

HCG Diet and Cystic Fibrosis

West Coast University

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NURS 225: Nutrition in Health and Disease

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Topic # 1: HCG Diet**Part I, Criteria # 1: Identification of Nutrients**

According to the Dudek (2016), the RDAs represent the average daily-recommended intake to meet the nutrient requirements of 97% to 98% of healthy individuals by life stage and gender. When estimating the nutritional needs of people with health disorders, health professionals use the RDA's as a starting point and adjust them according to the individual's need (Dudek, 2013). Even though HCG is a hormone injection program, there are extremely strict and limited food choice to their diet plan such as: 500 calories limit per day, no cosmetic products that contain fat in them, 2 small apples are not an expectable exchange for 1 apple. Table 1 below lists some foods that patients are allowed to choose from for daily intake (Simeons, 2016).

Table 1 The Original HCG Diet Protocol by Dr. Simeons

<i>The Original HCG Diet Protocol by Dr. Simeons</i>	
Breakfast:	Tea or coffee in any quantity without sugar. Only one tablespoonful of milk allowed in 24 hours. Saccharin or Stevia may be used.
Lunch:	1. 100 grams of veal, beef, chicken breast, fresh white fish, lobster, crab, or shrimp. All visible fat must be carefully removed before cooking, and the meat must be weighed raw. It must be boiled or grilled without additional fat. Salmon, eel, tuna, herring, dried or pickled fish are not allowed. The chicken breast must be removed from the bird [prior to cooking.] 2. One type of vegetable only to be chosen from the following: spinach, chard, chicory, beet-greens, green salad, tomatoes, celery, fennel, onions, red radishes, cucumbers, asparagus, cabbage. 3. One breadstick (grissino) or one Melba toast. 4. An apple, orange, or a handful of strawberries or one-half grapefruit.
Dinner :	The same four choices as lunch (above.)

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Due to such strict rules and limitation on food selection, patients would end up with deficiency in two important macronutrients such as carbohydrate and fat. As we can see, if we plug in some foods from Table 1 above into MyFitnessPal website we would end up with 509 calories, which is very close to what the HCG program requires (Lose weight with MyFitnessPal. Retrieved from <http://www.myfitnesspal.com/>). However, if we look at the amount of carbohydrate remaining, it is obvious that patients only consume 50% of their daily-recommended calories. Carbohydrate is a macronutrient that is important in providing energy for the daily living.

Clearly, patients using HCG program are very limited on fat consumption. According to example below, if we follow The Original HCG Diet Protocol by Dr. Simeons, we would end up with only 5 grams from fat when the daily-recommended intake is 40 grams. Fats come in multiple different forms. While some are bad and should be limited, some are essential for the body; therefore, limiting the amount of fat consumption to almost completely nothing is not a good diet plan. On the other side, this program provides a very sufficient amount of protein to the patients. As we can see from Table 2 below, patient fulfilled the amount of daily-recommended requirement, 60 grams, with the additional 4 grams. This might be also the key element to the program that claims that by injecting HCG, patients will not feel hungry. It might be because the high amount of protein patients consume that make them feel less hungry.

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Table 2 Patient Food Diary from MyFitnessPal Showing Daily Intake Goals versus RDAs.

Breakfast		Calories kcal	Carbs g	Fat g	Protein g	Sodium mg	Sugar g
Red diamond - Sugar Free Tea, 8 oz		0	0	0	0	5	0
Raw - Milk, 1 tsp(s)		3	0	0	0	2	0
Add Food Quick Tools		3	0	0	0	7	0
Lunch							
Homemade - Chicken Breast - Boiled, 100 gram		162	0	3	30	0	0
Asparagus - Cooked, boiled, drained, 1 cup		40	7	0	4	25	2
Granforno - Grissino Breadstick, 1 breadstick		20	4	0	1	0	0
Fruit - Apple, Whole, 1 ea		50	22	0	0	2	17
Add Food Quick Tools		272	33	3	35	27	19
Dinner							
Generic - Boiled Lobster Tail, 100 gram		89	2	1	19	486	0
Atkins - Plain - Spinach, Steamed, 1 cups		75	11	1	9	0	0
Granforno - Grissino Breadstick, 1 breadstick		20	4	0	1	0	0
Fruit - Apple, Whole, 1 ea		50	22	0	0	2	17
Add Food Quick Tools		234	39	2	29	488	17
Snacks							
Add Food Quick Tools							
Totals		509	72	5	64	522	36
Your Daily Goal		1,200	150	40	60	2,300	45
Remaining		691	78	35	-4	1,778	9
		Calories kcal	Carbs g	Fat g	Protein g	Sodium mg	Sugar g

Part I, Criteria # 2: RDA Approval Analysis

As mentioned previously, Recommended Dietary Allowances (RDAs) is the average daily dietary intake level sufficient to meet the nutrient requirement of 97% to 98% of healthy individuals in a particular life stage and gender group (Dudek, 2013). Even though the amount of intake varies on the individual, HCG program still provides patient with very little in micronutrients such as calcium, potassium, iron, fiber, sodium, vitamin A, and vitamin C. However, out of these nutrients, there are five nutrients that the diet is very deficient in: sodium, potassium, calcium, vitamin A, and iron. These 5 nutrients are not even at 50% of the daily-

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recommended intake. Sodium plays an important role in fluid and electrolyte balance. Even though deficiency is rare, patient can experience nausea, dizziness, and/or muscle cramps (Dudek, 2013). Potassium is also important in fluid and electrolyte. It also has nerve impulse transmission function and skeletal and cardiac muscle activity. Deficiency will lead to muscle weakness, anorexia, confusion, and irregular heartbeats (Dudek, 2013). Calcium involves in bone and teeth formation, blood clotting, nerve transmission, contraction and relaxation of muscles, and blood pressure regulation. Deficiency in this mineral can lead to impaired growth in children and osteoporosis in adults (Dudek, 2013). Vitamin A is very important in formation of visual purple, normal growth and development of bones and teeth, healthy skin and hair, and also important in immune function. Deficiency can result in ceases of bone growth, dry skin, decrease saliva production, and impair immune system (Dudek, 2013). Last but not least, iron is very important in transporting oxygen. Iron in foods exists in two forms: heme iron, found in meat, fish, and poultry, and nonheme iron, found in plants such as grains, vegetables, legumes, and nuts. The majority of iron in the diet is nonheme iron (Dudek, 2013).

Part 2, Criteria 1# Nutrition and Pathophysiology

Cystic fibrosis is a genetic disorder where the individual inherits one defective gene (mutation of the transmembrane conductance regulator gene [CFTR] located on chromosome 7) from each parent and is “characterized by abnormally thick mucus secretions from the epithelial surfaces that results in progressive lung disease, pancreatic insufficiency and dysfunction of the gastrointestinal and genitourinary systems”. Due to the CFTR’s inability to function properly leads to obstruction of the ducts and glands of affected organs such as the lungs and pancreas,

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digestive tract, liver, skin and reproductive organs (Nahikian-Nelms, Sucher, & Lacey, 2016, pp. 650).

Patients with cystic fibrosis, enzymes are suppressed and unable to reach the small intestines related to pancreatic insufficiency secondary to obstructed ducts. These patients will show symptoms such as abdominal distention; frequent bowel movements that are oily, bulky, and foul smelling; and even with normal appetite will present with poor growth pattern, decreased muscle mass and decreased subcutaneous tissue. These patients, both children and adults, are also at risk for electrolyte imbalance and dehydration due to excessive sweating in hot weather and fever related to the increased levels of chloride and sodium in their sweat. Other complications that occur because of the disease process include varices and cirrhosis of the liver with portal hypertension; cystic fibrosis related diabetes (10% to 15% of adults of adults) with subsequent clinical complications is acquired. Also, patients with cystic fibrosis have a higher risk of infection (mainly *Staphylococcus aureus* and *Pseudomonas aeruginosa*) due to defective or impaired cilia action, which can lead to the inability to clear mucus from the lungs due to the defective regulation of the respiratory tract. The major cause of death (more than 95% of patients) with cystic fibrosis patients is pulmonary insufficiency, which in turn leads to pulmonary failure (Nahikian-Nelms, Sucher, & Lacey, 2016, pp. 650).

To prevent nutritional deficiencies, maintain nutritional status, and maximize growth of patients with cystic Fibrosis, early detection is of the utmost importance. Some of these diagnostic tests to help with early detection include DNA analysis of the CFTR gene to confirm mutation, pancreatic function tests, pulmonary function tests, and a sweat chloride test (usually done during the newborn screening). “Common nutrition diagnostic labels for cystic fibrosis include inadequate energy intake, inadequate oral intake, increased energy needs, malnutrition,

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less than optimal intake of fats, inappropriate intake of types of carbohydrates, inconsistent carbohydrate intake, inadequate vitamin and mineral intake, altered GI function, altered nutrition-related laboratory values, underweight, unintended weight loss, self-monitoring deficit, limited adherence to nutrition-related recommendations, and poor nutrition quality of life” (Nahikian-Nelms, Sucher, & Lacey, 2016, pp. 653). Most studies show that cystic fibrosis patients have vitamin and mineral deficiencies including Vitamin A, Vitamin D, Vitamin E, and Iron and Zinc (mostly children and adolescence). Although Vitamin A deficiency is common, it also can be misleading because during an infection or an acute illness a patient’s the serum plasma Vitamin A levels may be decreased. Due to the increased prevalence of bone fractures and osteoporosis, Vitamin D needs to be monitored carefully to ensure they are receiving the right amount because studies have also shown that CF patients still have low levels of Vitamin D concentrations despite intake of supplements (Nahikian-Nelms, Sucher, & Lacey, 2016, pp. 651-652).

Part 2, Criteria # 2: Medical and Nutrient Related Interventions and Dietary Needs

Timely interventions and accurately assessing their nutritional status is very important because many cystic fibrosis patients may present with multiple nutritional diagnoses at any given time related to the complexity of their disease. Every treatment plan for CF patients will vary from patient to patient but, also usually include the “following components; airway clearance techniques; oral, inhaled and nebulized medications; nutrition therapies; and a fitness plan” (Cystic fibrosis Foundation, n.d.); and nutritional-related medication management with Pancreatic Enzyme Therapy.

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“Because a significant number of individuals with CF have pancreatic insufficiency, malabsorption of dietary fat, protein, fat-soluble vitamins, and other nutrients often occurs... Individuals with CF are prescribed pancreatic enzyme supplements. These enzymes are specifically formulated with an enteric coating that allows for better absorption into the duodenum. The target dose is 1500 to 2500 unit’s lipase/kg... [and the] FDA has issued a rule requiring manufacturers of pancreatic enzyme supplements to obtain approval for their products [because of the inconsistencies in the formulation].” With this new FDA ruling in place, Pancreatic enzyme supplements, like any new drug, must go through the same standards of testing before being distributed to the public (Nahikian-Nelms, Sucher, & Lacey, 2016, p. 652).

Cystic fibrosis patients, especially with pancreatic insufficiencies, need adequate intake of calories to help with development and growth and these needs will vary based on each individual and their nutritional status. These patients usually need 1 ½ to 2 times that amount calories than someone without cystic fibrosis and “if an individual has significant growth deficits, lung disease, or malabsorption, energy requirements may be significantly increased (110%–200% of the RDA for age)”. Usually caloric intake is never restricted or minimized due to the majority of CF patients have difficulty gaining or maintaining their weight (Nahikian-Nelms, Sucher, & Lacey, 2016, p. 652). Cystic fibrosis patients have trouble absorbing fats related to pancreatic insufficiency and in turn they have trouble absorbing fat-soluble vitamins such as Vitamin A, Vitamin D, Vitamin E and Vitamin K, which are critical for normal growth. Besides taking these fat-soluble vitamins as supplements they need to ensure they consume appropriate amount of water-soluble vitamins, such as; Vitamin C and the B-complex vitamins (to include biotin and pantothenic acid, and folic acid) (Cystic fibrosis Foundation, n.d.).

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One treatment recommended for cystic fibrosis patients include Airway clearance, which allows the mucus that is thick and viscous to loosen up and dislodge from their lungs allowing for better oxygenation, improve lung function and helps decrease the risk of lung infections. Some techniques include: coughing or huffing; chest physiotherapy (including percussion with cupped hands or equipment can be prescribed and ordered through various manufacturers). Along with these Airway clearance techniques, usually cystic fibrosis patients are on long term bronchodilators (usually nebulized) that can result in abdominal pain and anorexia, corticosteroids, antibiotics like ciprofloxacin may have delayed absorption when taken with dairy products, mucus thinners, and “CFTR (cystic fibrosis transmembrane conductance regulator) modulator therapies. [They] are designed to correct the function of the defective protein made by the CF gene and there are currently [only] two FDA-approved CFTR modulators: ivacaftor (Kalydeco®) and lumacaftor/ivacaftor (Orkambi®)” (Cystic fibrosis Foundation, n.d.).

Part 3, Criteria # 1 Nutrient Calculations

Our patient is a 22-year-old female who is 5'5" (65 inches) and 112 pounds (50.9 kg).

BMI

Using this calculation, the patient’s BMI is 18.6 and according to the Quick Bite Interpreting BMI Chart, the patient’s BMI barely meets the Healthy Weight, which ranged from 18.5 to 24.9 (Dudek 2014, p. 7). “The 2002 Nutrition Consensus Report states that there is no perfect method to estimate the calorie needs of a person with CF” (Nahikian-Nelms, et al., 2016, p.652).

$$112 / 65 \times 65 (4225) = 0.0265 \times 703 = 18.6 \text{ BMI}$$

BMR

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Since the patient's BMI falls under the Healthy Weight category to estimate her caloric needs we will use the equation for a healthy adult, which is (weight in kg) x (30 kcal/kg). Using this calculation, we estimate that her calorie intake needs would be roughly be 1527 kcal. The BMI plus activity and food intake is the calculation documented below.

$$112 \times 10 = 1120 \times 0.20 \text{ (activity)} = 224 + 1120 = 1344 \times 0.1 \text{ (food)} = 134 + 1344 = 1478 \text{ calories/day}$$

CHO

For carbohydrate intake, should be individualized and “should be monitored to achieve glycemic control. Although carbohydrate is not restricted, patients should be taught to distribute carbohydrate calories throughout the day and to avoid concentrated carbohydrate loads” (Nahikian-Nelms, et al., 2016, p.653).

$$1478 \times 0.45 = 665 \text{ calories then/by } 4 \text{ calories/gram} = 166 \text{ grams/day}$$

$$1478 \times 0.65 = 960 \text{ calories then/by } 4 \text{ calories/gram} = 240 \text{ grams/day,}$$

Daily range 665-960 calories/day from CHO, 166 - 240 grams/day,

PRO

Protein intake, recommended intake is roughly 1.5 to 2.0 times the Daily Recommended Intake (DRI) for that age (Nahikian-Nelms, et al., 2016, p.653). “The Recommended Dietary Allowance (RDA) for protein for healthy adults is 0.8 g/kg” and “the Acceptable Macronutrient Distribution Range (AMDR) for protein for adults is 10% to 35% of total calories” (Dudek 2014, p. 54). With a caloric intake of 1527 kcal, minimum protein intake of 10% and protein equaling 4 kcals/gram, for a healthy patient would need a minimum intake of roughly 38.2 grams. Since a cystic fibrosis patient needs 1.5 to 2.0 times the normal intake of protein, at a minimum a cystic fibrosis patient would need 57.3 grams to 76.4 grams of protein per day.

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$112 \text{ lb.} / 2.2 \text{ kg/lb.} = 50.9 \text{ kg.} \times 0.8 \text{ gm/kg} = 40.7 \text{ grams protein daily, healthy person}$

Or

$40.7 \text{ grams} \times 1.5 \text{ times as much, requirement} = 61 \text{ grams/day protein} \times 4 \text{ calories/gram} = 244 \text{ calories/day}$

$40.7 \text{ grams} \times 2 \text{ times as much, requirement} = 81.4 \text{ grams/day} \times 4 \text{ calories/gram} = 326 \text{ calories/day}$

Daily range 244 - 326 calories/day, or 61 - 81 grams/day

FAT

For patients with cystic fibrosis, there is no restriction on fat intake because it is essential for weight maintenance. Unlike the 25% to 35% recommended fat intake for the normal population, cystic fibrosis patients require a greater fat intake of 35% to 40% of total kcal (Nahikian-Nelms, et al., 2016, p.653). With a caloric intake of 1527 kcal, maximum fat intake of 40% and fats equaling 9 kcals/grams, the patient would need a minimum intake of roughly 67.9 grams of fat per day.

$2839 \times 0.35 = 994 \text{ calories then/by } 9 \text{ calories/gram} = 110 \text{ grams/day}$

$2839 \times 0.40 = 1136 \text{ calories then/by } 9 \text{ calories/gram} = 126 \text{ grams/day}$

Daily range 994 – 1136 calories/day, or 110 – 126 grams/day

Part 3, Criterion #2 SMART Goals and Patient Care Plan

SMART Goal # 1: Patient will make a menu for two days, 3 meals/day with a heme rich protein food in two meals, menus will be discussed at the end of the shift. Patient was able to plan six meals with four containing heme rich proteins. Goal met SMART Goal # 2: Patient will consume 75% of 2 meals during this 12—hour shift. Goal met patient consumed 100% of breakfast and

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75% of lunch. SMART Goal # 3: Patient will consume a serving of probiotic rich food, (yogurt) daily by end of shift. Goal met, patient consumed a Greek yogurt for lunch.

Patient is a 22-year-old female who's 5'5" (65 inches) and 112 pounds (50.9 kg), BMI of 18.6 who was diagnosed with cystic fibrosis at two years old. She came to the ER complaining that she has trouble breathing. Her blood pressure is 130/86, heart rate 92 beats per minute, temperature of 98.8 degrees Fahrenheit, and oxygen saturation at 88% in room air. Patient denies any history of smoking or illicit drug use and occasionally has an alcoholic drink. Patient states that she is still taking Ciprofloxacin after having pneumonia about two weeks ago.

As an RN caring for a person with cystic fibrosis, there are many roles and duties that one must be responsible for. An RN must ask the patient if they have any type of food allergies. There are no particular foods that an adult with cystic fibrosis should really avoid, but you must take precautions before giving food that a patient may be allergic to. The RN must assess the patient for low protein by obtaining the serum prealbumin and globulin levels. Patient teaching would include the importance of maintaining a high protein, fat diet with a daily consumption of probiotics (Jafir, 2014). Listen to the patient and what she likes to eat, thus avoiding any ethnocentrism. Give the patient different options of high protein meals to choose from in order to effectively gain the nutrients needed. Advise the patient to consider what foods she prefers that are easy to chew that are also high in protein, and fat.

The plan for maintaining nutritional balance throughout the shift was implemented by first collaborating with the nutritionist to aid in planning a food menu that tailored the patient's needs, making sure to accommodate the patient's appetite. After the menu was provided, the patient decided on eat hot cereal, with scrambled eggs, and whole wheat toast for breakfast, lunch included Greek yogurt, butter lettuce salad and fruit, and for dinner roasted chicken, mashed potatoes with gravy, and edamame.

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Patient was asked what kind of high protein foods she would like to eat at home and replied with chicken, salmon, and steak. Patient airway was ensured before feeding by checking gag reflex and her ability to swallow. Suction was also readily available by her bedside. I monitored the patient's protein by obtaining labs and assessing her total protein, albumin, prealbumin and globulin levels.

Due to thick and sticky mucus build up in the lungs, it is very important that the RN check the patient's airways because it can suddenly get clogged. The nurse must auscultate breath sounds and recognize wheezing, crackles, or rhonchi. Assess the patient's air way and ensure a patent passage. Teach the patient how to perform effective coughing and deep breathing techniques daily in order to help the secretion of sputum. Other duties include physiotherapy to aid in secretion of the mucus. The patient should be in a comfortable position with the head elevated in a semi-fowler position. Thick, sticky mucus also makes it easier for bacteria to colonize into the lungs so the RN must assess the patient for any lung infections. This may also result in the patient preferring softer foods, for ease of eating and swallowing. The nurse must check labs such as blood tests for WBC and platelet count, ABGs, sputum culture, as well a chest x-ray. The thick mucus can also block tubes or ducts in the pancreas (George & Hazle, 2016). The thick mucus can lead to malnutrition due to digestive enzymes not being able to reach the small intestine.

Educate the patient in the importance of physical exercise and how it helps with improving GI motility and respiratory muscles (George & Hazle, 2016).

During patient teaching, she showed willingness to learn as she stated that she learns better if I demonstrated techniques. Patient showed understanding as she demonstrated effective coughing and deep breathing techniques, preparation of meal plans and protein sources. She stated that she will

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practice these techniques daily to excrete her sputum. She also understood to take her antibiotics throughout the entire time it is prescribed (Miller & Stoeckel, 2016).

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