Childhood Overweight Case Study 2
FDNS 4050/6050

Patient History:
David is 9 years old and lives with his mom, Jessica, outside of Hawkinsville, Georgia. He has no siblings. David's parents divorced 3 years ago, and he rarely sees his father. Jessica works as a nurse practitioner at Taylor Memorial Hospital in the intensive care unit. Because of her varied work hours, Jessica's mom often takes care of David and helps him get ready for school. David is in the fourth grade at Pulaski County Elementary School.

David recently joined a basketball team, and was required by the county to have a physical exam prior to enrolling in the youth basketball league. The pediatrician who examined David at Pulaski County Health department indicated to the grandmother that David had gained a considerable amount of weight over the past two years. Measurements of David's height and weight were obtained beginning at four years of age and recorded until the current time (see below). The pediatrician also tested David's blood and found the following laboratory values.

Age	Wt (lbs)	Ht (in)
4	39	42
5	45	45
6	49	47
7	57	49
8	87	55
9	107	58

Laboratory values	
Total cholesterol	185 mg/dL
HDL	40 mg/dL
LDL	125 mg/dL
Triglycerides	85 mg/dL
Blood pressure	120/85 mmHg
Fasting blood glucose	110 mg/dL

Basketball is the only sport David participates in. Practice is usually once a week for 1 hour, and games are every Saturday. Most afternoons he goes home on the school bus and stays with his grandmother. Afterwards he usually does his homework, watches television and plays video games until his mom picks him up. David's grandmother lives on a non-productive cotton and peanut farm down a rural two-lane highway in Pulaski County. On the weekend if his mom is not working, they may take a walk together.

Lately, David's appetite has dramatically increased and his energy levels are low. In addition, David frequently complains of having to go to the restroom to urinate more than usual.

Nutrition History:
The following is a typical 24-hour intake for David:

***Breakfast*:** 1 Frisco breakfast sandwich from the local Hardees and large orange juice (12 ounces) or 2 large bowls of corn flakes with 2% milk (16 ounces)

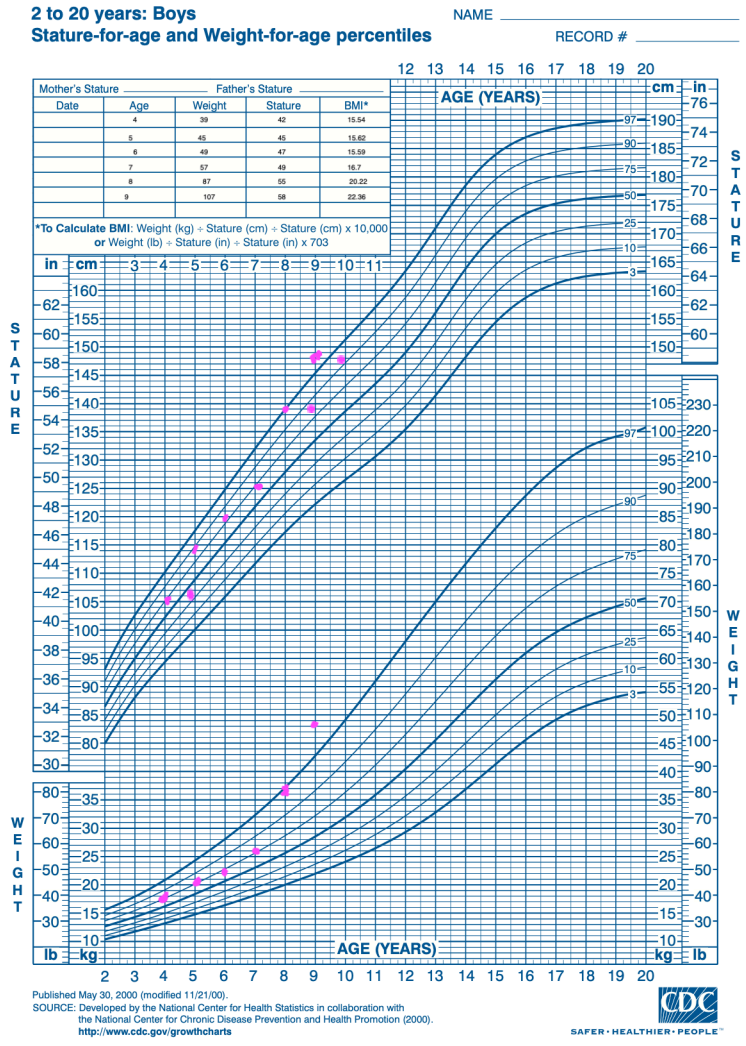
***Lunch*:** Eats at school; 2 corn dogs, fruit cup (6 ounces), 2 cups of tater tots, 1 cookie, juice (6 ounces)

***Snack*:** Cheetos, 3 big handfuls, 2 chocolate chip cookies, and a sweet tea (12 ounces)

***Supper*:** Fried fish (frozen; 2 large pieces), macaroni and cheese (1 cup), turnip greens (1 cup), 1 biscuit, and a sweet tea (12 ounces)

***Snack*:** Chocolate ice cream (1 cup)

1. Plot the growth data on the age/weight, age/height and the age/BMI charts (use CDC growth charts and attach them to your case study). What is your interpretation of his growth pattern (e.g. concerns, specific percentiles, future problems)? **[6 points]**



Until age 7, David's growth pattern was normal based on the CDC growth charts. However, in the last 2 years, David's weight and height have increased drastically, placing him in or above the 97th percentile in both categories. Although they both increased, which makes it seem like the weight gain may have come with the growth in height, his BMI also increased drastically. His BMI hovered around 15-16 until age 8, when it increased to 20.22 and 22.36 at age 9. At age 8, he was in the 95th percentile, which classifies him as obese (Brown, 2020). At age 9, his BMI was even higher than the BMIs of those in the 95th percentile. Although David did start gaining weight at the time in which most children reach the BMI rebound, his BMI increased more than a healthy amount. I do have several concerns that come with David's growth. For example, he may start puberty earlier than kids who are not overweight. In addition, obesity increases the risk for chronic diseases and is associated with increasing insulin levels. This can then lead to insulin resistance (Brown, 2020). In fact, his high appetite, low energy levels, and frequent urination lead me to believe that this may already be an issue. These are all health issues that one should try to prevent. Therefore, his weight gain has possible negative consequences for his health and well-being.

2. What factors in David's history may account for changes in his weight? List at least four. **[2 points]**

    1. He spends lots of time watching television and playing video games in the afternoons. Children through age 9, which is David's age, face a higher risk of obesity if they watch more than 1.5 hours of television each day, and I believe David does (Brown, 2020). His changes in growth began when his parents divorced and he began spending afternoons at his grandmother's home, where he watches tv and plays video games.
    2. David lacks much physical activity. He only plays a sport for about 2 hours each week (practice + game), and he is rather sedentary when at home. The only other activity noted is an occasional walk with his mother. This lack of physical activity could play a part in his weight change.
    3. His dramatic increase in appetite and low energy levels also influence his weight gain. These lead to inactivity and an increase in food consumption, which can cause one to gain weight.
    4. David consumes lots of unhealthy snacks throughout the day, and he consumes a lot of sugar in his sweet tea. His diet also includes a lot of saturated fats. His eating habits in conjunction with his physical activity could have impacted his weight gain.

3. Fill in the following chart. What are the normal values for children in his age group? In the comments section, address the following: Are the values considered normal? If not, what percentile do they fall under? You will need to do some research here! **[8 points]**

Biochemistry	His Value	Normal Value (9 y.o.)	Comments
Total cholesterol	185 mg/dL	<170 mg/dL (Cholesterol: Types, 2020)	No, his total cholesterol is higher than it should be. He is at least in the 75th percentile. His value falls between the 75th and 95th percentiles (Skinner et al., 2011).
HDL	40 g/dL	>45 mg/dL (Cholesterol: Types, 2020)	No, his HDL levels are lower than they should be. He falls between the 5th and 25th percentiles, but much closer to the 5th (Skinner et al., 2011)
LDL	125 mg/dL	<110 mg/dL (Cholesterol: Types, 2020)	His LDL levels are very high for his age, putting him in about the 90th percentile (Skinner et al., 2011)
Triglycerides	85 mg/dL	<150 mg/dL (Triglyceride Levels, 2021)	Yes, his triglyceride levels are normal.
Blood pressure	120/85 mmHg	95-110/56-70 mmHg (Vital Signs, n.d.)	No, his blood pressure is rather high for his age. He seems to fall into about the 95th percentile for blood pressure (Blood Pressure Levels, n.d.).
Fasting BG	110 mg/dL	70 to 100 mg/dL (Blood Sugar Test, 2021)	No, his fasting blood glucose levels are high, putting him in the 97th percentile (Peplies et al., 2014).

4. Should you be concerned about David's increase in appetite? Are his dietary and physical patterns normal for young boys his age? Explain. **[8 points]**

I think we should be concerned about David's increase in appetite because it is causing him to eat much more than the average boy his age. Also, it would be more appropriate for his appetite to be so large if he was extremely active, but David does little physical activity. The average 9-year-old boy should eat between 1,600 and 2,000 calories (Parent Tips: Calories, n.d.); however, David seems to be eating way above this number daily. Although his diet does include some nutritious foods throughout the day, his diet also includes lots of sugary foods and lacks many vegetables and whole fruits. School-age children are encouraged to engage in at least 60 minutes of physical activity each day (Brown, 2020), but David does not seem to do this. Rather, he spends more time

watching television and playing video games, so his physical activity levels are not quite normal either.

5. Analyze his diet using a diet analysis program.
   a. How does his diet compare to recommendations for a boy his age with respect to nutrients (macronutrients + micronutrients)? What are the consequences of this type of diet? Looking for extensive analysis, here. Give specific numbers! **[8 points]**

Macronutrients:

David consumes about 106g of protein each day. This is much higher than the recommended 34g of protein that the Dietary Guidelines recommend that 9-year-old males eat. However, this makes up about 11% of his caloric intake, which does fall within the 10-30% that is recommended. 36.7% of David's caloric intake comes from fats, which is higher than the recommended 25-35%. David consumes about 489g of carbohydrates each day, which exceeds the recommended 130g (U.S. Department of Health and Human Services [HHS] and U.S. Department of Agriculture [USDA], 2015). However, similar to his protein intake, carbohydrates do make up the recommended percentage of his intake. David's high intake of the macronutrients could lead to several different consequences. Firstly, the large number of calories he consumes can cause him to be overweight, which it seems to be doing. In addition, the large number of carbohydrates he consumes along with their high glycemic indexes could lead to high blood glucose levels, increasing his risk for insulin resistance or type 2 diabetes (Brown, 2020). He is already having symptoms of these issues. Lastly, his low intake of fiber could lead to higher risk for cardiovascular disease and obesity. It could also cause constipation (Brown, 2020).

Protein: 106 g □ 34 g recommended

Fat: 36.7% of his diet □ 25-35% of diet recommended

Saturated fat: 52.1g □ 12.8% of his caloric intake □ recommended <10%

Carbs: 489.2 g □ 130 g recommended

Fiber: 23 □ 31 g recommended

Sugar: 217.1 g □ 23.6% of his caloric intake □ recommended <10%

(HHS & USDA, 2015)

Micronutrients:

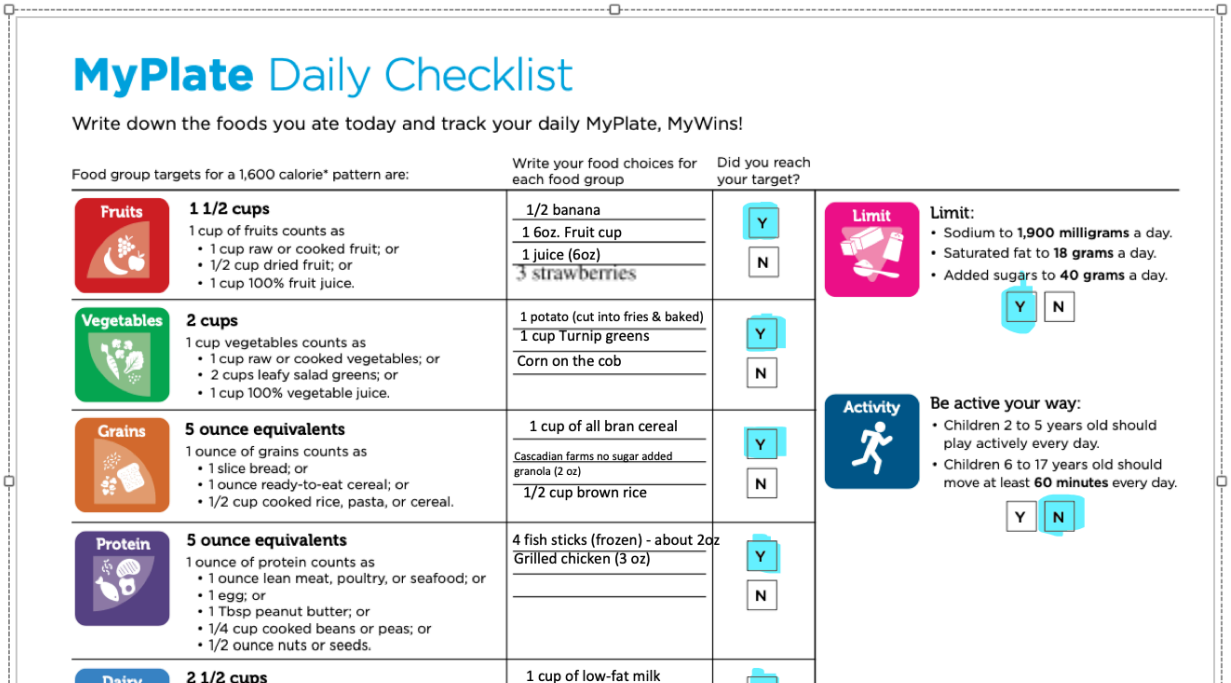
David consumes a much higher quantity of many of the micronutrients than is recommended for males his age. In fact, he consumes too much of each micronutrient except for potassium and vitamin D. Several of David's micronutrient intakes will have more obvious consequences on his body. For example, David's extremely high sodium intake and rather low potassium intake could increase his risk for hypertension (Brown, 2020). His lab results show that his blood pressure is already higher than the normal 9-year-old. Although David consumes far more calcium than is recommended, he does not consume enough

vitamin D, which is important for his body to properly absorb this calcium (Brown, 2020). Because he is still growing, he needs calcium for healthy bone formation. Therefore, he could have increased risk for bone fractures as he grows and also osteoporosis later in life.

Calcium: 1688.9 □ 1300 mg recommended
Iron: 19.3 mg □ 8mg recommended
Magnesium: 293.7 mg □ 240 mg recommended
Phosphorous: 1547.4. mg □ 1250 mg recommended
Potassium: 3379.2 mg □ 4500 mg recommended
Sodium: 6415.8 mg □ 2200 mg recommended
Zinc: 9.1 mg □ 8,g recommended
Copper: 1400 mcg □ 700 mcg recommended
Manganese: 4 mg □ 1.9 mg recommended
Selenium: 142.9 mcg □ 40 mcg recommended
Vitamin A: 13560.2 IU □ 600 mg RAE
Vitamin E: 11.3 mg □ 11 mg AT recommended
Vitamin D: 347.7 IU □ 600 IU recommended
Vitamin C: 215.2 mg □ 45 mg recommended
Thiamin: 2.4 mg □ .9 mg recommended
Riboflavin: 2.5 mg □ .9 mg recommended
Niacin: 18.3 mg □ 12 mg recommended
Vitamin B6: 1.5 mg □ 1 mg recommended
Vitamin B12: 3.9 mcg □ 1.8 mcg recommended
Vitamin K: 567.5 mcg □ 60 mcg recommended

(HHS & USDA, 2015)

b. Go to the MyPlate.gov website □ Online Tools □ Daily Checklist □ Use the table provided and your calculated energy needs from 5.a. to select a Checklist for David. Complete the checklist (can be handwritten) and attach to the case study. Take into consideration his weight, current likes, and blood work in the menu plan. **[8 points]**



MyPlate Daily Checklist

Write down the foods you ate today and track your daily MyPlate, MyWins!

Food group targets for a 1,600 calorie* pattern are:		Write your food choices for each food group	Did you reach your target?
Fruits	**1 1/2 cups** 1 cup of fruits counts as • 1 cup raw or cooked fruit; or • 1/2 cup dried fruit; or • 1 cup 100% fruit juice.	1/2 banana 1 6oz. Fruit cup 1 juice (6oz) 3 strawberries	Y N
Vegetables	**2 cups** 1 cup vegetables counts as • 1 cup raw or cooked vegetables; or • 2 cups leafy salad greens; or • 1 cup 100% vegetable juice.	1 potato (cut into fries & baked) 1 cup Turnip greens Corn on the cob	Y N
Grains	**5 ounce equivalents** 1 ounce of grains counts as • 1 slice bread; or • 1 ounce ready-to-eat cereal; or • 1/2 cup cooked rice, pasta, or cereal.	1 cup of all bran cereal Cascadian farms no sugar added granola (2 oz) 1/2 cup brown rice	Y N
Protein	**5 ounce equivalents** 1 ounce of protein counts as • 1 ounce lean meat, poultry, or seafood; or • 1 egg; or • 1 Tbsp peanut butter; or • 1/4 cup cooked beans or peas; or • 1/2 ounce nuts or seeds.	4 fish sticks (frozen) - about 2oz Grilled chicken (3 oz)	Y N
Dairy	**2 1/2 cups**	1 cup of low-fat milk	

Limit

Limit:
- Sodium to **1,900 milligrams** a day.
- Saturated fat to **18 grams** a day.
- Added sugars to **40 grams** a day.

Y N

Activity

Be active your way:
- Children 2 to 5 years old should play actively every day.
- Children 6 to 17 years old should move at least **60 minutes** every day.

Y N

Breakfast: All bran cereal with low-fat milk (cut up ½ banana and put it in the cereal)
Lunch: fish sticks, homemade baked fries, fruit cup, juice
Snack: oikos vanilla Greek yogurt, Cascadian Farms granola (no sugar added), and cut-up strawberries
Dinner: Grilled chicken, turnip greens, corn on the cob, brown rice
Snack: low-fat chocolate milk

6. a. What are physical activity recommendations for children David's age? **[2]**

Children that are David's age are recommended to engage in at least 60 minutes of physical activity every day. It is also recommended that parents/guardians limit children's screen time to no more than 2 hours each day (Brown, 2020).

b. Is David meeting these recommendations? **[2]**

Based solely on the information provided in the patient's history, David is not meeting these recommendations. He does not engage in enough physical activity most days of the week. However, if he is actually engaging in moderate to vigorous physical activity at school every day, he could be reaching these goals.

c. What suggestions could you make to his mother or grandmother in regards to his activity level? List at least four suggestions. Make these personal to David's life and current lifestyle. **[4 points]**
   1. She could limit the time he is allowed to spend watching television and playing video games.
   2. She could set an example for him by being active herself. For example, she could come up with games that they could participate in together that require them to move their bodies.
   3. She could encourage him to start a new sport, which would allow him to be more physically active without requiring as much effort from the grandmother.
   4. She could go on walks with him around the farm, since we know he likes going on walks.

7. What are the goals for weight loss in the pediatric population? Under what circumstances might weight loss in overweight children not be appropriate? **[2 points]**

For children, the goal of treatment is to get the child into the 85th percentile in BMI-for-age. For children who are considered overweight (the 85th-95th percentile), the goal is not weight loss. Rather, it is for them to slow their weight gain as they grow until they reach their target percentile. For children who are considered obese (greater than or equal to the 95th percentile), it is recommended that the children maintain their weight or lose no more than 1lb. per week until they reach the 85th percentile or less. However, for children in the 99th percentile or higher, it is recommended that they lose weight. They should lose no more than 2 lb. each week.

The ultimate goal for the pediatric population is to establish maintainable, healthy eating and physical activity habits that will continue throughout their lives (Brown, 2020). Weight loss in overweight children may not be appropriate if they are very young. For example, kids from ages 2 to 5 should not strive to lose weight at all, rather they should maintain their weight as they grow (Brown, 2020). Because kids still have a lot of height to gain, losing weight may not be the best plan. If they maintain their weight while they grow in height, their BMI will decrease on its own without getting too low.

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