

# Nutrition Assessment of Pregnant Adolescents

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Pregnancy places adolescent females who, in general, are at risk for nutritional problems at even greater risk. Because of this, and the importance of nutrition in the course and outcome of pregnancy, all pregnant adolescents should have a formal assessment of their nutritional status at the beginning of their prenatal care, with ongoing surveillance throughout the pregnancy.

The purpose of the nutrition assessment is to:

- Evaluate the nutritional status of the pregnant adolescent.
- Identify those pregnant adolescents who are at nutritional risk.
- Formulate an individualized nutrition care plan with follow-up and referral, when appropriate.

Table 1 summarizes the process of nutrition assessment. This chapter will discuss the components of nutrition assessment, management and follow-up.

## COMPONENTS OF A NUTRITION ASSESSMENT

No single measure or test can give an accurate picture of a person's nutritional status. A complete nutrition assessment should include the following components:

- Relevant history: medical, obstetric, and psychosocial
- Dietary assessment
- Weight/height evaluation
- Laboratory testing

### Relevant History

The following information collected from the medical, obstetric, and psychosocial history will help identify nutritional risk factors and nutrition problems. Factors such as current living situation, economic status, and past or present emotional or medical difficulties may all impact the nutritional status of the adolescent. The following summarizes the most important variables in each area that need to be explored and documented.

### Medical History

The medical history will provide relevant information for nutrition assessment in pregnancy.

- Pre-existing conditions (such as PKU, cystic fibrosis, diabetes, cardiovascular or renal disease) or recurrent illnesses or infections. These require special nutrition guidance.
- History of chronic illness in the family, such as diabetes, hypertension, cardiovascular disease and alcoholism.

TABLE 1  
Nutrition Assessment of Pregnant Adolescents

	Dietary	Relevant History	Weight/Height	Laboratory
<b>Components of initial nutrition assessment</b>	Dietary practices and patterns	Medical	Body mass index	Hemoglobin
	Food resources and management	Obstetric	Weight gain pattern	Other indicated lab tests
		Psychosocial		
		Socioeconomic		
<b>Findings that warrant further evaluation or intervention</b>	Dietary inadequacy	Chronic diseases	Underweight/overweight before pregnancy	Anemia
	Inadequate food resources or management	Unfavorable reproductive history	Inadequate/excessive weight gain	Other abnormal lab values
	Vegan diets	Young maternal age		
	Pica	Substance use		
		Significant emotional stress		
		Poverty/homelessness		

Source: Story M, Alton I. Nutrition issues and adolescent pregnancy. *Nutr Today* 1995;30:142-151.

- Physical disabilities.
- Age at menarche (calculate gynecologic age: the difference between chronological age and the age at menarche).
- Past or present history of an eating disorder (anorexia nervosa or bulimia nervosa). These individuals are at risk for inadequate nutrient and calorie intakes and reluctance to gain weight (see Chapter 9).
- Current or past use of cigarettes, tobacco, drugs and alcohol. Substance use creates a special vulnerability to nutritional deficiencies and affects the health and growth of the fetus (see Chapter 13).
- Current use of prescription or over-the-counter medications, drugs or herbs, and weight control products. Ask the adolescent to provide the name, frequency of use, and dosage of all products or medications used.

- Previous nutritional deficiencies, such as iron deficiency anemia.
- Type and frequency of physical activity. Is the intensity and type of exercise appropriate during pregnancy? (See Chapter 12).

### Obstetric History

A poor reproductive history may be indicative of nutritional problems.

- Parity and outcomes: Adolescents with previous pregnancies can be at increased nutritional risk due to depletion of nutrient reserves.
- Length of time between pregnancies: Less than one year between pregnancies may lead to depletion of nutrient reserves.

- History of preterm delivery (before 37 completed weeks of gestation), low birth weight infants (less than 5-1/2 lbs) or higher birth weights: Low birth weights may suggest nutritional problems, whereas higher birth weights may indicate latent diabetes.
- Weight gain and patterns in previous pregnancies: The amount and pattern of weight gain in previous pregnancies will help identify high-risk women.
- Prolonged nausea or vomiting in present or past pregnancies: Its persistence may lead to nutritional depletion.
- Presence of gestational diabetes, pregnancy-induced hypertension, or anemia in past or present pregnancies: Special nutrition guidance is needed for these cases.
- Previous use of steroid contraceptives: They may lower vitamin stores (folate, vitamins B<sub>6</sub>, B<sub>12</sub> and C).
- Breastfeeding experience with previous infants or intentions for breastfeeding with current pregnancy.
- Emotional health: Feelings of loneliness or depression can cause lack of appetite or overeating.
- Feelings about pregnancy: Such as acceptance, denial, commitment, and motivation. Denial may impact weight gain.
- Enrollment in school or employment: Does her schedule allow regular meals/snacks?
- Education and cognitive level: Tailor nutrition education and counseling to the appropriate level (see Chapters 15 and 18).

## DIETARY ASSESSMENT

An essential component to nutrition assessment is dietary assessment, which includes nutrition history, dietary intake, and nutrient analysis of the diet.

### Nutrition History

#### Food Management and Resources

### Psychosocial History

Emotional, social or economic stresses during pregnancy may interfere with an adequate diet.

- Economic status: A low income may mean limited money for food. Primary sources of calories may be from inexpensive low-protein, high-carbohydrate or high-fat foods.
- Living situation: Is she living alone, with family or friends? In a large household? In a chaotic environment? Is she homeless? These factors may increase her risk of an inadequate diet.
- Utilization of prenatal care: Regular prenatal medical visits are essential to a healthy pregnancy.
- Family structure: Number in household, intactness of the family, relationships between the adolescent and other family members. Assess family support. In dysfunctional or unsupportive families there may not be a “healthy” nutritional environment.
- Peer relations: Assess the relationships with and support from friends. Isolated teens are at increased risk for inadequate diet.
- Relationship with the baby’s father: What is the extent of his involvement and influence on decision-making?
- Food resources: Food availability and budget. How much is usually spent each week/month on food (both groceries and eating out)? How large is the household? Does the family ever run out of food before there is money to buy more? Ask, “During the last month, were there any days when you didn’t have enough food to eat or money to buy food?”
- Food assistance programs: Do they receive food stamps, food commodities, free or reduced school lunch? Are they enrolled in the WIC program (Supplemental Food Program for Women, Infants, Children)? Do they utilize emergency food pantries?
- Food purchasing: Who does the shopping? How often? Where?
- Cooking facilities: Do they have a refrigerator, stove, oven, microwave, freezer, hot plate? Are they in working order? Do they have running water?
- Food preparation: Who cooks? How often? Does the adolescent have basic cooking skills? What types of food does she know how to prepare?
- Eating away from home: How often? With whom? Where? Type of food purchased? If she is enrolled in school, does she eat school breakfast or lunch?

## Dietary Practices and Patterns

- **Appetite:** Note appetite prior to pregnancy and changes during pregnancy.
- **Usual eating and meal patterns:** Check eating regularity, with whom, and where. How often does she skip meals? Ask her to describe a typical day, including every time she eats or drinks. Meals eaten on weekdays and weekend days may vary tremendously. Is she eating any differently now that she is pregnant? Ask about changes made.
- **Usual snack patterns:** Frequency, amounts, and typical snacks eaten. Remember, adolescents may snack more than eat meals.
- **Food allergies or intolerances:** Milk intolerance and food allergies need to be considered.
- **Cultural/ethnic or religious practices:** Ask about types of foods, preparation methods, taboos or food avoidances. Check beliefs regarding what one should or should not eat during pregnancy (see Chapter 17).
- **Food preferences and dislikes:** Ask about her favorite and least favorite foods. Are there any food cravings or aversions while pregnant?
- **Dieting practices:** Frequency of dieting and methods used to lose weight. Frequent dieting may be indicative of low nutrient reserves.
- **Binge eating episodes:** Does she eat large amounts of food in a short period of time? Does she ever feel that she cannot stop eating even when she feels full?
- **Purging methods:** Does she ever self-induce vomiting, use laxatives, diuretics or excessive exercise to control her weight?
- **Unusual food patterns, eating of non-food substances (pica).** (See Chapter 10).
- **Vitamin, mineral or other dietary supplements, including herbs and teas:** Frequency of use, type, and dosage should be assessed.
- **Special dietary problems of pregnancy:** Nausea, vomiting, heartburn, and constipation.
- **Attitudes about eating and weight gain during pregnancy:** Self-administered questionnaires for nutrition history can be filled out by the adolescent in the clinic waiting area. However, self-administered questionnaires must be used with caution in low

income and low education populations who may not have the necessary reading or language skills (see Figure 1 in Chapter 18).

## Assessing Dietary Intake

The purpose of assessing the dietary intake is to evaluate the nutritional quality of the diet. Information on food intake can be obtained by a number of methods including: 1) 24-hour food recall; 2) food frequency questionnaire; 3) food record; and 4) diet history. The method chosen depends on the specificity desired, the training of the personnel, the time available, and the cooperation of the adolescent. Table 2 provides guidance for choosing an appropriate dietary assessment method.

TABLE 2

### Choosing the Approach for Dietary Assessment

Consider the following questions when deciding on the appropriate dietary assessment method:

- **What is my objective in collecting the information?** (e.g., to determine if energy intake is adequate, to determine overall quality of the diet, to determine calcium intake, etc.)
- **How will I use the information?**  
Decide how accurate and detailed the food intake information needs to be. Avoid collecting information you will not use.
- **What is the standard to which the information collected should be compared—a predetermined number of servings of foods from various food groups or a nutrient standard such as the Dietary Reference Intakes?**  
Often it is sufficient to discuss food use rather than intake of nutrients. Nutrients are important in the management of certain chronic diseases.
- **What resources do I have for collecting, analyzing, and interpreting dietary data?**  
Dietitians can provide detailed diet assessments and interpret dietary analysis programs.

Adapted from: Institute of Medicine. Nutrition during pregnancy and lactation: an implementation guide. Committee on Nutritional Status During Pregnancy and Lactation, Food and Nutrition Board. Washington, DC, National Academy Press, 1992.

## 24-Hour Recall

This method involves recording all foods and beverages consumed within the past 24 hours. While this method provides quantitative information on food intake, a major limitation is that it may not be representative of a typical day for an adolescent. This is especially true for adolescents since their diets are generally not consistent on a day-to-day basis. A single 24-hour recall should never be used as the sole basis for evaluating dietary adequacy. Ascertain whether the intake on the day reported is typical. A recall is a useful nutrition education tool when reviewing the intake data with the adolescent and comparing it to the Food Guide Pyramid (see Appendix B). This is especially useful for concrete thinking adolescents or the very young adolescent.

### Guidelines for Conducting a 24-hour Recall

- Adolescents generally dislike dietary recalls. “It’s too hard to remember.” Keep in mind that unstructured eating patterns make remembering difficult. It is critical to point out the importance of knowing this information. Some adolescents may respond better if it is presented as a challenge, “Let’s see how good your memory is.”
- An example of how to initiate the recall process is: “I would like to know what you’ve eaten within the past 24 hours. Could you please tell me everything that you ate or drank, including meals, snacks, beverages, candy and alcohol? Why don’t you start with the last thing you had to eat or drink today and we’ll work backwards.” (See Appendix C1.) Remembering what was eaten can be difficult. Always allow time for contemplation.
- Discussing daily routines may jog the memory and improve the accuracy of the information obtained. For example, “Did you eat or drink anything between classes? After school, did you have anything to eat or drink? Did you eat before you went to bed last night?”
- Alternate between open-ended questions, “What was the first thing you had to eat today?” and direct questions like “How much?” “How was it prepared?” “Did you finish it?”
- Avoid asking leading questions such as “How much milk did you have to drink?” This suggests to the adolescent that she should have reported drinking milk

and could lead to over-reporting of some foods or reporting foods/beverages not consumed.

- To improve memory, use situational cues: “What did you do yesterday afternoon?” “Who were you with?”
- To obtain a detailed and accurate assessment of dietary intake, specific information is needed for amounts and types of food eaten. Food models or props should be used to help the adolescent indicate quantities more accurately. Props include a teaspoon and tablespoon; several sizes of glasses and bowls; and something to indicate thickness of food, such as a ruler. Actual food containers may improve the food recall of individuals with poor literacy skills or English as a second language.
- To improve accuracy, prepare a list of foods commonly consumed by adolescents and, at the end of the recall, ask if they ate any of the foods on the list in the last 24 hours.
- After completing the 24-hour recall, it is important to ask the adolescent if it was a typical intake and, if not, how it was different from usual intake.

### Food Frequency Questionnaire

This method involves asking an adolescent how often she eats the foods on a list over a specified period. This type of questionnaire helps to evaluate the “core” diet and what modifications are needed. Appendix C2 shows an example of a food frequency form. It can be helpful when used in combination with a food record or 24-hour recall. An example of a food frequency questionnaire that has been adapted for use with low literacy populations is shown in Chapter 18.

One method that can be used with adolescents with low literacy skills or English as a second language is a picture sort method of food frequency. Individuals are asked to sort a series of pictures by whether or not they have eaten that food item in a specified period of time. They are then asked to sort the pile of “eaten food items” by frequency of consumption (highest frequency to lowest frequency). Individuals can then be assessed for frequency of consumption of the most commonly eaten foods. It is important to use pictures of culturally appropriate foods that are commonly consumed by adolescents when using this method to ensure accuracy of results.

TABLE 3  
**Strengths and Limitations of Various Dietary Assessment Methods  
 Used in Clinical Settings**

	<b>Strengths</b>	<b>Limitations</b>	<b>Applications</b>
<b>24-Hour Recall</b>	<p>Does not require literacy</p> <p>Relatively low respondent burden</p> <p>Data may be directly entered into a dietary analysis program</p> <p>May be conducted in-person or over the telephone</p>	<p>Dependent on respondent's memory</p> <p>Relies on self-reported information</p> <p>Requires skilled staff</p> <p>Time consuming</p> <p>Single recall does not represent usual intake</p>	<p>Appropriate for most people as it does not require literacy</p> <p>Useful for the assessment of intake of a variety of nutrients and assessment of meal patterning and food group intake</p> <p>Useful counseling tool</p>
<b>Food Frequency</b>	<p>Quick, easy and affordable</p> <p>May assess current as well as past diet</p> <p>In a clinical setting, may be useful as a screening tool</p>	<p>Does not provide valid estimates of absolute intake of individuals</p> <p>Can't assess meal patterning</p> <p>May not be appropriate for some population groups</p>	<p>Does not provide valid estimates of absolute intake for individuals, thus of limited usefulness in clinical settings</p> <p>May be useful as a screening tool, however, further development research is needed</p>
<b>Food Record</b>	<p>Does not rely on memory</p> <p>Food portions may be measured at the time of consumption</p> <p>Multiple days of records provide valid measure of intake for most nutrients</p>	<p>Recording foods eaten may influence what is eaten</p> <p>Requires literacy</p> <p>Relies on self-reported information</p> <p>Requires skilled staff</p> <p>Time consuming</p>	<p>Appropriate for literate and motivated population groups</p> <p>Useful for the assessment of intake of a variety of nutrients and assessment of meal patterning and food group intake</p> <p>Useful counseling tool</p>
<b>Diet History</b>	<p>Able to assess usual intake in a single interview</p> <p>Appropriate for most people</p>	<p>Relies on memory</p> <p>Time consuming (1 to 1-1/2 hours)</p> <p>Requires skilled interviewer</p>	<p>Appropriate for most people as it does not require literacy</p> <p>Useful for assessing intake of nutrients, meal patterning and food group intake</p> <p>Useful counseling tool</p>

Source: Lisa Harnack, DrPh, RD, Division of Epidemiology, University of Minnesota

## Food Record

This method is also known as a food diary; individuals are asked to write down all the foods and beverages consumed for a specific period (usually 1, 3, or 7 days). Since recording food intake may lead to changes in eating behavior, it should be reinforced that eating practices should not change during the record keeping. This method is not recommended for the initial dietary assessment, as compliance is low. It is, however, a valuable technique to use in counseling situations for nutrition problems, such as inadequate or excessive weight gain. An example of a form for adolescents to record their food intake is given in Appendix C3.

## Diet History

There is no single approach that is widely accepted in conducting a diet history. The client is generally asked what she usually eats for each meal and between meals, how much and how often items listed are eaten. Traditionally the diet history was in-depth and required a highly trained nutritionist to determine a picture of the usual total diet. This approach may be unrealistic in general practice, but may be useful in high-risk pregnancies.

Table 3 lists strengths and limitations of the various methods previously described.

## Guidelines for Collecting Dietary Intake Data

- Good interviewing skills are the basis for acquiring accurate information (see Chapter 15).
  - Establish a comfortable atmosphere and show a sensitive, caring and respectful attitude. Keep good eye contact and a conversational tone.
  - Using at least two approaches for evaluating dietary intake increases the accuracy of the data. The two methods most commonly used together are the 24-hour recall and the food frequency questionnaire.
  - The purpose and need for gathering dietary information should be explained to the adolescent at the start of the interview.
  - Be nonjudgmental and noncritical of the foods eaten. Adolescents often feel sensitive about their diets, especially if they feel they aren't eating the right foods. If they perceive criticism, they may not give honest and accurate information.
  - Avoid interjecting positive or negative evaluative comments during the assessment. For example, a comment such as, "That's great! You drank four glasses of milk yesterday" may give the message that she can elicit praise by saying the right things. Critical comments such as "You mean you really ate three candy bars yesterday?" may cause her to avoid telling the truth. Save comments until the end of the assessment.
  - Keep in mind that adolescents' eating habits and lifestyle may not conform to your own values. Adolescents can receive proper nutrition from a variety of diet patterns.
  - Avoid using the word "diet" with an adolescent, as it is often associated with weight loss and may be confusing to her.
  - The wording of a question is critical. Avoid questions that suggest the correct answers (leading questions) such as "Did you have a dark green vegetable today?" or "How much milk did you drink today?"
  - Use three-dimensional food models, cardboard food models, or food portion visuals to help estimate quantities of foods eaten. How a serving size is defined will vary among teens. For example, when a teen says she drank a cup of milk, the glass (cup) size may be 16 oz.
- An easy way to have teenagers learn food serving sizes and estimate food portions is the following:<sup>1</sup>
- 3 oz of meat is about the size and thickness of a deck of playing cards or an audiotape cassette.
  - A medium apple or peach is about the size of a tennis ball.
  - 1 oz of cheese is about the size of 4 stacked dice.
  - 1/2 cup of ice cream is about the size of a tennis ball.
  - 1 cup of mashed potatoes or broccoli is about the size of your fist.
  - 1 teaspoon of butter or peanut butter is about the size of the tip of your thumb.
  - 1 oz of nuts or small candies fits into the palm of your hand.

TABLE 4  
**Food Intake Evaluation for Pregnant Teenagers**

Areas to be Evaluated	Significance
Variety of foods eaten	A varied diet is most likely to provide the 40-plus nutrients needed for good health. A variety of foods should be eaten from each of the major food groups in the Food Guide Pyramid.
Number of servings eaten from each food group	Low intakes from a food group indicate a cross-check to determine type, quantity, and frequency of food intake. Less than 4 servings of milk products may mean insufficient calcium intake. Less than 3 servings of meat or meat alternates may mean insufficient protein and iron intake. Less than 5 servings of fruit and vegetables may mean insufficient vitamin A and vitamin C intake. Less than 6 servings of grain products may mean insufficient intakes of some vitamins/minerals.
Time between meals and snacks	Long lapses may indicate inadequate food resources, possible substance abuse, or dieting. They also may be due to forgetting during the recall. Too short a time lapse may reflect excessive snacking or emotional eating.
Adolescent's definition of a serving	What a teen believes is a serving may or may not match the "standard" serving size from the Food Guide Pyramid.
Quantity and frequency of consumption of high sugar and high fat foods	Too many high fat or high sugar may indicate inadequate intake of nutrient-dense foods or excess consumption of calories.
Beverages consumed (both with and between meals)	Beverages can greatly impact a teen's nutrient intake. Some beverages (milk, juice) contribute to nutritional needs while others such as soda or sweetened drinks provide mostly calories.
Reliance on fast foods	Frequent consumption of fast foods could lead to a diet low in fiber, vitamins and minerals, and high in sodium and calories. Heavy reliance on these foods may indicate a lack of interest in or knowledge of cooking.

Adapted from Mahan LK, Rosebrough RH. Nutritional requirements and nutritional status assessment in adolescence. In: Mahan LK, Rees J.M, eds. Nutrition in adolescence. St. Louis: Times Mirror/Mosby, 1984.

- If you want a teenager to write down her past 24-hour food intake or keep a food diary, be sure to tell her that you don't care what her writing looks like or if there are misspellings. Some teenagers may be reluctant to record their food intake because of embarrassment about spelling mistakes or poor penmanship. Electronic methods such as tape recorders can be used to verbally report information for those who do not feel comfortable keeping written food records.

### Evaluating Dietary Data

Dietary data should be evaluated for nutritional adequacy and used to guide nutrition counseling. Various approaches can be used for evaluation.

- Qualitatively, the diet of a pregnant adolescent can be quickly assessed for general adequacy using the Food Guide Pyramid. Table 4 provides a food intake evaluation guide which emphasizes potential areas of concern.

- The adequacy of the food pattern should be reviewed with the adolescent, comparing her food intake to the Food Guide Pyramid. A nutrition evaluation sheet for use with the pregnant adolescent is shown in Appendix C4.
- For those with suspected dietary inadequacies or excesses, dietary information can be translated into nutritional data and then compared to the Recommended Dietary Allowances or Dietary Reference Intakes (see Chapter 4). Numerous computer programs, some of which are client-operated, are currently available for these purposes.

## HEIGHT/WEIGHT EVALUATION

A weight history, height and serial weight measures are essential in assessing nutritional status and risk during pregnancy. Weight should be measured at every prenatal visit. Prepregnancy body mass index (BMI) based on age can be used to classify weight status (prior to pregnancy) to determine target weight gain.

### Weight History

Weight history should be collected from every pregnant adolescent at her initial visit. The following information is necessary for a prenatal weight history:

- Height
- Current weight
- Prepregnancy weight: Was she over- or underweight? Did she lose a significant amount of weight before pregnancy? What is her perception of her weight? If she is uncertain of prepregnancy weight, try asking: “What did you weigh at your last period?” or “Have you noticed a change in how well your clothes fit?”
- Pattern and amount of weight gain during current pregnancy: Has there been any weight loss during the pregnancy? Is the weight gain above or below target range?
- Weight gain in past pregnancies: Inquire about the amount of weight lost after pregnancy.
- Feelings about gaining weight during pregnancy: How much does she think she should gain? Also,

inquire about the advice others have given her on weight gain, including friends and the baby’s father.

- Physical activity patterns prior to and during pregnancy, including type and frequency of activity.

## Measurements

### Height

Measure height before pregnancy or as early in the pregnancy as possible to reduce errors caused by changes in posture.<sup>2</sup> Height is most accurately measured with a stadiometer. The adolescent stands, shoes removed, on a stationary flat surface with measuring tape attached. An attached, movable block, squared at right angles against the vertical flat surface, is brought down to the crown of the female’s head to read the height. Using a rod attached to a scale is a less accurate method of taking height and should be avoided.

### Weight

Weigh adolescents on a platform beam balance scale with movable weights or on a high-quality electronic scale that is graduated to the nearest 0.25 lb (100 g), and use the same scale each time.<sup>2</sup> Scales should be calibrated every three months. Weight measures should be taken with light indoor clothes with shoes and purse removed. Remember that the person measuring the weight should be nonjudgmental regarding weight and weight change.

### Prepregnancy Weight-for-Height Assessment.

The total amount of weight gain recommended for pregnant adolescents depends largely on their weight status before pregnancy. Most epidemiological studies suggest that use of recalled prepregnancy weight introduces recall bias and may not be accurate.<sup>3</sup> However, in a study of adolescents, recalled prepregnancy weight correlated closely with measured weight.<sup>4</sup>

The Institute of Medicine<sup>2</sup> recommends the use of body mass index (BMI) for assessment of prepregnant weight status. BMI is weight (kg)/height<sup>2</sup> (m<sup>2</sup>). For pregnant adults the reference standards are based on the Metropolitan Life Insurance tables of desirable body

weight-for-height. The percentage of desirable weight-for-height is converted to BMI and the cut-off values that distinguish underweight and overweight from normal weight correspond to approximately 90% and 120% of the Metropolitan Life tables.<sup>2</sup> Since these are adult values they may not be appropriate for adolescents.

The following recommendations for BMI values for adolescents have been made using national reference data (Table 5).<sup>3,5</sup> A table that converts height and weight measures to corresponding BMI values is found in Appendix F.

TABLE 5  
BMI Indicators of Weight Status  
for Adolescent Females

Weight Status	BMI Cut-Off Values
Thinness	< 5th percentile for age
At Risk for Overweight	≥ 85th but < 95th percentile for age
Overweight	≥ 95th percentile for age

TABLE 6  
BMI Values for Adolescent Females

Age (yr)	Thinness (BMI)	At Risk for Overweight (BMI)	Overweight (BMI)
11	< 15	> 21	> 25
12	< 15	> 22	> 26
13	< 15	> 23	> 27
14	< 16	> 24	> 28
15	< 16	> 24	> 29
16	< 16	> 25	> 29
17	< 17	> 25	> 30
18	< 17	> 26	> 30
19	< 17	> 26	> 30

Sources: Himes JH, Dietz WH. Guidelines for overweight in adolescent preventive services: recommendations from an expert committee. *Am J Clin Nutr* 1994;59: 307-316; and WHO Expert Committee on Physical Status, The use and interpretation of anthropometry. WHO technical report series: 854. Geneva, Switzerland. 1995, p. 445.

Table 6 provides the age-specific BMI cut-off values used to define thinness, at risk for overweight and overweight, for adolescent girls. Recommended total weight gain ranges for pregnant adolescents based on prepregnancy weight status are found in Chapter 9.

### Skinfold Thicknesses

Skinfold measurements are an indirect measure of body fatness and energy storage, and consist of measuring a double layer of skin and subcutaneous fat with calipers at specified body sites. Monitoring of skinfolds during pregnancy may have potential usefulness in predicting high-risk adolescent pregnancies.<sup>6</sup> However, at this time, little is known about body fat patterns during pregnancy.

In pregnancy, it cannot be assumed that the relationship between skinfolds and total body fat described for nonpregnant women also applies. Relocation of existing fat stores from central to peripheral sites may occur during pregnancy to facilitate accommodation of the fetus in the abdominal cavity (see Chapter 4). Thus, increased skinfold thickness on the arms, on the legs, or even on the back may not reflect an increase in the total body fat of a pregnant woman.<sup>3</sup> Further, normative or reference data for pregnant women, including adolescents, have not been reported.<sup>3</sup> For these reasons, skinfold measures are not recommended as a routine clinical tool during pregnancy.

## LABORATORY EVALUATION

Although laboratory methods can provide objective and precise data regarding nutritional status, the interpretation of this data is limited for the following reasons:

- Lack of established norms for pregnant adult women and adolescents for some laboratory tests.
- Due to physiologic changes, such as blood volume expansion, blood levels of nutrients change during pregnancy. Some decrease (glucose, total protein, and water-soluble vitamins) and some increase (lipids, fat-soluble vitamins, and some amino acids).
- The need for more knowledge about roles of particular nutrients in pregnant and nonpregnant states.

TABLE 7  
Warning Signs of Nutrition Problems in Pregnant Adolescents

Medical/Obstetric Factors	Nutrition/Dietary Factors	Psychosocial Factors
Adolescent < 16 years or gynecological age < 2*	Inadequate refrigeration or cooling facilities	Inadequate income
A previous pregnancy	Lack of transportation or accessibility to grocery store	Living alone or in an unstable family or other environment
Closely spaced pregnancy	Cultural or religious dietary restrictions	Little family, partner or peer support
History of poor obstetric or fetal performance	Frequent eating away from home	Denial or failure to accept the pregnancy
Chronic systemic disease	Frequent snacking on low nutrient dense foods	Significant emotional stress or depression
Past or present eating disorder: anorexia nervosa or bulimia nervosa	Poor appetite	
Underweight or overweight prior to pregnancy	Limited, monotonous or highly processed diet	
Inadequate weight gain during pregnancy	Irregular meal patterns (skipping meals)	
Excessive weight gain during pregnancy	History of frequent dieting	
Persistent nausea or vomiting during pregnancy	Exclusion of a major food group(s)	
Iron deficiency anemia or other nutritional deficiencies	Binge eating episodes	
Severe infections	Eating of non-food substances (pica)	
Heavy smoker	Nontraditional dietary pattern (i.e., strict vegetarianism)	
Alcohol or drug use	Overuse of nutritional supplements	
	Heavy caffeine intake	

\* gynecological age = chronological age – age at menarche

TABLE 8  
**Protocol for Assessment and Management of Normal Teenage Pregnancy**

### Initial Evaluation (if possible)

Review clinical data/medical record

Height and weight

- Gynecological age
- Physical signs of health
- Expected delivery date

Review laboratory data

- Hematocrit or Hemoglobin
- Urinalysis

Collect dietary intake data using best suited methodology

Ask follow-up questions on eating behaviors, food use, discomforts, weight status

Begin to build relationship with client

Assess attitude about, and acceptance of, prepregnancy weight and weight gain during pregnancy

Assess client's perspective of nutrition issues

Assist with referrals for improved food access if necessary

Inquire about nausea and vomiting and suggest possible remedies

Discuss need for folate, iron and other supplemental vitamins and minerals as appropriate

Identify priorities and create a nutrition plan, focusing on concerns identified

Discuss recommended diet for pregnancy

Discuss usual weight gain patterns and weight gain recommendations

Assess client's willingness to make dietary changes

Come to agreement with client about any initial changes and steps to take; have client state plan as she perceives it

### Second and Subsequent Visits

Review current weight and laboratory results

- Anemia
- Glucose screen at 24-28 weeks

Ask about behavior changes in response to nutrition advice from last visit

Ask about additional nutrition-related problems or concerns

Inquire about previous referrals to other agencies

Discuss weight gain; involve the client in plotting her own weight

Reinforce healthful practices and progress on specific behavior changes

Identify continuing or new nutritional problems or concerns

Assess infant feeding plans if client will parent the infant, and promote breastfeeding, yet support the client regardless of her feeding method choice

Identify priorities and create nutrition plan, focusing on concerns identified

Ask client to state the plan as she perceives it

### Postpartum Visits

Help client understand safe methods of managing weight following delivery

Review infant feeding practices and infant growth; provide assistance for any problems

Remind her of the importance of healthy eating throughout life

Discourage use of harmful substances

Despite these limitations, laboratory data can provide important baseline information for nutritional assessment at the beginning of and throughout pregnancy.<sup>7</sup> Laboratory tests done on pregnant adolescents cannot be measured against nonpregnant standards.

### Laboratory Indices

The following laboratory indices are particularly relevant in assessing the nutritional status of pregnant adolescents:

- Hemoglobin and hematocrit: The most common nutritional complication of pregnancy is anemia. Routine laboratory tests for anemia include hemoglobin or hematocrit. Serum ferritin can be used to estimate iron reserves. It can also be used to confirm that anemia is due to iron deficiency versus a deficiency in other nutrients. Chapter 10, Table 1 provides the laboratory values indicative of anemia in pregnancy.
- Glucose screen: A fasting 50-g, 1 hour post-glucose challenge test between 24 and 28 weeks of gestation is usually recommended to screen for gestational diabetes mellitus. Chapter 10 provides further information for laboratory screening of gestational diabetes mellitus.
- Urinary ketones: The presence of ketones in the urine should be assessed in adolescents with weight loss.

## EVALUATION AND MANAGEMENT

Once the nutrition assessment has been completed (see Appendix C5), nutrition risk factors and the identification of overt or potential nutrition problems should be evident. For review, warning signs of nutrition problems in pregnant adolescents are listed in Table 7.

All pregnant adolescents need nutrition education and individualized guidance. Figure 1 shows basic nutrition guidelines that should be followed with all adolescents regardless of their nutritional risk. It also delineates broad principles for working with adolescents with nutritional problems, inadequate food resources, or those with sound dietary practices.

In an effort to synthesize the various parts of the assessment and management processes, Table 8 depicts an example of an overall protocol for nutrition assessment and management of pregnant adolescents.

### MOTIVATIONAL INTERVIEWING: AN APPROACH TO WORKING WITH PREGNANT ADOLESCENTS

Motivational interviewing is a method that is used to help people improve their willingness and ability to make behavior changes. Developed by Miller and Rollnick,<sup>8</sup> motivational interviewing can be a beneficial tool for use with adolescents.<sup>9, 10</sup>

Berg-Smith and colleagues<sup>10</sup> have developed a motivational intervention model for use with adolescents in an effort to increase motivation to make dietary changes. An adaptation of their model, to be used with pregnant adolescents, is listed in Figure 2. A description of this adapted model and a brief discussion of each of the steps are listed below.

The purpose of the motivational intervention model (Figure 2A) is to assess the “readiness” of pregnant adolescents to make dietary changes. A second objective of this model is to help the counselor identify and adapt intervention strategies based on the adolescent’s interest in making dietary changes.

### Intervention Steps

#### Establish a Relationship

- The counselor starts by asking how the adolescent is feeling. Use open-ended questions about her health and any concerns she may have.

#### Set the Agenda

- The counselor lets the adolescent know how long the appointment will take.
- The counselor makes suggestions about what will occur during the appointment, including any measurements or data that will be collected. If height and weight measurements will be taken or a dietary recall will be administered the counselor lets the adolescent know this at this time.

FIGURE 1  
**General Guidelines for Nutrition Education and Counseling of Pregnant Adolescents**

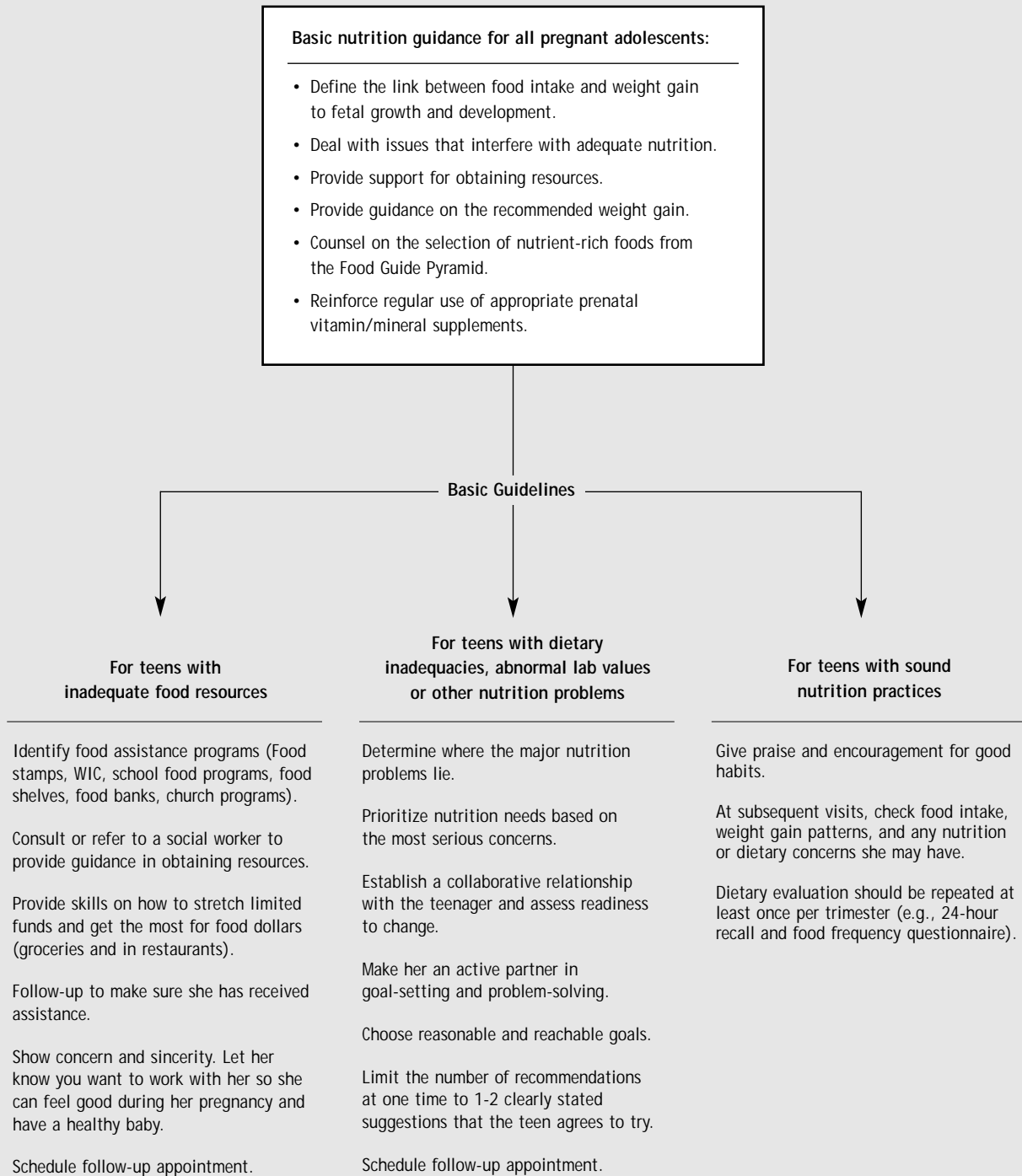
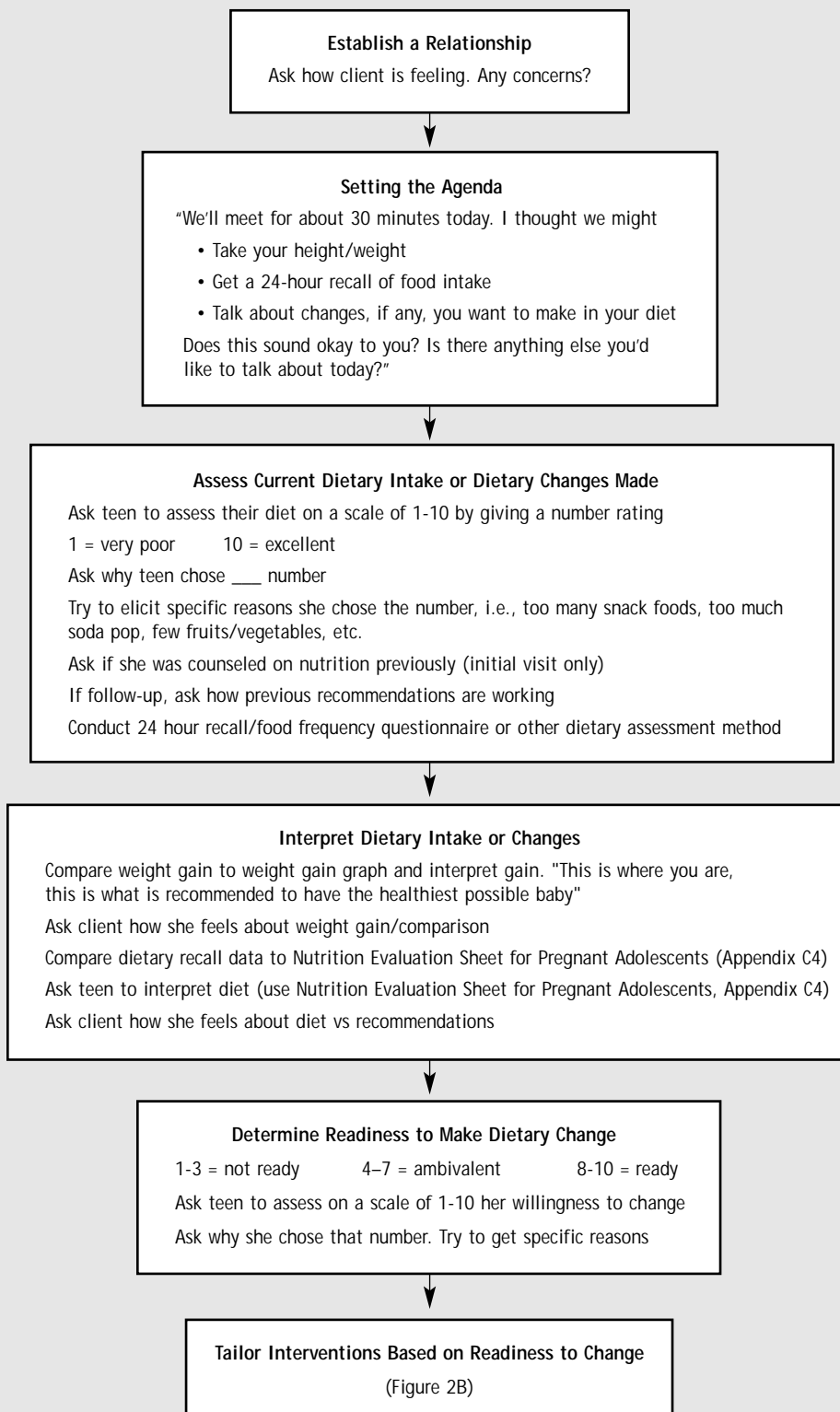


FIGURE 2A  
**Example of a Motivational Intervention for Adolescent Pregnancy**



- Next the counselor asks the adolescent if she would like to discuss any other topics or if there are other activities she would like to include during the appointment.

### **Assess Current Dietary Intake or Dietary Changes Made**

- This step involves the assessment of how the adolescent feels about her current food intake and eating patterns. The counselor asks the teen to rate her current eating habits on a scale of 1-10 with 1 meaning poor and 10 meaning excellent. This is noted in the medical chart.
- The adolescent is asked why she chose the number that she did. Open-ended questions about specific reasons for her choice should be used to gather information. Prompts can be used when necessary. Chapters 6 and 7 may be useful in determining some of the common concerns and thoughts that pregnant adolescents have about their eating.
- The counselor asks if the teen has received any nutrition counseling prior to this visit (initial visit only). If this visit is a follow-up appointment, the counselor asks about previous recommendations and whether they were useful. Open-ended questions are used to determine what difficulties or barriers were encountered when trying to make recommended dietary changes.
- The counselor assesses dietary intake using a 24-hour recall, food frequency or other methods as appropriate. Height and weight measurements are also taken during this step.

### **Interpret Dietary Intake or Changes**

- The counselor plots the adolescent's weight and compares her weight gain to recommended weight gain using a weight gain chart. This information is interpreted by saying, "This is where you are on the weight gain chart. This is what is recommended at this stage of pregnancy to ensure that you have a healthy baby."
- Open-ended questions are used to assess how the adolescent interprets her rate of weight gain compared to the recommended gain and how she feels about her current weight.

- A similar pattern is followed for dietary intake information. Using the Nutrition Evaluation Sheet for Pregnant Teens (Appendix C4), the dietary intake of the teen is compared to that recommended during pregnancy.
- The teen is asked to look at the data and interpret how her diet compares to the dietary recommendations. She is also asked how she might improve her dietary intake.

### **Determine Readiness to Make Dietary Change**

- The adolescent is now asked to rate her willingness to make dietary changes on a scale of 1-10. The numbers 1-3 are interpreted to mean that she is not ready to make changes. A score of 4-7 is interpreted as ambivalent about making changes, while a score of 8-10 signals that she is ready to make changes.
- The teen is asked why she chose the number she did.
- Open-ended questions are used to gather information about why she is/isn't ready to make changes. Chapters 6 and 7 may provide insight about what barriers teens perceive to interfere with eating a healthy diet.
- Interventions are then tailored to the level of change the adolescent reports (Figure 2B).<sup>8-10</sup>

### **Tailoring Interventions**

#### **Not Ready to Make Dietary Change**

- In this case, the counselor helps to increase the knowledge of the adolescent about the importance of nutrition during pregnancy and provides motivation for making dietary changes.
- The adolescent is asked what she would need to have or know in order to increase her ability to make dietary changes. Open-ended questions are asked and prompts are used when necessary.
- The counselor asks if there is anything they can do to assist the teen in making dietary changes.
- A respectful tone is used, letting the adolescent know that she is accepted even if she is not ready to make dietary changes at this time.

FIGURE 2B  
Tailored Intervention Stages

### Stage 1. Teen is Not Ready to Make Dietary Change

Practitioner Goal: To increase teen's knowledge of need for prenatal nutrition and to educate/motivate

- Ask teen what skills she would need to make her willing to change her diet
- Ask teen how you could help her become ready to change
- Reinforce she is respected even if she chooses not make changes
- Offer advice such as "I would recommend you increase your vegetable intake. However it's your choice. If you decide at some time that you might want to eat more vegetables, then I will be glad to help you. In the meantime, may I call you periodically just to see how you're doing?"
- Ask open ended questions
- Offer advice (with permission) and emphasize choice and personal responsibility

### Stage 2. Teen is Ambivalent About Dietary Change

Practitioner Goal: To motivate and empower teen and to understand factors related to ambivalence

- Explore hesitancy. Ask what she likes/dislikes about current diet or have her list pros/cons of making dietary change
- Ask about "good eating" habits or pros of making change first to set positive tone. Then ask cons or bad habits
- Then ask what she feels the next step should be
- Offer to maintain contact periodically to check on her progress

### Stage 3. Teen is Ready to Make Dietary Change

Practitioner Goal: To help teen develop a plan and to define and negotiate specific strategies

- Ask client what she thinks needs to be changed
- Ask for specific ideas/methods
- Help set small, realistic goals for 1-2 changes and make suggestions on how to measure change
- Choose rewards for achieving goals
- Make a follow-up appointment to monitor progress

Source: Adapted from Berg-Smith SM, Stevens VJ, Brown KM, et al. A brief motivational intervention to improve dietary adherence in adolescents. *Health Education Research: Theory and Practice* 1999;14(3):399-410.

- The counselor asks if they can offer advice. An example of advice given is "I would recommend that you increase your calorie intake each day by adding an additional afternoon snack. This will improve your rate of weight gain. However, it is your choice. If you decide at some time that you might want to do this I will be glad to help you. In the meantime, may I call you periodically to see how you are doing?"

### Ambivalent about Dietary Change

- The counselor attempts to determine the factors that are causing ambivalence and to empower the adolescent to make changes.
- The counselor asks the adolescent what she likes and dislikes about her current diet. Alternatively, the health provider can ask what the pros and cons to making a specific dietary change would be. It is often best to have the teen start by listing the pro's first. This sets a positive atmosphere.
- The teen is asked what she thinks the next step should be. If she is not able to think of a next step the counselor works with her to brainstorm a list of possibilities.
- A respectful tone is used and the adolescent is reminded that even if she decides not to make any changes at this time, the counselor will be available to help her in the future. An offer to call the teen periodically to check on her health is made.

### Ready to Make Dietary Change

- The counselor works with the motivated adolescent to develop a plan for making changes.
- The adolescent is asked what changes she thinks she should make. Specific ideas are gathered using open-ended questions, and prompts when necessary.
- The teen is asked to prioritize the list of suggestions made.
- The counselor helps the teen identify one or two changes that she would like to make first. Ideas for how to measure change and how to overcome barriers are also cooperatively developed.
- Rewards for successfully implementing dietary changes are determined.

### Ending the Appointment

- The adolescent is praised for her involvement in the appointment activities and suggestions made are summarized. Words of encouragement are offered.
- Follow-up visits are scheduled at this time.

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