

# First Steps Nutrition Modules

## Module 3 – Nutrition Assessment

### *Introduction*

The nutrition-related objectives for pregnancy include the following:

- Infant born at full-term infant (37 weeks gestational age or later) weighing 2500 to 4200 g (5 lb, 8 oz to 9 lb, 6 oz)
- Maternal pregnancy weight gain within the Institute of Medicine (IOM) guidelines
- Hemoglobin/hematocrit levels maintained within acceptable levels for gestation
- Appropriate prenatal vitamin and/or mineral supplement use
- Dietary intake adequate to meet essential nutrient needs of mother and baby
- Breastfeeding discussed and promoted as the infant feeding method
- Family planning goals and method(s) identified

Attaining these objectives begins with a thorough nutrition assessment.

The initial nutrition assessment provides the dietitian with valuable information about the nutritional status of the individual as well as information with which to identify potential nutrition interventions. Subsequent assessments help the dietitian evaluate the effectiveness of each intervention and identify additional risk factors.

In order to be useful, the dietitian must gather accurate information and carefully evaluate it. Hamaoui and Hamaoui (1998) summarize this:

*“To provide meaningful guidance, the nutritional assessment must answer at least four basic questions:*

*First, with what nutrient reserves has the woman entered pregnancy?*

*Second, what are her own physiologic needs, and what are the added requirements of her pregnancy?*

*Third, does she have any disease process or is she receiving any therapy that might affect her nutrient requirement or nutrient tolerance?*

*Fourth, is her current intake meeting her nutritional needs?”*

This module reviews the process of nutrition assessment, highlighting the nutritional issues of the pregnant woman. The discussion of the assessment and intervention process is organized as follows:

- Anthropometrics
- Biochemical Indicators
- Medical/Clinical Indicators
- Dietary Intake
- Developing Intervention and Education Plans

In each section, potential risk factors are identified. These factors are summarized in a table at the end of this module.

*Estimated time to complete this module: 60 minutes.*

## **Learning Objectives**

Participants will be able to:

- Complete a nutrition assessment for a pregnant woman
- Evaluate an individual's anthropometric status (pre-pregnancy weight and BMI, weight gain through pregnancy) and set goals for weight gain in the measurement system understood by the individual (e.g. pounds and inches vs. kilograms and centimeters)
- Evaluate common biochemical indicators (hemoglobin, hematocrit)
- Identify common drug-nutrient interactions, including effects of smoking and substance abuse
- Evaluate an individual's reported dietary intake, compared to recommendations
- Identify factors that affect dietary intake (including nausea, vomiting, heartburn, resources)
- Describe nutrition risk factors as indicated by some medical data
- Identify psycho-social issues that may affect food intake and nutritional status
- Develop an individualized intervention and education plan (including goals for weight gain, treatment/prevention of iron deficiency, general diet quality, adequate folate intake and plan for infant feeding method)
- Refer clients to members of the MSS/ICM team and/or community providers, as appropriate

## Outline

- I. INTRODUCTION – An overview of nutrition assessment
- II. ANTHROPOMETRICS
  - a. Assessing Weight, Height and Body Mass Index
  - b. Setting Goals for Weight Gain
    - Table: IOM Recommended Weight Gain
- III. BIOCHEMICAL INDICATORS
  - a. Hemoglobin and Hematocrit
    - Table: Guidelines for evaluating indicators of iron status
  - b. Others
- IV. MEDICAL/CLINICAL
  - a. Current Pregnancy
  - b. Previous Pregnancies
  - c. Medical Data and History
  - d. Drug-nutrient Interactions
    - i. Common Medications
    - ii. Herbal and botanical supplements
    - iii. Alcohol, tobacco, other drugs
- V. DIETARY INTAKE
  - a. Evaluating an individual's intake
    - ii. Tools: 24-hour recall, food record, food frequency questionnaire, USDA multiple pass recall
    - iii. Guidelines: Specific nutrients, Food pattern, Fluid
      - Table: Recommendations for food pattern during pregnancy
  - b. Factors that affect intake
    - i. Physical changes
    - ii. Food security
    - iii. Cultural factors and beliefs
    - iv. Psychosocial issues
- VI. DEVELOPING INTERVENTION AND EDUCATION PLANS
  - a. Factors That Affect Plans
  - b. Common plans that can be adapted for individual clients
    - i. Setting weight gain goals

- ii. Treatment or prevention of iron deficiency
- iii. General diet quality
- iv. Adequate folate intake
- v. Plan for infant feeding method
- c. Nutrition Visits

## VII. REFERRAL FLAGS AND RESOURCES

- a. Potential Resources
- b. Situations that indicate a need for referral

## VIII. CASE EXAMPLE

- a. Kayla
- b. Sharmaine

## IX. REFERENCES AND RESOURCES

- a. References
- b. Resources
- c. Table: Pregnancy risk factors

## X. QUIZ

## *Anthropometrics*

### **Assessing Weight, Height and Body Mass Index**

Appropriate maternal weight gain during pregnancy is a critical factor in health pregnancy outcomes. Module 2, Nutrition and Normal Pregnancy described some of the risk factors associated with inadequate and excessive rates of weight gain. Monitoring weight gain throughout pregnancy is important. The rate of weight gain, especially during the second and third trimesters, is as important as (if not more important than) the total amount of weight gained.

#### **Method**

1. Determine and record:

- Prepregnancy weight
- Body Mass Index (BMI) on IOM BMI and Weight Gain Charts, OR using pre-pregnancy weight-for-height, select appropriate prenatal weight gain chart
- Height and weight at initial visit
- Estimated date of delivery (EDD) OR estimated date of confinement (EDC)
- Weeks gestation at initial visit

2. Weigh, measure\* and record on Prenatal Weight Gain Chart:

- Weight at initial visit
- Weight gained at each prenatal (or WIC) visit

\* When measurement equipment is not available, obtain weight from medical record, WIC, or client. (Document the source in the chart.)

Prenatal weight gain charts, based on 2009 IOM recommendations have been published:

- California Comprehensive Perinatal Services of the Department of Health:  
<http://www.cdph.ca.gov/pubsforms/forms/Pages/MaternalandChildHealth.aspx>
- [http://www.nal.usda.gov/wicworks/Sharing\\_Center/NY/prenatalwt\\_charts.pdf](http://www.nal.usda.gov/wicworks/Sharing_Center/NY/prenatalwt_charts.pdf)

3. Evaluate appropriateness of weight gain at each visit

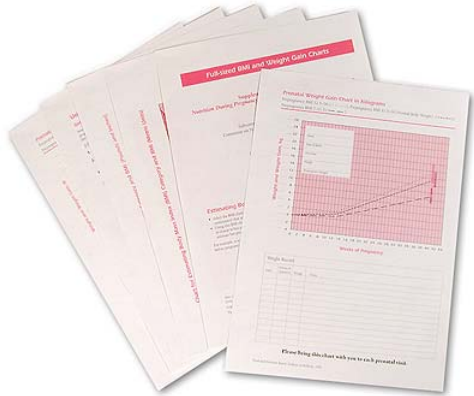


Figure: Institute of Medicine weight gain charts

### **Risk factors related to weight and weight gain:**

- pre-pregnancy overweight or obesity– Why? Women who are overweight or obese before pregnancy have increased risk for complications, including hypertension, preeclampsia, gestational diabetes, cesarean delivery, and long-term obesity postpartum. The risk of developing disorders increases with the degree of obesity (for example, women who are overweight are twice as likely to develop gestational diabetes than women with normal weights; the risk increases eightfold in women who are severely obese). (ADA, 2009)

Their infants are at increased risk for macrosomia. (IOM, 1992) Birth defects (including neural tube defects) are more common among infants born to obese women, as well. (ADA, 2009)

- pre-pregnancy underweight – Why? Women who are underweight are at increased risk for complications (e.g., antepartum hemorrhage, premature rupture of the membranes, preterm delivery, anemia, endometriosis) and their infants may be at increased risk for having low birthweights. (IOM, 1992)
- inadequate weight gain – Why? Inadequate weight gain is associated with the same risks as pre-pregnancy underweight. (Kaiser, 2002)
- excessive weight gain – Why? Excessive weight gain is associated with the same risks as pre-pregnancy overweight. (Kaiser, 2002)
- woman’s concerns about weight gain

*Please note:* Large, rapid weight gain (i.e., > 1 kg/week) is usually indicative of increases in extracellular water; this can be confirmed if edema is present. (Hamaoui, 1998). This may be a sign of hypertension and should be addressed by the medical provider.

### **Setting Goals for Weight Gain**

The Institute of Medicine has published recommendations for weight gain during pregnancy, based on pre-pregnancy body mass index (BMI). (IOM, 2009)

It can also be helpful to ask about weight gain goals determined by the woman and her medical provider.

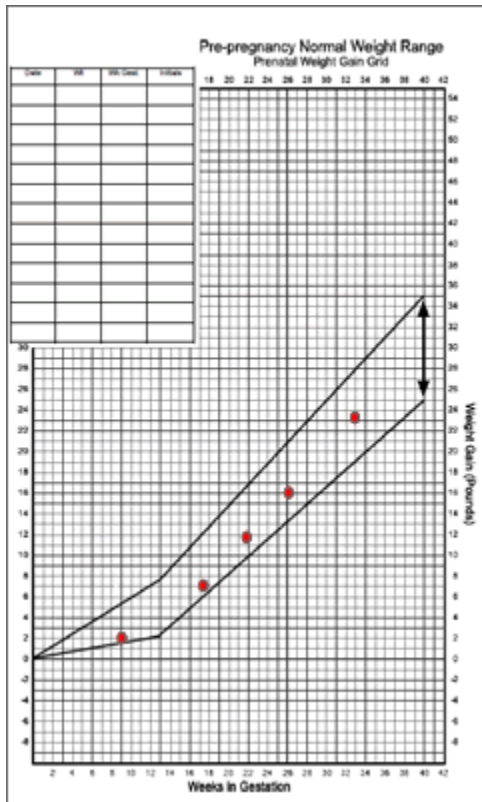


Figure: plotted graph of weight gain

A discussion of weight gain goals and expectations is often helpful early in pregnancy *before* weight gain becomes a problem. This discussion can include the risks of over- and underweight as well as guidelines for weight gain during each trimester, to help women have the information they need to make the best decisions around having a healthy weight gain.

Prepregnancy BMI		Recommended weight gain	Rates of Weight Gain During the 2 <sup>nd</sup> and 3 <sup>rd</sup> Trimesters (Pounds per week)
Underweight	< 18.5	28-40 lb	1 lb (1-1.3) 0.5 kg
Normal Weight	18.5 to 24.9	25-35 lb	1 lb (0.8-1.0) 0.4 kg
Overweight	25 to 29.9	15-25 lb	0.6 lb (0.5-0.7) 0.3 kg
Obese	≥30.0	11-20 lb	0.5 lb (0.4-0.6) 0.2 kg

Other:			
Twin pregnancy	Normal pre-pregnancy weight	37-54 lb	1.5 lb 0.7 kg
	Overweight	31-50 lb	
	Obese	25-42 lb	
Triplet pregnancy	Not given	~50 lb overall	

*Table 3-1. Recommended weight gain during pregnancy*



## Biochemical Indicators

### Hemoglobin and Hematocrit

#### Method

1. Determine and record hemoglobin or hematocrit values, if available.
2. Evaluate hematological data.
3. If below standard values, refer for further diagnostic work up with physician.

#### Risk factors related to hemoglobin and hematocrit

- Iron deficiency anemia (Kaiser, 2002) – Why? Anemia during pregnancy can increase the risk of hypertension in the mother and poor pregnancy outcome, and low birthweight and iron deficiency in the infant during the first year of life. Severe maternal iron deficiency compromises fetal iron status. This may affect the infant's development, including socio-emotional behavior, recognition memory, later IQ, and motor skills. (Georgieff and Innis, 2005; Lozoff et al, 2006) Some suggest that severe iron deficiency can impair mother-infant bonding.

Routine screening for iron deficiency in asymptomatic pregnant women is recommended. (USPTS, 2006) Guidelines for evaluating indicators of iron status of pregnant women have been published. (See Table below)

Stage of Pregnancy	Hematocrit * (%)	Hemoglobin * (g/dL)
1st trimester (0-12 weeks)	>33.0	>11.0
2nd trimester (13-26 weeks)	>32.0	>10.5
3rd trimester (27-40 weeks)	>33.0	>11.0
Centers for Disease Control and Prevention. Recommendations to prevent and control iron deficiency in the United States. MMWR – April 03, 1998 / 47 (RR-3); 1-26.		
* Low levels may indicate iron deficiency. High values (Hct >45.0% or Hgb >15.0 g/dL) in the 2nd trimester or later may indicate poor blood expansion.		
Exceptions: Race-based differences in hemoglobin concentration and hematocrit levels have been documented; the Institute of Medicine suggests lowering cutoff values for black adults (by 2% for hematocrit and 0.8 g/dL for hemoglobin).		
Smoking may falsely elevate hemoglobin and hematocrit and mask anemia. The CDC recommendations suggest adjusting the cutoffs for hemoglobin and hematocrit, based on smoking level.		

Table 3-2. Guidelines for evaluating indicators of iron status during pregnancy

	<b>Hematocrit (%)</b>	<b>Hemoglobin (g/dL)</b>
> 2.0 packs per day	-2.0	-0.7
All smokers	-1.0	-0.3
Adjustment of maximum hematocrit values and hemoglobin concentration for anemia, based on smoking. (Smoking increases hemoglobin/hematocrit)		
Centers for Disease Control and Prevention. Recommendations to prevent and control iron deficiency in the United States. MMWR – April 03, 1998 / 47 (RR-3); 1-26.		

*Table 3-3. Adjustment of maximum hematocrit values and hemoglobin concentration for anemia, based on smoking*

## **Others**

Other biochemical indicators should be evaluated as indicated. In some instances, specific medical conditions (e.g., gestational diabetes) will require regular biochemical monitoring. Interpretation of some laboratory measures may be difficult due to normal physiologic changes that are associated with pregnancy.

## Medical/Clinical

Overt clinical symptoms of nutrient deficiencies are rare in the US and are described elsewhere. Other medical and clinical data can provide valuable information about an individual's nutritional risk, and can affect the nutrition care plan.

Some clinical factors that affect (or are affected by) nutritional status are reviewed below. Here, they are organized into discrete categories. In practice, however, the information will probably be dispersed throughout the interview and team process.

### Current Pregnancy

Data to collect*	Why this is relevant
Expected date of delivery (EDD) or expected date of confinement (EDC)	Affects weight gain goals and guidelines for nutrient intake throughout pregnancy (NAS, 1990)
Reported fundal height progression or sonogram results, including evidence of multiple fetuses, IUGR, macrosomia	Multiple fetuses – increased nutrient needs, affects weight gain goals (NAS, 1990) Read more below.  IUGR – associated with inadequate weight gain during pregnancy (CDC, 2005) Read more below.  Macrosomia – associated with excessive weight gain during pregnancy and/or gestational diabetes (CDC, 2005) Read more below
Lactation during current pregnancy	Affects recommendations for nutrient intake, especially energy (Merchant, 1990) Read more below
Hyperemesis gravidarum	Often requires medical nutrition therapy (Hamaoui, 1998) Read more below
Activity restrictions for current pregnancy	Affects energy intake recommendations (NAS, 1990) Read more below
Blood pressure	May affect nutrient intake recommendations, including sodium. Read more below
Edema	
Nausea or vomiting	Can increase nutritional risk if there are significant effects on intake and/or weight gain (Kaiser, 2002) Read more below
Urine screen for glucosuria,	Blood glucose screen at 24-28 weeks gestation, or

ketonuria	earlier if at risk  Monitor carbohydrate and nutrient intake  Read more below
Obvious signs of malnutrition	Medical nutrition therapy may be required (Kaiser, 2002, NAS, 1990)
* in most cases, the source for this data will be client report, screening questionnaires, and/or the medical record	

*Table 3-4. Clinical factors that affect or are affected by nutritional status*

### **Multiple gestation**

Multiple births (e.g., twins, triplets) is associated with increased risk for the infant (prematurity, intrauterine growth restriction, low birthweight) as well as for the mother (pre-eclampsia, iron-deficiency anemia). Recommendations for weight gain goals and energy intakes are generally higher than those for singleton pregnancies. In addition vitamin and mineral supplementation is recommended. (This is covered in more depth in Module 2.)

### **Intrauterine Growth Restriction (IUGR)**

Inadequate weight gain during pregnancy has been associated with intrauterine growth restriction and low birthweight. (CDC, 2005)

### **Macrosomia**

Macrosomia is often associated with excessive weight gain during pregnancy and/or gestational diabetes. Complications associated with macrosomia include shoulder dystocia and maternal and infant morbidity. (CDC, 2005)

### **Lactation during current pregnancy**

Breastfeeding while pregnant is a nutrition risk factor. It seems that the fetus's nutrient needs are met, at the expense of the mother's. It is reasonable to assume that the nutrient needs of a pregnant, lactating mother are increased above needs during pregnancy alone. Thus, ensuring an adequate nutrient intake may require more careful attention for the woman who is breastfeeding and pregnant. (Merchant, 1990)

### **Hyperemesis gravidarum**

It is estimated that 1-2% of pregnant women have hyperemesis gravidarum. (Hamaoui, 1998) Diagnostic criteria include intractable vomiting, disturbance of nutritional status, weight loss of at least 5%, ketosis, and acetonuria. Hyperemesis gravidarum can result in neurologic disturbances, liver damage, retinal hemorrhage, and renal damage.

Hyperemesis gravidarum is different than the "morning sickness" that is common among pregnant women. Symptoms are not time-specific and occur throughout the day (vs. being worse, for example, in the morning). Women are often unable to perform activities of daily living, and hyperemesis gravidarum interferes with sleep. Ketones are often

present, dehydration and electrolyte imbalances are common, and urine is scant, dark, and malodorous.

The etiology of hyperemesis gravidarum is not known, however theories include the influence of adrenal dysfunction, hormonal changes, and human chorionic gonadotropin (hCG) levels. Olfactory triggers have also been documented; these are thought to be a result of enhanced chemoreception with increased estrogen levels. (Erick 1995)

Treatment is “symptomatic,” and usually includes rehydration therapy and avoidance of “trigger smells,” (both food and non-food); antiemetics, hyperalimentation, and hospitalization are often necessary.

### **Physical activity restrictions**

Restrictions on physical activity (or limited physical activity) during pregnancy will affect energy needs. Suggested energy intake may need to be lowered below what is generally recommended for pregnant women, if physical activity is significantly decreased. (NAS, 1990)

### **Hypertensive disorders and edema**

Pregnancy-induced hypertension (which usually occurs after the 28th week gestation) and preeclampsia are two hypertensive disorders that occur during pregnancy. Although there are no nutrition interventions for these disorders, treatment (e.g., bed rest, medications) may have nutrition-related implications. (August 2006) For more information, see Module 4, Medical Nutrition Therapy for Specific Conditions.

### **Nausea and vomiting**

“Morning sickness” is reported to occur in about 50-75% of all pregnancies. It becomes a nutrition risk factor when it has effects on weight gain and/or nutrient intake. (Kaiser, 2002) For more information, including recommendations to minimize problems, see Module 2, Nutrition and Normal Pregnancy.

### **Gestational Diabetes**

Gestational diabetes is the most common metabolic disorder of pregnancy, occurring in about 2% of all pregnancies, usually in the last trimester. Gestational diabetes is more common among women who are overweight or obese.

Gestational diabetes is associated with an increased risk of complications for both the mother and fetus (gestational hypertension, macrosomia, labor difficulties); mother and baby are also at an increased risk for developing type 2 diabetes. Treatment focuses on blood glucose control (sometimes requiring the use of insulin), and includes additional fetal monitoring. Medical Nutrition Therapy for gestational diabetes is covered in Module 4, Medical Nutrition Therapy for Specific Conditions.

### **Previous Pregnancies**

<b>Data to collect*</b>	<b>Why this is relevant</b>
Parity and interconceptual period	Increased parity is associated with iron deficiency and excessive maternal postpartum weight retention (CDC,

	2005) Read more below
History of pregnancy-induced hypertension (PIH), gestational diabetes, anemia, inadequate weight gain, infection, hemorrhage	Can be indicative of increased risk for subsequent pregnancies (August, 2006; ADA, 2004; Kaiser, 2002) Read more: hypertensive disorders, gestational diabetes, weight gain risk factors
History of premature delivery, infant with low birthweight, or high birthweight (>4000 g or 8 lb, 12 oz)	May indicate previous nutritional problems and increased risk for current pregnancy (Worthington-Roberts, 1997) Read more below
Infant with birth defect, e.g., neural tube defect	May affect recommendation for folate intake (USPSTF, 1996) Read more below
Maternal weight changes in previous pregnancies	Potential indicator of risk for current pregnancy (Worthington-Roberts, 1997)
* in most cases, the source for this data will be client report, screening questionnaires, and/or the medical record	

Table 3-5. Clinical factors that affect or are affected by nutritional status – previous pregnancies

### Parity

The number of previous pregnancies has long-term health implications for the mother and effects on birthweight for some groups. Increased parity is associated with excessive maternal postpartum weight retention and with iron deficiency. (CDC, 2005)

### Low birthweight and macrosomia

Previous pregnancies that resulted either in low birthweights or macrosomia may be indicative of previous nutrition-related problems and an increased risk for the current pregnancy. (Worthington-Roberts, 1997)

Low birthweight (<2500 grams or 5.5 pounds) increases an infant's risk of morbidity/mortality in the neonatal period, deficits in later growth and cognitive development, pulmonary disease, diabetes, and heart disease. Macrosomia (>4500 grams or 9.9 pounds) has been associated with obstetric complications, birth trauma, and higher rates of neonatal morbidity/mortality.

### Infant with neural tube defect

Many organizations recommend an increased folate intake (e.g., a pharmacologic dose of 4 g per day starting at least 1 month prior to conception and continued through the first trimester) for women who have had an infant with a neural tube defect such as spina bifida. (USPSTF, 1996)

## Medical Data and History

Data to collect*	Why this is relevant
Chronic diseases (e.g., diabetes, hypertension)	<ul style="list-style-type: none"> <li>• Need to ensure specialty care</li> <li>• May require MNT – see protocols for diabetes, asthma, food allergy, thyroid disease (Kaiser, 2002; ADA, 2004)</li> <li>• Read more below</li> </ul>
Gastrointestinal disorders (e.g., malabsorption, lactose intolerance)	<ul style="list-style-type: none"> <li>• Need to ensure specialty care</li> <li>• May require MNT (Kaiser, 2002)</li> <li>• Read more below</li> </ul>
Genetic metabolic disorder (e.g., phenylketonuria)	<ul style="list-style-type: none"> <li>• Refer for specialty care and MNT (Kaiser, 2002)</li> <li>• Read more below</li> </ul>
History of mental illness or depression	<ul style="list-style-type: none"> <li>• May affect nutrient intake and may indicate need for specialty care (Kaiser, 2002) Read more below</li> </ul>
Eating disorders (e.g., anorexia nervosa)	<ul style="list-style-type: none"> <li>• Refer for specialty care and MNT (Kaiser, 2002; Lusskin, 2005) Read more below</li> </ul>
Oral health, dental issues	<ul style="list-style-type: none"> <li>• May affect nutrient intake</li> <li>• Periodontal disease associated with low birthweight, SGA (Boggess, 2006)</li> <li>• Increased rate of dental caries in child (AAP, 2003)</li> <li>• Read more below</li> </ul>
Recurrent infections or illness (e.g., foodborne illness, sexually transmitted diseases)	<ul style="list-style-type: none"> <li>• May affect nutrient needs</li> <li>• May have implications for pregnancy outcome (Williamson, 2006)</li> <li>• Fetal loss or premature birth</li> </ul>
Observable injuries, old or new	<ul style="list-style-type: none"> <li>• May indicate domestic abuse and need for referral</li> </ul>
Present or past use of tobacco, alcohol, drugs (prescription and OTC, “street”)	<ul style="list-style-type: none"> <li>• May affect nutrient needs</li> <li>• Refer for treatment (Kaiser, 2002)</li> <li>• Read more below</li> </ul>
Physical activity and exercise (recreation preferences, sedentary behavior)	<ul style="list-style-type: none"> <li>• May affect recommendations for energy intake (NAS, 1990) Read more above</li> </ul>
Age <19 years (MSS target area is <16 years)	<ul style="list-style-type: none"> <li>• Affects recommendations for weight gain and nutrient intake (Williamson, 2006; Kaiser, 2002) Read more below</li> </ul>

HIV infection/AIDS	<ul style="list-style-type: none"> <li>• MNT to manage symptoms, medication-nutrient interactions</li> <li>• Affects infant feeding choice (Mofenson, 2005)</li> <li>• Read more below</li> </ul>
Bariatric surgery (gastric bypass)	<ul style="list-style-type: none"> <li>• Problems with persistent vomiting</li> <li>• Dumping syndrome</li> <li>• Nutrient deficiencies: iron, vitamin B12, folate, calcium (Woodard, 2004)</li> <li>• Read more below</li> </ul>
<p>* in most cases, the source for this data will be client report, screening questionnaires, and/or the medical record</p> <p>(MNT – medical nutrition therapy)</p>	

*Table 3-6. Clinical factors that affect or are affected by nutritional status – medical data and history*

### **Chronic diseases**

Chronic diseases, such as diabetes and hypertension may require medical nutrition therapy and/or specialty care. In some cases, referral to a team of providers with expertise in managing the disorders of pregnant women may be necessary. In other instances, continued care by the woman's existing care providers may be appropriate. Medical nutrition therapy for selected conditions is summarized in Module 4, Medical Nutrition Therapy for Specific Conditions.

### **Gastrointestinal disorders**

Gastrointestinal disorders, whether chronic (e.g., Crohn's disease) or acute, have nutritional implications and may affect a woman's nutrient intake as well as her nutrient needs. Specialty care may be required for some women. Medical nutrition therapy for selected conditions is summarized in Module 4, Medical Nutrition Therapy for Specific Conditions.

### **Genetic metabolic disorders**

Women with genetic metabolic disorders have unique concerns during pregnancy. Maternal phenylketonuria (PKU) is the disorder for which the most is known; it requires careful management and monitoring by an interdisciplinary team with experience managing pregnancies of women with PKU. Without treatment, pregnancy outcomes for women with PKU are poor, and often include microcephaly, mental retardation, severe cardiac anomalies, and other congenital defects. (Walter, 2000)

Pregnant women with genetic metabolic disorders should be referred to a specialty care center for management. In Washington State, a referral should be made to the University of Washington PKU/Biochemical Genetics Program (206-598-1800). A national list of centers that treat genetic metabolic disorders can be found at the National



Newborn Screening and Genetics Resource Center (<http://genes-r-us.uthscsa.edu/>); some may provide maternity support services.

### **History of mental illness or depression**

The direct nutrition-related implication of mental illness or depression is the effect on nutrient intake. Providers should note that low income women are at higher risk for depression, especially during pregnancy, because of added stress, lack of support and resources. Clients tend to deal with this depression and stress by either not eating or over eating higher calorie foods. In addition, a referral for specialty care (if care is not already in place) may need to be facilitated. Drug-nutrient interactions should be considered if a woman is taking medication.

### **Eating disorders**

Eating disorders (e.g., anorexia nervosa, bulimia nervosa) occur in about 1% of pregnancies. Treatment generally requires the collaboration of an interdisciplinary team with experience in eating disorders and pregnancy. Signs and symptoms of an eating disorder can include lack of weight gain over 2 consecutive prenatal visits (2<sup>nd</sup> and/or 3<sup>rd</sup> trimester), history of an eating disorder, unexplained electrolyte abnormalities, obsession with weight gain or eating habits, and hyperemesis gravidarum. (Luskin, 2005; Astrachan-Fletcher et al, 2008)

### **Oral health and dental issues**

Maternal oral health has implications for pregnancy on several levels. Oral problems can interfere with an adequate intake. In addition there is an association between maternal periodontal disease and low birthweight/small for gestational age. Finally, children whose mothers have oral health problems have an increased risk of dental caries themselves. (Boggess, 2006; AAP, 2003)

If an individual's water is not fluoridated or is inadequately fluoridated, supplemental fluoride during pregnancy is needed. Good oral care is especially important during pregnancy, so questions about fluoride can provide a good opportunity to discuss oral hygiene and care.

### **Present or past use of tobacco, alcohol, drugs (prescription and OTC, "street")**

The effects of tobacco, alcohol, or drug use (including prescription, over-the-counter, and "street") is discussed in the next section. Related to nutritional status, nutrient intake may be inadequate, and nutrient needs may be affected by some drugs. (Kaiser, 2002) If a client recently quit using tobacco or drugs her appetite will generally increase, especially for high calorie comfort foods. See Module 4, Medical Nutrition Therapy for Specific Conditions for more information

### **Adolescence**

Adequate nutrient intake is of special concern for the pregnant adolescent. In addition to the nutrients needed to support a healthy pregnancy, nutrients are also needed for the adolescent's growth and development. In addition, nutrient intakes of many adolescents are inadequate. (Williamson, 2006; Kaiser, 2002) See Module 2, Nutrition and Normal Pregnancy for a brief discussion of the nutrient needs for pregnancy during adolescence.

### **HIV infection/AIDS**

The goals of pregnancy management for the woman who is infected with HIV or has

AIDS are to ensure a healthy outcome and to prevent the transmission of HIV to the infant. Treatment generally involves the use of antiretroviral medications. Nutrition implications of maternal HIV/AIDS include management of any disease-related symptoms, infections, and medication-nutrient interactions (including appetite changes and lipodystrophy). HIV/AIDS will also affect infant feeding choice; in the US, women with HIV/AIDS are advised not to breastfeed. (Mofenson, 2005)

### **Bariatric Surgery**

Bariatric (gastric bypass) surgery can contribute to nutrition-related complications. Persistent vomiting may occur when food intake is not appropriately reduced or when food is not chewed well or is eaten too quickly. For women with an adjustable gastric band, the fluid in the band may be reduced to decrease vomiting.

Dumping syndrome is another common complication of bariatric surgery; the amount of glucose used to screen for gestational diabetes is enough to cause dumping syndrome. Micronutrient deficiencies are another potential complication, especially for women who have had the Roux-en-Y gastric bypass. Nutrients of particular concern are iron, vitamin B12, folate, and calcium. Healthy weight gain during and after pregnancy should also be carefully considered. (Woodard, 2004)

## **Drug-nutrient Interactions**

### **Common Medications**

The medications most commonly used by women during childbearing years (18-44) include over-the-counter pain medications and medications to treat the common cold. Common prescription medications include birth control pills and medications for health conditions (e.g., asthma, epilepsy, hypertension, and depression).

It is important to identify any drug-nutrient interactions, as well as to discuss the use of over-the-counter medications that may or may not be appropriate for use during pregnancy.

The Centers for Disease Control and Prevention (CDC) website (<http://www.cdc.gov/ncbddd/meds/>) includes resources related to medication use during pregnancy and lactation.

### **Herbal and botanical supplements**

Most herbal and botanical supplements have not been adequately studied, especially for use during pregnancy. Some may be safe by themselves, but may be dangerous when combined with other medications or nutrients.

Some supplements with implications for pregnant women are reviewed in Module 2, Nutrition and Normal Pregnancy.

### **Alcohol, tobacco, other drugs**

## **Alcohol**

Infants born to mothers who abuse alcohol during pregnancy are at an increased risk for fetal alcohol syndrome and fetal alcohol affects. This is reviewed in Module 2 and Module 4.

## **Tobacco**

Use of tobacco during pregnancy has been associated with fetal growth retardation and low birthweight. The carbon monoxide and nicotine from smoking limits the fetus's oxygen supply, and reduces birthweight by an average of 200 grams (about 7 ounces); risk of preterm delivery may also be increased. Tobacco use is also associated with fetal nicotine addiction and complications, including abruptio placentae, placenta previa, bleeding during pregnancy, premature and prolonged rupture of the membranes, and preterm delivery. See Module 4.

Eliminating or reducing tobacco use is a focused goal of MSS/ICM. If the client decides to decrease or stop tobacco use, the dietitian should be aware that the client's food intake may increase with stress levels. The dietitian should take this opportunity to work with the client on other ways to reduce stress, such as walking and coordinate services with MSS BHS.

## **Illegal (or “street”) drugs**

Marijuana interferes with oxygen supply to fetus and may impair growth. Marijuana use during pregnancy has been linked to lower birthweights and attention deficits/impulsivity in children.

Cocaine use during pregnancy causes fetal hypoxia and reduced nutrient supply to the fetus. It has been associated with premature rupture of membranes, premature labor, IUGR and spontaneous abortion. Complications for the infant include withdrawal, cerebral infarction, possible congenital effects, lower scores on neurological development tests, and attention deficits. Substance abuse is covered in Module 4.

## **Risk factors related to drug-nutrient interactions:**

- Substance abuse
- Use of tobacco
- Inappropriate use of vitamins, minerals, herbs

## *Dietary Intake*

Does the individual's current intake meet her nutritional needs? To answer this question, the dietitian needs to have a good idea of the individual's food pattern and the nutritional values of the food ingested, as well as an understanding of nutrient needs during pregnancy.

Nutrient needs during pregnancy are reviewed in Module 2, Nutrition and Normal Pregnancy. This section discusses some tools for collecting information about an individual's food pattern and some tools for comparing the data to recommendations. The end of this section includes a list of diet-related risk factors.

Information gathered during the initial interview should enable the dietitian to summarize risks, strengths, priorities related to nutrient intake and practices:

- Identify specific food groups that are inadequate/excessive
- Indicate probable nutrient inadequacies
- Identify socio-economic barriers to adequate diet
- Describe the client's awareness of the importance of nutrition, concerns about her own intake, and interest in and priorities for making diet-related changes

### **Evaluating an individual's intake**

#### **Tools**

One of the first steps in dietary assessment is the collection of accurate dietary intake information. A number of tools used to collect information about a client's intake are reviewed below:

#### **24-hour recall**

*Method:* The types and amounts of food eaten in a 24-hour period are described. This is can be used as a screening tool, and the dietitian may find the use of food models, measuring cups, and other visual aids helpful in estimating portion sizes.

*Strengths:* This tool can be useful during follow-up to measure adherence to dietary recommendations.

*Limitations:* The client may not remember everything eaten in the specified period, and reported portions may not be accurate. Also, the recall may not represent a typical day's intake.

#### **Food record**

*Method:* All foods consumed in a specified (usually 3- or 7-day) period are recorded. Information to make the record accurate includes detailed portion sizes and methods of food preparation (e.g., baked, sautéed, steamed). A record of the time of day that foods were eaten can also be helpful. If 3 days are recorded, the time span should include 1

weekend day. It is important to review the completed food record with the client to clarify foods and portion sizes.

*Strengths:* A food record provides good prospective data, and in general, is a good tool to estimate an individual's usual energy intake.

*Limitations:* Accurate information can be difficult to obtain, as errors in portion size estimation are common and foods that are added to other foods (e.g., jelly, margarine) are often omitted. This tool requires a time commitment from the client, and may not reflect her usual intake.

### **Food frequency questionnaire**

*Method:* The client completes a questionnaire (usually a checklist) that identifies which foods she eats and the amount of food consumed in a set amount of time (for example, 5 servings of meat per week or 3 glasses of milk per day).

*Strengths:* The food frequency questionnaire is useful as a screening tool for assessing the intakes of groups of people. It does not require as much time as a diet history or food record.

*Limitations:* Food frequency questionnaires provide an overestimate of an individual's intake and do not necessarily quantify a person's usually daily intake. Additionally, they do not necessarily provide information about specific foods that a woman consumes.

### **USDA Multiple-pass Recall**

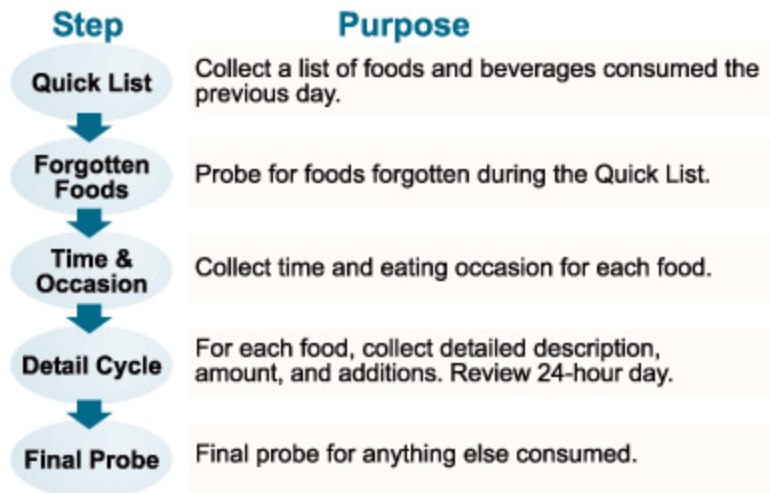
*Method:* This interview method consists of 5 steps; the client:

1. lists the foods and beverages consumed
2. answers a series of questions about "forgotten foods" (e.g., beverages)
3. describes when the foods were consumed
4. describes the amount of each food consumed using the Food Model Booklet, a tool with visual aids
5. responds to a final probe for any other foods consumed

*Strengths:* This tool has been validated for assessing the energy intakes of groups of children and adults. The discussion components and use of visual aids seem to be appealing to respondents.

*Limitations:* Use of this method is time consuming.

## 5-Step Multiple-Pass Approach



### Guidelines


#### Specific Nutrients






Recommendations for intakes of specific nutrients during pregnancy are discussed in Module 2, Nutrition and Normal Pregnancy, and a summary table of the Dietary Reference Intakes (DRIs) during pregnancy is available.

#### Food Pattern

Most food pattern recommendations are based on the Food Guide Pyramid and 2005 Dietary Guidelines. A table outlining general guidelines for amounts and types of foods is included below. In addition, the dietitian should evaluate the individual's usual food pattern (e.g., timing of meals and snacks).

The MyPyramid website includes a tool to individualize recommendations for intake, based on the client's age, stage of pregnancy, weight, height, and physical activity level. (<http://www.mypyramid.gov/mypyramidmoms/index.html>).

Food Group	Pregnant or lactating (11-50- year olds) Servings/day	Serving size
Protein (About 2 oz more than recommended for non-pregnant women) 	7	1 oz meat, poultry, or fish 1 cup cooked, dry beans ½ cup tofu 1 egg 2 Tbsp peanut butter 1/3 cup nuts

<p>Milk products</p> 	<p>3-4</p>	<p>1 cup milk or buttermilk 1 cup yogurt 1 1/2 oz natural cheese 2 oz processed cheese 1 cup calcium-fortified soy milk</p>
<p>Grains (especially whole grain and enriched)</p> 	<p>6-11</p>	<p>1 slice whole wheat bread 1 oz ready-to-eat cereal (about 1 cup of most cereals) 1/2 cup cooked cereal, rice, or pasta 3-4 small or 2 large crackers</p>
<p>Fruits</p> 	<p>2-4</p>	<p>1 medium-sized piece of fruit 1/2 cup chopped, fresh, cooked or canned 1/4 cup dried fruit 3/4 cup 100% fruit juice</p>
<p>Vegetables (Eat dark green, leafy, yellow, or orange vegetables often)</p> 	<p>3-5</p>	<p>1 cup raw, leafy vegetables 1/2 cup other (fresh or cooked vegetables) 3/4 cup vegetable juice</p>
<p>Fats and Sweets</p> 	<p>Use sparingly</p>	
<p>Fluid</p>	<p>In addition, the dietary assessment should evaluate the adequacy of fluid intake. In general, 48-64 oz of water is suggested; extra water is needed for illness (e.g., fever, polyuria, vomiting, diarrhea) or hot weather. Whether or not the client's water supply is fluoridated can also be ascertained.</p>	

Adapted from:  
International Food Information Council (IFIC). Healthy Eating During Pregnancy. Available online. Accessed 10/21/2006.  
Eating for Two, 2002, March of Dimes

US Department of Agriculture. Dietary Guidelines for Americans, 2005, 6th Edition. <http://www.healthierus.gov/dietaryguidelines/>. Accessed 25 May 2006.  
 Nutrition during pregnancy and the postpartum period: a manual for health professionals. 1990, California Department of Health Services, Maternal Child Health Branch

Table 3-7. General guidelines for amounts and types of foods

## Factors that affect intake

### Physical changes

Physical changes that are associated with pregnancy and can affect a woman’s intake include the following:

- Nausea and vomiting or “morning sickness” (not hyperemesis gravidarum)
- Taste and appetite changes
- Reflux or “heartburn”
- Constipation

These symptoms (and some suggestions for minimizing problems) are discussed in Module 2, Nutrition and Normal Pregnancy.

The clinician should evaluate what effect these symptoms have on the individual’s intake.

### Food security

A major barrier to good nutritional status is lack of access to an adequate food supply. Access can be limited by financial resources, food management skills, food purchasing and preparation skills, transportation, and the environment. The clinician should consider:

Considerations	Why this is relevant
Does the client have the income and/or resources to obtain, store, and prepare food?	If clients are limited in finances, transportation and meal preparation skills they tend to buy more refined prepackaged foods higher in calories and lower in nutrients.  Refer (WIC, food resources)
Does the client qualify for and/or use community resources, WIC, food banks, Basic Food Program?	These are good ways to increase the food supply at home. Often times WIC programs offer classes on budgeting and food preparation. Eligibility for the Basic Food Program (formerly Food Stamps) is now 200% of FPL.



	Refer, if needed
Does the client have stable housing	Lack of food storage and/or may compete with others for food.  Refer, WIC, Housing, local meal programs

Table 3-8. Considerations related to food security

### Cultural factors and beliefs

Cultural factors and beliefs play a big role in food choices and eating patterns. A discussion of culture is included in Module 9 .

### Psychosocial issues

Considerations	Why this is relevant
What support system is available to the client (family, friends)?	May affect food choices and availability Refer if depression is suspected (Kaiser, 2002) Refer to Behavioral Health Specialist (BHS)
Is there documented or suspected domestic abuse?	Other than given safety issues some partners will restrict or control food intake  Refer to BHS and other local resources
What psychological stresses are present?	May affect food choices and availability Refer if depression is suspected
What is the client's emotional and psychological attitude toward pregnancy and parenting responsibilities? What about her partner?	This can affect nutrient intake Refer (risk for depression) Refer to BHS
What is the client's interest in and knowledge of healthy eating practices during pregnancy? What are her goals and concerns?	Will affect nutrition interventions planned with client, and the likelihood of an intervention being successful
Does the client demonstrate a low level of mastery or self-esteem?	This has been associated with a low rate of weight gain in some groups (Kaiser, 2002) Refer to BHS

Table 3-9. Considerations related to psychosocial issues

**Risk factors related to dietary intake:**

- Nausea and vomiting or constipation that interferes with an adequate intake
- Reflux or “heartburn” that affects a woman’s food choices
- Food insecurity and/or an inadequate food supply
- Vegetarianism (See a discussion in Module 2, Nutrition and Normal Pregnancy)
- Lactose intolerance
- Limited support system
- Domestic abuse
- Psychological stresses; disinterest in healthy eating practices
- Negative feelings about pregnancy and parenting
- Beliefs/practices related to food and eating (cultural, regional, etc.)
- Stress with minimal coping skills
- Low level of mastery or self esteem
- Pica

## *Developing Intervention and Education Plans*

A nutrition care plan should be individualized and based on the client's risk factors and priorities. The plan should include any needed interventions such as nutrition education, informational handouts, and medical and community referrals as well as follow-up evaluation and interventions. Nutrition issues should be documented in the MSS Interdisciplinary Care Plan.

This section describes some factors that can affect an individual's nutrition care plan and addresses some common issues for pregnant women. Medical nutrition therapy for specific disorders is reviewed in Module 4, Medical Nutrition Therapy for Specific Disorders.

### **Factors That Affect Plans**

The goals of the woman and her family are a critical factor in the design of effective nutrition interventions:

- Does the woman see nutrition as important? Does she have the support of her partner and other family members in making changes?
- Is the woman working outside the home? Does she plan to work throughout her pregnancy? After pregnancy? Is this a choice? Is this decision supported by her partner and other family members?
- What are the woman's attitudes toward parenting? Her partner's attitudes? Those of her family?
- How does the individual client learn best? (e.g., written, visual, oral, combination) What is her educational level? What is her literacy level? Is language a barrier? Does she have visual or hearing impairments?

Family beliefs about nutrition, eating, and parenting greatly affect the development of nutrition interventions and whether or not they will be implemented successfully.

- What are the client's thoughts about weight gain? How much weight did she gain with past pregnancies? What are her partner's thoughts? What about those of other women in her family?
- What are the client's plans or goals for infant feeding? What about her partner? What have other women in her family done?

### **Common plans that can be adapted for individual clients**

Some general interventions for common nutrition-related issues are outlined below. These should be individualized, based on the client's priorities, specific nutrition-related concerns, resources, and ability to implement.

In addition, Bright Futures in Practice: Nutrition includes screening guidelines for the prenatal period as well as suggested counseling messages. These are summarized in a table.

Screening Guidelines and Suggested Messages for the Prenatal Period  
Bright Futures in Practice: Nutrition

	For Women Planning to Breastfeed	For Parents Planning to Bottle-feed
Interview Questions	<p>Have you thought about breastfeeding?</p> <p>Do you know about the benefits of breastfeeding for you and your baby?</p> <p>Do you have any concerns about your diet and breastfeeding?</p> <p>Do you restrict any foods in your diet because of lack of appetite, food aversions, vegan or vegetarian diets, weight gain, food allergies and sensitivities, or any other reason?</p> <p>Does your family have a history of food allergies?</p> <p>Are you taking prenatal vitamins? Do you plan to take any in the future?</p> <p>Do you take vitamin or mineral supplements?</p> <p>Do you drink wine, beer, or other alcoholic beverages?</p> <p>Do you use any drugs (prescription, over-the-counter, or illegal)?</p> <p>Do you have any questions about feeding your baby?</p> <p>What experiences have you had feeding babies?</p> <p>With your own children? Other children? Your siblings?</p> <p>What does your partner or family think about your plan for feeding?</p> <p>Are you concerned about having enough money to buy food?</p> <p>Do you smoke? Does anyone smoke in your home?</p> <p>Do you have problems with your teeth?</p> <p>Does the water you drink contain fluoride?</p>	
	Do you have any questions about	Do you know what infant formula you plan to

	<p>breastfeeding?</p> <p>Have you attended any classes on breastfeeding?</p> <p>Do you have family members or friends who will help as you are learning to breastfeed?</p> <p>Do you know how to contact breastfeeding support groups or lactation consultants?</p> <p>Do you know your HIV status?</p>	<p>use? Is the infant formula iron fortified?</p> <p>How will you prepare the infant formula?</p> <p>After the infant formula is made, how will you store it?</p> <p>Do you have family members or friends who will help you feed your baby?</p>
Counseling	<p>Consume folic acid, especially before pregnancy and during the first trimester. Eat a variety of foods that contain folate, in addition to a folic acid supplement and foods that are fortified with folic acid.</p> <p>Foods that contain folate include fruits (e.g., oranges, strawberries, avocados); dark-green leafy vegetables (e.g., spinach, turnip greens); some other vegetables (e.g., asparagus, broccoli, Brussels sprouts); and legumes (e.g., black, pinto, navy, and kidney beans).</p> <p>Try to maintain a healthy weight throughout pregnancy.</p> <p>A safe amount of alcohol consumption by pregnant women is not known. The only sure way to avoid the possible harmful effects of alcohol on the fetus is to avoid drinking alcoholic beverages entirely.</p> <p>If you smoke, quit or cut back to improve your health and the health of your baby.</p> <p>Maintain good oral hygiene and obtain dental care .</p> <p>Weight loss after pregnancy should occur gradually by adjusting energy intake, level of physical activity, or both.</p> <p>Moderate physical activity, such as gentle aerobics (e.g., walking, swimming), is recommended as soon as possible after delivery.</p>	
	Learn your HIV status. If you are HIV positive, do not breastfeed.	Prepare 2 oz of infant formula every 2 to 3 hours at first. Make more if your baby seems hungry, especially as the infant grows.

	<p>Begin breastfeeding your baby as soon as possible after birth, usually within the first hour.</p> <p>Nurse your baby when she shows signs of hunger. Try not to wait until she is crying; crying is the last sign of hunger.</p> <p>Breastfeed your baby about 8 to 12 times every 24 hours until she seems satisfied.</p> <p>Do not give your baby supplements (e.g., water, glucose, formula) unless a medical condition requires it.</p>	<p>To prevent cavities, avoid doing things that may harm your baby's teeth (e.g., putting her to bed with a bottle, propping a bottle in her mouth, giving her a bottle when she's not hungry).</p>
<p>Adapted from: Story M, Holt K, Sofka D, eds. 2002. Bright Futures in Practice: Nutrition, Second edition. Arlington, VA: National Center for Education in Maternal and Child Health.</p>		

Table 3-10. Screening Guidelines and Suggested Messages for the Prenatal Period  
Bright Futures in Practice: Nutrition

### Setting weight gain goals

#### Indications for use

A discussion of weight gain goals is warranted for all pregnant women. Goals for women who are overweight, obese or underweight are reviewed in Module 4, Medical Nutrition Therapy for Specific Disorders.

#### Message to client

Adequate weight gain during pregnancy is important for the infant's growth and development and for the mother's health. Review:

- Components of weight gain
- Recommended pattern of weight gain on weight gain grid
- Dietary recommendations to promote appropriate weight gain (e.g., meal and snack patterns)
- The role of physical activity in weight gain and maintenance of good health and fitness

#### Educational resources

- 9 Months to Get Ready (available for download or order through the Washington State Department of Printing General Store)
- Give Your Baby a Healthy Start (available for download or order through the DOH Washington State Department of Printing General Store)

## **Treatment or prevention of iron deficiency**

### **Indications for use**

Women who have iron deficiency or who are at risk for iron deficiency (e.g., as indicated by food pattern)

### **Message to client**

Iron requirements are increased during pregnancy. Iron is important for the baby's development (anemia during pregnancy can increase the risk of low birthweight and or iron deficiency in the infant) and also to the mother's health (anemia makes a person feel "tired").

### **Intervention** (CDC, 1998; USPTS, 2006)

The CDC guidelines for prevention and treatment of iron deficiency anemia during pregnancy are:

#### *Prevention*

- Oral, low-dose (30 mg/day) supplement (per medical provider)
- Adequate intake of iron-rich foods and foods that enhance iron absorption (e.g., foods with vitamin C)

#### *Treatment* (once iron deficiency anemia is identified and confirmed):

- Oral supplement (60-120 mg/day) per medical provider
- Counseling about correcting iron-deficiency anemia through diet
- Decrease dose to 30 mg/day when hemoglobin or hematocrit normalize per medical provider

### **Educational resources**

- Iron for Strong Blood (available in 9 languages) – (available for download or order through the DOH Washington State Department of Printing General Store)

## **General diet quality**

### **Indications for use**

General diet quality should be discussed with all pregnant women. Specific messages should be based on the individual's risk factors and individual nutritional status.

### **Message to client**

An inadequate diet presents risk for mother and for baby. Review:

- Recommendations based on food guide pyramid and/or food pattern recommendations

- Use of prenatal vitamin/mineral supplements
- Need for iron and good food sources of iron
- Importance of vitamin C and folic acid
- Selecting a variety of nutrient-rich foods for protein, vitamins, minerals
- Preventing or minimizing constipation with fiber, fluid, and activity
- Importance of eating pattern (i.e., meals and snacks)

Multiple vitamin and mineral supplements are recommended for the following groups (Kaiser, 2002):

- Women who smoke or use alcohol or drugs
- Women with or at risk for iron deficiency anemia
- Women with “poor quality” diets
- Women who follow vegetarian or semi-vegetarian food patterns (a supplement with vitamin B12 is especially important, since folic acid supplementation can mask the symptoms of a B12 deficiency)
- Women who are carrying more than one fetus

### **Educational resources**

- 9 Months to Get Ready (available for download or order through the DOH Washington State Department of Printing General Store)
- Be a Healthy Mom (available for download or order through the DOH Washington State Department of Printing General Store)
- Give Your Baby a Healthy Start (available for download or order through the DOH Washington State Department of Printing General Store)

### **Adequate folate intake**

#### **Indications for use**

Women whose folate and folic acid intakes are inadequate

#### **Message to client**

- Folate is important early in pregnancy to reduce the risk of neural tube defects (like spina bifida) in your infant
- Folate is important throughout pregnancy to prevent anemia
- Folate is important before pregnancy, and it is important to replenish folate stores during the postpartum period

### **Educational resources**

- “Before You Know You’re Pregnant” – information developed by the CDC; explains the importance of getting enough folic acid everyday, as well as birth defects related to inadequate intake and key sources of folic acid (English and Spanish). Text, pdf, supporting materials, and ordering information available at <http://www2.cdc.gov/ncbddd/faorder/orderform.htm>.
- “Preventing Birth Defects: Folic Acid” – a card developed by the CDC for dietitians. [http://cdc.gov/ncbddd/folicacid/documents/HCP%20Tip%20Card\\_Dietitian.pdf](http://cdc.gov/ncbddd/folicacid/documents/HCP%20Tip%20Card_Dietitian.pdf)



## **Discuss breastfeeding knowledge and plans**

### **Indications for use**

Plans for infant feeding should be discussed with each client.

### **Message to client**

Ask the client what she has heard about breastfeeding and her plans. Encourage the client to discuss her feelings and knowledge . Affirm what you have heard and ask permission to share information (See Module 6, Module 7, and Module 8). Support the client's decision. Offer practical information about returning to work, addressing concerns of other family members, and resources.

### **Educational resources**

- DOH Breastfeeding etc, Going back to work
- Bright Futures in Practice: Nutrition list of questions and messages for the prenatal period
- 9 Months to Get Ready (available for download or order through the DOH Washington State Department of Printing General Store)

## **Nutrition Visits**

The suggested schedule for Prenatal Nutrition Visits is listed in Module 1, The Role of the MSS RD in First Steps.

The initial prenatal visit should occur as soon as possible in the pregnancy, and subsequent nutrition visits should be based on client need.

## Referral Flags and Resources

Often, the nutrition assessment will bring issues to light that are outside of the dietitian’s scope of practice. In these situations, referrals can be made – to other First Steps providers, or to resources in the community.

### Potential Resources

All members of the First Steps team are potential resources. See Module 1 for brief summaries of the services that each team member can provide. Other resources in the community may include:

- Dietitians at WIC or other medical care agencies
- Obstetrical care providers (e.g., physicians, nurse practitioners, midwives)
- Mental health professionals (e.g., psychologists/psychiatrists, therapists, counselors, social workers)
- Dentists and dental hygienists
- Primary care providers

### Situations that indicate a need for referral

Situations or conditions that indicate a need for referral	Potential resource
Medical conditions out of scope of practice of First Steps team (e.g., metabolic disorder, gestational diabetes that cannot be controlled with diet)	<ul style="list-style-type: none"> <li>• Specialty care center</li> </ul>
Psychological disorders	<ul style="list-style-type: none"> <li>• Behavioral health specialist</li> <li>• Medical provider</li> <li>• Other community resources</li> </ul>
Risk for post partum depression	<ul style="list-style-type: none"> <li>• Behavioral health specialist</li> <li>• Primary care provider</li> </ul>
Suspected domestic abuse	<ul style="list-style-type: none"> <li>• Domestic violence resources</li> <li>• Behavioral health specialist</li> </ul>
Suspected substance abuse (by client or others in household) – consider client’s risk for use or readiness for intervention. If use is known or suspected, schedule more frequent visits and alert team members.	<ul style="list-style-type: none"> <li>• See Module 4</li> <li>• 24 Hour Alcohol/Drug Help Line 1-800-562-1240 (Funding provided by the Department of Alcohol and Substance Abuse – DASA).</li> <li>• Resources and referrals are also available for teens and their parents: <a href="http://www.the.teenline.org">http://www.the.teenline.org</a>, 1-877-345-</li> </ul>

	TEEN (8336).
Inadequate resources for basic needs (housing, food, transportation)	<ul style="list-style-type: none"> <li>• See Module 9</li> </ul>

Table 3-11.Situations that indicate a need for referral

## Case Example: Kayla

Kayla is a 20-year-old single woman, who came to her local WIC office seeking food assistance. She is living with a friend temporarily, but wants to find her own apartment. She works part time at a convenience store for minimum wage. Kayla is pregnant with her first baby and uncertain of her due date, but believes she is about four months pregnant. She has not received medical care for her pregnancy because she has no medical insurance. Kayla does not know how to apply for medical/financial assistance, but has serious financial difficulties including “running low on food.”

Kayla says she experienced nausea and vomiting for about three months, and lost weight during that time. Her current weight is ten pounds more than her reported pre-pregnancy weight; her pre-pregnancy weight was appropriate for her height. Kayla says she smoked ½ pack of cigarettes per day, and is not concerned about the effects of smoking on the baby. Several of her friends smoked during their pregnancies and “their babies were fine.”

**Identify nutrition risk factors for Kayla.** (Check all that apply)

- a. weight loss
- b. pre-pregnancy overweight
- c. inadequate rate of weight gain
- d. anemia or iron deficiency
- e. nausea or vomiting during pregnancy
- f. food insecurity and/or inadequate food supply
- g. use of tobacco

*Kayla's pre-pregnancy weight was appropriate, and her current rate of gain seems appropriate as well. Risk factors for Kayla include weight loss, nausea/vomiting, food insecurity, and use of tobacco.*

**What additional information would you like to have?**

*Suggested response:*

*Additional information about the following would be helpful:*

- *current meal pattern*
- *past medical history*
- *feelings about pregnancy*
- *social support*
- *use of supplements and medications*
- *concerns about weight gain*

**Develop a nutrition care plan.**

*Suggested response:*

*A nutrition care plan for Kayla should incorporate her preferred learning method, social situation, and beliefs.*

*The plan should include:*

- *weight gain goals*
- *general diet quality*
- *potential nutrient deficiencies (including supplements indicated because of tobacco use)*
- *tobacco cessation*
- *a discussion about infant feeding methods*

### **Case Example: Sharmaine**

Sharmaine is a 26-year old woman who is about 12 weeks pregnant. The midwife at her clinic suggested she come to the First Steps office to see what other services she is eligible for.

She is a vegetarian, but does eat eggs. She eats some dairy products, but does not like milk. Sharmaine is about 25 pounds overweight, and says she has had weight problems since adolescence. She has gained about 10 pounds during this pregnancy. Sharmaine described her usual food pattern:

- Breakfast – coffee with cream, egg sandwich or donut
- Lunch – usually does not have time for lunch, so snacks a lot when she gets home from work (usually chips or crackers)
- Dinner – pasta with sauce, bread, salad

**Identify nutrition risk factors for Sharmaine.** (Check all that apply)

- a. pre-pregnancy overweight
- b. inadequate rate of weight gain
- c. anemia or iron deficiency
- d. nausea or vomiting during pregnancy
- e. food insecurity and/or inadequate food supply
- f. use of tobacco
- g. inappropriate food pattern
- h. vegetarianism
- i. pica

*Risk factors for Sharmaine include pre-pregnancy overweight, vegetarianism, and an inappropriate food pattern. Her rate of weight gain is not inadequate and is even excessive. You do not have enough information to identify iron deficiency, food insecurity, use of tobacco, or pica; those are topics to discuss as part of the nutrition assessment.*

**What additional information would you like to have?**

*Suggested response:*

*Additional information about the following would be helpful:*

- *supplement and medication use*
- *past medical history*
- *social support*
- *feelings about pregnancy*
- *feelings about weight gain*

**Develop a nutrition care plan.**

*Suggested response:*

*A nutrition care plan for Sharmaine should incorporate her preferred learning method, social situation, and beliefs.*

*The plan should include:*

- *weight gain goals*
- *general diet quality*
- *potential nutrient deficiencies*
- *a discussion about infant feeding methods*

## References and Resources

### References

American Academy of Pediatrics (AAP), Section on Pediatric Dentistry. Oral health risk assessment timing and establishment of the dental home. *Pediatrics*. 2003;111(5): 1113-1116. (statement reaffirmed August 1, 2009)

American Diabetes Association. Gestational Diabetes Mellitus – Position statement. *Diabetes Care*. 2004. 27(Supplement 1): S88-S90.

American Dietetic Association. Position of the American Dietetic Association and American Society for Nutrition: Obesity, Reproduction, and Pregnancy Outcomes. *J Am Diet Assoc*. 2009; 109:918-927.

Astrachan-Fletcher E, Veldhuis C, Lively N, Fowler C, Marcks B. The reciprocal effects of eating disorders and the postpartum period: a review of the literature and recommendations for clinical care. *Journal of Women's Health*. 2008; 17(2):227-239.

August P, Sibai B. Clinical features, diagnosis, and long-term prognosis of preeclampsia. UpToDate version 18.1. 2010. Accessed 28 June 2010.

Bogges KA, Beck JD, Murtha AP, Moss, K, Offenbacher S. Maternal periodontal disease in early pregnancy and risk for a small-for-gestational-age infant. *American Journal of Obstetrics and Gynecology*. 2006; 194:1316-1322.

Centers for Disease Control and Prevention. Recommendations to prevent and control iron deficiency in the United States. *MMWR – April 03, 1998 / 47 (RR-3)*; 1-26. Accessed 28 June 2010. <http://www.cdc.gov/mmwr/preview/mmwrhtml/00051880.htm>

Centers for Disease Control and Prevention. What is PedNSS/PNSS? [Pediatric and Pregnancy Nutrition Surveillance System] PNSS Health Indicators. 2010. ([http://www.cdc.gov/pednss/what\\_is/pnss\\_health\\_indicators.htm](http://www.cdc.gov/pednss/what_is/pnss_health_indicators.htm)). Accessed 28 June 2010.

Erick M. Battling morning (noon and night) sickness. *J Am Diet Assoc*. 1994; 94(2):147-148.

Erick M. Hyperolfaction and hyperemesis gravidarum: what is the relationship? *Nutrition Reviews*. 1995; 53(10): 289-295.

Georgieff MK, Innis SM. Controversial nutrients that potentially affect preterm neurodevelopment: essential fatty acids and iron. *Pediatric Research* 2005; 57(5, pt 2): 99R-103R.

Hamaoui E, Hamaoui M. Nutritional assessment and support during pregnancy. *Gastroenterology Clinics of North America*. 1998; 27(1): 685-703.

Institute of Medicine, Food and Nutrition Board. *Weight Gain During Pregnancy: Reexamining the Guidelines*. Washington DC: National Academy Press. 2009. Online at <http://www.iom.edu/en/Reports/2009/Weight-Gain-During-Pregnancy-Reexamining-the-Guidelines.aspx>.

Institute of Medicine. *Nutrition Services in Perinatal Care*, 2nd edition. Washington DC: National Academy Press. 1992.

Kaiser LL, Allen L. Position of the American Dietetic Association: Nutrition and lifestyle for a healthy pregnancy outcome. *J Am Diet Assoc* 2002; 102(10):1479-1490.

Lozoff B, Beard J, Connor J, Felt B, Georgieff M, Schallert T. Long-lasting neural and behavioral effects of iron deficiency in infants. *Nutrition Reviews*. 2006; 64(5):S34-S43.

Lusskin SI, Misri S. Eating disorders in pregnant women. UpToDate Online 18.1. Accessed 28 June 2010.

Merchant K, Martorell R, Haas JD. Consequences for maternal nutrition of reproductive stress across consecutive pregnancies. *Am J Clin Nutr*. 1990; 52(4): 616-620.

Mofenson LM. Counseling and obstetrical management of the HIV-infected woman to reduce perinatal HIV transmission. UpToDate Online 18.1. Accessed 28 June 2010.

National Academy of Sciences. *Nutrition During Pregnancy*. I. Weight gain. II. Nutrient supplements. Washington DC: National Academy Press; 1990.

US Preventive Services Task Force (USPSTF). *Guide to Clinical Preventive Services*. Second Edition. Report of the U.S. Preventive Services Task Force. Chapter 42. Screening for Neural Tube Defects- Inducing Folic Acid/Folate prophylaxis. 1996.

US Preventive Services Task Force (USPSTF), Agency for Healthcare Research and Quality. *Folic Acid to Prevent Neural Tube Defects*, Topic Page. Rockville, MD. Online: <http://www.ahrq.gov/clinic/uspstf/uspsnrfol.htm>.

US Preventive Services Task Force, Agency for Healthcare Research and Quality. Screening for Iron Deficiency, Topic Page. May 2006. Online: <http://www.ahrq.gov/clinic/uspstf/uspsiron.htm>

Walter JH. Inborn errors of metabolism and pregnancy. *J Inher Metab Dis* 2000;23:229-236.

Williamson CS. Nutrition in pregnancy. *Nutrition Bulletin* 31, 28-59.



Woodard CB. Pregnancy following bariatric surgery. J Perinat Neonat Nurs. 2004;18(4):329-340.

Worthington-Roberts B, Williams SR. Nutrition in Pregnancy and Lactation, 6th ed. Dubuque, IA: Brown & Benchmark Publishers; 1997.

## **Resources**

### **Nutrition Assessment**

#### **Pregnancy Risk Factors**

The nutrition-related risk factors discussed in this module are summarized in a table.

#### **WIC Works Resource System: Prenatal Weight Gain**

This website is a compilation of resources related to prenatal weight gain, including links to MCHB Work Group Report, Institute of Medicine Guidelines, and state-developed educational materials. [http://www.nal.usda.gov/wicworks/Topics/prenatal\\_weight.html](http://www.nal.usda.gov/wicworks/Topics/prenatal_weight.html)

#### **Weight Gain Charts**

Prenatal weight gain charts, based on 2009 IOM recommendations have been published by the California Comprehensive Perinatal Services of the Department of Health: Download the appropriate pdf from this site:

<http://www.cdph.ca.gov/pubsforms/forms/Pages/MaternalandChildHealth.aspx>

#### **Healthy Weight Gain in Pregnancy: A Clinician's Tool**

This clinical practice guideline educates obstetric providers and nutritionists about appropriate weight gain during pregnancy, based on the new Institute of Medicine recommendations. The document provides tips for monitoring and counseling, and lists references and resources. <http://here.doh.wa.gov/materials/healthy-pregnancy-weight-gain>

#### **MyPyramid – Food Intake Patterns**

The suggested amounts of foods to consume from the basic food groups, subgroups and oils to meet recommended nutrient intakes at 12 different energy levels are summarized in this table, available from the US Department of Agriculture.

[http://www.pyramid.gov/downloads/MyPyramid\\_Food\\_Intake\\_Patterns.pdf](http://www.pyramid.gov/downloads/MyPyramid_Food_Intake_Patterns.pdf)

The site includes “MyPyramid Plan for Moms,” which gives a personalized plan for women. The pregnant woman enters her age, height, pre-pregnancy weight, physical activity level, and due date. A breastfeeding woman enters similar information and the baby’s birth date. Breastfeeding women also select if they are feeding their baby breastmilk only or supplementing with formula. Following these entries, a personalized MyPyramid Plan for Moms will be provided that can be downloaded in a full-color printout. <http://www.MyPyramid.gov>

### ABCs of Folic Acid Counseling

This continuing education tutorial is designed to help health care professionals learn how to quickly counsel women about folic acid and help them reduce their risk of having a child with spina bifida. The tutorial is available at <http://sba-resource.org/sbaacd>.

### Nutrition and the Pregnant Adolescent

Story M, Stang J (eds). *Nutrition and the Pregnant Adolescent: A Practical Reference Guide*. Minneapolis MN: Center for Leadership, Education, and Training in Maternal and Child Nutrition, university of Minnesota, 2000. A pdf version and ordering information are available online: <http://www.epi.umn.edu/let/pubs/nmpa.shtm>.

## **Cultural Competence**

### Cross Cultural Health Care – Case Studies

Developed by the MCHB-funded Pediatric Pulmonary Centers, this online learning module includes core concepts of, and four cross-cultural health care case studies. The material also includes links to websites with information on specific cultures.

<http://ppc.mchtraining.net/>

### National Center for Cultural Competence at the Georgetown University Child Development Center

This MCHB-funded center provides training, networking, and product development and dissemination. The website includes a variety of documents, resources (including self-assessment checklists for individuals, programs, and agencies) and links to other organizations. <http://www11.georgetown.edu/research/gucchd/nccc/index.html>

### Ethnomed

The EthnoMed website contains information about cultural beliefs, medical issues and other related issues pertinent to the health care of recent immigrants to Seattle or the US, many of whom are refugees fleeing war-torn parts of the world.

<http://www.ethnomed.org>

## **Medication Use During Pregnancy**

### DART/ETIC

The Developmental and Reproductive Toxicology and Environmental Teratology Information Center (DART/ETIC) is a database maintained by the National Library of Medicine. It contains information about developmental and reproductive toxicology, including medications. More information is at:

<http://www.nlm.nih.gov/pubs/factsheets/dartfs.html>. The actual database can be found here: <http://toxnet.nlm.nih.gov/>. This site also includes LactMed, which provides information about medication use during lactation.

### Centers for Disease Control and Prevention

The Centers for Disease Control and Prevention (CDC) website includes resources

related to medication use during pregnancy and lactation. <http://www.cdc.gov/ncbddd/meds/>.

#### Organization of Teratology Information Specialists Fact Sheets

To educate the public, the Organization of Teratology Information Specialists has compiled "fact sheets" on various exposures of concern. Fact Sheets answer frequently asked questions about exposures during pregnancy, and have been designed to print on a single double-sided page. [http://otispregnancy.org/otis\\_fact\\_sheets.asp](http://otispregnancy.org/otis_fact_sheets.asp)

## Quiz

1. Rapid weight gain (i.e., >1 kg/week) is usually indicative of:
  - a. gestational diabetes
  - b. increases in extracellular water
  - c. inadequate energy intake
  - d. appropriate rate of weight gain
  
2. For women who are overweight before pregnancy (i.e., BMI > 29.0), the recommended weight gain is:
  - a. no additional weight
  - b. at least 15 pounds
  - c. 28-40 pounds
  - d. Up to 50 pounds
  
3. Anemia during pregnancy is associated with:
  - a. hypertension in the mother and low birthweight and iron deficiency in the infant
  - b. hypertension and iron deficiency in the infant
  - c. inadequate maternal weight gain
  - d. maternal IQ
  
4. Screening for iron deficiency is indicated for:
  - a. women who smoke
  - b. women with a history of iron deficiency
  - c. women who do not eat meat or take an iron supplement
  - d. all women
  
5. Lactation during current pregnancy is included in the nutrition assessment because:
  - a. it affects recommendations for nutrient intake
  - b. it is a good indicator of whether or not breastfeeding will be successful
  - c. it places the fetus at serious medical risk
  - d. it may lead to increased stress once the baby is born
  
6. A history of bariatric surgery is relevant to the nutrition assessment because it:

- a. reflects a problem with weight management and affects nutrient intake and weight gain goals
- b. can be associated with nutrient deficiencies, including zinc and fat soluble vitamins
- c. can be associated with dumping syndrome
- d. requires specialty care

7. Use of tobacco during pregnancy has been associated with which of the following:

- a. fetal growth retardation
- b. low birthweight
- c. risk of preterm delivery
- d. a and b only
- e. all of the above

8. In general, an intake of 48-64 ounces of water per day is recommended. Which of the following may increase fluid needs:

- a. illness (e.g., fever, polyuria, vomiting diarrhea)
- b. hot weather
- c. hypertension
- d. a and b only
- e. all of the above

9. Questions about reflux or “heartburn” should be included in the nutrition assessment because reflux:

- a. can indicate more serious gastrointestinal disorders
- b. can affect a woman’s intake
- c. is common during pregnancy
- d. none of the above; reflux should not be included in the nutrition assessment

10. Questions about psychosocial issues (e.g., support system, psychological stresses, attitude toward pregnancy) are included in the nutrition assessment because:

- a. They may affect food choices and availability
- b. They may indicate a need for referral to additional resources
- c. A and B
- d. None of the above; they are out of the dietitian’s scope of practice and should not be included in the nutrition assessment

11. The CDC guidelines for prevention of iron deficiency anemia during pregnancy include:

- a. Oral, low-dose (30 mg/day) iron supplement (per medical provider)
- b. Oral iron supplement (60-120 mg/d) (per medical provider)
- c. Adequate intake of iron-rich foods and foods that enhance iron absorption
- d. Counseling about correcting iron-deficiency anemia through diet
- e. a and c
- f. a, c, and d

12. A discussion about general diet quality often includes information about vitamin and mineral supplements. A prenatal multiple vitamin supplement is recommended for which of the following groups of women:

- a. all pregnant women
- b. women with a history of hypertension
- c. women who eat fewer than 3-4 meals per day
- d. women who follow vegetarian or semi-vegetarian food patterns

13. When risk for post partum depression is identified or suspected, potential referral resources include:

- a. Behavioral health specialist and primary care provider
- b. Behavioral health specialist and domestic violence resources
- c. Specialty care center
- d. Specialty care center and primary care provider