 mg/day
- Good sources of calcium:
  - Dairy products
  - Kale, cabbage, broccoli, and other vegetables
  - Fortified products

#### Audio

Calcium requirements increase especially in the third trimester of pregnancy, when the fetus is rapidly building bone. Pregnant women who do not consume enough calcium may later experience decreased bone remineralization and low concentration of calcium in breast milk.

Lead stored in bone mass is released into the blood stream during remineralization. This process is exaggerated in women who consume insufficient calcium, and they may experience higher levels of lead in the blood, which can cross the placenta and affect the fetus. Elevated blood lead levels are associated with preterm birth, low birth weight, and developmental delays. The populations most affected by exposure to lead are low-income, urban, and immigrant families.

The recommended dietary allowance for calcium during pregnancy is 1,000 mg/day. However, for pregnant teens, this is 1,300 mg/day.

Good dietary sources of calcium include:

- Dairy products,
- Kale, cabbage, broccoli, and other vegetables, and,
- Fortified products

#### Developer's Notes

Sync appearance of on-screen text with audio

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 53 to click and drag a new food item.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 63.

### Graphics

iStock image ID (plate): 184276935

<http://www.istockphoto.com/photo/empty-plate-on-white-gm184276935-17095484>

iStock image ID (liver): 98397247

<http://www.istockphoto.com/photo/roasted-liver-gm98397247-12530662>

iStock image ID (eggs): 173234780

<http://www.istockphoto.com/photo/group-of-brown-raw-eggs-one-is-broken-isolated-white-gm173234780-20938628>

iStock image ID (seafood): 183875021

<http://www.istockphoto.com/photo/seafood-variety-gm183875021-16528942>

iStock image ID (cheese): 185241445

<http://www.istockphoto.com/photo/some-dairy-products-shot-on-reflective-white-background-gm185241445-19706273>

iStock image ID (beans): 648982918

<http://www.istockphoto.com/photo/three-kinds-of-beans-on-white-background-gm648982918-118093231>

iStock image ID (salt): 459020397

<http://www.istockphoto.com/photo/morton-iodized-salt-on-white-gm459020397-22822735>

iStock image ID (coffee): 503593158

<http://www.istockphoto.com/photo/black-coffee-in-cup-mug-isolated-gm503593158-82626469>


iStock image ID (wine): 532520347

<http://www.istockphoto.com/photo/wine-glass-set-gm532520347-55873420>

### References

National Institutes of Health, Office of Dietary Supplements. (2016). *Calcium: Fact sheet for health professionals*. Retrieved from <https://ods.od.nih.gov/factsheets/Calcium-HealthProfessional/>

### Vitamin, Minerals, and Other Requirements During Pregnancy



#### Iron

- Supports the fetus, placenta, and production of additional red blood cells
- Low iron stores result in weakness, fatigue, poor attention span, and long-term consequences for the fetus when deficiency occurs in pregnancy
- Iron deficiency anemia results in lower hemoglobin levels and symptoms of iron deficiency, plus paleness, exhaustion, and/or rapid heart rate
- Iron deficiency is linked to lower scores on intelligence and attention tests in preschoolers

#### Audio

Iron supports the fetus, the placenta, and the production of additional red blood cells during pregnancy. Iron deficiency occurs when someone's iron stores are low. This can lead to weakness, fatigue, poor attention, and long-term consequences for the fetus when iron deficiency occurs in pregnancy. If left untreated, it can progress to iron deficiency anemia which results in lower hemoglobin levels. Patients may have all the symptoms of iron deficiency, plus paleness, exhaustion, and/or rapid heart rate. Iron deficiency in pregnancy is linked to lower scores on intelligence and attention tests in preschoolers. During the last 2 months of gestation, the fetus draws iron from the mother to build up enough iron stores to last 6-8 months after birth. Preterm infants are therefore at higher risk for iron deficiency, since they miss out on this crucial time of iron accumulation.

The recommended dietary allowance for iron during pregnancy is 27 mg/day.

Good sources of iron include:

- Meat,
- Seafood,
- Beans,
- Some vegetables, and,
- Iron-fortified foods

Many pregnant women take iron supplements to ensure that they are meeting the RDA. However, supplements are not always well tolerated. Constipation is common, as are nausea,

cramps, and gas. Women are recommended to supplement their diets with 30 mg iron/day in the 2nd and 3rd trimesters. However, women with iron-deficiency anemia are often prescribed much higher amounts, 60 mg/day or more.

#### Developer's Notes

Sync appearance of on-screen text with audio

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 53 to click and drag a new food item.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 63.

#### Graphics

iStock image ID (plate): 184276935

<http://www.istockphoto.com/photo/empty-plate-on-white-gm184276935-17095484>

iStock image ID (liver): 98397247

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iStock image ID (seafood): 183875021

<http://www.istockphoto.com/photo/seafood-variety-gm183875021-16528942>

iStock image ID (cheese): 185241445

<http://www.istockphoto.com/photo/some-dairy-products-shot-on-reflective-white-background-gm185241445-19706273>

iStock image ID (beans): 648982918

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iStock image ID (salt): 459020397

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iStock image ID (coffee): 503593158

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iStock image ID (wine): 532520347


<http://www.istockphoto.com/photo/wine-glass-set-gm532520347-55873420>

#### References

National Institutes of Health, Office of Dietary Supplements. (2016). *Iron: Dietary supplement fact sheet*. Retrieved from <https://ods.od.nih.gov/factsheets/Iron-HealthProfessional/#h2>

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### Vitamin, Minerals, and Other Requirements During Pregnancy



#### **Iodine**

- Important for fetal brain development and thyroid function in both the mother and fetus
- Recommendation: 220 µg/day
- Good sources of Iodine:
  - Iodized salt
  - Seafood
- Sea salt may have naturally occurring iodine but not all salts contain iodine

#### Audio

Iodine is important for fetal brain development and thyroid function in both the mother and fetus.

RDA for iodine during pregnancy: 220 µg/day.

Good sources of iodine include iodized salt and seafood.

Sea salt may have naturally occurring iodine, but note that not all salts contain iodine. For instance, Kosher salt does not contain iodine.

#### Developer's Notes

Sync appearance of on-screen text with audio

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 53 to click and drag a new food item.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 63.

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<http://www.istockphoto.com/photo/group-of-brown-raw-eggs-one-is-broken-isolated-white-gm173234780-20938628>

iStock image ID (seafood): 183875021

<http://www.istockphoto.com/photo/seafood-variety-gm183875021-16528942>

iStock image ID (cheese): 185241445

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<http://www.istockphoto.com/photo/three-kinds-of-beans-on-white-background-gm648982918-118093231>

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<http://www.istockphoto.com/photo/morton-iodized-salt-on-white-gm459020397-22822735>

iStock image ID (coffee): 503593158

<http://www.istockphoto.com/photo/black-coffee-in-cup-mug-isolated-gm503593158-82626469>

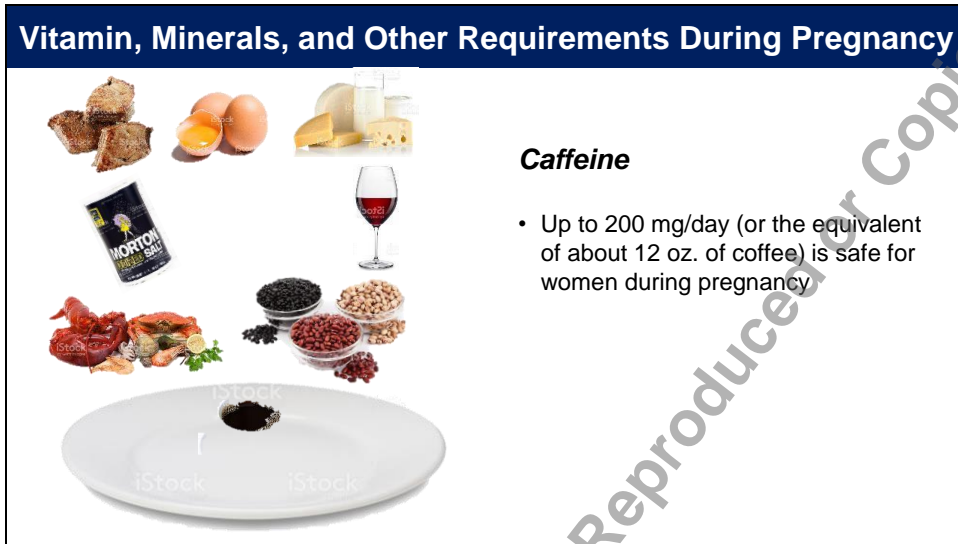
iStock image ID (wine): 532520347

<http://www.istockphoto.com/photo/wine-glass-set-gm532520347-55873420>

### References

National Institutes of Health, Office of Dietary Supplements. (2011). *Iodine: Fact sheet for health professionals*. Retrieved from <https://ods.od.nih.gov/factsheets/Iodine-HealthProfessional/#h2>

### Vitamin, Minerals, and Other Requirements During Pregnancy



**Caffeine**

- Up to 200 mg/day (or the equivalent of about 12 oz. of coffee) is safe for women during pregnancy

#### Audio

Up to 200 mg caffeine per day (or the equivalent of about 12 oz. of coffee) is safe for women during pregnancy.

#### Developer's Notes

Sync appearance of on-screen text with audio

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 53 to click and drag a new food item.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 63.

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iStock image ID (wine): 532520347

<http://www.istockphoto.com/photo/wine-glass-set-gm532520347-55873420>

### References

The American College of Obstetricians and Gynecologists. (2016). *Your pregnancy and childbirth*. Retrieved from <http://www.acog.org/-/media/Womens-Health/nutrition-in-pregnancy.pdf?dmc=1&ts=20170427T0200052740>

### Vitamin, Minerals, and Other Requirements During Pregnancy



#### **Alcohol**

- Can easily pass through the placenta to the fetus and disrupt normal development
- High alcohol consumption (several drinks per day) is related to abnormal mental development and growth
- No defined safe level of alcohol intake
- The US Surgeon General strongly advises against any alcohol intake while a woman is pregnant or may become pregnant

#### Audio

Alcohol can easily pass through the placenta to the fetus and disrupt normal development. High alcohol consumption (several drinks per day) is related to abnormal mental development and growth in the child. There is no defined safe level of alcohol intake. The US Surgeon General strongly advises against any alcohol intake while a woman is pregnant or may become pregnant.

#### Developer's Notes

Sync appearance of on-screen text with audio

The learner should be able to click and drag each food item to the plate. The food item should stay on the plate and trigger some audio and the appearance of on-screen text. Once the audio is completed, the food item should disappear off the plate. The learner should be redirected to slide 53 to click and drag a new food item.

The learner will need to click and drag each food item to the plate at least once before proceeding to the next part of the module on slide 63.

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<http://www.istockphoto.com/photo/three-kinds-of-beans-on-white-background-gm648982918-118093231>

iStock image ID (salt): 459020397

<http://www.istockphoto.com/photo/morton-iodized-salt-on-white-gm459020397-22822735>

iStock image ID (coffee): 503593158

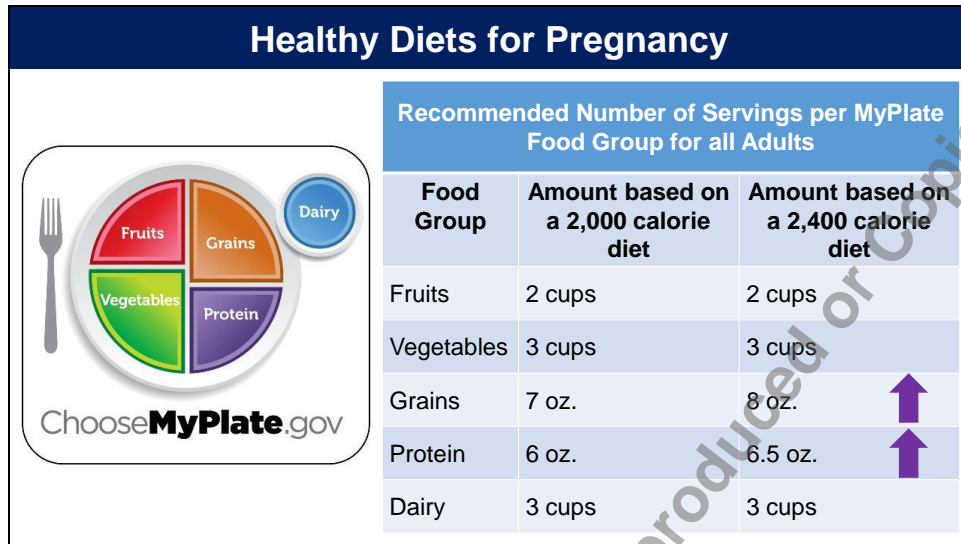
<http://www.istockphoto.com/photo/black-coffee-in-cup-mug-isolated-gm503593158-82626469>

iStock image ID (wine): 532520347

<http://www.istockphoto.com/photo/wine-glass-set-gm532520347-55873420>

### References

Centers for Disease Control and Prevention, National Center on Birth Defects and Developmental Disabilities. (2005). *Advisory on alcohol use in pregnancy: A 2005 message to women from the U.S. Surgeon General*. [Fact Sheet]. Retrieved from <https://www.cdc.gov/ncbddd/fasd/documents/sg-advisory.pdf>



#### Audio

Healthy diets and nutrient requirements during pregnancy do not differ greatly from the recommendations in the USDA's 2015-2020 Dietary Guidelines for Americans and the dietary reference intake (DRI). Most nutrient requirements are slightly higher, and some key nutrients that are required in amounts above the DRI's for non-pregnant women were discussed previously. The overall balance of food from the five food groups should remain the same, with an emphasis on fruit, vegetable, and whole grains intake.

For pregnant women, food pattern recommendations are based on caloric needs. As caloric needs increase during the pregnancy, the amount of food from each food group increases. As with any dietary recommendations, cultural foods and preferences should be taken into account. The MyPlate recommendations by food group can accommodate a wide variety of dietary habits and preferences.

#### Developer's Notes

Pronounce "DRI" as "D.R.I."

#### Graphics

United States Department of Agriculture. (2017). MyPlate (full plate) [Digital image]. Retrieved from <https://www.choosemyplate.gov/myplate-graphic-resources>

#### References

The American College of Obstetricians and Gynecologists. (2016). *Your pregnancy and childbirth*. Retrieved from <http://www.acog.org/-/media/Womens-Health/nutrition-in-pregnancy.pdf?dmc=1&ts=20170427T0200052740>



### Audio

A diet recall can be used as an indicator of eating patterns. You can quickly assess the adequacy of diet intake by comparing a participant's diet recall or food frequency questionnaire to the MyPlate food groups and proportions. A detailed nutrient analysis is not always possible and comparing food intake to food recommendations will give an idea of which nutrients might be lacking. This also serves as a starting point for diet counseling

### Developer's Notes

Have each textbox and accompanying arrows appear in sync with audio

### Graphics

iStock image ID: 517663904

<http://www.istockphoto.com/photo/choosing-the-right-name-for-you-baby-gm517663904-89610383>

### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

**Iron Assessment**

**Hematocrit**  
 Ratio of the volume of red blood cells to the total volume of blood

**Hemoglobin**  
 Amount of the hemoglobin protein

Normal Iron Concentrations During Pregnancy		
Weeks' gestation	Hemoglobin, g/dL	Hematocrit, %
0-14	>11.0	>33.0
14-26	>10.5	>32.0
26-40	>11.0	>33.0

### Audio

Iron levels vary from woman to woman and change throughout the course of pregnancy. Due to the fast increase in blood volume in the first half of pregnancy and the resulting hemodilution, iron concentrations fall in mid-pregnancy.

Hematocrit refers to the ratio of the volume of red blood cells to the total volume of blood. Hemoglobin is the amount of the hemoglobin protein. When looking at the normal iron concentrations during pregnancy, we can see where the concentrations fall in mid-pregnancy. Please note that these values are greater than what is depicted on the graph; for example, at 0-14 weeks' gestation, the hematocrit for a pregnant woman is greater than 33%.

### Developer's Notes

Have hematocrit and hemoglobin textboxes appear in sync with the audio.


Have Normal Iron Concentrations During Pregnancy graph appear at audio cue, "When looking at...". Each set of bars for each weeks' gestation should appear one at a time, one after the other.

### Graphics

### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

### Multivitamin Supplements During Pregnancy



Aim to meet micronutrient needs through diet

Prenatal supplements may benefit women who are at risk of deficiency because they:

- Do not normally consume an adequate diet
- Are carrying multiples
- Smoke, drink, or use drugs
- Are vegan
- Have a nutrient deficiency

#### Audio

Women should aim to meet their micronutrient needs through diet, as the nutrient-dense foods that provide vitamins and minerals also have the benefits of being high in antioxidants and fiber. Prenatal supplements may benefit women who are at risk of deficiency because they:

- Do not normally consume an adequate diet,
- Are carrying multiples,
- Smoke, drink, or use drugs,
- Are vegan, and/or,
- Have a nutrient deficiency

Most pregnant women take a multivitamin supplement, and use of supplements in low-income pregnant women has been shown to decrease the risk of low birth weight, preterm delivery, and certain malformations. There are many over the counter or prescription prenatal vitamins with varying amounts of nutrients.

#### Developer's Notes

Have each row in the table appear in sync with audio

#### Graphics

iStock image ID: 180761945

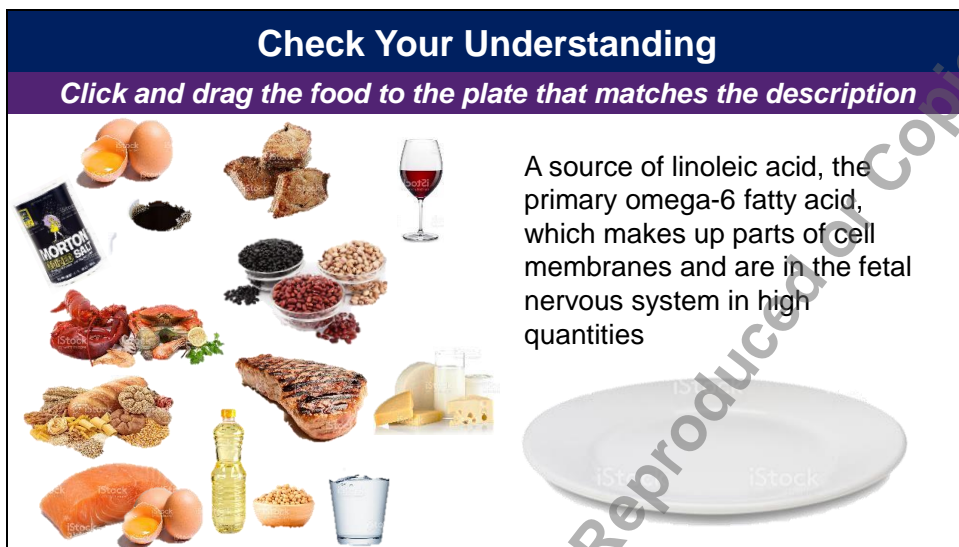
<http://www.istockphoto.com/photo/portrait-of-pregnant-african-american-woman-holding-medication-pills-tablets-gm180761945-24843201>

#### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

### Check Your Understanding

*Click and drag the food to the plate that matches the description*



A source of linoleic acid, the primary omega-6 fatty acid, which makes up parts of cell membranes and are in the fetal nervous system in high quantities

#### Audio

Now, let's take a moment to check your understanding of the material for this section.

#### Developer's Notes

This exercise is a click and drag activity. The learner needs to click and drag the food to the plate that matches the description. The learner should be able to do this as many times as possible until they correctly click and drag the right food to the plate.

Group image of fish and eggs together (image on the bottom left-hand corner) as one clickable object.

Descriptions and matching foods:

- Description: A source of linoleic acid, the primary omega-6 fatty acid, which makes up parts of cell membranes and are in the fetal nervous system in high quantities  
Food: Soybean oil  
iStock image ID (fat):  
<http://www.istockphoto.com/photo/oil-beans-on-the-white-background-gm509678132-85909069>
- Description: Women need about 71 grams of this per day but the average pregnant American women consumes just over this amount so deficiencies are rarely seen.

Food: Steak

iStock image ID (protein): 610883320

<http://www.istockphoto.com/photo/grilled-new-york-steak-isolated-on-white-gm610883320-105002007>

- Description: A source of folate which prevents anemia, ensures fetal growth, and improves birth outcomes by preventing neural tube defects

Food: Beef liver

iStock image ID (liver): 98397247

<http://www.istockphoto.com/photo/roasted-liver-gm98397247-12530662>

- Description: Source of calcium and is especially important in the third trimester when the fetus is rapidly building bone

Food: Cheese and milk

iStock image ID (cheese): 185241445

<http://www.istockphoto.com/photo/some-dairy-products-shot-on-reflective-white-background-gm185241445-19706273>

- Description: Provides iodine, which is important for fetal brain development and thyroid function for both the mother and fetus

Food: Iodized salt

iStock image ID (salt): 459020397

<http://www.istockphoto.com/photo/morton-iodized-salt-on-white-gm459020397-22822735>

### Graphics

iStock image ID (plate): 184276935

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iStock image ID (liver): 98397247

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iStock image ID (coffee): 503593158

<http://www.istockphoto.com/photo/black-coffee-in-cup-mug-isolated-gm503593158-82626469>

iStock image ID (wine): 532520347

<http://www.istockphoto.com/photo/wine-glass-set-gm532520347-55873420>

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iStock image ID (protein): 610883320

<http://www.istockphoto.com/photo/grilled-new-york-steak-isolated-on-white-gm610883320-105002007>

iStock image ID (fat):

<http://www.istockphoto.com/photo/oil-beans-on-the-white-background-gm509678132-85909069>

iStock image ID (salmon): 157641208

<http://www.istockphoto.com/photo/a-large-pink-salmon-fillet-isolated-on-a-white-background-gm157641208-13708633>

iStock image ID (eggs): 173234780

<http://www.istockphoto.com/photo/group-of-brown-raw-eggs-one-is-broken-isolated-white-gm173234780-20938628>

iStock image ID (water): 183858622

<http://www.istockphoto.com/photo/glass-of-water-isolated-on-white-gm183858622-16269160>

## References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.



## Section 4: Food Safety During Pregnancy

### Audio

In addition to maternal and fetal nutrition needs during pregnancy, pregnant women also need to take into consideration food safety.

### Developer's Notes

### Graphics

### References

## Food Safety Issues During Pregnancy

**Women are at a higher risk of infection during pregnancy and special care should be taken with certain food products that carry the risk of foodborne illnesses**



Click on each of the foodborne illnesses with a special cause for concern for pregnant women to learn more about the condition.

**Listeriosis**

**Toxoplasmosis**

**Seafood Contamination**

### Audio

Women are at higher risk of infection during pregnancy and special care should be taken with certain food products that carry the risk of food-borne illnesses or contamination that could affect the fetus. Pregnant women should use extra caution when choosing and handling foods that are potentially hazardous. Undercooked and/or raw meat, seafood, and eggs should always be avoided. There are also some other common foodborne illnesses that are of special cause for concern for pregnant women.

Click on each of the foodborne illnesses with a special cause for concern for pregnant women to learn more about the condition.

### Developer's Notes

Clicking on each button should lead to a different slide. Once the audio in that slide is completed, the learner should be brought back to this slide. The learner should have to select each button once before proceeding with the module on slide 74.


### Graphics

iStock image ID: 184371092

<http://www.istockphoto.com/photo/pregnant-woman-buying-cleaning-products-in-super-market-gm184371092-17481486>

### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

Listeriosis	
Symptoms ranging from flu-like symptoms, muscle aches, and diarrhea, to no symptoms at all	
Risk to the fetus is much higher	
<p>The following foods should be avoided by pregnant women:</p> <ul style="list-style-type: none"><li>• Raw or smoked fish</li><li>• Unpasteurized cheese or milk</li><li>• Undercooked meat</li><li>• Cold cuts and hot dogs that have not been heated properly</li></ul>	

#### Audio

*Listeria monocytogenes* is a foodborne illness with symptoms ranging from flu-like symptoms, muscle aches, and diarrhea, to no symptoms at all. However, the risk to the fetus is much higher, and complications include preterm delivery, miscarriage, or stillbirth. Certain foods are at higher risk of contamination with *Listeria* than others. The following foods should be avoided by pregnant women:

- Raw or smoked fish,
- Unpasteurized cheese or milk,
- Undercooked meat, and,
- Cold cuts and hot dogs that have not been heated properly

#### Developer's Notes

Sync appearance of table rows with audio

When the learner proceeds to the next slide, it should go back to slide 70 since the learner should have to select each button once before proceeding with the module.

#### Graphics

iStock image ID (smoked salmon): 508038346

<http://www.istockphoto.com/photo/smoked-salmon-gm508038346-85025715>

iStock image ID (dairy products): 182707383

<http://www.istockphoto.com/photo/dairy-products-gm182707383-12408185>


iStock image ID (hotdog): 184097716

<http://www.istockphoto.com/photo/hot-dog-gm184097716-1831755>

### References

Brown, J. E., Isaacs, J. S., Krinke, B., Murtaugh, M., & Lechtenberg, E. (2016). *Nutrition through the life cycle* (6th ed.). Boston, MA, United States: Wadsworth, CENGAGE Learning.

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Toxoplamosis	
Infection passed to fetus via the mother	
In the fetus, it may cause: <ul style="list-style-type: none"><li>• Mental retardation</li><li>• Blindness</li><li>• Seizures</li><li>• Death</li></ul>	
Potential sources: <ul style="list-style-type: none"><li>• Undercooked meats</li><li>• Cat litter</li></ul>	

#### Audio

*Toxoplasma gondii* can cause an infection that may be passed to the fetus via the mother. A mother may not have symptoms, but in the fetus, it may cause mental retardation, blindness, seizures, or death. Potential sources of *toxoplasma gondii* include undercooked meats and cat litter. Pregnant women should avoid changing cat litter if possible. If it is not possible, gloves should be worn and special care should be taken to wash hands and avoid cross-contamination.

#### Developer's Notes

Sync appearance of table rows with audio

When the learner proceeds to the next slide, it should go back to slide 70 since the learner should have to select each button once before proceeding with the module

#### Graphics

iStock image ID (steak): 154110357

<http://www.istockphoto.com/photo/steak-gm154110357-17416899>

iStock image (kitten): 155378861

<http://www.istockphoto.com/photo/kitten-in-the-litter-box-gm155378861-19910908>

#### References

Centers for Disease Control and Prevention. (2017). *Parasites – toxoplasmosis (toxoplasma infection)*. Retrieved from

[https://www.cdc.gov/parasites/toxoplasmosis/gen\\_info/pregnant.html](https://www.cdc.gov/parasites/toxoplasmosis/gen_info/pregnant.html)

### Seafood Contamination


Too much mercury can affect the fetus's developing brain

Women of childbearing age, including pregnant and lactating women, should consume:

<p>2-3 servings per week of low-mercury fish like:</p> <ul style="list-style-type: none"> <li>• Flounder</li> <li>• Salmon</li> <li>• Sardines</li> <li>• Tilapia</li> <li>• Canned light tuna</li> </ul>	<p>1 serving per week of:</p> <ul style="list-style-type: none"> <li>• Albacore or white tuna</li> <li>• Yellowfin tuna</li> </ul>	<p>Avoid high mercury fish such as:</p> <ul style="list-style-type: none"> <li>• Shark</li> <li>• Swordfish</li> <li>• King mackerel</li> </ul>
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[Click here to download the FDA's advice about eating fish](#)

[Click here to review advisories for eating locally caught fish in New York State](#)



#### Audio

Although seafood is rich in EPA and DHA that benefit a fetus, there is potential to consume too much mercury from certain types of fish. Too much mercury can affect the fetus's developing brain. Women should aim to eat 2 or 3 4-oz. servings of low-mercury fish per week and avoid fish potentially high in mercury. Tuna is a commonly eaten fish and there are many kinds with varying levels of mercury. The best choice for tuna is "canned light tuna," which is a mix of smaller species of tuna with lower levels of mercury.

According to the FDA and EPA women of childbearing age, including pregnant and lactating women, should consume:

- 2-3 servings per week of low-mercury fish like:
  - Flounder
  - Salmon
  - Sardines
  - Tilapia
  - Canned light tuna
- 1 serving per week of:
  - Albacore or white tuna
  - Yellowfin tuna
- Avoid high-mercury fish such as:
  - Shark
  - Swordfish
  - King mackerel

For women who are eating locally caught fish, either fresh water or salt water, there is the potential for fish to be contaminated with mercury, PCBs, or other pollutants. The New York State Department of Health issues fish advisories that detail guidelines based on specific fish species and bodies of water in New York. Women who eat locally caught fish should be urged to check the advisories for further guidance:

Click the left button to download a chart from the FDA on advice about eating fish. Click on the right button to review advisories for eating locally caught fish in New York State.

#### Developer's Notes

Sync appearance of table rows with audio

When the learner proceeds to the next slide, it should go back to slide 70 since the learner should have to select each button once before proceeding with the module

The left button should link to a PDF titled, "FDA Advice About Eating Fish". The right button should link to the following website:

[https://www.health.ny.gov/environmental/outdoors/fish/health\\_advisories/](https://www.health.ny.gov/environmental/outdoors/fish/health_advisories/)

#### Graphics

iStock image ID: 464479396

<http://www.istockphoto.com/photo/tuna-can-gm464479396-59045234>

#### References

United States Food & Drug Administration. (2017). *Advice about eating fish: What pregnant women & parents should know*. [Fact Sheet]. Retrieved from

<https://www.fda.gov/Food/FoodborneIllnessContaminants/Metals/ucm534873.htm#VI>

New York State Department of Health. (2017). *New York State health advice on eating fish you catch*. Retrieved from

[https://www.health.ny.gov/environmental/outdoors/fish/health\\_advisories/](https://www.health.ny.gov/environmental/outdoors/fish/health_advisories/)

A blue pen and a spiral notebook are positioned in the top right corner of the slide. The pen is blue with a silver clip and is lying diagonally. The notebook is blue with a silver spiral binding and is also lying diagonally, partially overlapping the pen.

## Section 5: Check Your Understanding

### Audio

Now, let's do a few quick exercises to check your understanding of the material we've covered.

### Developer's Notes

### Graphics

### References

### Check Your Understanding

A pregnant woman with long brown hair, wearing a bright red sleeveless dress, is sitting on a dark brown couch. She is looking down at a smartphone in her hands. The background is a light-colored wall with a decorative pattern of blue and green circles. The image is watermarked with 'iStock by Getty Images' multiple times.

Luz is using a smartphone app to order lunch delivered from her favorite restaurant. She is six months pregnant and knows that there are certain foods that she should be avoid to reduce the risk of foodborne illnesses or contamination that will affect her child.

#### Audio

Before we conclude the module, let's check your understanding one last time. Let's say that Luz is using a smartphone app to order lunch delivered from her favorite restaurant. She is six months pregnant and knows that there are certain foods that she should be avoid to reduce the risk of foodborne illnesses or contamination that will affect her child.

#### Developer's Notes

#### Graphics

iStock image ID: 479873314

<http://www.istockphoto.com/photo/pregnant-woman-using-a-smartphone-gm479873314-68267375>

#### References

### Check Your Understanding

Indicate which dishes would be safe to eat by clicking the shopping cart icon. Click on the trash icon to indicate which dishes would not be safe to eat.



Two runny poached eggs and smoked salmon topped with hollandaise sauce

Shopping cart icon

Trash can icon

Undo

Submit

#### Audio

As Luz is going through the restaurant's menu, read the title and the descriptions of each item on the smartphone. Indicate which dishes would be safe for her to eat by clicking the shopping cart icon. Click on the trash icon to indicate which dishes would not be safe for her to eat. Your choices will be listed below each icon. If you want to undo your previous selection, click the undo button. When you are done, click on the submit button.

#### Developer's Notes

Program this slide so that clicking on either the shopping cart icon or the trash icon will have the food listed below the icon in the box. The images and descriptions of the food should change, cycling through five different items (see images off to the side on how this should appear). If the learner wants to undo their last selection, they should be able to hit an undo button listed at the bottom of the screen.

#### Answers:

Meals that should be listed under the shopping cart icon:

- Pan-fried Salmon
- Grilled Sardines

Meals that should be listed under the trash can icon:

- Smoked Salmon Benedict
- Steak Frites
- House Sushi Roll

Hitting the submit button should trigger feedback audio:

If the learner gets all of the correct answers: Great job! Recall that undercooked meat, seafood, and eggs should always be avoided by pregnant women. High mercury fish such as tuna should be eaten sparingly. Pregnant women can have 2-3 servings of low-mercury fish, such as salmon and sardines, once per week.

If the learner gets one or more incorrect answers: Sorry, one or more of your answers was incorrect. Try again.

### Graphics

iStock image ID (smartphone): 501826678

<http://www.istockphoto.com/photo/iphone-6-gm501826678-81563879>

iStock image ID (trash icon): 512284214

<http://www.istockphoto.com/vector/waste-management-and-recycling-icons-gm512284214-87083531>

iStock image ID (shopping cart icon): 530763204

<http://www.istockphoto.com/vector/shopping-cart-vector-icon-supermarket-trolley-pictogram-gm530763204-93516539>

iStock image ID (smoked salmon benedict): 157638355

<http://www.istockphoto.com/photo/eggs-benedict-with-smoked-salmon-gm157638355-13891947>

iStock image ID (steak frites): 171255350

<http://www.istockphoto.com/photo/grilled-beefsteak-with-french-fries-gm171255350-20174905>

iStock image ID (grilled salmon): 511991578

<http://www.istockphoto.com/photo/fried-salmon-gm511991578-86924317>

iStock image ID (sushi): 512247239


<http://www.istockphoto.com/photo/fish-roll-gm512247239-46844988>

iStock image ID (sardines): 506624429

<http://www.istockphoto.com/photo/grilled-portuguese-sardines-with-salt-herbs-and-lemon-gm506624429-45513270>

### References

### Module 3 Recap



- A women's body undergoes dramatic changes to support the growing embryo and fetus
- Critical periods of embryo and fetal growth can be impacted by nutritional status
- Appropriate weight gain increases the likelihood of a healthy birth weight
- Women are at a higher risk of infection during pregnancy and caution should be taken with foods that carry the risk of foodborne illnesses or contamination

#### Audio

Now, let's go over some key points of the module. During pregnancy, **a women's body undergoes dramatic changes to support the growing embryo and fetus**. Women experience increases in nutrient stores and changes in macronutrient metabolism, all to maximize energy for their baby's development.

Fetal nutrient stores are built up rapidly in the last month of pregnancy and infants that are preterm suffer from a greater risk of nutrient deficiencies. Women are at higher risk for preterm delivery if they are underweight before conception, have inadequate weight gain, and/or are obese. Prenatal vitamin use and regular exercise during pregnancy can reduce the risk of preterm delivery.

**Appropriate weight gain increases the likelihood of a healthy birth weight.** The recommended amount of weight gain is dependent upon prepregnancy weight status and whether the pregnancy is singleton or twin. The recommended amount of weight gain for a singleton pregnancy is between 15 to 40 pounds.

The extra calorie intake averages about 300 kcal/day. Pregnant women need a combination of carbohydrates, protein, and certain types of fat, as well as vitamins and minerals, from either dietary or supplemental means. Healthy diets and nutrient requirements during pregnancy are not so different from the USDA Dietary Guidelines for Americans; while some nutrients are required in greater amounts and the amount of food increases, the overall balance of food from

the five food groups should remain the same.

**Women are at a higher risk of infection during pregnancy and caution should be taken with foods that carry the risk of foodborne illnesses or contamination.** Women can experience adverse symptoms due to foodborne illnesses but the effects on the fetus are much more severe, ranging from preterm delivery, miscarriage, neurological damage, or even death. **Other common problems women can experience during pregnancy include pica, nausea and vomiting, *hyperemesis gravidarum*, heartburn, and constipation.**

Overall, healthy pregnancies lead to healthy babies. Having good nutrition and dietary habits throughout pregnancy can improve the likelihood of having a healthy infant. In the next module, you will take what you learned about pregnancy to identify common and special conditions, formulate interventions, and practice conducting in-depth participant-centered discussions. Using participant-centered skills, you will discuss, conduct an assessment, set goals, and make referrals using case studies.

#### Developer's Notes

Have each bullet point appear in sync with audio

#### Graphics

iStock image ID (top left photo): 513103800

<http://www.istockphoto.com/photo/pregnant-african-american-woman-gm513103800-87453221>

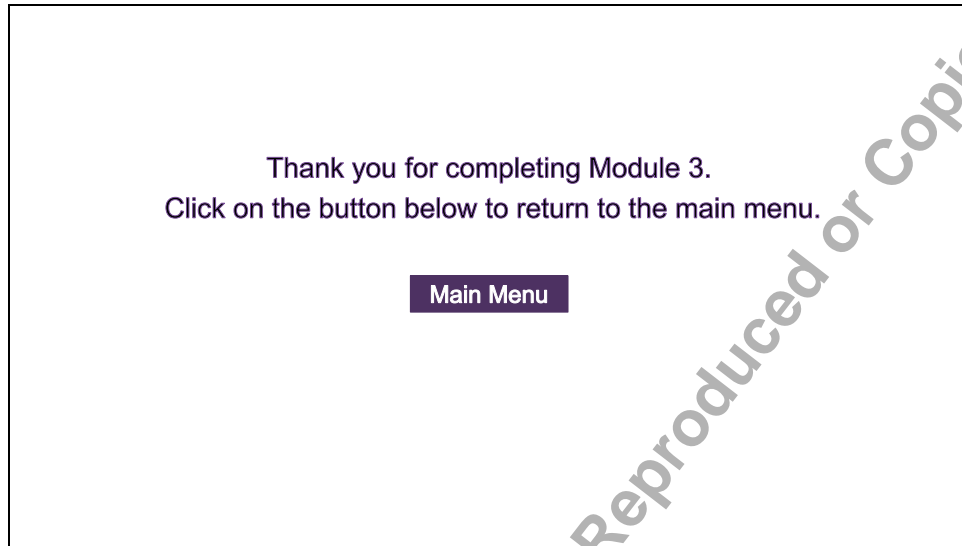
iStock image ID (top right photo): 646495284

<http://www.istockphoto.com/photo/i-cant-wait-to-meet-you-little-baby-gm646495284-119324889>

iStock image ID (center photo): 458851193

<http://www.istockphoto.com/photo/nurse-with-pregnant-woman-using-tablet-gm458851193-31098242>

#### References



Audio

Thank you for completing Module 3. Click on the button below to return to the main menu.

Developer Notes

Program Main Menu button to return to a main menu or close the module window.

Graphics

Source