First Steps Nutrition Modules

Module 4 – Medical Nutrition Therapy for Specific Conditions

Introduction

An existing medical condition, or one that is acquired during pregnancy, is a risk factor generally for both mother and infant. Medical nutrition therapy (MNT) is often required for conditions that are associated with pregnancy. Usually, collaboration with other health care providers (multi-discipline and/or multi-agency) is required, and referral to other providers is needed.

MNT is within the scope of practice of the MSS dietitian. The First Steps Policy and Procedure Manual will provide minimal interventions for the MSS risk factors (read the guidelines). This module reviews several of these conditions in more detail.

The Institute of Medicine presents MNT for medical issues in a functional framework (IOM, 1992), with attention to:

- Estimating nutrient requirements
- Adapting to changing needs
- Physical and physiologic limitations,
- Effects of medical therapies on nutrition (e.g., medications that cause mineral losses, vomiting, diarrhea; affect method of feeding)
- Summarizing and tracking pertinent nutritional data

Estimated time to complete this module: 60 minutes.

Learning Objectives

Participants will be able to:

- Describe the medical risks and nutritional implications of some common complications which occur with or affect pregnancy

- Describe basic medical nutrition therapy for some common complications associated with pregnancy: gestational diabetes, hypertensive disorders, underweight, overweight and obesity

Read more: Guidelines for Evaluating Medical Conditions

This is a general MSS guideline when reviewing MSS medical risk factors.

Screen and Assess

- *Review the client's health history*
- *Observe and record any negative physical health symptoms or client complaints discovered or discussed during a visit*
- *Determine the current status of the medical condition/symptoms and management by the obstetrical care provider*
- *Review and record any treatment prescribed or self-administered to decrease symptoms and/or prevent complications during the maternity cycle*
- *Explore the client's understanding of the medical condition/symptoms, treatment and the potential effects it may have on pregnancy, health, and infant outcomes*

Educate

- *Share preventive health information and self-care methods that may enhance her ability to cope with the condition/symptoms and follow any prescribed treatment regimes*
- *Review basic health care messages including "danger signs" during pregnancy*

Intervention

- *Refer to MSS Nurse regarding any emergent or increasing symptoms of physical distress or discomfort*
- *Refer to the MSS RD for Medical Nutrition Therapy (MNT)*
- *Coordinate care and consult with the medical provider regarding emergent symptoms and/or emergency room when symptoms require immediate attention*
- *Case conference and develop a plan with interdisciplinary team*

Surveillance- Monitor, F/U and ongoing assessment

- *Continue to follow client status and determine if interventions are working or need to be adjusted*
- *Document outcomes on the care plan, and if no changes occurred since the risk factor was identified, note why*

Outline

I. INTRODUCTION

II. GESTATIONAL DIABETES

- a. Screening and Diagnosis
- b. Medical Management
- c. Medical Nutrition Therapy
  - i. Assessment: Anthropometric, Biochemical, Clinical, Dietary
  - ii. Intervention
- d. Post-partum Considerations
- e. Care Coordination
- f. Resources
- g. Case Example

III. HYPERTENSIVE DISORDERS

- a. Medical Management
- b. Medical Nutrition Therapy and Nutrition-related Implications
  - i. Assessment, Anthropometric, Biochemical, Clinical/Medical, Dietary
  - ii. Intervention
- c. Care Coordination
- d. Case Example

IV. UNDERWEIGHT

- a. Medical Management
- b. Medical Nutrition Therapy and Nutrition-related Implications
  - i. Assessment: Anthropometric, Biochemical, Clinical/Medical, Dietary
  - ii. Intervention
- c. Care Coordination
- d. Resources
- e. Case Example

V. OVERWEIGHT & OBESITY

- a. Medical Nutrition Therapy and Nutrition-related Implications
  - i. Assessment: Anthropometric, Biochemical, Clinical/Medical, Dietary
  - ii. Intervention
- b. Care Coordination
- c. Case Example

VI. SUBSTANCE ABUSE

- a. Medical Nutrition Therapy and Nutrition-related Implications

Gestational Diabetes

Gestational diabetes (GDM) is defined as "any degree of glucose intolerance with onset or first recognition during pregnancy." (ADA, 2004) About 7% of pregnant women develop GDM in the US. GDM is associated with complications:

Infant

- macrosomia
- pulmonary issues
- neonatal hypoglycemia and jaundice
- obesity and glucose intolerance in late adolescence and adulthood

Mother

- preterm labor
- hypertensive disorders
- increased risk of difficult labor and delivery
- infection
- increased risk of developing type 2 diabetes after pregnancy
- depression
- increased risk of Cesarean section

Even though this section covers gestational diabetes the interventions are the same for those with type 1 or 2 diabetes. The only difference with type 1 or 2 diabetes, compared to GDM, is hyperglycemia during conception and the first trimester is associated with congenital defects and spontaneous abortion. This can also occur with women who have had undiagnosed diabetes (which can be the case for some obese women).

Screening and Diagnosis

Current recommendations from the American Diabetes Association suggest that women with risk factors for GDM (see below) should undergo glucose screening early in pregnancy. Women of average risk and women with high risk, but negative screening, should be tested between 24-28 weeks gestation.

Generally, testing involves a two-step approach: (1) initial screening with a glucose challenge test, and (2) diagnostic oral glucose tolerance test.

Maternal Risk Factors

Risk factors for GDM include:

- Overweight or obesity
- Personal history of GDM
- Glycosuria
- Family history of diabetes
- Age > 25 years

- Delivered a large baby (>9 lbs) in the past
- Problems (e.g., stillbirth) with previous pregnancy
- Member of an ethnic group with an increased prevalence of GDM or type 2 diabetes (Native American, Asian, Hispanic, African American, or Pacific Islander)
- Polycystic ovary syndrome

Women at low risk (who do not necessarily require glucose screening) have all of the following characteristics:

- Age <25 years
- Weight normal before pregnancy (BMI <25)
- Not a member of an ethnic group with an increased prevalence of GDM or type 2 diabetes (e.g., Hispanic, African, Native American, South or East Asian, Pacific Island)
- No known diabetes in first-degree relatives
- No history of abnormal glucose tolerance
- No history of poor obstetric outcome

Medical Management

Intensive treatment is recommended for women with GDM. This usually involves daily self-monitoring of blood glucose and medical nutrition therapy. Insulin is sometimes recommended; oral glucose-lowering agents are not usually used, and their safety during pregnancy requires more research. Insulin doses typically require adjustment throughout pregnancy because of increases in insulin antagonists and body mass. Moderate exercise is recommended for most women with GDM. Most women can continue to exercise as they did prior to pregnancy, unless limited by a medical condition (e.g., uterine contractions, fetal distress, or maternal hypertension).

Medical Nutrition Therapy (MNT)

The goals for Medical Nutrition Therapy (MNT) for gestational diabetes are the same as for any pregnancy (adequate nutrients to support maternal weight gain and fetal growth and development). In addition, MNT should focus on maintaining maternal blood glucose control and preventing ketosis. (ADA, 2006) Special attention to appropriate rate of weight gain during pregnancy and weight management in the post-partum period is also recommended.

Read more: Goals of medical nutrition therapy for diabetes and gestational diabetes

1. To attain and maintain optimal metabolic outcomes, including

- *blood glucose levels in the normal range or as close to normal as is safely possible to prevent or reduce the risk for complications of diabetes*
- *a lipid and lipoprotein profile that reduces the risk for macrovascular disease*
- *blood pressure levels that reduce the risk for vascular disease*

2. *To prevent and treat the chronic complications of diabetes; modify nutrient intake and lifestyle as appropriate for prevention and treatment of obesity, dyslipidemia, cardiovascular disease, hypertension, and nephropathy*

3. *To improve health through healthy food choices and physical activity*

4. *To address individual nutritional needs, taking into consideration personal and cultural preferences, resources and lifestyle while respecting the individual's wishes and willingness to change*

RD Assessment

Anthropometric
Weight and height should be monitored as usual. Note: If there are concerns about slow weight gain, the use of concentrated sweets to enhance weight gain should be avoided.

Biochemical

- Blood glucose (typically measured 4 times per day – before breakfast and after each meal) Consider client's access to monitoring equipment/supplies; ability.

  Goals for GDM:
  Fasting and premeal: 60-105 mg/dl
  1-hour post prandial: <140 mg/dl
  2-hours post prandial: <120 mg/dl

- Glycosolated hemoglobin (HbA1C) – reflects average blood glucose levels for 4-6 weeks; often monitored monthly during pregnancy

- Fructosamine – reflects average blood glucose levels for about 2 weeks
- Urine ketones (may be monitored if type 1 diabetes)

Read more: Ketosis

Ketosis occurs when the liver's glycogen stores are depleted, and the body makes glucose from fatty acids and amino acids. Severe ketosis is called ketoacidosis. It is accompanied by dehydration, lethargy, nausea and/or vomiting, confusion, tachycardia, and hypotension, and can progress to coma. In addition to maternal effects, ketoacidosis has been associated with toxicity to the developing fetus. Ketonemia (ketones in the blood) is indicated by measuring ketones in the urine (ketonuria). Ketotic breath (fruity, with an acetone smell) is another indicator of ketoacidosis.

Urine ketones are generally checked daily, in the fasting state (usually first morning urine) and during the day when meals are missed, if the client is ill, or if blood glucose levels are >200 mg/dl.

Potential Causes of Ketosis in Women with GDM

- *Inadequate energy or carbohydrate intake*
- *Omission of meals or snacks*
- *Prolonged intervals between meals (e.g., >10 hours between bedtime snack and breakfast)*
- *Possible worsening of glucose status, with blood glucose >200 mg/dl*
- *Illness*
- *Inadequate insulin dose*

Clinical
Document any symptoms related to hypo- or hyperglycemia. Document the insulin dose.

Dietary
- Assess past or current adherence to meal plan
- Estimate energy needs based on diet history and rate of weight gain, activity level, and correction of ketosis.

RD MNT Intervention

In general an individualized meal plan should be developed that incorporates the client's:

- Blood sugar goals
- Weight gain goals
- Physical activity level
- Food preferences
- Lifestyle, work schedule, restaurant eating habits

A 2006 position paper states that "MNT for GDM focuses on food choices for appropriate weight gain, normoglycemia, and absence of ketones." (ADA, 2006)

Carbohydrate intake (amount and distribution) should be individualized, but an ADA position paper suggests a minimum of 175 g carbohydrate per day. Food intake (specifically energy and carbohydrates) should be distributed into small, frequent meals and snacks. Carbohydrates seem to be less well tolerated at breakfast.

1. **Small, frequent meals and snacks** (e.g., 3 meals, 2-4 snacks each day) with distributed carbohydrates throughout the day. An evening snack usually needed to prevent ketosis overnight.

2. **Diet Composition**

   - **Carbohydrate Intake**
     - In general, restriction of carbohydrates to 35-40% of total energy intake decreases maternal blood glucose levels.
       - Women with gestational diabetes mellitus (GDM) should consume a minimum of 175 grams of carbohydrate per day based on the

Dietary Reference Intake (DRI) for pregnant women. This allows provision of glucose to the fetal brain and will help to prevent ketosis (ADA EAL).

- The recommended approach is to begin with strict carbohydrate control (~35%) and liberalize if self-monitored blood glucose levels (SMBG) are consistently <130-140 mg/d at 1-hour post prandial or <120 mg/dl at 2-hours post prandial

- Total carbohydrate intake should be less than 45% of energy to prevent hyperglycemia in women with GDM. Carbohydrate intake affects postprandial blood glucose levels; increased postprandial blood glucose levels are associated with increased incidence of large-for-gestational age infants and increased rate of Cesarean sections (ADA EAL).

- Carbohydrate seems to be less tolerated (have a greater effect on blood glucose levels) in the morning than throughout the rest of the day. Limiting morning carbohydrate to 15-30 g at breakfast and <25% of daily carbohydrate intake before noon is suggested. This will probably require that little or no fruit, milk, and processed cereals be eaten in the morning.

- Complex carbohydrates should be used. Fiber may help to regulate blood glucose levels (e.g., legumes, oats, bran, and raw fruits and vegetables).

- Use of alternative sweeteners should also be discussed; they are safe for use with people with diabetes when consumed within acceptable daily intake (ADI) levels established by the FDA. No adverse effects have been reported from use of artificial sweeteners except for saccharin due to slowed fetal clearance and aspartame in women with phenylketonuria (ADA, 2006)

- Sick Days or morning sickness- It is important to maintain an adequate intake, even when there is nausea and vomiting. Small, frequent, low-fat meals, with liquids between meals, may minimize symptoms of morning sickness. For severe vomiting, the lost meal may be replaced with 50 g carbohydrate as juice.

- **Protein, Fat, Fiber & Vitamin and Mineral Supplementation –** Needs for these nutrients are the same as for women without diabetes. Protein and fiber may help slow down the absorption of carbohydrates and can help with stabilization of blood sugar when consumed at each meal.

  When blood glucose levels are not maintained in the goal range (indicated by self-blood glucose monitoring logs, or glycosylated hemoglobin), a detailed diet history should be obtained. If needed, the diet plan should be adjusted, and/or strategies developed to increase adherence to the plan.

Instruction/education should be individualized to the client's needs and may include one of the following:

- Food Guide Pyramid with instruction on portion sizes (http://www.diabetes.org/food-and-fitness/food/planning-meals/diabetes-food-pyramid.html) The American Diabetes Association's Diabetes Food Pyramid groups foods based on carbohydrate and protein content.
- Menu planning, including MyFoodAdvisor from the American Diabetes Association: http://www.diabetes.org/food-and-fitness/food/my-food-advisor/
- Carbohydrate counting (http://www.diabetes.org/food-and-fitness/food/planning-meals/carb-counting/)

3. **Monitor blood glucose levels.** Clients should have a log to keep track of blood sugars and medication.

   When blood glucose levels are not maintained in the goal range (indicated by self-blood glucose monitoring logs, or glycosylated hemoglobin), a detailed diet history should be obtained. If needed, the diet plan should be adjusted, and/or strategies developed to increase adherence to the plan. RD should check with the client and/or medical provider to see what goals were set for the client's blood sugar levels. Goals may vary.

4. **Physical Activity**

   Always suggest women check with their medical providers to make sure there are no contraindications that the MSS provider may be unaware of. In general, encourage women with gestational diabetes mellitus (GDM) to participate in physical activity for 30 minutes per day for a minimum of three times per week. Research indicates that regular physical activity during pregnancy aids with improved glycemic control and reduces the common discomforts of pregnancy, without a negative effect on maternal or neonatal outcomes.

   Contraindications to physical activity during pregnancy (and conditions that should be followed by a medical provider) may include but are not limited to: pregnancy-induced hypertension, premature rupture of membranes, intrauterine growth retardation, preterm labor or history of preterm labor, incompetent cervix/cervical cerclage, and persistent second or third trimester bleeding.

5. **Surveillance- Monitor, Follow-up and ongoing assessment**

   Monitor and reassess blood glucose, weight, diet, physical activity and pharmacological therapy (if indicated) in women with gestational diabetes mellitus (GDM). Research indicates that Medical Nutrition Therapy (MNT) results in improved maternal and neonatal outcomes. Best outcomes are documented with a minimum of three visits.

Post-partum Considerations

Women with GDM should be monitored for hyperglycemia at least 6 weeks postpartum, and then at least every 3 years thereafter. Nutrition education should focus on maintaining a healthy weight and recognizing the symptoms of hyperglycemia, since women with GDM are at increased risk for developing diabetes. Family planning is especially important for women with diabetes; hyperglycemia during conception and during the first trimester is associated with congenital defects and spontaneous abortion.

Breastfeeding is promoted for all women, especially those with gestational, type 1, or type 2 diabetes. Breastfeeding could help to reduce the risk of diabetes in infants (ADA evidence library). For women who are breastfeeding and remain on insulin, insulin dosing may need to be decreased, food patterns may need more frequent adjustment, and evening and/or late-night snacks may be needed (ADA, 2006).

Care Coordination and Collaboration

An interdisciplinary approach is most effective (Franz et al, 2002). The following providers may be included:

- Medical care provider
- MSS team case conferencing at minimum and depending on client needs:
    - CHN for warning signs and medical follow-up
    - MSS BHS for mental health and coping skills
    - If needed, under the direction of the MSS clinicians involved, the CHW may provide some health messages and help clients connect to resources
- If involved coordination of care with hospital and/or WIC RD
- If indicated a specialty clinic (endocrinologist)

Resources

It's Never Too Early to Prevent Diabetes
http://www.ndep.nih.gov

This website includes tip sheets in English and Spanish for children at risk for type 2 diabetes, and a booklet for adults to help women and their families make healthy food choices. The website also encourages individuals to be more physically active to help prevent or delay type 2 diabetes.

Gestational Diabetes and Low-Calorie Sweeteners: Answers to Common Questions
http://www.foodinsight.org/Resources/Detail.aspx?topic=Gestational_Diabetes_and_Low_Calorie_Sweeteners_Answers_to_Common_Questions.

This publication includes information about the use of artificial sweeteners during pregnancy.

Case Example: Maureen

Maureen is a 26-year old woman who was identified as having gestational diabetes at 28 weeks gestation. A glucose challenge test indicated the need for further testing, and an oral glucose tolerance test was used to confirm the diagnosis.

Maureen's pre-pregnancy BMI was 28, indicating overweight. She is working closely with the MSS team to manage her condition:

- she monitors blood glucose levels 4 times per day (before meals)
- she checks her urine for ketones
- she is seen by the dietitian every two weeks at first ; adjustments are made to her food pattern based on her blood glucose levels

So far, Maureen has not needed insulin to maintain blood glucose levels within the desired range. If she needs insulin, the MSS team may help her connect to additional medical referrals recommended by her medical provider (e.g., endocrine team).

Hypertensive Disorders

Hypertensive disorders occur in about 12 to 22% of pregnancies. There are four major hypertensive disorders in pregnancy, each with different clinical features, risk factors, and associated risks:

- **Chronic hypertension** is hypertension that developed before pregnancy, during pregnancy before 20 weeks gestation, or that continues longer than 12 weeks postpartum

- **Gestational hypertension** is mild hypertension without proteinuria that develops in the latter part of pregnancy. Some women with gestational hypertension will develop preeclampsia during the course of the pregnancy

- **Preeclampsia** is gestational hypertension with proteinuria that begins after 20 weeks gestation, in a woman who previously had normal blood pressure.

- **Eclampsia** is gestational hypertension with proteinuria that begins after 20 weeks gestation in a woman who previously had normal blood pressure, with the development of grand mal seizures with no other neurologic condition.

- **Preeclampsia superimposed upon chronic hypertension** is the onset of proteinuria (after 20 weeks gestation) in a woman with chronic hypertension

- **Prehypertension** is a systolic pressure ranging from 120 to 139 mm Hg or a diastolic pressure ranging from 80 to 89 mm Hg. Prehypertension tends to get worse over time. Within four years of being diagnosed with prehypertension, nearly one-third of adults ages 35 to 64 and nearly half the adults age 65 or older develop high blood pressure.

Diagnostic Criteria for Hypertensive Disorders in Pregnancy

Disorder	**Hypertension (>140/90)**	**Proteinuria**
Chronic hypertension	Present before pregnancy, or during pregnancy before 20 weeks gestation or after 12 weeks postpartum	negative
Gestational hypertension	Present >20 weeks gestation	negative
Preeclampsia	Present > 20 weeks gestation	positive
Preeclampsia superimposed upon chronic hypertension	Before 20 weeks	Positive after 20 weeks
Eclampsia	Present >20 weeks gestation, also accompanied by grand mal seizures with no other neurologic condition	Positive

Table 4-2. Diagnostic criteria for hypertensive disorders in pregnancy

Risk factors for hypertension include:
- First pregnancy
- Overweight or obese
- Diabetes, renal disease, or lupus
- Multiple gestation
- Family history of hypertension (sister or mother)
- Maternal age <18 and >35-40 years
- Glucose intolerance during pregnancy (i.e., high first GTT test but stable second test), even if not diagnosed with GDM
- Unexplained fetal growth restriction

Risk Factors specific to Preeclampsia
- Preeclampsia in previous pregnancy
- Obesity
- African American
- Age >35
- Chronic HTN
- Pregestational diabetes
- Multiple gestation

Hypertension during pregnancy can cause decreased blood flow to the placenta, potentially slowing the baby's growth and increasing the risk of low birthweight, placental abruption, preterm delivery, and future cardiovascular disease. Preeclampsia and chronic hypertension can lead to stroke, heart failure, or liver or kidney damage. It is also associated with fetal growth restriction, preterm delivery, fetal demise, and miscarriage. Pregnant women with hypertension are more likely to undergo a Cesarean section.

Medical Management

For most women, medical management of hypertension involves blood pressure monitoring, monitoring of renal and liver function, and fetal monitoring (growth and activity, amniotic fluid volume, and blood flow).

In some cases bedrest is recommended, but no studies support its effectiveness for most women. This may be due to low compliance by women but the literature is not clear on this issue. Antihypertensive medications are not generally used, unless blood pressure is significantly elevated (e.g., diastolic >105-100 or systolic >150 mmHg) or other factors are present (e.g., secondary hypertension, end-organ damage, history of stroke). Early delivery is considered in some cases (e.g., women with severe hypertension or pregnancy complications).

RD Assessment

The nutrition goals for hypertension are the same as those for a typical pregnancy. There are a few additional factors to consider, however.

Anthopometric
Rapid weight gain (e.g., >2 lb/week or 6 lb/month) may suggest preeclampsia

Biochemical
Hematorcrit may be elevated due to hemoconcentration associated with preeclampsia

Additional tests may be indicated, including renal function tests (BUN, serum creatinine, creatinine clearance tests) and monitoring for proteinuria

Clinical/Medical
- Fundal height progression will provide information about fetal growth restriction
- Blood pressure will naturally fall in the first trimester and continue to be low until mid-pregnancy, then increase to non-pregnant values in the third trimester; a single systolic blood pressure reading of >140 mmHg before 20 weeks gestation indicates increased risk of preeclampsia
- Non-dependent edema (e.g., swollen eyes, puffy fingers and hands) can be indicative of preeclampsia and requires immediate medical referral; dependent edema (seen in the ankles and feet) is normal in pregnancy
- Symptoms of neurologic dysfunction, which require immediate attention, include headaches, blurred vision, and tendon hyperreflexia
- If antihypertensive medications or diuretics are prescribed, evaluate potential nutrient-medication interactions

Fetal Surveillance
Fetal surveillance testing is usually individualized based on severity of disease. Tests include ultrasound and biophysical profile.

Dietary
Calcium intake (dairy, non-dairy, and supplements)

RD MNT Intervention

1. **Diet -** Support client in identifying barrier (limited resources, limited cooking skills, limited knowledge, coping skills) to healthy habits and how to incorporate healthy habits into their lives. The following are guidelines for improving hypertension

    - **DASH Dietary Pattern -** Individuals should adopt the Dietary Approaches to Stop Hypertension (DASH) dietary pattern which is rich in fruits, vegetables, low-fat dairy, and nuts; low in sodium, total fat, and saturated fat; and adequate in calories for weight management. The DASH dietary pattern reduces systolic blood pressure by 8-14 mmHg. Studies have shown a link between a food pattern high in fiber, potassium, magnesium, and calcium and lower rates of preeclampsia. (Frederick et al, 2006; ADA EAL)

- **Dietary Sodium** -intake should be limited to no more than 2300 mg sodium (100 mmol) per day. Reduction of dietary sodium to recommended levels lowers systolic blood pressure by approximately 2 - 8 mmHg. If the patient demonstrates adherence to a 2300 mg sodium diet but has not achieved the treatment goal, then the dietitian should recommend the DASH dietary pattern and/or reduction in sodium to 1600 mg to further reduce blood pressure.
- **Calcium** -Low dietary calcium may increase risk of hypertension during pregnancy. Several small trials have shown decreases in risk of hypertension with calcium supplementation. (Hofmeyr, et al, 2006; Atallah, 2002). Calcium intakes greater than 4000 mg per day can cause calcium toxicity. If calcium is proposed as a therapy to reduce blood pressure, advise that the effect of calcium as a single nutrient on blood pressure in healthy or hypertensive adults is unclear. Epidemiological studies report that dietary patterns containing calcium lower than recommended levels (DRI) may be associated with elevated blood pressure. The effect of dietary patterns with calcium intake above the DRI on blood pressure in healthy or hypertensive adults is minimal.

  Evaluate medications for nutrient interactions. Often times hypertensive medications specifically will have food interactions.

2. **Physical Activity** - Women with hypertension should talk with their medical provider regarding walking or incorporate water aerobics. Physical activity should not be an issue for women with chronic hypertension, but it may not be allowed for those who have developed gestational hypertension. If physical activity is allowed dietitians need to encourage individuals to engage in aerobic (walking, swimming) physical activity for at least 30 minutes per day on most days of the week, as it reduces systolic blood pressure by approximately 4 - 9 mmHg.

3. **Weight Management**- Slow weight gain based on 2009 IOM recommendations. Significant weight gain (e.g., >7 lbs within a week or month), especially with no changes in client diet, can be a sign of preeclampsia.

4. **Blood Pressure** - Management of elevated blood pressure should be based on a comprehensive program including lifestyle modification (weight, medical, nutrition therapy, physical activity and behavioral health) and possible pharmacologic therapy. The MSS agency should be educating women on blood pressure during pregnancy and warning signs.

5. **Surveillance- Monitor, follow-up and ongoing assessment**
   The RD should monitor interventions provided and follow-up on the client's health status to see if the interventions have been implemented, if they are helping and if changes in care need to be made.

Certain counseling and nutrition intervention strategies require special consideration for pregnant women with hypertensive disorders. In general, nutrition interventions may be able to help prevent preeclampsia (or its progression), and the dietitian can assist in

medical interventions through the early detection of symptoms. Once the condition has progressed, however, medical therapies that are beyond the scope of nutrition practice are often needed.

Care Coordination

The inter- or multi-disciplinary team can include health care providers from a number of agencies. The following providers may be included:

- MSS Team Case Conferencing at minimum
    - CHN can take blood pressures and educate on blood pressure and warning signs
    - MSS BHS may work with the women on mental health status (depression) and coping skills.
    - If needed, under the direction of the MSS clinicians involved, the CHW may provide some health messages and help clients connect to resources.
- If another community (WIC) or hospital RD is involved coordinate care of nutrition services, as needed
- Medical care provider

Case Example

Roxanne is a 24-year old woman with hypertension. The dietitian working with Roxanne made a point to assess Roxanne's calcium intake and to watch for non-dependent edema at each visit, in addition to providing counseling about general nutrition. During a routine appointment, the dietitian noticed that Roxanne's eyes, fingers, and hands were "puffy." After consultation with the nurse, an urgent referral to Roxanne's OB provider was made.

Underweight (BMI<18.5)

Maternal underweight in pregnancy is associated with increased risk for infants with low birthweights and other complications, including anemia, antepartum hemorrhage, and premature rupture of the membranes. (IOM, 1992) Although the risks are significant, underweight is less likely to be identified as a risk factor than overweight. Important roles for dietitians include identifying women who are at-risk, and helping to assure positive birth outcomes.

Medical Nutrition Therapy and Nutrition-related Implications

The nutrition goals for women who are underweight are the same as those for a typical pregnancy, with emphasis on ensuring an adequate intake of energy and other nutrients.

RD Assessment

Anthopometric

- Accurate measurements of weight and height are essential in identifying women who are underweight (BMI<18.5). Determine if weight gain is within IOM recommendations and if not, identify possible contributing factors:

  Factors Associated with Low Prenatal Weight Gain (Hickey et al, 1997; Wells et al, 2006; Hickey, 2000)

  - Pregnancy-related nausea
  - Preterm labor
  - Education <12 years
  - Smoking and alcohol use
  - Unwanted pregnancy
  - Caring for more than one preschool-aged child at home
  - Not using own car for errands
  - Working more than 40 hours per week
  - History of eating disorder

  Unless there is an underlying medical cause for underweight, no medical management is generally indicated.

Biochemical

No special biochemical measurements are indicated.

Clinical/Medical

- Assess if fetus is growing at expected rate per health care provider via care coordination or client report.
- Family genetic (e.g., thin, high metabolism)
- Is there a history of an eating disorder, or behaviors associated with disordered eating?
- Is nausea and vomiting interfering with an adequate intake?

- Are there other physical reasons preventing an adequate intake? (e.g., oral lesions, preexisting conditions)

Dietary
Is there anything interfering with the client's intake? (e.g., access to food, lack of time, limited food preparation skills, food choices that are not nutrient-dense, major oral health issues)

RD MNT Intervention

As with all MNT, intervention for underweight during pregnancy should focus on the identified reasons for the problem, and should be developed based on the client's goals, priorities, and resources. Some general strategies for specific contributors to underweight are discussed below.

1. Health Messages

- Reinforce what client is doing well
- Weight gain during pregnancy
    - Review the overall weight gain goal for women who are underweight prior to pregnancy (28-40 lbs.); also discuss the client's current weight gain as it relates to that goal. Explain that gaining enough weight can reduce the risk of complications during pregnancy (LBW/preterm birth), and make a difference in her baby's birth weight and overall health
    - Assess woman's knowledge of eating healthy on a budget and physical activity habits
    - Ask about client's thoughts about weight gain, weight gain with past pregnancies

2. Address barriers to healthy eating and weight gain

Intake: Address specific barriers to food consumption:

- Resources to purchase sufficient food – refer to available resources (e.g., WIC, Food Stamps, food banks, etc.)
- Transportation to purchase food – identify neighborhood resources, periodic shopping trips, bus routes
- Lack of food preparation skills, storage facilities – work on simple methods for quick meals that require little preparation
- Lack of nutrition knowledge – offer strategies for increasing energy density of food (e.g., added peanut butter, cheese, margarine or butter)
- Lack of motivation – monitor fetal growth with client, through fundal height measurements or ultrasound reports
- Set small goals to increase meal pattern (3 meals, 2-3 snacks per day)
- Nausea and vomiting (see Module 2 for specific suggestions related to food pattern)

- When vomiting persists into the second and third trimesters, consult with OB provider to discuss appropriate intervention

3. Stress and Mental Health
Stress may cause some women to stop eating or to turn to unhealthy coping mechanisms that can lead to a reduction in intake (e.g., smoking, mental health disorder)

Identify with the client how stress and mental health (depression, anxiety, etc.) status impacts her food intake and meal patterns. The client will need to develop healthy coping skills. MSS RD should work with and refer clients to MSS BHS as indicated.

4. Physical Activity
Most women should be physically active during pregnancy but in some cases that physical activity could be excessive. Help client set realistic goals for activity or to adjust energy intake to meet needs

5. Surveillance – Monitor, follow-up and ongoing assessment
The RD should monitor interventions provided and follow-up on the client's health status to see if the interventions have been implemented, if they are helping and if changes in care need to be made.

Care Coordination and Collaboration

The following providers may be included:
- MSS team case conferencing for women gaining weight outside IOM guidelines and other involvement as needed based on client risk and needs, e.g., MSS BHS regarding stress and mental health
- If community (WIC) or hospital RD involved coordination of nutrition care is needed
- Medical provider

Case Example: Lindsey

Lindsey is a 24-year old woman who was underweight prior to pregnancy. She wants to give her baby the best opportunity, and she sees pregnancy as a good opportunity to improve her overall health.

RD provides healthy eating and meal pattern recommendations that are specific to Lindsey's situation. These include:

- a referral to the WIC program
- suggestions for increasing the energy density of foods
- recommendations for fitting 3 meals and 2-3 snacks into Lindsey's busy day
- a discussion about the importance of social supports

Overweight and Obesity

A 2009 American Dietetic Association position paper states:

> *During pregnancy, numerous metabolic adjustments occur to increase the availability of energy, nutrients, and oxygen to the developing fetus. In non-obese women, these metabolic adjustments pose no increased risk for complications. However, in obese women, who already have aberrations in glucose and lipid metabolism, further adjustments induced by hormonal changes in pregnancy create a metabolic milieu that enhances the risk for metabolic disorders, such as gestational diabetes mellitus (GDM) and pre-eclampsia. The greater the degree of maternal obesity, the higher the risk of developing these metabolic disorders. For example, the risk of GDM is increased two fold in overweight compared with normal-weight women, and it is increased eightfold in the severely obese (BMI >40)." (2009 ADA)*

The best pregnancy outcomes are associated with maternal weight gain at the lower range of the recommendations for all pregnant women. Overweight and obesity are associated with several pregnancy complications, including hypertensive disorders, gestational diabetes, fetal macrosomia, increased risk of Cesearan section and anesthetic and perioperative complications during delivery. Nutrition counseling is needed to ensure appropriate weight gain goals and nutrient intakes.

RD Assessment

The goal of medical nutrition therapy is not weight loss, but weight gain that allows for adequate fetal growth, without increasing maternal adipose tissue.

Anthopometric

- Record prepregnancy weight, height and determine BMI

2009 Institute of Medicine (IOM) Recommendations

Prepregnancy BMI	BMI+ (kg/m2) (WHO)	Total Weight Gain Range (lbs)	Rates of Weight Gain 2nd and 3rd Trimester (lbs) (Mean Range in lbs/wk)
Underweight	<18.5	28–40	1 (1–1.3)
Normal weight	18.5-24.9	25–35	1 (0.8–1)
Overweight	25.0-29.9	15–25	0.6 (0.5–0.7)
Obese (includes all classes)	≥30.0	11–20	0.5 (0.4–0.6)

Guidelines should be used "in concert with good clinical judgment as well as a discussion between the woman and her care provider about diet and exercise. If a woman's gestational weight gain (GWG) is not within the proposed guidelines, clinicians should consider other relevant clinical evidence, modifiable factors that might be causing excessive or inadequate gain, and information on the nature of excess GWG (e.g., fat or edema) as well as both the adequacy and consistency of fetal growth before suggesting that a woman modify her pattern of weight gain" (IOM 2009).

Evaluate client's knowledge of pregnancy weight gain recommendations & expectations

Biochemical
No special biochemical measurements are indicated, however women who are overweight or obese are at increased risk for developing gestational diabetes, so pay particular attention to the results of the glucose tolerance test.

Clinical/Medical
Evaluation of clinical or medical factors does not generally require anything special. Women who are overweight or obese are at increased risk for some medical conditions (e.g., gestational diabetes, hypertension), so associated conditions should be considered. In addition, particular attention should be paid to:

- Fetal growth- fundal height progression, or sonogram results
- Prenatal care provider's recommendations concerning weight gain during pregnancy
- Prepregnancy weight, gestational weight gain, and birth outcomes for previous pregnancies
- History of eating disorder diagnosis or treatment
- Family or client pregnancy history of specific medical issues (e.g., hypertension, diabetes)
- Lifestyle data (e.g., activity level, recreational preferences, sedentary behaviors)
- Psychosocial issues (e.g., depression, boredom, social support)
- Previous bariatric surgery has nutrition-related implications. See Module 3 for more information.

Dietary
Evaluation of an individual's intake will require the same general process for women who have normal weights. Some issues that may require focus are highlighted below.

- Evaluate overall quality and quantity of food intake, including usual intake of fats and sweets, fast or convenience foods and sweetened beverages
- Discuss where food is usually consumed and the mealtime environment
- Is the client currently doing anything to limit weight gain during this pregnancy?
- Is there a history of difficulties with body image, weight loss, dieting, or energy restriction?
- Food insecurity, and knowledge of food preparation and eating healthy on budget
- Impacts of stress on food choices and eating behaviors

RD MNT Intervention

Details of the nutrition care plan for a woman who is overweight will depend on her individual circumstances, priorities, and resources. Some strategies for specific issues are reviewed below.

1. Knowledge - Educate client on why weight gain is monitored during pregnancy and about client-specific weight gain recommendations

2. **Weight gain -** Intervene if indicated by assessment

   a. **Low weight gain (<2 pounds per month after the first trimester):** Assess if this is ok for this clie**nt**. If the client is eating healthy, not trying to lose weight, physically active and the fetus is growing well per MD then i**ntervention is not needed**

      If intervention for low weight gain is indicated
      - Help the client understand weight gain recommendations and what will give her baby the best chance of a good birth weight
      - Assess for adequate protein intake, work to improve the quality of protein sources in the diet, and the nutrient density of foods
      - Work with the client to institute a regular meal pattern (e.g., 3 meals, 3 snacks per day) by setting small, achievable, incremental goals
      - If medical provider has recommended weight loss, emphasize nutritional quality of food choices, to provide an adequate intake for mother and baby. Monitor weight progression.

   b. **High weight gain above IOM recommendations**: assess overall weight gain, explore possibilities for additional information to stabilize weight gain. The following dietary modifications may be helpful, depending on the individual's food patterns:
      - Reduce the amount of sweetened beverages (e.g., soda, juice, sweet tea, sweetened coffee drinks) consumed
      - Decrease the amount of fat consumed from fried foods, fast food, snacks, and dairy products
      - Institute a regular meal pattern, including 3 meals per day; skipping meals can contribute to weight gain by stimulating appetite and overeating
      - Talk with medical provider about physical activity

      Excessive weight gain (>7 pounds per month)
      This could be an indicator of fluid gain which could be an early sign of hypertension and preeclampsia

3. Physical activity - Encourage increased physical activity (e.g., walking for 10 minutes at a time, and working up to 30 minutes 3 or more days per week). Help the client to set

realistic goals. If more strenuous types of exercise are being considered, encourage client to discuss plans with her OB care provider. Review barriers to physical activity and ways that may work for the client. Educate the client on benefits of physical activity which include, healthy weight gain, stress reduction, easier delivery and will help with postpartum weight loss (ACOG, 2006).

4. Surveillance- Monitor, F/U and ongoing assessment

The RD should monitor interventions provided and follow-up on the client's health status to see if the interventions have been implemented, if they are helping and if changes in care need to be made.

Care Coordination and Collaboration

The following providers may be included:

- MSS team case conferencing for women gaining weight outside of IOM guidelines and others as needed based on client need
- If involved, coordination with other community RD(s) (WIC or WSU extension) for HRCP coordination and available resources (e.g., classes on food preparation and eating on a budget)
- Medical care provider

Case Example: Sarah

Sarah is a 28-year old woman who is 17 weeks pregnant. She has struggled with weight since early adolescence. Her pre-pregnancy BMI was 30, and she has gained about 5 pounds since then. Sarah's goal during pregnancy is not to gain any additional weight, and she says she would be pleased if she lost some weight. She has stopped drinking colas (was drinking about 24 ounces per day) and now eats 2 meals each day, instead of snacking all day.

Is Sarah's current rate of weight gain appropriate? Why or why not?
Sarah's prepregnancy BMI (30) meets IOM criteria for obesity. Weight gain throughout pregnancy should be 11 to 20 pounds. Her current rate of weight gain is appropriate so far.

Is Sarah's approach to weight management realistic? Why or why not?
Sarah has made some nice changes to her food pattern (e.g., decreasing her soda intake), but may need some help understanding a healthy approach to weight management during pregnancy. Eating only 2 meals per day is probably not the best approach, and Sarah may need some help planning meals and snacks.

Weight loss during pregnancy is not healthy for her infant, and a gain of at least 11 pounds is recommended The dietitian should applaud Sarah's efforts but share possible concerns with skipping meals & gaining less than 11 lbs for the pregnancy total

Are you concerned about her intake?
As discussed previously, Sarah should be congratulated on the changes she has already made. Concerns and areas which can be improved include:

- Food pattern (2 meals per day vs. several meals and snacks)
- Overall nutritional adequacy

In addition to intake, physical activity should be discussed.

Case Example: JoAnn

JoAnn is a 24-year old woman who is 20 weeks pregnant; this is her second pregnancy. She gained about 45 pounds during her first pregnancy, and did not get back to her pre-pregnancy weight. Her BMI at the start of this pregnancy was 28.5 (overweight). Over the last 2 months, she has gained about 15 pounds. She is not too concerned about gaining weight, since most women in her family are heavier after having children. JoAnn works full-time. She often snacks on things she buys from the vending machine, so she can work through lunch and accrue overtime pay.

What should the dietitian consider as JoAnn's nutritional status is assessed and as a plan is developed?
Considerations for JoAnn include:

- Extra attention for hypertension, diabetes, macrosomia
- Regular meals, problem-solving at work
- Nutritional adequacy of intake
- Appropriate rate of weight gain; discuss risks of excessive weight gain to JoAnn and to baby
- Discuss how much harder it will be to get the weight off postpartum and long term impacts of that- obesity, diabetes etc
- Physical activity

Substance Abuse

Substance abuse during pregnancy has a direct negative effect on fetal growth, development and poor health status. Tobacco is the most commonly abused drug during pregnancy, causing more than 15% of cases of low birthweight in a large multicenter study. (Shiono, et al, 1995) Alcohol is a known human teratogen and use during pregnancy is considered the leading cause of preventable intellectual disability in infants, and also contributes to low birthweight and delayed motor development. Among pregnant women ages 15-44 years, about 11.8% admit to drinking some alcohol during the previous month. (ACOG, 2008) About 4% of pregnant women report illicit drug use (ACOG, 2008)

Dietitians can help clients by providing referrals for treatment programs and nutrition counseling to improve health behaviors.

"Nurturance of healthy behaviors through universal screening, brief intervention and referral to treatment is part of the traditional healing role." ACOG 2008

Screening, brief intervention and referral for unhealthy behaviors such as substance abuse requires communication skills based on a respectful approach with all clients and belief in their potential for change. Intensive research over the past decade with pregnant and post partum women and their children supports this approach in helping women achieve abstinence and or reduction of use.

Washington State Department of Health best practice guide available at:

- http://here.doh.wa.gov/materials/smoking-cessation-during-pregnancy-guidelines-for-intervention/15_PregSmok_E09L.pdf
- http://here.doh.wa.gov/materials/substance-abuse-during-pregnancy-guidelines-for-screening/15_PregSubs_E09L.pdf

Support systems that are available to the client:

- If the person is willing to make a quit attempt, provide assistance setting a Quit Date and refer to Washington State Quitline http://www.quitline.com/; 1-800-QUIT-NOW
- Medical referral
- Community resources
- Secondhand smoke materials
- WIC

Medical Nutrition Therapy and Nutrition-related Implications

The nutrition goals for women with substance abuse problems are the same as those for a typical pregnancy. Special considerations that are sometimes associated with substance abuse are reviewed below

RD Assessment

Anthopometric

- Women who abuse substances often obtain prenatal care later in pregnancy than other women, and may not know or remember LMP, prepregnancy weight, or weight gain pattern
- Women who smoke or abuse alcohol or drugs tend to have lower prepregnancy weights and tend to gain less weight during pregnancy than women who do not
- Women who have just stopped using or abusing substances may have high weight gains and this should be monitored

Biochemical

- Evaluate hemoglobin and hematocrit according to general hematological assessment guidelines and smoking status, if appropriate
- Urine screens for drug use may be included in the care process

Clinical/Medical

- Emphasize the importance of regular prenatal medical care
- Consider history of previous deliveries with congenital conditions related to maternal substance abuse (known effects are summarized in the table below)
- Include evaluation for obvious clinical signs of malnutrition
- Consider HIV status
- Consider lifestyle data (including history and current use – frequency, amount, last use – and history and current use by others in household or family)

Substance	**Risks during/after pregnancy**
Tobacco	• Increased risk for placenta problems including placenta previa and placental abruption, still birth • Increases the risk of preterm birth and/or low birthweight baby, ectopic pregnancy • Increased risk for sudden infant death syndrome / sudden unexplained infant death (March of Dimes http://www.marchofdimes.com/professionals/14332_1171.asp)
Alcohol	• Fetal Alcohol Spectrum Disorders (FASD), a range of effects that can occur in an individual whose mother drank alcohol during pregnancy o Fetal Alcohol Syndrome (FAS) – severe end of the FASD spectrum ▪ Fetal death ▪ Abnormal facial features, growth problems, and central nervous system (CNS) Problems ▪ Learning, memory, attention span,

	communication, vision, or hearing problems ▪ Hard time in school and trouble getting along with others o Alcohol-Related Neurodevelopmental Disorder (ARND): ▪ Intellectual disabilities ▪ Problems with learning and behavior ▪ Do poorly in school and have difficulty with math, memory, attention, judgment, and impulse control o Alcohol-Related Birth Defects (ARBD): ▪ Heart, kidney, or bone deformities ▪ Hearing problems o Fetal Alcohol Effect: The term fetal alcohol effects (FAE) was previously used to describe intellectual disabilities and problems with behavior and learning in a person whose mother drank alcohol during pregnancy. In 1996, the Institute of Medicine (IOM) replaced FAE with the terms alcohol-related neurodevelopmental disorder (ARND) and alcohol-related birth defects (ARBD). (*http://www.cdc.gov/ncbddd/fasd/facts.html)*
Cocaine	• Prematurity • Low birthweight, length, and head circumference • Placenta abruption • Maternal death • Subtle cognitive and motor changes, later deficits in some children, including deficits in some aspects of cognitive performance, including processing and attention to tasks (http://www.drugabuse.gov/ResearchReports/Cocaine/treatment.html#maternal)
Heroin	Heroin abuse during pregnancy, together with related factors like poor nutrition and inadequate prenatal care, has been associated with adverse consequences including: • Low birthweight • If the mother is regularly abusing the drug, the infant may be born physically dependent on heroin and could have serious medical complications requiring hospitalization (http://www.drugabuse.gov/infofacts/heroin.html)
Marijuana	Research has shown that some babies born to women who used marijuana during their pregnancies: • Display altered responses to visual stimuli, increased tremulousness, and a high-pitched cry • Have been observed to perform tasks involving sustained attention and memory more poorly than non-exposed

	children do http://www.drugabuse.gov/ResearchReports/Marijuana/Marijuana4.html#pregnancy
Methampheamine	• Preterm delivery • Low birthweight • Agitation with neonatal withdrawal • Neurotoxic response in male offspring

Table 4-3. Effects of selected substance use during pregnancy

Dietary

Because maternal-fetal nutritional status is a significant factor in moderating impact of substance use on pregnancy outcome, diet assessment is important and should give special attention to:

- Food availability, access to food, and food purchasing, storage, and preparation resources
- Effect of drug use on appetite and intake
- Diet quality prior to pregnancy and during pregnancy
- Support for eating regular healthy meals and snacks

MSS Intervention

Interventions should be individualized to the client's needs. Some general recommendations for specific issues related to substance abuse are discussed below. Some have specific nutrition-related implications. Nutrition appointments may provide opportunities for intervention traditionally started by mental health professionals as well as the opportunity for identification of problems and referral.

Active alcohol or illegal drug use

- Refer to and encourage participation in drug/alcohol treatment program. In the State of Washington, all pregnant women have priority eligibility for live-in drug treatment. (See above guide. State alcohol and drug hotline: 1-800-562-1240)
- Encourage participation in MSS and WIC
- Avoid making judgmental statements about the client's lifestyle
- Utilize a "Stages of Change Model" for assisting client to problem-solve about her substance use
- Reinforce and encourage all clients to remain drug-free
- Intervention for depression may be necessary before drug/alcohol treatment can be effective

Smoking or exposure to tobacco smoke during pregnancy

- Utilize a "Stages of Change Model" for client decision-making regarding when and how to reduce harm from tobacco.
- Refer to smoking cessation program, when client is ready. Refer to State Quitline: 1-800-784-8669. You can even fax the Quitline a referral and they will proactively call the woman. See the resource section of the best practice guide.

- If client is unable to stop smoking, but willing to limit use, attempt to reduce to 5 or fewer cigarettes per day
- Educate client about negative impact of tobacco use and environmental exposure on fetal growth and development
- If client lives with smokers, discuss importance of avoiding exposure for herself or her infant to secondhand smoke, and develop list (with client) on steps to take to avoid exposure

Poor dietary intake, high or inadequate gain

- Ensure that client has access to food. Assist client with access to healthy foods
- Assess possible effects of substances on appetite. Current drug use may decrease intake and if the client stops using, intake may increase dramatically.
- Discuss importance of prenatal weight gain and nutrition for healthy growth, physical and mental development of fetus
- Encourage use of prenatal vitamin and mineral supplement
- If client is unable to consume adequate energy and nutrient-dense foods, recommend a complete liquid or powdered nutritional supplement and regular high-calorie snacks
- Evaluation for mental depression should be considered. Risk of depression is high among people with substance abuse problems, and may cause anorexia, loss of motivation to eat, or overconsumption of high calorie foods, depending on the individual. Refer as appropriate

Preparation for parenting responsibilities

- Cocaine-exposed neonates, with decreased state regulation, attention, and responsiveness, may interact negatively with caregiver (who may already have compromised parenting skills because of drug use, withdrawal symptoms, depression, or other factors)
- Reinforce the need for, and encourage client to remain drug-free
- If client has not yet had treatment for substance abuse, reassess readiness
- Refer client to parenting classes before the infant is born
- Drug use is often associated with less stable and more isolated living situations. Encourage eligible clients to MSS or ICM services. Referrals for housing and community support are important for parenting success.
- Encourage prenatal decision making about family planning and implementation as early as possible postpartum.

Infant feeding choice

- Women who are otherwise drug-free but who continue to smoke, should be encouraged to breastfeed
- Women on methadone for opiate treatment can breastfeed
- Use of illegal drugs or alcohol is incompatible with breastfeeding
- Communicate with infant's primary care provider re: nutritional status

Care Coordination

The following providers may be included:

- MSS team case conferencing at minimum and based on client needs
    - MSS BHS mental health and coping skills
    - MSS CHN medical issues and health messages
    - If needed, under the direction of the MSS clinicians involved, the CHW may provide some health messages and help clients connect to resources
- Medical provider (referral is required)
- WIC
- Substance abuse treatment resources – even if client is not yet ready to reduce or abstain at present
- Infant's primary care provider

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."

Where do you think Kayla falls on the Stages of Change scale related to smoking cessation? For more information about Stages of Change, see First Steps tobacco and family planning training materials.

a. not ready to quit
b. thinking about quitting
c. preparing to quit
d. quitting
e. staying quit
f. relapse

It seems that Kayla has no intention of quitting. She may be uninformed about the dangers of tobacco or may be unprepared to deal with nicotine withdrawal symptoms.

The dietitian can provide information to Kayla. One example is: "As your provider, I need you to know that quitting smoking is the most important thing you can do to protect

the health of your unborn baby. If and when you are ready to cut down I can help you get started."

The dietitian should document this risk factor on Kayla's care plan, offer support, and provide additional client-centered information. This should be discussed during Kayla's case conference.

Case Example: Marie

Marie is a 25-year old woman who has abused alcohol. Referrals to appropriate treatment and counseling resources have been made.

The dietitian completes an assessment of Marie's nutritional status, and works with Marie to incorporate the following recommendations into a plan:

- appropriate rate of weight gain
- appropriate meal and snack pattern
- adequate macro- and micro-nutrient intake (multivitamin)
- access to food, including purchasing, storage, and preparation resources

References and Resources

References

American College of Obstetricians and Gynecologists (ACOG). ACOG Committee Opinion No. 422: At-risk drinking and illicit drug use: ethical issues in obstetric and gynecologic practice. Obstet Gynecol. 2008; 112(6): 1449-1460.

American College of Obstetricians and Gynecologists (ACOG) Practice Bulletin. Clinical management guidelines for obstetrician-gynecologists – Gestational diabetes. Obstetrics & Gynecology. 2001; 98(3): 525-538.

American College of Obstetricians and Gynecologists (ACOG). Guidelines for exercising during pregnancy. Online: http://www.acog.org/publications/patient_education/bp045.cfm. Accessed 07 July 2010.

American College of Obstetricians and Gynecologists (ACOG). Substance use: obstetric and gynecologic implications. ACOG: Committee Opinion: Special Issues in Women's Health, 2005.

American Diabetes Association. Gestational diabetes mellitus (Position Statement). Diabetes Care. 2004;27(Suppl 1):S88-S90.

American Diabetes Association. Nutrition recommendations and interventions for diabetes -2006. *Diabetes Care*. 2006; 29(9):2140-2157.

American Dietetic Association: Evidence Analysis Library. Hypertension Nutrition Evidence Analysis Project. Accessed 28 June 2010. http://www.adaevidencelibrary.com/topic.cfm?cat=1405.

American Dietetic Association. Evidence Analysis Library. Gestational Diabetes Evidence-Based Nutrition Practice Guideline. Accessed 28 June 2010. http://www.adaevidencelibrary.com/topic.cfm?format_tables=0&cat=3733&library=EBG

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. Online: http://www.eatright.org/About/Content.aspx?id=8376

Atallah AN, Hofmeyr GJ, Duley L. Calcium supplementation during pregnancy for preventing hypertensive disorders and related problems. Cochrane Database Syst Rev. 2002;1:CD001059.

August P, Sibai B. Clinical features, diagnosis, and long-term prognosis of preeclampsia. UpToDate version 14.1. 2005. Accessed 15 June 2006.

Barss VA, Repke JT. Patient Information: Preeclampsia. UpToDate version 14.1. 2005. Accessed 15 June 2006.

Duley L, Henderson-Smart D, Meher S. Altered dietary salt for preventing pre-eclampsia, and its complications (review). Cochrane Database of Systematic Reviews 2005, Issue 4. Art. No.: CD005548. DOI: 10.1002/14651858.CD005548.

Edwards LE, Hellerstedt WL, Alton IR, Sotry M, Himes JH. Pregnancy compliations and birth outcomes in obese and normal-weight women: effects of gestational weight change.Obstet Gynecol. 1996 ;87(3):389-94.

Franz MJ, et al. Evidence-based nutrition principles and recommendations for the treatment and prevention of diabetes and related complications. Diabetes Care. 2002;25(1):148-198.

Frederick IO, Williams MA, Dashow E, Kestin M, Zhang C, Leisenring WM. Dietary fiber, potassium, magnesium, and calcium in relation to the risk of preeclampsia. J Reprod Med. 2006;50(5):332-344.

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

Hickey CA. Sociocultural and behavioral influences on weight gain during pregnancy. Am J Clin Nutr. 2000;71(suppl):1364S-1370S.

Hickey CA, Cliver SP, Goldenberg RL, McNeal SF, Hoffman HJ. Low prenatal weight gain among low-income women: what are the risk factors? Birth. 1997;24(2): 102-108.

Hofmeyr GH. Atallah AN, Duley L. calcium supplementation during pregnancy for preventing hypertensive disorders and related problems. Cochrane Database of Systematic Reviews 2006, Issue 3. Art. No.: CD001059. DOI: 10.1002/14651858.CD001059.pub2.

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. Online at: http://www.iom.edu/CMS/3788/18257.aspx.

King JC. Maternal obesity, metabolism and pregnancy outcomes. Annu Rev Nutr. 2006;26:271-291.

Luke B, Hediger ML, Washington J. Prenatal nutrition. In: Samour PQ, King K, eds. Handbook of Pediatric Nutrition, 3rd ed. Sudbury MA: Jones and Bartlett Publishers. 2005.

Lusskin SI, Misri S. Eating disorders in pregnant women. UpToDate version 14.1. 2005. Accessed 15 June 2006.

Oregon Pediatric Nutrition Practice Group, Oregon Dietetic Association. Selecting and Concentrating Infant Formula: guidelines for healthcare professionals. 2005. Ordering information at: http://www.eatrightoregon.org/pnpg/resources.htm

Rumbold AR, Crowther CA, Haslam RR, Dekker GA, Robinson JS. Vitamins C and E and the risks of preeclampsia and perinatal complications. N Engl J Med 2006;354(17):1796-1806.

Shiono PH, Kebanoff MA, Nugent RP, et al. The impact of cocaine and marijuana use on low birth weight and preterm birth: a multicenter study. Am J Obstet Gynecol 1995;172(1 Pt 1): 19-27.

Stage E, Norgard H, Damm P, Mathiesen E. Long-term breast-feeding in women with type 1 diabetes. Diabetes Care. 2006; 29(4):771-774.

Wells CS, Schwalberg R, Noonan G, Gabor V. Factors influencing inadequate and excessive weight gain in pregnancy: Colorado, 2000-2002. Maternal and Child Health Journal. 2006;10(1):55-62.

Resources

Gestational Diabetes

It's Never Too Early to Prevent Diabetes
http://www.ndep.nih.gov

This website includes tip sheets in English and Spanish for children at risk for type 2 diabetes, and a booklet for adults to help women and their families make healthy food choices and be more physically active to help prevent or delay type 2 diabetes.

Gestational Diabetes and Low-Calorie Sweeteners: Answers to Common Questions
http://www.foodinsight.org/Resources/Detail.aspx?topic=Gestational_Diabetes_and_Low Calorie Sweeteners Answers to Common Questions.

This publication includes information about the use of artificial sweeteners during pregnancy.

Menu planning, including **MyFoodAdvisor** from the American Diabetes Association: http://www.diabetes.org/food-and-fitness/food/my-food-advisor/

Food Guide Pyramid with instruction on portion sizes (http://www.diabetes.org/food-and-fitness/food/planning-meals/diabetes-food-pyramid.html) The American Diabetes Association's Diabetes Food Pyramid groups foods based on carbohydrate and protein content.

Carbohydrate counting (http://www.diabetes.org/food-and-fitness/food/planning-meals/carb-counting/)

Substance Abuse

Washington State Department of Health Best Practice Guide

- http://here.doh.wa.gov/materials/smoking-cessation-during-pregnancy-guidelines-for-intervention/15_PregSmok_E09L.pdf

- http://here.doh.wa.gov/materials/substance-abuse-during-pregnancy-guidelines-for-screening/15_PregSubs_E09L.pdf

Pregnant Women Chemical Dependency/Abuse Information Resource Guide (note: this links to a pdf) - DSHS Division of Alcohol and Substance Abuse (DASA) http://www1.dshs.wa.gov/pdf/hrsa/dasa/PregnantWomenGuide.pdf

Guidelines for Screening for Substance Abuse During Pregnancy - Washington State Department of Health - website also includes other resources http://www.doh.wa.gov/cfh/mch/DrugAlcohScreen.htm

Fetal Alcohol Spectrum Disorders
For more information about Fetal Alcohol Spectrum Disorders, visit these websites:

- http://depts.washington.edu/fasdpn/
- http://depts.washington.edu/fasdwa/
- http://www.cdc.gov/ncbddd/fas/
- http://mchlibrary.info/guides/fasd.html

Drinking and Reproductive Health: A Fetal Alcohol Spectrum Disorders Prevention Tool Kit
This continuing education activity presents strategies to help health professionals identify women who drink and engage them in changing behavior to reduce their risk for an alcohol-exposed pregnancy. Other materials include handouts for patients, screening tools, and counseling tips. Ordering information (no cost) at: http://www.acog.org/from_home/misc/dept_pubs.cfm.

Quiz

1. Gestational diabetes is associated with increased risk of complications for the infant including:

a. hypertensive disorders
b. increased risk for type 1 diabetes
c. low birthweight, prematurity, and failure to thrive
d. macrosomia, neonatal hypoglycemia, and jaundice

2. Maternal risk factors for gestational diabetes include:

a. overweight and obesity
b. family history of diabetes
c. history of gestational diabetes
d. a and c only
e. all of the above

3. Medical management of gestational diabetes usually involves:

a. daily self-monitoring of blood glucose and medical nutrition therapy
b. daily self-monitoring of blood glucose and insulin
c. daily self-monitoring of blood glucose and oral glucose-lowering agents
d. medical nutrition therapy only

4. Post partum considerations for women with diabetes include all of the following, EXCEPT:

a. Family planning
b. Monitoring for hyperglycemia
c. Maintaining a healthy weight
d. Infant formula feeding, since breastfeeding is contraindicated

5. For most women, medical management of hypertension involves which of the following:

a. antihypertensive medications
b. early delivery
c. monitoring of blood pressure, renal and liver function, and of the fetus
d. supplemental sodium

6. A systolic blood pressure reading of >____ mm Hg before 20 weeks gestation indicates increased risk of preeclampsia.

a. 80
b. 100
c. 120
d. 140

7. Which of the following statements is correct:

a. Excessive dietary calcium intake may increase risk of hypertension during pregnancy.
b. Restriction of dietary sodium will prevent preeclampsia.
c. One study showed a link between a food pattern high in fiber, potassium, magnesium, and calcium and lower rates of preeclampsia.
d. Many studies indicate that supplementation with vitamins C and E will reduce the risk of preeclampsia

8. Obesity increases the risk of some pregnancy complications. The best outcomes are associated with maternal weight gain that is:

a. at the lower range of what is recommended
b. at the upper range of what is recommended
c. as low as possible
d. greater than 35 pounds

9. The goal of medical nutrition therapy for overweight and obesity is:

a. weight loss
b. weight maintenance
c. weight gain that allows for adequate fetal growth
d. weight gain of at least 40 pounds

10. Factors associated with low prenatal weight gain include all of the following EXCEPT:

a. underweight
b. obesity
c. unwanted pregnancy
d. smoking and alcohol use
e. low socioeconomic status

11. Medical nutrition therapy for underweight women should include which of the following:

a. recommendations for decreasing physical activity
b. use of an energy-dense supplement
c. assessment of intake
d. referral for an endocrine work-up

12. Because maternal-fetal nutritional status is a significant factor in moderating the impact of drug use on pregnancy outcome, diet assessment is important and should give special attention to which of the following:

a. food availability, access to food, and food purchasing, storage, and preparation resources
b. use of a prenatal vitamin supplement
c. possible effects of substances on appetite
d. all of the above

13. True or false: Women who are otherwise drug-free but who continue to smoke should be encouraged to breastfeed.

a. true
b. false