Jamey Whitmer is taken to see her pediatrician by her parents, who have noticed she appears to stop breathing while sleeping. She is diagnosed with sleep apnea related to her weight and referred to the registered dietitian for nutrition counseling.

I. Understanding the Disease and Pathophysiology

1. Current research indicates that the cause of childhood obesity is multifactorial. Briefly outline the roles of genetics, environment, and nutritional intake in development of obesity in children.

Although obesity is not inherited in families, multiple genes may be involved in the development of obesity that contribute to body weight (i.e. appetite, energy intake, taste preferences, resting energy expenditure, the thermic effect of food, nonexercise activity thermogenesis, and the body’s efficiency in storing energy) and how a person responds to environmental factors (i.e. diet, physical activity, and culture). Contradictory to this, studies have shown that BMI can be passed from parents to offspring independent of environment. Also (for those genetically predisposed to obesity especially), lifestyle and environmental factors determines the severity of obesity. For example, an environment including low-cost, tasty, energy-dense food, in large portions can increase the severity of the disease. This is also known as an “obesigenic environment” (Nelms, Sucher, Lacey, & Roth, p. 257-258).
2. Describe health consequences of overweight and obesity for children.

Adolescent obesity has both short- and long-term health consequences. The health consequences of those overweight and obesity include:

- Overweight and obesity as an adolescent or adult.
- Psychosocial difficulties
  - Negative self-image
  - Depression
  - Decreased socialization
- Cardiovascular risk factors
  - Hyperlipidemia
  - Hypertension
  - Hyperinsulinemia
- Type 2 diabetes

(Nelms, p. 255-256) and (Mahan, Excott-Stump, & Raymond, p. 402).

3. Jamey has been diagnosed with sleep apnea. Define sleep apnea.

Sleep apnea is a potentially serious sleep disorder in which breathing repeatedly stops and starts and is associated with loud snoring and restless sleep (“Sleep apnea”).

4. Explain the relationship between sleep apnea and obesity.

Fat deposits around the upper airway due to excess weight in an overweight or obese person may obstruct breathing and cause sleep apnea (“Sleep apnea”).

II. Understanding the Nutrition Therapy

5. What are the goals for weight loss in the pediatric population?

Goals for weight loss in the pediatric population include focusing on healthy eating and increasing physical activity to decrease in the rate of weight gain, maintenance or weight, and only in severe cases slow, gradual weight loss. The goals for each individual child will be different. Also, the use of highly restrictive diets or medication is reserved for only when other diseases are present or if there are no other options (Mahan, p. 402).
6. Under what circumstances might weight loss in overweight children not be appropriate?

The only time weight loss is recommended is when the child displays comorbid conditions or has completed the adolescent growth spurt. Therefore weight loss is not appropriate for children unless they have other disease conditions present from the obesity or there are no other options (Mahan, p. 424).

7. What would you recommend as the current focus for nutritional treatment of Jamey’s obesity?

For the current focus for nutritional treatment of Jamey’s obesity, I would recommend general nutrition education that includes consumption of 5 or more servings of fruit and vegetables per day, reducing consumption of sweetened beverages, participation in 60 minutes of physical activity per day, and limiting screen time to 2 hours or less per day (Mahan, p. 424).

III. Nutrition Assessment

8. Evaluate Jamey’s weight using the CDC growth charts provided (p.8): What is Jamey’s BMI percentile? How is her weight status classified? Use the growth chart to determine Jamey’s optimal weight for her height and age.

Jamey is slightly above the 97th percentile (approximately 99th percentile) for her age based on her BMI of 24.9. Her weight status is classified as obese due to the fact that Jamey has a BMI greater than or equal to the 95th percentile for her age and sex (Nelms, p. 243). Based on the growth chart, Jamey’s optimal weight for her height and age is 72 pounds.

9. Identify two methods for determining Jamey’s energy requirements other than indirect calorimetry, and then use them to calculate Jamey’s energy requirements.

1. Equation for calculation of estimated energy requirement (EER) as established by the Institute of Medicine. This is the most accurate determination and is for females 9 through 18 years old.

   \[ \text{EER} = \text{Total Energy Expenditure (TEE)} + \text{Tissue Deposition} \]
   \[ \text{EER} = 135.3 - 30.8 \times \text{age in years} + \text{PA} (10.0 \times \text{weight in kg} + 934 \times \text{height in m}) + 25 \]
   \[ \text{Jaime’s EER} = 1682.9 \text{ kcal per day} = \textbf{1700 kcal per day} \]
Jaime’s PA = 1.00 = sedentary

2. Estimation of resting energy expenditure (REE) using a predictive equation established by Harris-Benedict. This is a less accurate determination and is use for females of any age.

\[ \text{REE} = 655.1 + (9.6 \times \text{weight in kg}) + (1.9 \times \text{height in cm}) - (4.7 \times \text{age in years}) \]
Jaime’s REE = 1385.1 kcal per day = 1400 kcal per day

10. Dietary factors associated with increased risk of overweight are increased dietary fat intake and increased calorie-dense beverages. Identify foods from Jamey’s diet recall that fit these criteria.

- Breakfast burritos
- Whole milk
- Coffee Cream
- Bologna
- Mayonnaise
- Twinkies
- Fritos
- Fried chicken
- Butter
- Microwave popcorn
- Coca-Cola

11. Calculate the percent of kcal from each macronutrient and the percent of kcal provided by fluids for Jamey’s 24-hour recall.

Calculations were carried out by using the exchange system.

AM:
- Carbohydrate (g): 72
- Fat (g): 43
- Protein (g): 32

Lunch:
- Carbohydrate (g): 117
- Fat (g): 63
- Protein (g): 64

After school snack:
- Carbohydrate (g): 63
- Fat (g): 29
- Protein (g): 32

Dinner:
- Carbohydrate (g): 115
- Fat (g): 96
- Protein (g): 80

Snack:
- Carbohydrate (g): 37.5
- Fat (g): 6
- Protein (g): 3

Total carbohydrate: 404.5 g (4 kcal/g) = 1618 kcal
Total fat: 237 g (9 kcal/g) = 2133 kcal
Total protein: 211 g (4 kcal/g) = 844 kcal
Total kcal = 4595 kcal

Percent kcal from carbohydrate: (1618 kcal / 4595 kcal) x 100 = 35.2 %
Percent kcal from fat: (2133 kcal / 4595 kcal) x 100 = 46.4 %
Percent kcal from protein: (844 kcal / 4595 kcal) x 100 = 18.4 %
Percent kcal from fluids:
- 162 g from carbohydrate (4 kcal/g) = 648 kcal
- 60 g from fat (9 kcal/g) = 540 kcal
- 28 g from protein (4 kcal/g) = 112 kcal

Total kcal from fluids = (1300 kcal / 4595 kcal) x 100 = 28.3 %
12. Increased fruit and vegetable intake is associated with decreased risk of overweight. What foods in Jamey’s diet fall into these categories?

- Fried okra
- Mashed potatoes
- Apple juice

13. Use the ChooseMyPlate online tool to generate a customized daily food plan. Using this eating pattern, plan a 1-day menu for Jamey.

<table>
<thead>
<tr>
<th>NUTRIENT</th>
<th>YOUR INTAKE</th>
<th>RDA</th>
<th>% RDA</th>
<th>MIN</th>
<th>MAX</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alcohol (g)</td>
<td>0 g</td>
<td>—</td>
<td>0 %</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Calcium (mg)</td>
<td>0 mg</td>
<td>1300 mg</td>
<td>0 %</td>
<td>1300</td>
<td>1300</td>
</tr>
<tr>
<td>Calories (kcal)</td>
<td>0 kcal</td>
<td>—</td>
<td>0 %</td>
<td>1650</td>
<td>1700</td>
</tr>
<tr>
<td>Calories from Carbohydrate (kcal)</td>
<td>0 kcal</td>
<td>—</td>
<td>0 %</td>
<td>908</td>
<td>935</td>
</tr>
<tr>
<td>Calories from Monounsaturated Fat (kcal)</td>
<td>0 kcal</td>
<td>—</td>
<td>0 %</td>
<td>198</td>
<td>204</td>
</tr>
<tr>
<td>Calories from Polyunsaturated Fat (kcal)</td>
<td>0 kcal</td>
<td>—</td>
<td>0 %</td>
<td>198</td>
<td>204</td>
</tr>
<tr>
<td>Calories from Protein (kcal)</td>
<td>0 kcal</td>
<td>—</td>
<td>0 %</td>
<td>248</td>
<td>255</td>
</tr>
<tr>
<td>Calories from Saturated Fat (kcal)</td>
<td>0 kcal</td>
<td>—</td>
<td>0 %</td>
<td>0</td>
<td>119</td>
</tr>
<tr>
<td>Dietary Fiber (g)</td>
<td>0 g</td>
<td>26 g</td>
<td>0 %</td>
<td>20</td>
<td>26</td>
</tr>
<tr>
<td>Potassium (mg)</td>
<td>0 mg</td>
<td>4700 mg</td>
<td>0 %</td>
<td>4700</td>
<td>4700</td>
</tr>
</tbody>
</table>

www.Fitday.com

AM: 2 slices of whole grain toast with 2 tbsp. strawberry jelly, 1 egg scrambled, 8 oz. low-fat milk, 8 oz. coffee with Splenda and ½ cup low-fat milk

Lunch: 1 turkey sandwich (3 oz. turkey, ½ cup lettuce, ½ cup tomatoes, 1 tsp. mayonnaise, 2 slices whole grain bread), 8 oz. water

After school snack: ¾ cup low-fat yogurt with ½ cup fresh blueberries mixed in

Dinner: 1 cup baked potato wedges, 3 oz. grilled chicken breast (seasoned), ½ cup steamed broccoli, ½ cup cooked carrots (veggies mixed together and seasoned), 8 oz. diet Coca-Cola
Snack: 1/3 cup hummus with 1 oz. wheat crackers and 1 cup raw celery

14. Now enter and assess the 1-day menu you planned for Jamey using the MyPlate SuperTracker online tool. Does your menu meet macro- and micronutrient recommendations for Jamey?

<table>
<thead>
<tr>
<th>NAME</th>
<th>AMOUNT</th>
<th>UNIT</th>
<th>CALS</th>
<th>FAT(G)</th>
<th>CARBS(G)</th>
<th>PROT(G)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bread, whole wheat</td>
<td>4</td>
<td>oz</td>
<td>301</td>
<td>4</td>
<td>54</td>
<td>12</td>
</tr>
<tr>
<td>Jelly, all flavors</td>
<td>2</td>
<td>tablespoon</td>
<td>101</td>
<td>0</td>
<td>27</td>
<td>0</td>
</tr>
<tr>
<td>Egg, whole, cooked, scrambled</td>
<td>3</td>
<td>oz</td>
<td>142</td>
<td>10</td>
<td>27</td>
<td>9</td>
</tr>
<tr>
<td>Milk, 1% fat</td>
<td>1.5</td>
<td>cup</td>
<td>154</td>
<td>4</td>
<td>18</td>
<td>12</td>
</tr>
<tr>
<td>Turkey</td>
<td>3</td>
<td>oz</td>
<td>159</td>
<td>6</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>Lettuce, raw</td>
<td>0.5</td>
<td>cup, shredded or</td>
<td>4</td>
<td>0</td>
<td>1</td>
<td>0</td>
</tr>
<tr>
<td>Tomatoes, raw</td>
<td>0.5</td>
<td>cup</td>
<td>16</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>Mayonnaise, regular</td>
<td>0.33</td>
<td>tablespoon</td>
<td>33</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Yogurt, plain, lowfat milk</td>
<td>0.75</td>
<td>cup (8 fl oz)</td>
<td>116</td>
<td>3</td>
<td>13</td>
<td>10</td>
</tr>
<tr>
<td>Blueberries, raw</td>
<td>0.5</td>
<td>cup</td>
<td>41</td>
<td>0</td>
<td>11</td>
<td>1</td>
</tr>
<tr>
<td>Potatoes, baked, flesh, with salt</td>
<td>1</td>
<td>cup</td>
<td>113</td>
<td>0</td>
<td>26</td>
<td>2</td>
</tr>
<tr>
<td>Chicken, breast</td>
<td>3</td>
<td>oz, boneless, coc</td>
<td>166</td>
<td>7</td>
<td>0</td>
<td>25</td>
</tr>
<tr>
<td>Broccoli, cooked, from fresh</td>
<td>0.5</td>
<td>cup</td>
<td>44</td>
<td>2</td>
<td>6</td>
<td>2</td>
</tr>
<tr>
<td>Carrots, cooked</td>
<td>0.5</td>
<td>cup</td>
<td>41</td>
<td>2</td>
<td>6</td>
<td>1</td>
</tr>
<tr>
<td>Hummus</td>
<td>0.33</td>
<td>cup</td>
<td>144</td>
<td>7</td>
<td>16</td>
<td>4</td>
</tr>
<tr>
<td>Crackers, wheat</td>
<td>1</td>
<td>oz</td>
<td>134</td>
<td>6</td>
<td>18</td>
<td>2</td>
</tr>
<tr>
<td>Celery, raw</td>
<td>1</td>
<td>cup</td>
<td>19</td>
<td>0</td>
<td>4</td>
<td>1</td>
</tr>
</tbody>
</table>

**Totals**

<p>| | | | | | | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1727</td>
<td>54.6</td>
<td>204.4</td>
<td>107.3</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

www.Fitday.com

28 % kcal (491 kcal) from fat, 47 % kcal (817 kcal) from carbohydrate, and 25 % kcal (428 kcal) from protein. This closely meets Jamey’s macro- and micronutrient recommendations.
15. Why did Dr. Lambert order a lipid profile and blood glucose tests? What lipid and glucose levels are considered altered (i.e. outside normal limits) for the pediatric population? Evaluate Jamey’s lab results.

Dr. Lambert most likely ordered a lipid profile and blood glucose tests due to Jamey’s 24-hour recall. Her 24-hour recall is extremely high in total fat (especially saturated fat) and simple carbohydrates (especially from fluids). In the pediatric population that Jamey is in, glucose of 70-110 mg/dL is considered normal and anything outside that range is considered altered. Cholesterol of 170 mg/dL or above, HDL of less than or equal to 55 mg/dL (45 mg/dL for males), a LDL of greater than or equal to 110 mg/dL, or a LDL/HDL ratio greater than or equal to 3.22 (3.55 for males) are all considered altered lipid profile values.

16. What behaviors associated with increased risk of overweight would you look for when assessing Jamey’s and her family’s diets? What aspects of Jamey’s lifestyle place her at increased risk for overweight?

The fact that Jamey consumes excess calories during the day and her low level of physical activity place her at an increased risk for overweight. Jamey and her family need to make lifestyle modifications in order to decrease her risk.

17. You talk with Jamey and her parents, who are friendly and cooperative. Jamey’s mother asks if it would help for them to not let Jamey snack between meals and to reward her with dessert when she exercises. What would you tell them?

I would tell them that snacking between meals is not a problem. Snacking can actually help to prevent overeating at meals and keep the metabolism going throughout the day. As long and snacks are well balanced with other meals, snacks can be greatly beneficial and should not be forbidden. Also, I would not advise using desserts as a reward. This could be confusing for Jamey because calorie-dense desserts are a contributing factor to her obesity and it is important to teach her that desserts are something that are consumed in moderation. A better reward for Jamey’s parents to use for when she follows her new dietary guidelines could be a non-food reward. I would suggest making a system where she can collect a sticker on a chart for every meal in which she follows her restrictions. A certain number of stickers will earn her certain prizes like a small toy or a big weekend trip to her favorite amusement park.
18. Identify one specific physical activity recommendation for Jamey.

The USDA recommends 60 to 90 minutes of physical activity daily in order to strengthen cardiovascular integrity, increase sensitivity to insulin, and expenditure of excess energy/calories (Mahan, p. 406). One specific recommendation for Jamey specifically is to take 1 of the hours that she would normally be playing video games and spend that time playing outside with either neighborhood friends, her little sister, or her parents. I would also recommend that Jamey’s parents encourage participation in a spring club sport such as little league basketball or softball, which provides Jamey with incentive and a purpose for her increased physical activity each day. This way, she will feel that her physical activity will pay off in making her a more successful athlete and feel better about herself when she starts a new sport.

IV. Nutrition Diagnosis

19. Select two nutrition problems and complete PES statements for each.

1. Excessive food/beverage intake (NI-2.2) related to strong appetite and lack of physical activity as evidenced by large, calorie-dense meals and snacks in 24-hour recall.

2. Overweight/Obesity (NC-3.3) related to high energy intake and physical inactivity as evidenced by BMI in the 99th percentile, which is greater than or equal to the 95th percentile for her age and sex.


V. Nutrition Intervention

20. For each PES statement written, establish an ideal goal (based on signs and symptoms) and an appropriate intervention (based on etiology).

1. Goal: Small goals will be made to slowly reduce her kcal intake to 1700 kcal/day and increase physical activity to 60 min/day over a period of one month.

   Intervention: Nutrition education for Jamey and her parents on healthy eating—increasing fruit and vegetable consumption and reduction of sugar-sweetened and high-calorie beverages and increasing physical activity to 60 minutes per day.
2. Goal: Bring BMI less than or equal to the 85th percentile (Nelms, p. 243), which is a BMI of less than 19.4 (Mahan, p.1059) as Jaime grows older into her adolescent years.

Intervention: Nutrition education on healthy eating and how to replace calorie-dense foods and beverages and high fat foods with nutrient-dense, low-fat, or sugar-free alternatives and incorporation of physical activity into the daily routine (of the family in addition to Jaime) in order to supply Jaime’s energy needs and keep her healthy as she grows.

21. Mr. and Mrs. Whitmer ask about using over-the-counter diet aids, specifically Alli (orlistat). What would you tell them?

I would tell Jaime’s parents about the drug and how that relates to their daughter. “Alli is a drug that inhibits gastrointestinal lipase by targeting the central nervous system, which reduces about 33% of absorption of dietary fat. Benefits include reduction of LDL (bad cholesterol) and elevation of HDL (good cholesterol) as well as improved glycemic control and reduction of blood pressure. Side effects include fecal urgency, oily spotting and flatus with discharge (Mahan, p.479). Due to Jaime’s young age, I do not recommend that she use this over-the-counter drug. Alli only ends up reducing absorption of 150 to 200 kcal/day (Mahan, p.479), which is something that Jaime can easily achieve by making changes in her current eating habits. Also, if Jaime can make changes in her eating and lifestyle habits as a young girl without relying on a medication, these habits will stay with her throughout the rest of her life allowing her to maintain a healthy weight and prevent chronic disease.”

22. Mr. and Mrs. Whitmer ask about gastric bypass surgery for Jamey. Using EAL, what are the recommendations regarding gastric bypass surgery for the pediatric population?

According to the EAL, it is strongly recommended that obese children under the age of 13 are generally not considered to be appropriate candidates for weight-loss surgery (“Executive Summary of Recommendations”).
VI. Nutrition Monitoring and Evaluation

23. What is the optimal length of weight management therapy for Jamey?

Weight management in children is multifactorial. Therefore, the optimal length of weight management therapy for Jamey is not set in stone, dependent on many factors, and will happen for as long as she needs it. Every child is different her BMI will come into the normal range as she grows and focuses on eating healthy and being physically active with the help of her family. Jaime will get healthier and decrease her BMI at her own pace.

24. Should her parents be included? Why or why not?

Yes, Jaime’s parents should definitely be involved because her intervention strategies require family support in order for her to be successful. Parents are essential for modeling food choices, healthy eating habits, and leisure activities for their children (Mahan, p. 403). It is essential that parents take part in the nutrition interventions so they can have an input of what they like and can do as a family to make the dietary and physical activity changes in Jaime’s life easier and help ease her sleep apnea and other health issues more quickly.

25. What would you assess during this follow-up counseling session?

- Jaime’s weight and height in order to monitor her BMI and percentile.
- Jaime’s new 24-hour recall to determine current food, beverage, and nutrient intake.
- Jaime’s blood work to monitor lipid profile and glucose serum levels.
- I would have a conversation with Jaime and her parents about how compliance to the new nutrition recommendations (including kcal/day reductions, increasing fruits and vegetables, and reduction of high-calorie beverages) and physical activity (gradual increase to 60 minutes per day) is going and if they have any question or concerns or if we need to adjust intervention strategies or goals.
References


