

NUTR 7104 Reproductive & Pediatric Nutrition  
Case Study #5 Cystic Fibrosis  
(30 points)

Name: \_\_\_\_\_ Kelsey Higgins \_\_\_\_\_

Jennifer is a 10 year old girl with Cystic Fibrosis that was diagnosed at birth. She has minimal pulmonary disease normally and has been growing fairly well despite having some pancreatic insufficiency. Her weight and height have been following the 25<sup>th</sup> percentile. Her weight was 27 kg six months ago and is 25 kg currently and her height is 133 cm. However, Jennifer recently had a lung infection and her appetite has not yet returned to normal. Her parents ask to see you at her next outpatient medical visit to discuss her nutritional status. Jennifer is not very active. Her parents describe her as sedentary.

1. What are the goals of nutritional care for a child with Cystic Fibrosis? 2 points

The goals of nutritional care for a child with CF are to supply an adequate amount of calories while replacing pancreatic enzymes with each meal and snack. Vitamin, mineral, and salt supplementation are also important. **Avoid malnutrition.**

2. What are Jennifer's nutritional requirements (include energy and other nutrients)? 5 points

Jennifer's nutritional requirements are:

Energy: 105-110% of the DRI

Fat: Intake of 35-40% of the DRI

Protein: DRI

Vitamin A: 10,000 IU

Vitamin D: 400-800 IU

Vitamin E: 200-400 IU

Vitamin K: 300-500 IU

$$135.3 - (30.8 \times \text{age [y]}) + \text{PA} \times (10 \times \text{wt [kg]} + 934 \times \text{ht [m]}) + 25$$

$$\text{PA} = 1 \text{ (sedentary girl)}$$

$$135.3 - (30.8 \times 10) + 1 \times [(10 \times 27) + (934 \times 1.33)] + 25 = \sim 1,365 \times 1.1 = 1,500$$

**Textbook: Based on the IOM daily recommended intake, Jennifer's energy requirements would be: 2,175-2278 kcal/day as the estimated energy requirements for females 9-13 is 2071 kcal/day. (-1.5)**

3. What type of diet would you recommend for a child with Cystic Fibrosis (please be specific)? 5 points

At ten years old, Jennifer should be on a high-energy diet including 3 meals and 3 snacks/day to supply an adequate amount of calories and fat per day. She may need to add margarine to foods to increase fat and calorie content, as well as supplement with milkshakes throughout the day.

If Jennifer's symptoms persist (decreased appetite, weight loss) she may need to be on continuous tube feeds (1-2 kcal/mL) overnight supplying 30-50% of her energy needs. This could be done for a short time period until her lung infection is taken care of and her appetite resumes, then the TF could be tapered off.

Either way, she will need to continue to take enzymes either before meals and snacks, or given enzymes at intervals (start of tube feed, mid-feed, and end of feed) during tube feedings.

4. At Jennifer's age, what should her vitamin therapy regimen include and how would you monitor her compliance/progress? 5 points

Jennifer's vitamin regimen would include taking fat-soluble vitamins A, D, E, and K. I would suggest she take a CF-specific multivitamin if the family can afford it so she only has to worry about taking a maximum of 2 pills/day. If the family is unable to afford it, she could take a regular multivitamin along with additional individual vitamins to meet her needs. These are cheaper and are available at any drug or grocery store, but Jennifer would have to take 4-5 pills/day.

I would monitor her compliance and progress by frequent follow-ups speaking with her and her parents about when and how she takes the vitamins. 48000

5. What type of pancreatic enzyme preparation would you recommend for Jennifer and why? What dose would you suggest for her (be specific)? 5 points

I would recommend Jennifer take an enteric-coated pancreatic enzyme so the acidic environment of the stomach will not destroy them. Since Jennifer is an older child, she can swallow the enzyme capsule whole with any liquid before the meal to improve absorption. Extra enzymes can be taken for high-fat meals or an extra dose should be taken if the meal lasts longer than 60 minutes after their initial dose of enzymes.

I would suggest Jennifer be on 500-2,500 U lipase/kg/meal.

10 year old girl, weight 25 kg

Enzyme dose: Creon 24,000 – 2 capsules per meal

Creon 24,000 X 2 = 48,000 U lipase/meal

48,000/25 kg= 1,920 U lipase/kg/meal

6. Children with Cystic Fibrosis are at a greater risk for distal intestinal obstruction syndrome (DIOS) and constipation. How would you treat this condition in Jennifer? 5 points

DIOS is an acute fecal obstruction (complete or incomplete) in the ileocecum and is a complication of pancreatic insufficiency. It differs from constipation, which is a gradual fecal impaction of the total colon. If Jennifer developed DIOS, I would suggest treating it with oral laxatives (which is what constipation is treated with; a.k.a. Miralax), an intestinal lavage or enema, use of a balanced osmotic electrolyte solution, and rare but if needed: surgical intervention.

7. Adolescents with Cystic Fibrosis are at increased risk for Cystic Fibrosis-Related Diabetes (CFRD). What nutrition recommendations would you give to Jennifer and her family if she were diagnosed with CFRD? 3 points

If Jennifer were diagnosed with CFRD I would recommend they continue a liberal diet with no restrictions on total calories, fat, or salt. I would educate them on insulin therapy, carbohydrate counting, and emphasizing total carbohydrate intake versus source of carbohydrate. I would also discuss limiting foods and drinks high in simple sugars.

Great work. 28.5 / 30